SOLUTION MANUAL

- Solutions for Diagnostic Test
- Solutions for Language Comprehension
- Solutions for Mathematical Skills
- Solutions for Data Analysis and Data Sufficiency
- Solutions for Intelligence and Critical Reasoning
- Solutions for Mock Tests (1 to 5)
Solutions for Diagnostic Test

Solutions for questions 1 to 20:

1. Let the length of the train be x metres. When the train crossed a person then the distance covered is its own length. So \( x = (66 - 12) \times \frac{5}{18} \times 12 = 180 \text{ m} \) Choice (4)

2. The price per orange when sold in dozens = \( \frac{72}{12} = Rs 6 \)
The price per orange when sold in scores = \( \frac{100}{20} = Rs 5 \)
The required percentage = \( \frac{6 - 5}{6} \times 100 = 16\frac{2}{3} \% \) Choice (2)

3. Let the sum be Rs P.
\[ x (1 - \frac{1}{2}) = 7200 \]
\[ \Rightarrow x = 11000. \] Choice (3)

4. The amount of profit that is distributed among the common share holders = \( 640000 - 80000 - 100000 = Rs 160000 \)
The required percentage = \( \frac{160000}{640000} = 25 \% \) Choice (1)

5. Let the total distance be 3x km.
Time taken to cover x km
\[ \left( \frac{1}{3} \right) \text{ of } 3x = x \]
\[ = x \text{ hours} \]
Time taken to cover the remaining 2x km
\[ = 2x \times 20 \text{ hours} \]
Average speed = \( \frac{\text{Total distance}}{\text{Total time}} \)
\[ \frac{3x \times 100}{14x} = 21\frac{3}{4} \text{ kmph.} \] Choice (4)

6. C and D are two consecutive kilometer stones
\[ \therefore \text{CD} = 500 \text{ m} \]

7. Let the first term be a.
Let the common difference be ‘d’.
\[ \Rightarrow 5 \times a + 5d + 6d + 7d + 8d + 9d = 7200 \]
\[ \Rightarrow 5a + 36d = 7200 \]
\[ \Rightarrow 5a = 7200 - 36d \]
\[ \Rightarrow a = \frac{7200 - 36d}{5} \]
\[ \Rightarrow a = \frac{7200}{5} - \frac{36d}{5} \]
\[ \Rightarrow a = 1440 - \frac{36d}{5} \] (Choice (2))

8. Let the sum be Rs P.
\[ \therefore P \times \frac{15 - 10}{100} = 450 \]
\[ \therefore P = Rs 9000 \] Choice (2)

9. Probability of getting at most 2 heads when 3 coins are tossed = \( 1 - \left[ \text{Probability of getting exactly 3 heads} \right] = 1 - \left( \frac{1}{2} \right)^3 = \frac{7}{8} \] Choice (2)

10. Let the two numbers be a and b
\[ \Rightarrow \frac{a}{b} = \frac{36}{18} \] (Choice (4))

11. p = m (3p + q + r) \rightarrow (1)
qu = m (p + 3q + r) \rightarrow (2);
r = m (p + q + 3r) \rightarrow (3)
(1) + (2) + (3) \Rightarrow p + q + r = 5m
\[ \therefore m = \frac{1}{5} \] Choice (4)

12. Let the distance between his house and school be x km.
\[ \frac{x \times x}{5 \times 6} = \frac{15}{60} \]
\[ \Rightarrow x = \frac{1}{4} \Rightarrow x = 7.5 \text{ km} \] Choice (2)

13. Let the speeds of A and B be 4x m/s and 3x m/s respectively.
\[ \frac{600}{4x} = \frac{600}{3x} \text{ seconds} \]
In \( 600/x \) sec distance covered by
\[ A = \frac{600}{x} \times 4x = 2400 \text{ m} \]
So A meets B after covering every 2400 m. So A crosses B twice. Choice (4)

14. Let the number be x and k be any non-negative integer.
\[ \therefore x = kd + 10 \Rightarrow x^2 = k^2d^2 + 20kd + 100 \]
\[ \text{Remainder of } \left( \frac{x^2}{d} \right) = 0 + 0 + \text{Remainder of } \left( \frac{100}{d} \right) \]
\[ = 11 \Rightarrow d \text{ is a factor of 89, and d is not less than or equal to 11. So d = 89 as } \]
\[ 89 \text{ is prime} \]
\[ X^1 = k^2d^1 + 30kd(kd + 10) + 1000 \]
Solutions for questions 21 to 23:

21. The synonym of ‘Proliferating’ is ‘growing’. Choice (1)

22. ‘Integrate’ is ‘to become a part of’. Hence the synonym of ‘integration’ is ‘combination’. Choice (2)

23. ‘Comprehensive’ means ‘includes every thing’. Hence the synonym of ‘comprehensive’ is ‘inclusive’. Choice (1)

Solutions for questions 24 to 26:

24. The synonym for ‘conspicuous’ is ‘obvious’. The antonym is ‘obscure’. Choice (3)

25. ‘Tranquility’ means ‘calm and peaceful’. The antonym is ‘tumult’. Choice (2)

26. ‘Prodigious’ means ‘very large, enormous or impressive’. The antonym is ‘insignificant’. Choice (3)

Solutions for questions 27 to 30:

27. The error is in part 3 ‘Different’ is the appropriate word. Choice (3)

28. ‘Economic’ is the right word. Choice (2)

29. ‘Inclined’ is the right word. Choice (1)

30. ‘Preval’ is appropriate. Choice (2)

Solutions for questions 31 to 34:

31. ‘Mount’ means to organize and begin an activity or event, which goes with the first blank. ‘Unearth’ means to discover proof or some other information, especially after careful searching, which goes with the second blank. The other option do not go with the context. Choice (4)

32. The first and second blanks have to go with the last part of the sentence which says “because of the money that follows”. Since “impoverished” means being very poor, the impoverished cricket board is only too happy (happiness is a positive emotion) to receive the team because it suits their monitory interests/requirement. Choice (1)

33. The season in the first blank has to be one in which people are likely to spend good time. Hence, ‘festive’ season and ‘shopping’ would be the right options. It is not to be taken that people necessarily do not spend time during other seasons like summer and monsoon. The words in the other options do not fit the context. Choice (2)

34. ‘Although’ indicates that the second half of the sentence does not agree with the first half. Although the ‘industries’ has its core competence (adequately qualified or capable) in one area, it claims that other fields are not unrelated to it. Choice (3)

Solutions for questions 35 to 37:

35. ‘Little did I know that I would be returning home’ can be best replaced by ‘I did not know that I would be returning home’—with enduring images. The other options do not suit the context and the intention of the sentence. Choice (3)

36. ‘A stint at an art college certainly helps hone one’s skills’ can be best replaced by ‘studying at an art college helps to sharpen one’s skills (to hone means to sharpen). Choice (4)

37. ‘Federalism is the bedrock of our democracy’ can be best replaced by ‘federalism is fundamental to our democracy’. Bedrock means the main principles on which something is based, which means fundamental. Choice (1)

Solutions for questions 38 to 40:

38. The error is in (2), as the reference is to an action that began sometime in the past is still continuing and hence there has been (present perfect tense) a steady decline should be used in the place of there was. Choice (2)

39. The error is in (2) as one succeeds in doing something and not succeeds to do something. Hence ‘succeeded to project’ should be replaced by succeeded in projecting. Choice (2)

40. The error is in (3) as one learns the ways of life and not the way in life. ‘Ways of life’ means the manner in which people live. Choice (3)

Solutions for questions 41 to 45:

The given words are arranged in alphabetical order, in the following method.

In the first step, the word with the minimum number of letters is shifted to the first position. If two words have the same number of letters, then the one which occurs alphabetically first will be placed first.

41. Input: all of you must follow these rules
Step I: of all you must follow these rules
Step II: of all you must rules follow these
Step III: of all you must rules these follow
Choice (1)

42. Input: I do not know who he is
Step I: I do he not know who is
Step II: I do he is not know who
Step III: I do he is not who know
Choice (4)

43. From the choices, if the input is (1) Input: going to be a king is he
Step I: a going to be king is he
Step II: a be going to king is he
Solutions for questions 46 to 50:

44. From the choices, if the input is

(1) Input: who is the last person to come

Step I: is who the last person to come

Step II: is to who the last person come

Step II is not the last step

(2) he is the last person to come

Step I: he is to the last person come

Step II: he is to the come last person

Here, step II is the last step.

Choice (2)

45. Input: all the students must be present

Step I: be all the students must present

Step II: be all the must students present

Choice (2)

Solutions for questions 46 to 50:

46. The word 'Despite' indicates that the statement assumes that an icon in Bollywood will be affected by the trapping of tinsel town. Hence, I is implicit. From the statement II, it appears that becoming an icon occurs before getting affected. Hence, II is not implicit

Choice (1)

47. Unless the University assumes that some people want to do Hotel Management course, the advertisement would not have been given. The advertisement is given with an intention of attracting the people to the University also. Hence, both I and II are implicit.

Choice (4)

48. The statement assumes existence of the subject and the other hypothetical things referred to. Hence, both I and II are implicit.

Choice (4)

49. The word 'pity' indicates that the statement expects the government to take charge of the situation. Hence, I is implicit.

The statement has no reference to the feelings of the government towards the affected areas. Hence, II is not implicit.

Choice (1)

50. When a notice is given, it is assumed that there is a necessity to give such notice.

Hence, II is implicit. If it is assumed that the customers do not abide by the notice, then the notice would not have been issued. Hence, I is implicit.

Choice (4)

Solutions for questions 51 to 55:

51. The statement refers to the amount of leadership and the amount of management involved in a successful transformation. The word 'only' indicates that the statement is stressing on the significance of leadership over management in a successful transformation. Though the role of management is less significant as compared to the role of leadership in a successful transformation, its importance is not referred to in the statement. Hence, I does not follow. As the statement refers to leadership and management independently of each other, II can be concluded.

From the numbers used in the statement, III can be concluded.

Choice (2)

52. The statement refers to the creation of thousands and thousands of large organisations for the first time. But it is not clear whether the statement is about such huge numbers or to the large organization itself. Hence I does not follow. From the statement it cannot be concluded, whether there is anything else apart from good managers which can keep the organisations functioning. Hence II does not follow.

The statement refers to the organisations as 'those bureaucracies'. Hence III follows.

Choice (2)

53. According to the statement, China may become the largest economy sometime in the future. Hence, I follows. From the statement it is clear that China has the highest growth rate, even though it is not the largest economy. Hence, II does not follow, but III follows.

Choice (1)

54. From the statement it cannot be concluded that either education or opportunity alone brings about inspiration. Hence, neither I nor II follows. According to the statement education brings about opportunity and because of opportunity one get inspired, hence III follows.

Choice (3)

55. According to the statement ‘Lage Raho Munnabhai’ has exploded the myth that sequels are bad. From this both I and II can be concluded. From the statement, it cannot be known whether ‘Lage Raho Munnabhai’ is a movie or something else. Hence III does not follow.

Choice (2)

Solutions for questions 56 to 60:

56. RI is not able to explain the reasons behind stout’s arrest. By stating that the police are corrupt we can not justify the arrest. RII gives the appropriate reason behind the arrest.

Choice (2)

57. From the assertion, more crimes are committed by young people than by any other group of people. So, crime is becoming a choice for the young people which will be the cause for the assertion. Hence, RI is the reason and RII is irrelevant.

Choice (1)

58. RI is certainly the fact which violates human rights and even corrupts the youth. So, it could be the reason. Human rights group and the rise in charges of the MMS are in no way related. So, RII cannot be the reason.

Choice (1)

59. RI is not the reason. RII is the reason, as the Indian government follows non-violent policies. Hence, India can be considered a non-violent country.

Choice (2)

60. RI, certainly is the reason because of which the ban should be imposed. If celebrations consume excessive amounts of money and time, not only Valentine’s day but also many more such celebrations should be banned.

Choice (1)

Solutions for questions 61 to 66:

61. Using the first statement, we can find the expenditure on food as a fraction of the total expenditure. First statement alone is sufficient. Using the second statement, as we do not know the earnings of this month, we cannot answer the question.

Choice (1)

62. First statement alone is not sufficient, as we do not know the exact tip. Using second statement alone, as we determine the total sum he spent, on lunch alone. Therefore we can find the answer.

Choice (2)

63. First statement alone is not sufficient, as we do not know the ratio of their efficiencies or the efficiency of Tinku. Second statement alone is sufficient, as we know the ratio of their efficiencies.

Choice (2)

64. First statement alone is sufficient, as we know the total births from 1001 to 1005 and that from 1001 to 1004. From the second statement, we have the average number of annual births from 1001 to 1004 as 5 less than 820. For the same reason as above, the second statement alone is also sufficient.

Choice (4)

65. First statement alone is not sufficient, as it gives no information about the speed or
the distance. Second statement alone is sufficient, as it gives the speed, that is, the distance travelled in twenty minutes is given.

Choice (2)

66. First statement alone is not sufficient, as we do not know the number of boys or total strength of the class.
Second statement alone is sufficient, as we know the ratio of the number of boys and girls.

Choice (2)

Solutions for questions 67 to 69:

67. The required percentage increase
\[ = \frac{(24 + 42 + 60 + 90) - (20 + 35 + 45 + 59)}{20 + 35 + 45 + 59} \times 100 \]
\[ = \frac{216 - 159}{159} \times 100 \approx 35.8 \text{ per cent} \]

Choice (2)

68. The number of people who filed the tax returns in 2003-04 in any income range is greater than those who filed the tax returns from that range over the previous years.
∴ Maximum number of people filed the tax returns in 2003-04.

Choice (4)

69. The required percentage increase
\[ = \frac{90 - 70}{70} \times 100 \approx 28.6 \text{ per cent} \approx 29 \text{ per cent} \]

Choice (1)

Solutions for questions 70 to 74:

70. Cola Cola, GE, Nokia have improved their ranking. The value of these brands together is $142 Bn
Microsoft, Intel, Mc. Donald's and Mercedes have a deteriorated ranking.
The value of these brands together is $142.4 Bn.
∴ Difference in these two values = 142.4 – 142 = $0.4 Bn

Choice (3)

71. Brand value of H.P. and Oracle
\[ = \frac{160 \times (17.8 + 9)}{360} = \$11.9 \text{ bn} \]
The 10th ranked brand is valued at $21.4 bn. hence we cannot estimate the exact ranking of ORAHP in 2003.

Choice (4)

72. Brand value of Ralher in 2003 = \[32 + 11.1\times 18.9 = \$8.15 \text{ bn}\]
Brand value of Oracle in 2003 = \$ 4 Bn
\[ \Rightarrow 87 \text{ th} \]
rank. Brand value of HP in 2003 = $8.88 Bn \[\Rightarrow 71 \text{ st} \text{ rank}. \]
∴ Since Ralher's brand value is greater than Oracle's but less than that of HP it must be ranked somewhere between 71 and 87.

Choice (3)

73. Brand value of Cola Cola in 2002
\[ = \frac{70.3 \times 100}{112.5} = \$62.48 \text{ bn}. \]
Cola Cola's Brand value was 16.66 per cent (that is, 1/6) less than that of Microsoft in 2002 (that is Microsoft was 6/5 times the value of Cola Cola).
∴ Microsoft's brand value in 2002
\[ = \frac{62.48 \times 6}{5} = \$75 \text{ bn}. \]

Choice (4)

74. Brand value of top 5 brands in 2003 = $260.7 Bn
x \[= \frac{160 \times (17.8 + 9)}{360} = \$11.9 \text{ bn} \]
360
Total amount collected = 25040 + 13168 + 3800 = 42008

Choice (1)

75. By observation we know that the most popular programme is cartoon and the least popular is News.
Total number of people watching cartoons = 760 + 525 + 311 + 440 + 590 + 200 + 370 + 68 + 892 + 222 + 151 + 127 + 63 + 132 + 74 + 68 + 31 + 29 = 997
Difference in cartoons and News = 3913 – 997 = 3916

Choice (3)

76. Only one type of programme is only Cartoons, only Sports, … etc. The fastest way to solve it is to count all the numbers along the diagonal i.e 760 + 214 + 152 + 112 + 112 + 72 + 83 + 23 = 1528

Choice (2)

77. Number of kids whose 1st preference is cartoons (A) = 525 + 311 + 440 + 590 + 200 + 370 + 68 = 2380
No of kids whose 2nd preference is cartoons (B)
\[ = 892 + 222 + 151 + 127 + 63 + 132 + 59 = 1646 \]

Choice (4)

Solutions for questions 75 to 79:

75. We need to find out the number of people whose 1st preference is either Games or Quiz and whose 2nd preference is either Horror or Music. This means we need to count all those people whose 1st preference is Games and 2nd preference is either Horror/Music or all those whose 1st preference is Quiz and 2nd preference is Horror/Music.

Choice (1)

76. The total cost of fencing = 4 \times 2 \times 100 = Rs 8000

Choice (3)

77. Let the two digit numbers satisfying the given condition be of the form a, b. a + b is a perfect square.
\[ a \leq 9 \text{ and } b \leq 9, a + b \leq 18 \]
\[ \Rightarrow a + b \text{ can be } 1, 4, 9 \text{ or } 16 \]
If \[ a + b = 1, (a, b) = (1, 0) \]
If \[ a + b = 4, (a, b) = (1, 3), (2, 2), (3, 1) \text{ or } (4, 0) \]
If \[ a + b = 9, (a, b) = (1, 8), (2, 7), (3, 6) \text{ or } (4, 5) \]
If \[ a + b = 16, (a, b) = (7, 9), (8, 8) \text{ or } (9, 7) \]
∴ ab has a total of 17 possibilities.

Choice (1)

Solutions for questions 101 to 120:

101. As pipe P is at the middle of the tank, the water that is filled = 3000/2 = 1500 litres.
In this, the water filled by P and Q will be in the ratio of 2 : 3.
Q filled 3/5 \times 1500 = 900 litres.
∴ Part of the tank filled by Q = 900/3000 = 3/10

Choice (2)

102. The perimeter of the garden, \(P = 2(l + b) = 2(37.5 + 12.5) = 100\, m.\)
The total cost of fencing = 4 \times 100 = Rs 2400

Choice (3)

103. Let the two digit numbers satisfying the given condition be of the form a, b. a + b is a perfect square.
\[ a \leq 9 \text{ and } b \leq 9, a + b \leq 18 \]
\[ \Rightarrow a + b \text{ can be } 1, 4, 9 \text{ or } 16 \]
If \[ a + b = 1, (a, b) = (1, 0) \]
If \[ a + b = 4, (a, b) = (1, 3), (2, 2), (3, 1) \text{ or } (4, 0) \]
If \[ a + b = 9, (a, b) = (1, 8), (2, 7), (3, 6) \text{ or } (4, 5) \]
If \[ a + b = 16, (a, b) = (7, 9), (8, 8) \text{ or } (9, 7) \]
∴ ab has a total of 17 possibilities.

Choice (1)
4.5

Given, 

\[ x^2 = 108. \]

Speed of A = \( \frac{8.5}{17} \) kmph

\[ \text{Time taken by A to cover 8.5 km} = \frac{15 + 2}{17} \text{ min} \]

B started from P, 2 minutes after A started from P.

Choice (3).

\[ \text{It is the mid point,} \quad C \] of AB.

\[ \text{AOC, is a right angled triangle} \]

\[ \text{If x = 3, original fraction is} \quad \frac{3}{7} \]

If \( x = -1 \), original fraction is \(-1/-1 = 1. \) Hence \( x \neq -1. \)

Choice (2).

Each ring can be positioned in 10 ways. Hence, the three rings can be positioned in \( 10^3 \) ways. Of these, 1 combination is successful. Hence, unsuccessful attempts are \( 10^3 - 1. \)

Choice (3).

\[ \text{Let the numerator be} \quad x. \]

\[ \text{Form of the fraction} = \frac{x}{x^2 - 2}. \]

\[ \text{Given,} \quad \frac{x+2}{x^2-2+3} = 1/2 \Rightarrow 2x + 4 = x^2 + 1 \]

\[ \Rightarrow x^2 - 2x - 3 = 0 \Rightarrow x = 3 \text{ or } -1 \]

If \( x = 3 \), original fraction is \( \frac{3}{7} \)

If \( x = -1 \), original fraction is \(-1/-1 = 1. \) Hence \( x \neq -1. \)

Choice (2).

110. Let the speed of A be \( s \) m/sec. Let its length be \( L \) m.

\[ \frac{L + 300}{s} = 40. \] The required time = \[ \frac{1.2L + 360}{2s} \]

\[ \Rightarrow \frac{1.2[L + 300]}{2s} = 24 \text{ seconds. Choice (2)} \]

111. Let the new height be \( x \) cm.

\[ [\pi(7)](20-x)] = \frac{4}{3}[\pi] \left(\frac{7}{2}\right)^3 \left(\frac{7}{2}\right) \]

\[ \Rightarrow 20 - x = 7/6. \quad \text{Choice (4)} \]

112. Profit = Investment \( x \) Time period

\[ \therefore \quad \text{Here ratio of profits} = \frac{3 \times 2}{4 \times x} = 3:2 \]

Choice (3).

113. P(winning a prize for at least on one ticket) =

\[ 1 - P(\text{"Losing on all tickets"}) \]

\[ = 1 - (0.8)^4 = \left(1 + (0.8)^2\right)\left(1 - (0.8)^2\right) = \]

\[ (1.64) (0.36) = 0.5904 \quad \text{Choice (2)} \]

114. Each question can be answered in 3 ways either mark true or mark false or leave blank. Hence, total ways are \( 3^n \).

Choice (2).

115. Let the scores of the five students be \( a, b, c, d, e \) such that \( a > b > c > d > e \).

Then, \( a + b \) will be the highest sum.

\( a + c \) will be the next highest sum and \( b + c \) or \( a + d \) may be the third highest sum.

\( b + c = 177 \) and \( a + d = 176 \) ……case (1)

or \( a + d = 177 \) and \( b + c = 176 \) ……case (2)

Case (1): \( a = 95, \ b = 92, \ c = 84, \ d = 82 \)

\( \therefore \quad \text{So, the required average cannot be uniquely determined. Choice (4)} \)

116. GFHE is a trapezium where \( GF = 3 \) cm and \( HE = 4 \) cm and the distance between them, \( h = 12 \) cm.

\[ \therefore \quad \text{The area of the shaded region is} \quad \frac{1}{2} \times (\text{base}) \times (\text{height}) = \frac{1}{2} \times (6 + 4) \times 32 \text{ cm}^2 \]

Choice (2).

117. Let the length of the race be \( x \) m. Let the speed of B be \( y \) m/s. Speed of A = \( \frac{8.5}{3} \) m/s.

\[ \text{A and B finish the race simultaneously.} \]

Time taken by A to cover \( x - 120 \) m.

\[ \frac{x - 120}{4y/3} \Rightarrow \frac{3x}{4} = \frac{x - 120}{y} \Rightarrow 3x = 4(x - 120) \Rightarrow x = 480 \]

Choice (2).

118. Given \( (A + B)'s \) 1 day work = 1/24

\( (B + C)'s \) 1 day work = 1/36

\( (C + A)'s \) 1 day work = 1/48

\[ \therefore \quad 2(A + B + C)'s \] 1 day work = \[ \frac{1}{24} + \frac{1}{36} + \frac{1}{48} \]

\[ = 13/144; \therefore \quad (A + B + C)'s \] 1 day work = 13/288

\[ \therefore \quad B's \] 1 days work = \( (A + B + C)'s \) 1 day work

\[ - (A + C)'s \] 1 day work = \[ \frac{13}{288} - \frac{7}{48} - \frac{288}{288} \]

\[ \therefore \quad B \] can complete the work in 288/7 that is, \( 41\frac{1}{7} \) days.

Choice (2).

119. Let \( b \) be the height of raised field

Now equating volumes

\[ 
\pi \cdot (49)(1.46) = (300 - \pi 49)b \Rightarrow h = 1.54 m \]

Choice (3).

120. Let the expenditures of A and B be 5k and 4k respectively.

Let A's savings be \( a, \) B's income = \( a. \)

Given \( 5k + a \) = \( a ) \Rightarrow 5k = 5000 \Rightarrow k = 1000 \Rightarrow \)

\( b = 1000. \quad \therefore \quad B's \] expenditure = \( 4k = Rs \) 4,000.

Choice (1).

Solutions for questions 121 to 140:

121. Option (4) – from paragraph 2.

122. Option (4) – from paragraph 1.

123. Option (1) – from paragraph 3.

124. Option (3) – from paragraph 5.

125. Option (2) – from paragraph 6.

There is a failure of application of safety measures, because of negligence on the part of human subjects. Hence, human participation is reduced, whenever possible.

126. Refer to the last sentence of para 1.

Choice (4).

127. Refer to the last sentence in para 2. Options (2) and (3), though true, have been cited by the author to contrast greenhouse gases and aerosols.

Choice (1).

128. Option (1) is rendered false by the first sentence of para 7 which implies that South Asia and the northern Indian Ocean have higher concentrations of aerosols. The last line of para 6 renders option (2) false. Para 6 and para 7 lead us to understand that option (3) is true. The phrases “soot particles do not just block in the last line of para 6 and “aerosols over south Asia / the northern Indian Ocean” render option D to be true.

Choice (4).

129. Options (1) and (4) can clearly be ruled out as there is neither a difference of opinion.
expressed nor a supporting thought taken on a particular line of thought. Between (2) and (3), the words like 'however', 'nor' in sentences 1/3 of para 2 respectively, 'unlike' in line 1 of para 3 have been mentioned to give information on something that is commonly believed. Hence, option (2) is the right answer choice. Choice (2)

130. Refer to sentence 3 of the last para. Choice (4)

131. Refer to line 4 of para 1. Choice (2)

132. Refer to lines 5 and 6 of para 1. Choice (1)

133. The author mentions “men of highest type”, eg. statesmen like Lincoln, etc., to motivate. Thus, the passage does not only merely preach but also motivates. Hence, option (a) Choice (1)

134. Refers to the last line of para 2. Choice (1)

135. Refer to the lines 12 – 14 of para 2. Choice (4)

136. The drastic reduction in the population of the Andamanese can be attributed to all the reasons. [Refer para 2]. Choice (4)

137. The great Andamanese lacked resistance to diseases like pneumonia and measles. [Refer para 1] Choice (3)

138. The first contact was made when the British established a penal colony. [Refer para 1]. Choice (1)

139. The British hired the Andamanese to trace escaped convicts and to fight the Jarawas. Choice (4)

140. The increase in population can be attributed to influx of Indian settlers. Choice (1)

Solutions for questions 141 to 146:

141. The given sequence is B L 2 M Z 4 A Q R 3 F 7 E R 8 A Z 1 3 C M Z 1 O P 4 7
8th letter/digit to the 17th from left = (17 – 8)th or 9th element from left which is R. Choice (3)

142. A’s sister’s grandfather is A’s grandfather. A’s grand father’s only son is not A’s father, because he has only one child whereas A’s parents have at least two children that is, A and A’s sister. Hence, the person is A’s mother’s brother, who is the uncle of A and the uncle’s only child is the cousin of A. Choice (2)

143. The given sequence is 1010, 1111, 10110, 11111, 101010, 111111.

The decimal equivalents of the above binary numbers will be 10,15,22,31,42
⇒ 10^3,15^2,22^1,31^0,42^0,55.

Hence, the binary form of 55 which is 110111 is the next number. Choice (1)

144. Given, 35 : 143 : : ____ : 667

35 can be represented as. 5 x 7

143 can be represented as. 11 x 13

These are the products of consecutive prime numbers.

Here, 667 can be represented as. 23 x 29.

Two previous consecutive prime numbers of 23 are 17 and 19.

The missing term = 17 x 19 = 323. Choice (3)

145. The angle θ, between the hands of the clock at 20 minutes past 7 is given by the formula

θ = 30h – 11/2 m.

⇒ θ = 30 x 7 – 11/2 x 20 = 100°

Choice (2)

146. After replacing the symbols, the expression becomes 25 – 32 + 3 x 8 = 25 – 16 + 24 = 33

Choice (3)

Solutions for questions 147 to 151:

From (iii) and (iv), the girl wearing the green coloured dress is sitting to the right of girl wearing the orange coloured dress.

From (i), (iii) and the above result, the girl wear- ing the blue coloured dress.

From (iv), (ii) and the above result, the girl wearing the green coloured dress is sitting to the right of girl wearing the orange coloured dress.

Also from (vi), the arrangement is

147. Yellow Choice (3)
148. White Choice (4)

149. Shravya Choice (2)
150. White Choice (3)
151. Green Choice (4)

Solutions for questions 152 to 154:

152. The path traversed by David is as follows:

The vertical distance is (AB + CD + EF) = 5 +11 +7 = 23 km Choice (4)

153. Kareena is Karishma’s mother’s only son’s daughter. Hence, Karishma is Kareena’s father’s sister. Hence, Karishma is the aunt of Kareena. Choice (3)

154. In total, Ajay’s birthday will be 26 days before Pradeep’s birthday. Hence Ajay’s birthday will be on Saturday. Choice (4)

Solutions for questions 155 to 159:

Let us tabulate the data given.

<table>
<thead>
<tr>
<th>Name</th>
<th>Place</th>
<th>Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naresh</td>
<td>Hyderabad</td>
<td>March</td>
</tr>
<tr>
<td>Kishan</td>
<td></td>
<td>Not January</td>
</tr>
<tr>
<td>Siddharth</td>
<td></td>
<td>Not January</td>
</tr>
<tr>
<td>Prasant</td>
<td>Lucknow</td>
<td>March</td>
</tr>
<tr>
<td>Bibhas</td>
<td>Ahmedabad</td>
<td>Not January</td>
</tr>
<tr>
<td>Ritesh</td>
<td>Mumbai</td>
<td>Not February</td>
</tr>
<tr>
<td>Ankur</td>
<td>Chandigarh</td>
<td>March</td>
</tr>
</tbody>
</table>

Atmost three people celebrate their birthdays. So, for two months, three birthdays are celebrated in each month and in the other month, two birthdays are celebrated. that is, birthdays of Kishan and Siddharth, which cannot be in March or January. So, that must be in February.

Bibhas is from Chandigarh and he celebrates his birthday in March.

Ritesh, Ankur and Charan celebrate their birthdays in January.

Charan is from Mumbai.

Prasant is from Chandigarh.

The final distribution table is as follows...
Solutions for Diagnostic Test

155. Charan lives in Mumbai. Choice (4)

156. Kishan lives in either Pune or Indore. Choice (4)

157. The person from Pune celebrates his birthday in February. Choice (2)

158. Bibhas—Lucknow—March is the correct combination. Choice (4)

159. All the given choices are true. Choice (4)

Solutions for question 160:

160. Word: A M B I T I O N
   Logic: + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6
   Code: G S H O Z O U T

   Similarly,

   Code: V X O T Z U A Z
   Logic: - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6 - 6
   Word: P R I N T O U T

   ‘PRINTOUT’ is coded as ‘VXOTZUAZ’. Choice (1)

Solutions for questions 161 to 165:

161. This question can be best solved by simple inspection. We find that only in the year 1991 there was a doubling in the number of passengers travelling that is, a 100 per cent increase. Choice (3)

162. Total Occupancy Rate = \[
\frac{\text{Total Passengers travelling in 2003}}{\text{Total Seats Available}}\]

163. From the previous solution maximum number of passengers that can be transported by Airbus = 19.5 mn.
   Maximum number of passengers that can be transported by Concorde = 3.5 mn.
   \[\therefore\] Maximum number of passengers that can be transported by airline = 180 + 180 + 60 = 420 mn → (B)
   \[\text{as a percentage of (B)} = \frac{198.5}{420} \times 100 = 47.26\%\] Choice (2)

164. Aircraft with maximum carrying capacity is the Boeing 777–400.
   Total passengers transported by Boeing 777 – 400 in 2000 operating at 100 per cent capacity = 60 mn → (A)
   Total passengers travelling in 2003 = 600 mn → (B)
   \[\text{as a percentage of (B)} = \frac{600}{420} \times 100 = 10\%\] Choice (2)

165. Number of passengers expected to be flying in 2001 = 90 mn (50 per cent increase)
   Total available capacity in 2000 of all aircraft put together = 77 Mn; \[\therefore\] Deficit capacity = 13 Mn
   This deficit is to be filled with the aircraft with the least carrying capacity which is the Bombardier EJ-200.
   Number of passengers that can be carried by one Bombardier EJ-200 in 200 = 100 x 200 = 20000
   \[\therefore\] number of Bombardier EJ-200 to be purchased
   \[= \frac{161.5}{20000} \times 8075\] Choice (4)

Solutions for questions 166 to 170:

166. Total imports = 17 + 18 + 13 + 8 + 21 + 13 + 17 + 15 + 16 + 15 = 153; Total exports = 18 + 22 + 10 + 10 + 19 + 14 + 14 + 12 + 17 + 16 = 152
   Trade deficit = 153 – 152 = 1; Average imports = 153/10 = 15.3
   \[\therefore\] Required percentage = \[\frac{1}{15.3} \times 100 = 6.5\%\] Choice (3)

167. Total tonnage of exports = \[\frac{152 \times 10^6}{2000}\]
   = 76 \times 10^4; Total tonnage of imports = \[\frac{153 \times 10^4}{3000}\]
   = 51 \times 10^4; \[\therefore\] required percentage = \[\frac{76 – 51}{51} \times 100 = 49\%\] Choice (4)

168. The highest exports are to USA and the least imports are from Australia. Imports from USA = 18; Exports to Australia = 10
   \[\therefore\] Required percentage = \[\frac{18 – 10}{10} \times 100 = 80\%\] Choice (2)

169. Statement (1): As calculated before, the company’s imports are Rs 1 crore more than the company’s exports, hence a trade deficit (not trade surplus). Hence, this statement is false.
   Statement (2): The cumulative trade deficit is Rs 1 crore and the total imports of the company is Rs 153 crores. 1/153 ≠ 1/15, hence this statement is false.
   Statement (3): The trade deficit with China is (15 – 12) = 3, which is only 200 per cent more than the cumulative deficit.
   Statement (4): The difference between the highest exports and the lowest imports = 22 – 8 = Rs 14 crores.
   Average exports to Brazil and Germany = \[\frac{14 + 14}{2}\] Rs 14 crores
   As both the figures are equal, hence only statement (4) is definitely true Choice (4)

170. Total imports from Brazil, Japan, S.A, Russia and China = 13 + 16 + 13 + 21 + 15 = Rs 78 crores
   Total exports to the other five countries = 18 + 22 + 10 + 14 + 16 = 80
   Ratio = 78/80 = 0.975 Choice (1)

Solutions for questions 171 to 173:

The data is represented in the Venn Diagram below.
The figures are the percentages.
Percentage of students who watch all three = 6
Percentage of students who watch exactly two = 24
Percentage of students who watch exactly one = 64
∴ Percentage of students who do not watch any channel = 6
6 per cent is 18 ⇒ 100 per cent is 300 .... (1)
Let s per cent be the percentage of students who watch Star News.
Total percentage of students who watch some channels = 94 = (42 + 48 + s) – (percentage of students who watch exactly two channels) – 2(percentage of students who watch all three channels)
= (90 + s) – (24) – 2(6) ⇒ s = 40 ⇒ 120 students watch Star News .... (2)
If 10 per cent watch only CNN and Star News, (24 – 10) per cent watch only BBC and CNN or only BBC and Star News/.
∴ Of the 42 per cent who watch BBC (14 + 6) per cent watch other channels.
∴ 22 per cent watch only BBC, that is, 66 students watch only BBC .... (3)

171. Choice (2)

172. Choice (3)
173. Choice (1)

Solutions for questions 174 to 178:

174. The revenue in 1998 = \[24 \times 50 + 30 \times (45 - 5)\] \times 10^6 = 240 \times 10^7
The revenue in 1999 = \[25 \times 48 + 32 \times (50 - 2)\] \times 10^6 = 273.6 \times 10^7
The required percentage = \[\frac{273.6 - 240}{240} \times 100\] = 14 per cent Choice (2)

175. Year Required Percentage

<table>
<thead>
<tr>
<th>Year</th>
<th>Required Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>[\frac{42 - 7}{80} \times 100] = 50</td>
</tr>
<tr>
<td>1998</td>
<td>[\frac{40}{95} \times 100] = 42.10</td>
</tr>
<tr>
<td>1999</td>
<td>[\frac{48}{98} \times 100] = 48.97</td>
</tr>
<tr>
<td>2000</td>
<td>[\frac{46}{110} \times 100] = 41.81;</td>
</tr>
<tr>
<td>2001</td>
<td>[\frac{49}{113} \times 100] = 43.36</td>
</tr>
<tr>
<td>2002</td>
<td>[\frac{55.5}{121} \times 100] = 45.86</td>
</tr>
<tr>
<td>2003</td>
<td>[\frac{59.5}{124} \times 100] = 47.98</td>
</tr>
<tr>
<td>2004</td>
<td>[\frac{60}{130} \times 100] = 46.15</td>
</tr>
</tbody>
</table>

176. Revenue earned in 2000 = \[60 \times 28 + 46 \times \frac{35}{3} = 3290\]
∴ It has the highest in 2004.

Alternate method:
As the production and the sales outside India are both highest in 2004 along with the individual prices, the revenue is the highest in 2004. Choice (4)

177. The trend changed in 1999 and 2002. Choice (3)

178. Except in 1999 and 2000, in all other years, the loss due to storage was more than 10 per cent of the storage. Choice (3)

Solutions for questions 179 to 181:

179. Viewership of DD Sports during second half of February = \[60 \times 2/3 = 40°\]; Required ratio = 40° : 45° = 8 : 9 Choice (3)

180. Given, 80 per cent x (Actual value of DD sports) = 60°
∴ Actual value of DD sports = 75°. The total share is 360 + (75 – 60) = 375 per cent share of Set Max = \[\frac{150}{375} \times 100\] = 40 per cent Choice (3)

181. Given 45° – 90,000
360° = ?
\[? = \frac{360 \times 90000}{45} = 72,000\] Choice (4)
Solutions for Language Comprehension

AN OVERVIEW

GRAMMAR AND SENTENCE CORRECTION

Pr actice exercise 1

1. The train
2. He
3. There
4. Birds
5. The Prime Minister

Pr actice exercise 2

1. fly over
2. are
3. is suffering
4. is equipped with
5. have been discussing

Pr actice exercise 3

1. C
2. P
3. C
4. P
5. C

Pr actice exercise 4

1. Adverb clause
2. Adverb clause
3. Adverb clause
4. Adjective clause
5. Noun clause
6. Adverb clause
7. Adverb clause
8. Adverb clause
9. Adverb clause
10. Adverb clause

Pr actice exercise 5

1. Complex
2. Simple
3. Compound
4. Simple
5. Simple
6. Simple
7. Complex
8. Complex
9. Simple
10. Complex

Pr actice exercise 6

1. to come
2. to reach, to start
3. use
4. to see
5. die, tell

CORRECTION OF SENTENCES

Pr actice exercise 1

1. “Advice” is an uncountable noun; so many advices is (x)
   Much, a lot of, or plenty of, are used with uncountables.
   Answer: a lot of advice.

2. Many informations (x)
   information - uncountable noun
   Hence a lot of information (or) much information.

3. a summon (x)
   Summon is a verb - to call
   Summons is a noun - Magisterial orders.
   It is a singular noun
   The Magistrate has issued summons (√) ……

4. hairs (x)
   Should not be used in plural number.
   Answer: My hair has turned grey.
   ‘Hairs’ should be used only when counted separately, but not when in a bunch.

5. furnitures (x)
   It is used as a singular noun.
   Hence answer: Our office has purchased new furniture ……..

6. troubles - maker (x)
   “One of the” takes a plural noun and singular verb.
   ∴ Answer: One of the trouble - makers ……..
   The subject here is ‘one’, which is always singular. The sentence means ‘one among many’. So trouble-makers.

7. thefts (x)
   plural of thief is thieves
   Answer: Four thieves …….. (√)

8. machineries is wrong usage.
   (machinery: machines collectively)
   Answer: latest machinery.

9. many mischiefs (x)
   Many acts of mischief (√) or A lot of mischief (√)

10. order (x)
    (order: The way in which people or things are arranged)
    (orders: instructions)
    The Magistrate has passed orders ……..

11. Scissor (x)
    Names of instruments with two identical parts are always used as plural.
    Answer: This scissors ……….

12. Cannon: a large, heavy piece of artillery
    (plural form is cannon or cannons)
    Hence the sentence is correct.

13. alm (x)
    The beggar is begging for alms (√)
    (“alms” used as a plural noun).

14. luggages (x)
    He has lost all his luggage ……. (√) (luggage is used as a singular noun.)

15. The given sentence is correct.
    (Note: dispose is followed by the preposition ‘of’ and not ‘off’)

16. pain (x)
    “pain” means suffering.
    “pains” mean care.
    In the statement; she took great pains …….. (√)

17. The given sentence is correct because “innings” is used as a singular as well as a plural noun.

18. Sceneries (x)
    Scenery is always used as a singular noun. Hence the answer is: These scenes of Kashmir ….. (√)

19. brother-in-laws (x)
    The plural form of brother-in-law is brothers-in-law.
    Hence my brothers-in-law ……. (√)

20. These golds (x)
    This gold …….. (√)
    Gold is ‘material’ noun so uncountable.
    Hence singular.
Practice Exercise 2

1. Between you and I (x)
   Rule: When a pronoun is connected by a conjunction (and, or) with some other word in objective case, it must also be in the objective case.
   Hence answer: Neither of the boys …….
   has …… his record.

2. “do your duty ………” (x)
   one is an indefinite pronoun. The pronoun following ‘one’ should be one’s (not his/ her)
   Ans: One should do one’s duty ……… (✓)

3. Like you and he (x)
   Follows the same rule as in question 1 ‘you’ is the object.
   Hence Ans: Good students like you and him …… (✓)

4. You, he and I (x)—wrong ordering of words.
   While expressing a negative idea or guilt,
   First person—first
   Second person—second and
   Third person—third
   Ans I, you and he ………. (✓)

5. Only you and him (x)
   ‘You’ is in subjective case, as ‘you’ is doing the action.
   A pronoun in subjective case, when connected with another pronoun by a conjunction (and, or), the second pronoun also must be in subjective case.
   Hence only you and he ………. (✓)

6. If I were him ……… (x)
   “If I were ………” states impossible condition, the pronoun ‘I’ is in subjective case hence it should be followed by the subjective case of the pronoun.
   If I were he ………(✓)

7. Everyone announced one’s ………. (x)
   Everyone—indefinite pronoun
   “Everyone” is followed by the pronoun “his”.
   Everyone announced his ………

8. She helped everyone of those boys in doing their work (x)
   “everyone of the boys” should be followed by the pronoun “his”
   Hence answer: ………. in doing his work.

9. Every teacher and every student ………. their duty (x)
   [teacher and student are common genders].
   Hence answer: Every teacher and every student …….. his or her duty.

10. Neither of the boys …….. have ………. their records.

Practice Exercise 3

1. more wiser (x)
   usage of dual comparatives is wrong.
   Answer: I am wiser than…….. (✓)

2. …….. larger than you (x)
   The comparison should be between two similar things
   Answer: My house is larger than yours (✓)
   (Yours → Your house)

3. ……… is better than Chennai (x)
   The comparison is between the climate of two places. Hence it is correct to say: The climate of Hyderabad is better than that of Chennai (✓)

4. The given sentence is correct. Many a + Singular noun + Singular verb is the correct structure.

5. little sugar (x)
   Little – Not at all.
   A little – some
   (‘Little’ is used for uncountable nouns)
   A little sugar (✓)

6. Older (x)
   Older is used only when we compare people belonging to different families.
   Pooja is my elder sister (✓)

7. much fine (x)
   very fine (✓)
   ‘much’ is generally used in a negative sense. (much worse)

8. Senior than (x)
   The comparative adjectives which end in ‘or’ are always followed by ‘to’.
   My friend is senior to me by 4 years. (✓)

9. Preferable than (x)
   Preferable is followed by ‘to’
   Answer: Death is preferable to disgrace.

10. Worth-seeing city (x)
    City worth-seeing (✓)
    The adjective “worth-seeing” qualifies the noun “city”, but has to be used after ‘city’.

11. Both sisters are doctors (x)
    Both of my friend’s sisters are doctors. (✓)

12. The two first ……. (x)
    Answer: The first two chapters……
    The two first ……. (x)

13. Greater than any student (x)
    Suvarna is to be excluded from the students with whom she is being compared.
    Hence the correct sentence is Suvarna is greater than any other student. (✓)

14. better than any drama (x)
    The rule followed is the same as in the previous sentence.
    Further, if Shakuntala is the name of a drama or a woman is not clear, in which case, it becomes wrong comparison.

15. is further from (x)
    further is used to mean “additional”, farther is used to express distance.
    Hence the right sentence is, His house is farther…. (✓)

16. Later suggestion (x)
    Later refers to time, while latter refers to position.
    Hence later suggestion is erroneous in this context.
    The latter suggestion ……. (✓)
17. Smell sweetly (x)
   Smell sweet (✓)

18. Little learning (x)
   A little learning (✓)
   (Rule is the same as the rule mentioned in Q.5)

19. the most happiest ……. (x)
   Dual superlatives should not be used.
   The right sentence is ……… “the happiest”

20. The rich people hate poor (x)
    the rich hate the poor.
    the rich indicates → rich people
    the poor indicates → poor people

21. Concerned clerk (x)
    The usage is wrong. It conveys the meaning worried clerk.
    The appropriate answer clerk concerned …….. (✓)

22. dear to me than………. (x)
    dearer to me than (✓)

23. Little act …….. (x)
    A little act ……..(✓)
    (Refer to Q.5 for the rule)

24. the ferocious of all animals …… (x)
    The correct structure is: the most ferocious of all animals (✓)
    When “of all” or “of any other” are used in the sentence, the adjective is in its superlative.

25. the sharpest of the two (x)
    Rule: When selection of one of the two persons or things of the same kind is meant the comparative degree is preceded by “the” and followed by ‘of’.

—— Practice Exercise 3 ——

1. The given sentence is correct.

2. “Only wants’ (x)
   Rule: An adverb must be placed as near as possible to the word it modifies.
   Here ‘only’ modifies rupees ten thousand.
   (x)

3. Worked hardly (x)
   “Hardly” conveys a negative meaning.
   Worked hardly → did not work at all.
   Hence worked hard (✓)

4. hardly entered …….. than (x)
   “Hardly” is always followed by “when” …….. hardly entered……… when………
   (✓)

5. No sooner did I …….. when the train left (x)
   The expression “No sooner did” is always followed by than.

   The answer is: No sooner did I…. than
   the train left. (✓)

6. Completely finish your homework before
    lunch. (x)
    …….. finish your homework completely before lunch (✓)
    Adverb should follow verb and when object is present, adverb should follow that.

7. He always is …….. (x)
   He is always ……..(✓)
   Rule: The adverb should be placed after the ‘be’ verb in the sentence.

8. The given sentence is correct.

—— Practice Exercise 4 ——

1. Measles have (x)
   The names of diseases take singular verbs.
   Measles has (✓)

2. ‘Arabian Nights’ are (x)
   ‘Arabian Nights’ is the title of a book hence a singular verb should be used.
   ‘Arabian Nights’ is …….. (✓)

3. Five miles are (x)
   When a plural noun denotes some specific quantity taken as a whole, it takes a singular verb.
   Five miles is (✓)

4. The cost of all essential commodities have
    …….. (x)
   Rule: The error of proximity. The verb must agree with the actual subject of the sentence.
   ‘Cost’ is the subject in the sentence (singular)
   Hence the verb it takes is also singular.
   The cost of all essential commodities has…………(✓)

5. The construction of these buildings have
    taken …….. (x)
   The subject of the sentence is “the construction”. It is singular. Hence it takes a singular verb.
   The construction of the buildings has taken ……..(✓)

6. There are a bunch of keys (x)
   bunch of keys – collective noun.
   Hence it takes a singular verb.
   :. There is a bunch of keys………..(✓)

7. A pious man and good neighbour have
    died (x)
   Rule:
   When two nouns are joined by ‘and’ and they refer to the same person or thing, the verb is singular.
   A pious man and good neighbour has died (✓)

8. Bread and milk are (x)
   “Bread and milk” is treated as singular noun as they reflect a single idea, hence takes a singular verb.
   Bread and milk is ……….(✓)

9. Sanjay as well as his brothers have gone home (x)
   Rule: When the subject of the sentence consists of two nouns joined with “as well as”, then the verb agrees with the first subject.
   Sanjay as well as his brothers has gone ……..(✓)

10. …….. with his followers have escaped.
    Rule: When the subject of the sentence consists of two nouns joined with “with”, the verb agrees with the first subject.
     …….. with his followers has escaped.

—— Practice Exercise 5 ——

1. Sugar sells in (x)
   Sugar sells at (✓)

2. Congratulate upon (x)
   Congratulate on (✓)

3. time with (x)
   time by (✓)

4. travel with a bus (x)
   travel by bus (✓)

5. Among you and me (x)
   When two persons or things are referred to, we use between.
   Between you and me (✓)

6. among his two sons (x)
   between his two sons (✓)

7. suffering with (x)
   suffering from (✓)

8. working since five years (x)
   Since indicates a point of time.
   For indicates a period of time.
   Working for five years. (✓)

9. from morning (x)
   since morning (✓)

10. above eight years (x)
    for eight years(✓)

—— Practice Exercise 7 ——

1. …….. raining as he left the house (x)
   …….. raining when he left the house (✓)

2. Your action was either just or fair (x)
   Neither just nor fair (✓)

3. As I was ill, so I did not go to college (x)
   ‘So’ should not be used when the sentence begins with ‘As’.
   As I was ill, I did not go to college. (✓)
4. Both of you as well as ………. (x)  “Both” takes ‘and’; Hence the correct sentence is Both you and your brother are at fault. (✓)

5. I shall not come …. I am not invited (x) “Unless” means “If not” It does not take another negative word. I shall not come unless ….. I am invited (✓)

6. Unless you have no objection, I shall see you tomorrow (x) Unless you have any objection, I shall see you tomorrow (✓)

Rule: Same as in 5th sentence.

7. ……… lest you should not fall (x) “lest” means “in order that ……… not” (otherwise) “lest” always takes “should” with it. ……….lest you should fall.

8. He works hard because ………. (x) He works hard so that ……… (✓)

9. I am glad when ……….. (x) I am glad that ……….. (✓)

10. So (x) and (✓)

### STYLE

#### ERROR IDENTIFICATION

--- Practice Exercise 1 ---

**Solutions for questions 1 to 35:**

1. The right sequence is 1, 3, 2, 4. The error is in (4). The correction is – ‘they belong to that race or ethnic group’ because it is a reference to the ‘particular race or group’, mentioned in 2. Choice (4)

2. The right sequence is 1, 3, 2, 4. The error is in (4). The correction is – which is characteristic of, as it refers to ‘only one taxonomy’ and not to the organisms. Choice (4)

3. The correct order is 1, 4, 3, 2. The error is in (1). Reluctance is followed by to. Hence, the correction is – reluctance to accept social arguments. Choice (1)

4. The right sequence is 1, 4, 3, 2. The error is in (3). The correction is – coordinated the dozen democracies. Coordinate is followed by ‘with’ not ‘between’.Choice (3)

5. The correct order is 1, 4, 2, 3. The error is in (2). The correction is – by way of. ‘By way of’ means via, by means of, which is suitable in the context of the sentence. ‘By the way’ means ‘incidentally’. Choice (2)

6. The correct sequence is 1, 4, 3, 2. The error is in (3). The conjunction ‘but’ is right at the beginning of the part in the context of the sentence. Hence, the correction is – but rather an accumulation of …. in (3), since it is preceded by (4) which says – there was no single defining moment.

7. The correct sequence is 1, 3, 2, 4. The error is in (3). The correction is – conceptions ‘of’, ‘conceptions’ is not followed by ‘about’. Choice (3)

8. The correct sequence is 1, 4, 3, 2. 1 is linked to 4 as 4 mentions the consequences of ‘more destructive weapons’. It is followed by 3 as it presents the result of having that perception. It ends with 2. There is an error in (3). The correction is – as ‘did’ a sense that, … A comparison is being made and hence it has to be parallel in structure. Choice (3)

9. The right sequence is 1, 3, 4, 2. There is an error in (1). Solidarity, which means unity or agreement of feeling or action, especially among individuals with a common interest, is followed by ‘with’ and not ‘for’. Choice (1)

10. The right sequence is 1, 4, 3, 2. There is an error in (3). The correction is evidence ‘of’ damaging not ‘about’. Choice (3)

11. The correct sequence is 1, 3, 2, 4. There is an error in (3). The correction is – ‘on’ the need to ….. Agree ‘with’ is used when two people have the same opinion on something. If people agree ‘on’ something, they all decide to accept it. Choice (3)

12. The right sequence is 1, 3, 2, 4. There is an error in (2). Since the sentence clearly refers to the future, the correction is – superhighway ‘will be’ an Choice (2)

13. The right sequence is 1, 3, 4, 2. There is an error in (2). The correction is ‘at different stages’ Choice (2)

14. The right sequence is 1, 4, 3, 2. There is an error in (4). The correction is – as though it ‘were’ a personal …… right. We use ‘were’ and not ‘was’, in a hypothetical situation, even though the subject singular. Choice (4)

15. The right sequence is 1, 3, 4, 2. There is an error in (2). The correction is – assigned ‘itself’. The sentence indicates that America is planning to do something – a task. Hence, assign should be followed by the reflexive pronoun ‘itself’. Choice (2)

16. The right order is 1, 3, 2, 4. There is a grammatical error in (3). The correction is — personal integrity ‘for’ economic security. You exchange one thing ‘for’ another and exchange something ‘with’ somebody. Hence, ‘for’ is apt in the context of the sentence. Choice (3)

17. The right sequence is 1, 3, 2, 4. There is an error in (3). The correction is – vision of himself, Vision here would mean ‘view’. It is followed by ‘of’ and not ‘about’. Choice (3)

18. The correct sequence is 1, 3, 4, 2. There is an error in (3). The correction is child ‘into’ a dangerous monster. To transform is to change somebody ‘into’ something else. Hence, it is ‘into’ and not ‘to’. Choice (3)

19. The correct order is 1, 4, 3, 2. There is an error in (4). ‘Vent’ is not followed by ‘out’. Hence, the correction is – vent their anger. Choice (4)

20. The right sequence is 1, 3, 2, 4. There is an error in 4. Because it is an intellectual discipline based on …….., it ‘should’ meet …. integrity is the argument. Hence the correction is – history must/should meet. Choice (4)

21. The right sequence is 1, 4, 3, 2. There is an error in (2). The correction is – question mark ‘over’ and not ‘about’ guilt. Choice (2)

22. The right sequence is 1, 3, 2, 4. There is an error in (2). The correction is – but ‘to encourage’, according to the rule of parallelism ‘not just to prevent ____ to encourage’. Choice (2)

23. The right sequence in 1, 4, 3, 2 there is an error in (3) the correction is - rather than, since there is a contrast being presented - you focus on the individual, rather than on the structure of the game. Hence, apart from - which means ‘as well as’ does not suit the context. Choice (3)

24. The right sequence is 1, 4, 3, 2. There is an error in (1). The connection is - threatened with suspension. You threaten somebody ‘with’ something. If someone or someone threatens a person or thing, they say or imply that they will do something unpleasant - threatened ‘by’ is used in this sense. Hence, threatened ‘with’ is appropriate in the context of the sentence. Choice (1)

25. The correct sequence is 1, 3, 2, 4. There is an error in (3). The correction is - that it will. Since ‘so’ is already there in part 1, its repetition in 3 is erroneous. Choice (3)

26. The right sequence is 1, 4, 3, 2, 3 and 2 form a pair ‘person of good sense _ _ _’. 1 and 4 form a pair and is followed by 3.
There is an error in (1). Emphasize is followed by ‘that’ and not ‘on’. The correction is ‘emphasized the importance’ which is connected with ‘that’ is (3). Choice (1)

27. The correct order is 1, 3, 4, 2. There is an error in (4). Since 4 and 2 form a pair ‘_ _ _ _’ extracted from them’, indicates that there has to be a reflexive pronoun in 4 - contain within ‘themselves’. Choice (4)

28. The right sequence is 1, 4, 3, 2, 4 is a continuation of 1, 4 and 3 are linked ‘evidence’ and that are connected. 3 and 2 form a pair, ‘one of the features’, it is the result of experimentation. There is an error in (3). The correction is ‘on behalf of’ Choice (3)

29. The right sequence is 1, 4, 3, 2, 1 is linked to 4 as what they have ruled (pronounce authoritatively and legally to be the case) is stated in 4. Then follow 3 and 2. There is an error in (4) the correction - legal right ‘to’ on abortion. Choice (4)

30. The correct order is 1, 3, 4, 2, 4 and 2 form a pair ‘whose’ in 2 refers to statistics in 3. 1 and 3 form a pair as 3 is a continuation. There is an error in (4). The correction is ‘a’ healthy skepticism, since it refers to ‘skepticism’ in a particular situation. Hence, the article is required. Choice (4)

31. The order is 1, 4, 3, 2. The error lies in part 3. The use of ‘so’ is wrong here because the sentence begins with ‘having’. Choice (3)

32. The order is 1, 3, 2. 4. Part 3 is erroneous. ‘Such’ in the main clause should be followed by ‘that’ in the subordinate clause (‘such - - - - - that’). ‘Hence’ is incorrect. Choice (3)

33. The order is 1, 3, 2, 4. ‘India is the land of - - - - ’ is an incorrect expression. The definite article, in this case, should be replaced by ‘a’ because ‘a’ is used to represent one. Choice (1)

34. The order is 1, 3, 4, 2. Part 4 is erroneous. The sentence speaks about an action that will be completed before a certain point of time in the future. Hence, the verb should be in the future perfect tense that is, ‘will have completed’. Choice (4)

35. The order is 1, 4, 3, 2. The error lies in part 4. The verb ‘have’ does not agree with the singular subject ‘one’. The correction is ‘has presented - - - - ’. Choice (4)

--- Practice Exercise 2 ---

Solutions for questions 1 to 35:

1. ‘Birds’ is given in plural and the pronoun to correspond this is ‘their’ and not ‘its’. Choice (4)

2. ‘To drop my plate’ means that the action was done on purpose. It has to be ‘and dropped my plate _ _ _ _’ which suggests that it happened by mistake. Choice (3)

3. The use of ‘that’ is incorrect. It was compared with ‘those’ in other countries. Choice (3)

4. ‘Which’ is used when we talk about small number of possibilities whereas ‘what’ is more general. Choice (1)

5. As ‘one’ is the subject, it has to be used throughout. The use of ‘he’ in place of ‘one’ in part 4 is incorrect. Choice (4)

6. The third part of the sentence should be ‘and crystallizes it’. Crystallizes is a verb which takes an object. Choice (3)

7. Part 2 of the sentence is faulty as the preposition used should be ‘of’ and not ‘in’. One is the ‘master of the art’ not in the art. Choice (2)

8. The fourth part of the sentence is faulty, as ‘drifting into winter’ is correct - it indicates motion. ‘In’ does not indicate motion. Choice (4)

9. In the first part of the sentence ‘its’ is in the genitive case, so there need not be an apostrophe. ‘Because of its hardness’ is correct. Choice (1)

10. The third part of the sentence should read ‘devote yourself unswervingly and unflinchingly’ to maintain parallelism in construction. Choice (3)

11. In an ‘if clauses’, if the conditional clause contains present tense of the verb the main clause should have ‘will’ and not would. Hence the third part is incorrect, ‘--- that will lead to -----’ Choice (3)

12. The phrase ‘at variance with’ means disagreeing or opposing. The first part of the sentence which says ‘in variance’ with is incorrect. Choice (1)

13. Here ‘regulated’ is in the active voice it should be ‘have been regulated’ in the passive voice. Choice (2)

14. ‘Integrated by law’ should be followed by ‘regulated by practice’ to maintain parallelism in construction. Choice (3)

15. In the third part of the sentence ‘and marginalize teaching’ does not make sense. It should be ‘marginalize his teaching’. Choice (3)

16. Two ideas are mentioned in the sentence ‘morally right’ and ‘politically right’ so the word used should be ‘between’ and not among. Choice (1)

17. The error lies in the second part, in the use of the preposition ‘from’ which does not indicate a period of time. Here ‘for’ should be used to indicate a period of three years. Choice (2)

18. Here the meaning is the black man is somewhat bitter, so the first part of the sentence should read ‘a little bitter’ instead of ‘little bitter’ which has a negative connotation. Choice (1)

19. ‘Told’ is a transitive verb that needs an object. In the absence of an object we must use ‘said’ as it is an intransitive verb. ‘--- told us that -----’ Choice (1)

20. The error lies in subject-verb agreement. In this sentence the subject is singular hence the verb should be ‘recognises’. Choice (2)

21. Since the sentence does not speak of a comparison, ‘lesser’ which is in the comparative degree should be replaced by less.

22. Since the subject Norway’s problems is plural, in the second part of the sentence instead of ‘that’ the plural form ‘those’ should be used.

23. In the second part of the sentence ‘slid’ should be followed by the preposition ‘by’ as the phrase ‘slid by’ means ‘passed by’. Choice (2)

24. In the last part of the sentence ‘dare explorers’ is faulty. It should have the adjective ‘daring’ qualifying the noun ‘explorers’. Choice (4)

25. ‘Eminently’ means notably whereas ‘imminently’ means ‘impending or about to happen’. Hence it should be read ‘eminently cautious’. Choice (4)

26. ‘Phenomenon’ is singular, since the sentence talks about many unusual happenings it should be replaced by phenomena, plural.

27. The positioning of the adverb ‘reasonably’ is wrong, it should produce ‘well established. It is ‘reasonably well-established….’ is correct. Choice (1)

28. ‘Smartly’ should replace ‘smart’ as it is the appropriate adverb following the verb step.

29. The verbal phrase ‘look at’ means ‘consider or examine’ whereas ‘look to’ means ‘rely on’. In this context ‘look to’ is appropriate.

30. In the ‘Not since…..’ construction the auxiliary verb ‘has’ should follow the subject. Hence the sentence should read ‘Not since Gandhi has the world seen….’. Choice (2)
### Solutions for questions 1 to 10:

1. The time phrase ‘until the other day’ suggests a past time. Hence, the verb should also be in the past. It should be ‘that was derisive’ and not ‘that is’… Choice (3)

2. As the adverb should be positioned between the auxiliary and the main verb (‘is’ and ‘courting’), the correction is ‘… is assiduously courting …’ Choice (1)

3. That clause lacks the correct verb form. It should be ‘that cater to…’ since the noun that precedes that is plural. (Places and countries). Choice (3)

4. The adverb hardly should be placed after ‘are’. Choice (4)

5. It is not ‘chip with’ but ‘chip in with something’ which means to join with something. Choice (4)

6. A group of scientists is the subject which is singular and hence the use of the plural verb ‘are conducting’ is incorrect in 4. It has to be ‘is conducting’. Choice (4)

7. The positioning of ‘each’ and ‘would’ in the first part of 4 is incorrect. It conveys the intended meaning only if it is positioned as it is in the second part of 4. (i.e) it has to be ‘--- that each sell a million ------- the adverb placed between the verbs. Choice (4)

8. Part 3 is erroneous. The use of the gerund ‘in triggering’ is absurd. It does not convey the meaning intended. The correction is ‘--- which triggered the war ----’. Choice (3)

9. The use of the preposition ‘about’ after ‘overboard’ in incorrect in 1. It has to be ‘--- go overboard resorting to ---’. Choice (1)

10. It is the impact ‘of’ the tobacco industry and not ‘by’. Hence part 4 is incorrect. Choice (4)

#### Practice Exercise 3

### Solutions for questions 1 to 20:

1. The first sentence makes a statement that is in the nature of a generalized truth. So it has to be followed by the present tense. The past in B makes it specific. It has to be ‘has’ not ‘had’. Similarly C has an “if clause” and so must be followed by ‘should’ or ‘would’ in D, but not by ‘are’. The correction is ‘we would be savages----’. Hence B and D are incorrect. Choice (4)

2. ‘Finances’ (plural) refers to the money available to a person, an organization or a country. This is the meaning intended in A. Similarly B must have ‘assets’ as it refers to the property a person owns. Choice (1)

3. Sentence A has ‘its’ (possessive) in place of ‘it’s’ (it is). In sentence C the verb should be ‘say’ not ‘says’ since the subject is ‘researchers’, which is in the plural number. Choice (3)

4. Sentence B must have ‘people looking at it …’. Similarly in sentence C it should be ‘a place like Easter Island’. Choice (2)

5. Sentence B must have ‘ruins’, since it refers to the remains of destruction and damage. In sentence C the word should be ‘symbol of’, (a thing that represents or stands for something else) not ‘symbol in’. Choice (4)

6. Sentence B should read ‘blessed with’ but not ‘by’ --. ‘blessed with something’ is an idiom which means ‘to have something good’. Sentence D must have ‘flower’ (singular not plural) since the verb is singular and the reference is to a single flower. Choice (4)

7. Sentence D must have ‘to do’, … He was supposed ‘to do’ ….. (be supposed to do something means be required or expected to do something). As given the sentence is incomplete. Choice (1)

8. Sentence B should end … fondly imagine him to be. Sentence D should not have ‘from’ – suffer fools gladly. The idiom ‘not suffer fools gladly’ means ‘to have very little patience with people that you think are stupid.’ Choice (3)

9. In sentence B the conjunction should be ‘but’ not ‘since’ as two contrasting things are connected. In sentence D ‘everyones’ must have an apostrophe since it means the minds of everyone. Choice (2)

10. Sentence B must have ‘a British soldier’ since we are referring to one person. Sentence C must have the definite article before the superlative – the finest. In sentence D the intended word is ‘site’ (noun meaning an area of ground) not ‘cite’ (verb meaning quote as evidence). Choice (4)

11. Sentence A must have ‘environmental’ (adjective) not ‘environment’ (noun) since it modifies ‘cost’. Choice (1)

12. Sentence A must have cells (plural) since we are talking of 100 billion. In sentence D it should be ‘involved in’ not ‘involved with’. ‘Involved in’ means make someone take part in something whereas ‘involved with’ means to have a close personal relationship with someone. Choice (2)

13. You ‘discuss something’ not ‘discuss about something’. Hence A is incorrect. In sentence D it should be ‘blurted out’ meaning to say something suddenly without thinking. Choice (3)

14. Sentence C should begin ‘on account of …’ (meaning because of) not ‘on an account of …’. In sentence D it should be ‘… ‘Chilka is home to,’ meaning the large birds consider it their home. Choice (4)

15. Sentence A should read ‘at the earliest stage’ – ‘at’ rather than ‘in’ is preferred in referring to time. In sentence B the stem cells develop ‘into’ (not for) the different blood cells. In C, they are released ‘into’ (not on) the bloodstream. Finally, in D the stem cells can be collected ‘from’ (not ‘for’) the bone marrow. Choice (3)

16. Sentence A says flowers have always played a part. Hence the reference can not be to one religious ceremony so, it must be ceremonies (plural). In sentence B, their perfumes have a distinct ‘effect’ on the mind. The omission of the definite article is incorrect. Choice (2)

17. Sentence B must have ‘a consistent stream of cash’. Sentence C must read ‘to have’ not ‘having’ since the latter implies that the newspaper already has what is stated. Choice (1)

18. You can not ‘help’ polio vaccine but you can ‘help with’ polio vaccines. Hence sentence A should read ‘I helped with the …’. Sentence D must also have the modal auxiliary ‘would’ – ‘Then I’d check …’. Since the previous two sentences narrate in that manner. Choice (4)

19. Sentence C should read to find the balance. In sentence D parallelism requires
that 'by' is repeated .. not by sermons but by working….. Choice (3)

20. Sentence B should read ‘At the core of this Rs 20-crore project ….’ It is essential to have 'this' or 'the' here because the reference is to a specific project. Sentence D must have 'across' not 'through'. Choice (4)

--- PRACTICE EXERCISE 5 ---

Solutions for questions 1 to 20:

1. Sentence A should have ‘boasts of’ or only ‘boasts’ not ‘boasts about’. Sentence C should have the phrasal verb ‘account for’ (to be the explanation or cause of something). Sentence B and D are correct sentences. Choice (2)

2. It is the dream of an anthropologist (i.e.) ‘anthropologist’s dream’. Hence A is incorrect. Since sentence A is in the past tense, sentence B which talks of something that happened earlier, should be in the past perfect tense – ‘… had been discovered …’ not ‘were discovered’. C and D are grammatically correct. Choice (4)

3. In sentence B ‘a healthy threat’ is wrong; it is ‘a health threat’ (a threat to health). Sentence C should end … ‘it may be an addictive’ but not ‘it may addict.’ A and D are correct sentences. Choice (4)

4. Sentence A must have ‘seen as’ – the phrase means ‘to imagine somebody or something as’. In sentence C the right conjunction is ‘but’ not ‘and’ since ‘brilliant’ and ‘obscure’ are quite contradictory. B and D are correct sentences. Choice (2)

5. Sentence A must read ‘nearly fell’ not ‘fell nearly’ because the adverb ‘nearly’ qualifies ‘fell’. Sentence B must be …. soaked up to my thigh – ‘up to’ means ‘as far as’ here. C and D are correct sentences. Choice (3)

6. In sentence C the punctuation is wrong – the question mark should be inside the quotation mark. A, B and D are correct sentences. Choice (2)

7. Sentence B must have … gazed down at the …. Sentence D should read ‘plant and animal life’ not plants. A and C are correct sentences. Choice (2)

8. Sentence B must have ‘as exciting as’ not ‘so exciting as’. Sentence C must have the adjective ‘monosyllabic’ not the noun ‘monosyllable’ since it qualifies response. Sentence D should be ‘out of the question’ (idiom meaning impossible) not ‘off question’. Choice (3)

9. Sentence A must read …. no other drug enforcement agents … In the absence of ‘other’ it includes themselves. Sentence C must have ‘into’ not ‘in’. because the intended idea is to bring him into the open (means not hidden). Sentence D should be … more than a match. (meaning to a greater degree). Sentence B is a correct sentence. Choice (3)

10. In sentence A it should be ‘reputation for’ not ‘of’. In sentence B it should be ‘hit the headlines’ – an idiom which means ‘to be an important item of news in the newspaper’. Sentence C and D are correct sentences. Choice (4)

11. Sentence A must have the plural ‘creations’ – ‘one of’ is always followed by the plural noun. In sentence B it should be ‘a group of crystals’. Sentences C and D are correct. Choice (3)

12. Sentence A must have ‘use of’ not ‘use for’. If we lose the ‘use for’ something then it is no longer useful to us. (I have no use for school books now) but when we lose the ‘use of’ something we are no longer able to use it (I have no use of my right hand after the stroke). Sentence C must be – ‘He is also a music teacher ……’, linking it to his being an expert harmonium player. As given it implies that he is a music teacher at the municipal school in addition to being a music teacher somewhere else. This is neither stated nor implied. Sentences B and D are correct sentences. Choice (4)

13. In the context of what follows (predictions about the future) sentence A must have the simple present (promises) not the past (promised). In sentence C it must be the plural ‘industries’ not the singular ‘industry’ since a number of industries are referred to. Sentences B and D are correct sentences. Choice (4)

14. Sentence C must read ‘workspaces are increasingly being designed ……’ The adverb must be placed between the principal verb and the auxiliary or between two auxiliaries. In sentence D, however, the adverb ‘internationally’ must be at the beginning of the sentence since it qualifies ‘design’ but not ‘taken’. A and B are correct sentences. Choice (4)

15. Sentence C must read ‘workspaces are increasingly being designed ……’ The adverb must be placed between the principal verb and the auxiliary or between two auxiliaries. In sentence D, however, the adverb ‘internationally’ must be at the beginning of the sentence since it qualifies ‘design’ but not ‘taken’. A and B are correct sentences. Choice (4)

16. Sentence A must have the superlative (biggest) not the comparative (bigger). Sentence D has a comparative ‘more aggressive’, so the question arises ‘than what’? So the sentence must read ‘more aggressive than before’ or ‘becoming more aggressive’. B and C are correct sentences. Choice (2)

--- ERROR CORRECTION ---

--- PRACTICE EXERCISE 1 ---

Solutions for questions 1 to 45:

1. Option 1 is incorrect because the preposition ‘with’ should be replaced by ‘of’. In option 3 the phrase ‘sterner stuff’ should not be preceded by the article ‘a’. In option 4 the noun ‘easy’ should be changed to ‘ease’, because ‘a life of ease’ is the correct expression. Choice (2)

2. Options 2, 3 and 4 are incorrect because the conjunction ‘since’ and ‘because’ do not explain the ‘paradox’, which is being referred to. The ‘paradox’, is best stated by the conjunction ‘yet’. Choice (1)

3. Option 1 is incorrect because the words ‘nineteenth century’ should be preceded by the article ‘the’. Besides, the words, ‘world commonwealth’ should be preceded by the article ‘a’, because in this context a particular common-wealth is being referred to. Choices 3 and 4 are incorrect because the verb ‘is’ does not agree with both ‘cosmopolitanism’ and ‘nationalism’. Choice 4 is incorrect because is should be replaced by ‘are’ and

17. The present tense (makes) in B makes it a generalized statement but what follows in ’since then …..’ makes it specific. So the tense in B should be past (made). Sentences A, C and D are correct. Choice (2)

18. In sentence B it should be ‘reserve of’ not ‘in’. In sentence D it will rise over the coming years. A and C are correct sentences. Choice (1)

19. Statements B, C and D are incorrect. In statement B the reference is to ‘a system of railways’ hence ‘Indian railways’ is the correction. In statement C ‘the’ the pronoun ‘they’ is incorrect. The correction is ‘It’ because the reference is to ‘the railways’. The correction in D is ‘superiority over’ but not ‘on’. Hence choice is (1).Only sentence A is correct. Choice (1)

20. Sentence A must have the superlative (biggest) not the comparative (bigger). Sentence D has a comparative ‘more aggressive’, so the question arises ‘than what’? So the sentence must read ‘more aggressive than before’ or ‘becoming more aggressive’. B and C are correct sentences. Choice (2)
4. Option 1 is incorrect because here the correct conjunction to be used is so ......... as. Option 2 is incorrect because the word literature should not be preceded by the definite article. Option 3 is incorrect because the usage of 'so' ......... that is incorrect in this context. Choice (4)

5. Choice 1 is erroneous because the usage of the article 'a' before the words 'constant consternation' is incorrect. Besides, in choices 1 and 4 the word 'consternation' should be followed by the preposition 'to'. Option 2 is incorrect because the words 'many' and 'most' should be preceded the article 'the'. Choice (3)

6. Choice 2 cannot be the right answer because the words 'electorate', and 'opinion polls' should be preceded by the article 'the'. Option 3 is erroneous because the verb 'are' does not agree with the word 'electorate' which is taken as singular. Option 4 is incorrect because the adverb mostly is incorrectly used in place of 'most'. Choice (1)

7. Political parties can be replaced by the pronoun 'which' not 'who'. Hence choice 4 is ruled out. Choice 3 is incorrect because it should be 'the' sun. Choice 1 is incorrect because we are 'weary' 'of' not 'about' something. Choice (2)

8. The positioning of 'too' is correct only in choice 4. We do not say 'a' too complex, hence choices 1 and 3 are ruled out. The structure here is 'too……to' which is not followed in choice (2). Choice (4)

9. The sentence is a generalized statement as indicated by the latter part of the sentence. Therefore 'has been' in options (2) and (3) renders them incorrect. Option (1) does not convey proper sense, hence is ruled out. Choice (4)

10. The verb 'weathered' means to come safely through a difficult period or experience. Hence, “has been weathered” being in the passive is in apt. Thus (1) is ruled out as incorrect; the words “this time” shows that “finds” is correct and hence options (1) and (2) rules them out. Further, we say “many a crisis”, and so option (4) is the correct answer choice. Choice (4)

11. Both 'reflect' and 'depict' are followed by an object and hence options (1) and (3) are ruled out because of the preposition 'of'. Option (2) is also ruled out for the same reason above, Hence (4) is the right answer. Choice (4)

12. The infinitive “to win” and “to get” is appropriate since the sentence speaks of attributes which helped John Wright to achieve something (that is, to win the confidence and to get them to listen to him). So option (3) is ruled out, the other error is in the positioning of 'enough' which should be placed before the infinitive. Thus option (1) and (4) are ruled out. Choice (2)

13. The phrasal verb “look for” meaning search for something is appropriate in the context. Hence “looking into” in (4) is incorrect. Further “to get around” meaning “to avoid” is contextually relevant. Hence option (3) is the answer choice. Choice (3)

14. The verb ‘is’ ‘whispered’ is incorrect in option (3). The post of “special envoy” is a front with a purpose i.e to hide the secret activities. Hence the preposition ‘for’ is correct. The preposition ‘on’ rules out option (4). The relative pronoun ‘which’ being the subject of the clause requires a verb. Hence, in option 2, the verb ‘is’ is in the appropriate place and so renders it incorrect. Choice (1)

15. The past tense of ‘lie’ being ‘lay’ rules out (1). The word “oppressive” refers to conditions which oppress people and so the adjective ‘oppressed’ which refers to people render options (1) and (2) incorrect. Since the sentence is in the past tense, ‘has’ or ‘have’ is incorrect and so only option (3) is appropriate. Choice (3)

16. Concerns can “grow” or “sharpen” but not ‘grown’ or ‘sharpened’. So option (1) and (2) are eliminated. The sentence clearly implies that the concerns are already existing and so the conjunction ‘if’ is incorrect. ‘As’ gives the reason why “the concerns have grown and will further sharpen”. Thus the conjunction ‘if’ in option (4) rules it out. Choice (3)

17. The ‘be’ form of the verb renders the adjective ‘enough’ meaningful. ‘Does’ is meaningless. Option (1) is ruled out. The adverb ‘often’ follows the verb ‘is’ Option (2) is also ruled out. “Keeping the goal” would refer to a presentation while, in the context, the infinitive ‘to keep’ is more appropriate as it suggests a future action. This rules out (4). ‘To move’ again is erroneous as the action is in progression. Hence ‘moving’ makes it grammatically correct and renders it more meaningful. Choice (3)

18. Since the subject is ‘two molecules’ the pronoun should be “their”. The pronoun “its” in options (1) and (4) is incorrect. Choice (3)

19. The phrasal verb “go by” something which means “be guided by something” or “take it as a basis” is appropriate in the context. Options (1) and (2) are ruled out as ‘from’ in option (1) and ‘owing to’ in option (2) distort the meaning in the sentence. In option (3) the phrase “is made to appear making” is grammatically incorrect. Hence only (4) is right. Choice (4)

20. The adverb ‘powerfully’ modifies how the poet (Shakespeare), expresses the decline of youth and the inevitability of ageing. So, the adjective ‘powerful’ rules out options (1) and (3). The phrasal verb “muse over” meaning think carefully about something is appropriate in the context and so options (1), (2) and (3) are ruled out. Choice (4)

21. Options (2) and (4) are ruled out as “injustice” should be in the plural as we have ‘reports’. The second error is in the phrase “opportunities to basic education”. The correct form would be “opportunities for something”. This rules out options (2) and (3). The specific article ‘the’ is needed before “exploitation of children”. Choice (1)

22. We ‘portray’ someone ‘as’ someone else; ‘with’ renders options (1) and (4) incorrect. The adverb ‘more’ should be placed near the verb ‘matters’ and so option (3) is ruled out. ‘Roll up’ meaning fold something is correct. The right answer choice is option (2). Choice (2)

23. The verb ‘rising above’ is correct because it means that a building is tall. “Arising” is inappropriate because it refers to something that begins to exist. ‘Raising” would refer to someone else doing it. Hence options (1) and (3) are ruled out. ‘Unless’ expresses condition and ‘until’ time. The former is right here. Choice (4)

24. When something is “the modern face” of something we mean to say that it is in contrast to that in a particular aspect. Hence, the preposition ‘to’ is incorrect. Between options (3) and (4), option (4) is eliminated because the adverb ‘soon’ should be placed before the verb ‘disabuses’ hence option (3) is the right answer choice. Choice (3)

25. The sentence states that something “is a successful technique”. So, the verb ‘is’ here, indicates that it is of a general nature. ‘To tie’ is in the future tense while ‘tying’ is in keeping with the general nature of the sentence. This rules out options (3) and (4). The adjective ‘successful’
doesn’t go with the phrase “completion of a task”. Hence option (2) is ruled out. Choice (1)

26. It is clear from the phrase “conform with EU regulations” that Sweden joined the EU and not vice-versa. The statement gives examples of what Sweden did since joining the EU. Thus, options (3) and (4) are ruled out. The year 1995 is taken as a point of reference, therefore, the preposition “during” is erroneous and its correction is “in”. So, option (1) is ruled out. The “lifting of bans” is valid even now; hence ‘has had’ is correct. These corrections are seen in option (2). Choice (2)

27. Since there are a number of days we refer to the duration as a “five day period”. ‘Five days period’ is erroneous. This rules out options (1) and (3). In option (2), “from” is always followed by ‘to’. “Hence”, … and “between” is correct. Hence only option (4) is correct. Choice (4)

28. ‘Which’ rules out option 3 and ‘in development’ rules out option 4. The preposition ‘for’ is appropriate as the intention is that such kind of people will develop India. We say “a greater height” or “greater heights”. Hence between (1) and (2), the former is grammatically correct. Choice (1)

29. The prepositional phrase ‘ahead of’ means further forward or advanced than – ‘Ahead’ is always followed by ‘of’. Option (1) is ruled out. The adjective ‘big’ modifies the task and the tone in which it has been used is negative. Hence the word ‘very’ or ‘so’ (in (1), (3) and (4)) should be replaced by ‘too’, which is in tune with what is stated. So, option (4) is ruled out. Since there is no comparison, the adjective ‘smaller’ is erroneous in (3) should be ‘small’. Choice (2)

30. Both the conjunctions ‘as’ and ‘if’ appear correct and both make sense in the sentence and therefore “growth rate of 10 per cent” and “growth rate to 10 per cent consequently also respectively appear correct. It’s only the correlative conjunctions “not only … but also” in the sentence which decides the appropriate answer choice. ‘need to’ precedes ‘not only’ and so only choice 3 is right. Choice (3)

31. Since the verb ‘singles out’ is not parallel to ‘highlighted’, it should be changed to ‘singles out’. Choice (1) is therefore the right answer. Choice (4) is wrong because it should be ‘as being not ‘as to be’. Choice (1)

32. The underlined part has the following error. “Smotherer” as the verb does not exist. It should be smoother (stifle or put out). Choice (3)

33. The correction is ‘one and a half centuries’. Hence the right answer is choice (2). Choice (3) is wrong because when we have two proper nouns and both of them own the same thing, we should use apostrophe and ‘s’ to the second noun. Choice (2)

34. The underlined part has the following error. When we say having been done, we mean a huge time gap. Since the context suggests no time gap between turning off the file encryption and shifting the systems, we should say just turned off. Choice (2)

35. The underlined part has the following error. The verb instructed implies that the NGO taught the locals how to raise chicken, hence it takes the preposition ‘on’. Choice (4)

36. Since the collective noun ‘government’ refers to all people in the government as a group and not to each individual separately, its equivalent pronoun is ‘its’ and not ‘their’. Choice (3) is the right answer. Choice (3)

37. When the conjunction as is used in the combination of Adjective + as + subject + be-form verb, it means though or although. Therefore, the right answer is choice (4). Choice (4)

38. The underlined part has the following error, ‘to be wrenched’. We should not use ‘to + verb’ after ‘copes with’. However we can say…being wrenched. Choice (2)

39. Since the verb grow takes to + infinitive or to + be + part participle (in passive voice) and not being + part participle, choice (1) is the right answer. Choice (3) is wrong because the verb fascinate takes ‘by’ in passive voice and not ‘at’. Choice (1)

40. The underlined part has an error in tense. Since the context suggests that after the first action (that is, ‘Turnling’s publishing) had happened, the second action (that is, Cullough suggesting) happened, the first action should be in the past perfect tense, i.e., had published. Therefore, choice (4) is the answer. Choice (3) is wrong because few years mean hardly any years but the context suggests after some years. Choice (4)

41. Since none in this context means not one, i.e, no city, it takes a singular verb ‘from’ is wrong in choices (1) and (3), ‘rise’ is wrong in choice (4). Choice (2)

42. The comparative adjective… the + comparative adjective is the standard expression. Hence, choice (3) is the answer. Since hear does not take ‘to’ with its infinitive, choice (1) is wrong. Choice (2) is wrong because hear him preaching… distorts the meaning of the sentence. Choice (3)

43. The underlined part has one error, ie., too great. It should be. So…that, ‘across’ and ‘of” in choices (2) and (3) make them wrong. Choice (4)

44. The underlined part has two errors. The verb ‘inform’ does not take any preposition, hence it should be… informed… (not informed) The ‘concerned authorities’ would mean the worried authorities. But in fact, what we mean here is the right authorities (people). To get that meaning we should say the authorities concerned. Thus choice (3) is the right answer. Choice (3)

45. The underlined part has an error. When we use an adjective with the definite article the, the adjective refers to all the people of that class, e.g., The rich = all rich people similarly, the downtrodden = all downtrodden people. Therefore, it always takes a plural verb. Choice (1) is the right answer. Choice (1)

Practice Exercise 2

Solutions for questions 1 to 45:

1. The phrase many + a + noun always takes a singular verb, hence we should change ‘have’ to ‘has’. Thus choice (3) is the answer. Choice (1) is wrong because the noun ‘loyalty’ takes either ‘to’ or ‘towards’. Choice (3)

2. As per rules of grammar, we should not use two comparatives together. However, we can use one positive and one comparative. Therefore, choice (1) is the answer. Choice (1)

3. The idiomatic phrase ‘cannot be bothered to do something’ means that you do not want to spend your time or, energy doing it. The correction is …could not be bothered to nail on. Choice (1)

4. The underlined part is awkward. What is said in the part between commas just gives us some additional information about ‘Eddoes’. The correction is to replace being that with ‘who’. Choice (2) is the answer. Choice (3) is wrong because we should not use ‘that’ in Non-defining clauses. Choice (4) distorts the meaning of the sentence. Choice (2)

5. The correction is…wiped the decision off…. and not had wiped….because wiping something off something means removing something from something.
Choice(4) is the answer. Choice(3) is wrong because in case of plural nouns ending in s, we should not use s after apostrophe. Since off itself means away from, choices (1) and (2) are wrong. Choice (4)

6. The underlined part has two mistakes. One, ‘boldly’ as it is placed suggests that the philosopher is ‘bold’. But the sentence actually intends conveying that the speaker is ‘bold’ (here confident) when he defines the philosopher. Hence, it should be placed after the verb ‘said’. Two, ‘interested’ always takes ‘in’ and not ‘on’. Therefore, choice (2) is the right answer. Choice (2)

7. The underlined part has two mistakes. One, the time phrase ‘for the past . . . ’ indicates a situation that has continued over a period of time and still continues. Hence, we should present it in the present perfect tense; we should use been, that is, . . . who has been . . . ’. Two, ‘links’ cannot be ‘allleging’; they can only be alleged by someone. Hence, ‘alleged links’ is correct. Hence choice (3) is the right answer. Choice (4) is wrong as we cannot use the relative pronoun ‘that’ in non-defining clauses. Choice (3)

8. The non-finite verb ‘having stoked’ suggests two ideas which the sentence does not convey. One, it implies that the cost encouraged the fuel prices. Two, it shows that encouraging the prices happened long back and the cost’s sparking a violent protest has happened now, that is there is a huge time gap between the two. Besides, it is not the cost of one food item but many that has instigated violence. Hence, food staple should be plural. And the non-finite clause should have only the past participle, that is, ‘stoked’. Thus, choice (1) is the right answer. Choice (1)

9. When two nouns are connected by either ‘either . . . or’ or ‘neither . . . nor’, the verb agrees with the second noun in number. Since the second noun ‘officials’ is plural, the verb should also be plural, that is, ‘have’. Choice (4), thus, is the right answer. Choice (4)

10. Since the three verbs fund, conduct and write are parallel, the third verb ‘writing’ should also be in the past participle form, that is, ‘written’. Moreover, we always ‘raise’ an issue (mention or bring to someone’s notice) we do not ‘rise’, ‘rise’ cannot take an object. Therefore, choice (3) is the right answer. Choice (3)

11. When we begin a clause with ‘nor’, we should use a helping verb immediately after it. Since ‘primarily’ qualifies the verb look upon, it should be placed before the preposition ‘as’. Therefore, choice (2) is the right answer. Choice (2)

12. Since the noun ‘world’ is singular, the verb should be singular, that is, devotes. And, ‘devote’ always takes ‘to + ing verb’ and not ‘to + infinitive’. Thus, choice (3) is the right answer. Choice (3)

13. Since the verb phrase ‘has been’ is common, we need not use it in both the places; we can use it just before the correlative conjunction ‘not only’. The conjunction ‘not only . . . but also’ takes the same part of speech. In addition, the preposition ‘in’ is redundant. Thus, the right answer is choice (4). Choice (4)

14. Since we are referring to all debt collectors, we should use the plural verb, that is, ‘are’. Since we mean ‘delayed’ and not ‘recently’, we should use ‘late’ and not ‘lately’. Thus the right answer is choice (1). Choice (1)

15. Since the noun ‘scientists’ is plural, we should use the plural verb, that is, ‘claim’. Choice (2) is the right answer. Choice (3) is wrong because it suggests that the finding is not over. But the tone of the sentence (hunting . . . ) suggests otherwise. Choice (2)

16. As ‘the majority’ suggests ‘many’, the verb should be plural, that is, are. Hence, choice (4) is the right answer. Since ‘attributable’ take ‘to’ and not ‘for’, choice (2) is wrong. Choice (4)

17. Since the context suggests that in the presence of the circumstances, a skill comes into existence, we should use ‘in’ before ‘which’. So, choice (3) is the right answer. Choice (2) is wrong because we should use a singular verb with a ‘skill’. Choice (4) is also wrong as ‘many a skill’ takes a singular verb. Choice (3)

18. As ‘restrict’ is a verb that requires a reflexive pronoun, we should use ‘itself’. And as it takes ‘to + ing verb’, ‘to hitting’ is correct. So, choice (4) is the right answer. Choice (4)

19. When we define a noun with ‘some of’, we should use the objective relative pronouns. Hence, the correction is ‘some of whom’. Choice (2), therefore, is the answer. Choice (2)

20. The context suggests something that will not happen since we express this idea with ‘wish’. We should use the past tense verbs. As the past equivalent of ‘will’ is ‘would’, choice (1) is the right answer. Choice (1)

21. The expression as old as indicates equality of age, but the sentence indicates that the temples predate the Dravidian structures. The best choice 4 makes the point of comparison clear. It also uses the correct adjective ‘supposed’, rather than supposedly (an adverb) to modify the noun phrase Dravidian predecessors. Choice (4)

22. In this sentence, Ben Jonson the dramatist can be compared to Shakespeare the dramatist. His plays can not be. Only choice D brings out the correct comparison. Choices 1, 2 and 3 make illogical comparisons. Choice (4)

23. Each choice but 3 contains errors of agreement. The singular subject each takes a singular verb has and not have. Choice 4 is very awkwardly constructed and convey a very absurd idea. Choice 2 is wordy and contains the unnecessary ‘each of’. Choice 3 maintains subject–verb agreement (sons have made) and provides a clear structure. Choice (3)

24. In this sentence, “benefits of exercises” such as ‘aerobics’ and ‘lighter exercises’, should be followed by a plural verb ‘are’ and not ‘is’ (that are strenuous). Similarly, in the second part of the sentence, underestimated that is incorrect. The reference is to the plural “benefits of exercises” and the pronoun to be used is ‘those’ not that. In choices 3 and 4 the use of when nonsensically suggests that benefits of strenuous exercises are underestimated when they are derived from lighter exercises Choice 2 uses the correct pronoun those. Besides, ‘strenuous exercises’ is more concise and solves the Subject Verb agreement problem. The phase ‘strenuous exercises’ is also parallel to lighter exercises. Choice (2)

25. The use of the pronoun ‘it’ at the end of the sentence gives room for confusion and ambiguity. We are not sure whether the book was on his study or on magnets or on their properties. So, Choices 1 and 2 are eliminated. The inappropriate positioning of the adverb first in Choice 3 eliminates this option also. It suggests that he made the study first in 1600 and followed it up with another study later. Choice 4 is the best choice because it uses the term ‘magnetism’ and not ‘it’ or ‘they’. A detailed study is preferable to did a detailed study. Choice (4)

26. The original sentence contains no error and so Choice 1 is the best. It uses the idiomatic correct expression ‘distinguish between ‘s’ and ‘v’’. In choice 2, the use of from instead of and is incorrect. In Choices 3 and 4 farmers learn distinguishing and distinguishing of are ungrammatical. Choice (1)
27. The comparison in this sentence is between a fixed-interest housing loan and a floating interest loan. Choice 1 illogically compares loan with loan seeker and loan seekers respectively. In choices 2 and 4, the comparison is again illogical and imprecise. Prepositional phrases ‘with floating interest loan seeking’ in 2 and ‘floating interest loan seekers’ in 4 make the choices incorrect. Choice 3 makes the correct comparison between loans and also provides the active verb form ‘does not require’ which is parallel to requires. Choice (3)

28. The verb ‘calls’ is in simple present tense. Hence ‘approach’ is correct. It is not followed by ‘to’. Hence 4 is incorrect. Choice (3)

29. Centuries of servility ‘has’ (already) made him tame. Choice (3)

30. An act has been stated simply. Hence continuous tense should not be used. Verbs of possession are not used in the progressive tense. Choice (3)

31. A habitual action should be in the simple present tense. All the more, ‘leaves’ is present and hence ‘eats’ should be used. Choice (2)

32. quiting (it) seems to be …… Here we should use the Gerund form. Choice (3)

33. ‘cope’ is followed by ‘with’. Choice (1)

34. Christmas is an event and not a person. Therefore, ‘that’ is the right choice and not ‘who’. Choice (3)

35. Past continuous tense ‘was just setting’ is appropriate. The given sentence is correct. Choice (3)

36. “I can scarcely remember”, “I can hardly remember” indicate that the person finds it difficult or impossible to recall. ‘Rarely’ has the tone of ‘occasionally’ which is not intended. Choice (4)

37. Out of the choices (3) is the correct choice structurally, because ‘would’ cannot be followed by ‘wanted’. Choice (3)

38. To denote a completed action we use the simple past. Choice (2)

39. ‘as normal as possible’ is intended here. Choice (3)

40. The past tense is suggested by ‘talked’. ‘Had’ is not required, as all the other verbs ‘crept’, ‘hugged’ are also given in simple past. Choice (2)

41. ‘Became’ suggests past tense. ‘Had’ is not required. Choice (4)

42. ‘I always had’ …… past tense. ‘Have’ is not needed. Choice (3)

43. The use of ‘has’ or ‘had’ is incorrect. ‘Handed over, apologized and explained’ is correct. Choice (1)

44. ‘Many’ indicates number, quantity. So many memories is the correct usage. Choice (3)

45. It is an imaginary situation hence the structure is ‘as though I were……’. The given sentence is grammatically correct. Choice (1)

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**Practice Exercise 3**

**Solutions for questions 1 to 30:**

1. day dreaming …… and …… someone clinging …… ‘ing’ form should be used throughout. Choice (4)

2. The correct past tense to be used is ‘ground’. Maintain the past tense throughout. Heart broken and ignored, she ground her way…. Choice (2)

3. The word ‘most’ in the given sentence indicates the superlative degree. Hence, the correct form would be the one shown in option 4. Vithal is the most meticulous man that I have ever met. Choice (4)

4. The entire sentence talks of an incidence that took place in the past. Therefore, the correct form of the sentence would be – Hardly had Vina scolded her daughter, when she started crying. Choice (2)

5. ‘Informed’ indicates past tense. Therefore, the usage of ‘has’ is incorrect. ‘Had sent’ is the right form. Choice (3)

6. The correct expression would be ‘……… suggested that we should not talk about ……..’ Choice (2)

7. In either …… or the verb agrees with the latter. It should be ‘I am’. Choice (4)

8. The correct idiomatic expression is ‘cut out for’. Choice (2)

9. ‘to’ infinitive should be used here. Hence, ‘hard to get work’ is the right. Choice (3)

10. Parallelistm requires that ‘rather work’ is followed by ‘than sit and watch’. Choice (3)

11. The past tense should be applied uniformly “……… he hadn’t had ……… “, because ‘looked’ is part. Choice (1)

12. Here the simple present tense should be used. Option 1, ‘……… strongly desires ……..” is the answer. Choice (1)

13. The future tense is best represented by ‘will be’ and not ‘is’. Also holiday ‘for’ is the correct preposition to be used. Choice (2)

14. Scarcely ……… when. Correlative conjunctions. Hence, the right sentence would be “when it broke” as it has to be in simple past, corresponding to ‘did’. Choice (3)

15. ‘would visit’ indicates an action in the future. As ‘informed’ is also in past ‘will’ should be changed to would’. Choice (1)

16. ‘So’ indicates comparison. Here no comparison is intended. The man spent a lot because he had a lot of money. This idea is best conveyed by the clause ‘had a large amount of money’. Choice (4)

17. The sentence is in the past tense (knew that ….). Hence, to have uniformity the verb ‘is’ should also be in the past tense. Also, the comparative form ‘greater than’ should be followed by ‘other’. Hence, Choice (4)

18. The verb ‘believed’ is in the past tense. Hence ‘is’ should also take the past tense form ‘was’. Choice (4)

19. Whenever we have ‘neither ……..nor’ in a sentence the verb must agree with the number (singular/plural form) of the second subject. Since ‘members’ is plural we must use ‘have’ and not ‘has’. Choice (1)

20. ‘Verb + if’ should be followed by ‘could’ (past tense form). Hence, the sentence should read - The master tested the new boy to see if he could read English. Choice (3)

21. The original sentence gives the feeling that my marks are being compared with all the boys (and not their marks). Hence, our choice would be the one where ‘my marks’ are compared with the marks of the other boys. In option 4 ‘……….. than those of ……..’ means the marks of the other boys. Choice (4)

22. ‘Has’ indicates present tense. ‘I shall wait …… here’ indicates that we should have future tense throughout the sentence. Therefore, the correct form of the sentence should be ‘I shall wait here until the bus arrives.’ Choice (2)

23. This poem is ‘one of the many’. Hence the plural of poem (that is) ‘poems’ must be used. Choice (2)

24. The first part of the sentence, the main clause, is in past tense as ‘called’ is used. Hence what follows in the subordinate clause should also in past tense. ‘has seen’ is present perfect and hence is wrong. ‘saw’ is the correct usage. Choice (3)

25. The adjective ‘complete’ does not take the comparative degree or the superlative degree. Hence the use of ‘most’ is inappropriate. The use of ‘his’ is incorrect in options 1 and 3. Choice (4)
26. He has taken 'leave for two days'. Hence it becomes 'two days's leave' where 's' after the apostrophe need not be used. The use of 'his' is incorrect in option (1) and (3).
    Choice (1)

27. The error is in the usage of the question tag. A negative sentence takes a positive tag and vice versa. Also the same auxiliary verb (are) that has been used in the sentence is repeated in the question tag.
    Choice (3)

28. The appropriate usage is 'to arrest someone on a charge of something'.
    Choice (2)

29. 'None of the employers' is the subject of the given sentence, which is plural. Hence 'have' should be used and not 'has'. 'Invest in' is more appropriate that 'invest on' in this context.
    Choice (4)

30. 'A lot of money' is taken as a singular noun and so 'is' should be used in place of 'are'.
    Choice (2)

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**BEST SENTENCE**

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**Practice Exercise 1**

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**Solutions for questions 1 to 40:**

1. The original sentence is erroneous because the action denoted by the verb requires the use of the possessive pronoun. Hence the correction is '_ _ _ will depend on our doing something': Option 2 which is a repetition of the original sentence is therefore incorrect. Option 1 is incorrect for the same reason. Further, in option 2 the pronoun 'us' cannot be followed by the to infinitive. Option 4 is incorrect because of the incorrect tense. Since the reference is to the future the verb should be in the future tense '_ _ _ will depend on _ _ _'. Choice 3 is grammatically correct.
    Choice (3)

2. The original sentence given in the question is incorrect because the word century should be in the plural as we are talking about two centuries the seventeenth and the eighteenth. Option 1 is erroneous because of the preposition 'in'. Since the reference is to an occurrence throughout a particular period, it should be denoted by 'through' and not 'in'. Option 3 is incorrect because of the adjective 'most' which is generally used with quantity. Since the reference, here, is to period 'much' is the appropriate adjective and not 'most'. Only option 4 is right.
    Choice (4)

3. The given sentence is incorrect because the reference is to a period in human history hence it should be denoted by the adjective 'much', and not 'most'. Choice 2 is a repetition of the original. Options 3 and 4 are incorrect because of the inappropriate placement of the adverb 'mostly'. Since the reference here is to a vast period of history it should be denoted by 'much'. Hence choice 1 is correct.
    Choice (1)

4. The original sentence is incorrect because the expression 'which are among the world's oldest' is a parenthetical expression and therefore should be preceded and followed by commas. Options 1 and 3 are incorrect because the word 'home' should not be preceded by the article 'a'. Only option 4 is correct in terms of grammar and usage.
    Choice (4)

5. The original sentence is incorrect because the verb 'possesses', which is in the plural, does not agree with the subject 'individuals'. Choice 2 is repetition of the original. Options 3 and 4 are incorrect because of the use of the word 'that'.
    Choice (1)

6. The given sentence is erroneous because of the pronoun 'it' which is unnecessary. Option 2 which is a repetition of the original is therefore erroneous. In option 1 the expression 'which is' and the pronoun 'it' is not required. Therefore option 1 does not conform to standard English usage. In option 3 the word 'not' which is used after the word 'seldom' is not required. Hence 3 can be ruled out. Only choice 4 is most appropriate.
    Choice (4)

7. The original sentence is erroneous because of the preposition 'in'. The word 'toll' should not be followed by 'in'. The correct preposition to be used here is 'on'. In option 1 the preposition 'to' is incorrect after the word 'adopt' as it changes the meaning. Option 4 is incorrect because the sentence should be preceded by 'with'. In the given sentence the first part of the sentence talks about the condition which results in the second. Hence the sentence should begin with 'with'.
    Choice (3)

8. The given sentence is erroneous because parallelism is not maintained in the sentence. The word 'lead' is in the simple present while the verb 'adhering' is in the present continuous tense. Option 2 is a repetition of the given sentence. Option 3 is erroneous because although both the verbs are in the present continuous tense the verb 'are' is incorrect before the word 'consistency'. Option 4 is also incorrect because parallelism is not maintained in the sentence.
    Choice (1)

9. The original sentence is erroneous because the word 'life' should be in the plural because the word 'human' indicates that the reference is to many people. In option 3 apart from the word 'life' not being in plural, the pronoun 'his' does not agree with the subject 'one', hence option 3 is grammatically inconsistent. In option 4 there is no agreement between the pronoun and the subject. Only option 1 is grammatically correct.
    Choice (1)

10. The original sentence is erroneous because the apostrophe and s after the word chomsky is redundant – the phrases 'that of' indicates possession and hence the apostrophe is not required. Option 3 is erroneous due to the superlative adjective 'most'. Here a comparison is being made hence it should be denoted by the comparative adjective.
    Choice (4)

11. The word argument is either followed by 'for' or 'against'. Hence the original sentence is erroneous. Option 3 is erroneous because the word 'argument' should be in the plural because it should agree with the subject 'one of the'. Option 4 is erroneous because 'sometimes' should precede 'imposed'.
    Choice (1)

12. The original sentence is erroneous because the word 'so' should be followed by 'as' because 'so _ _ _ as' is the correct conjunction. In option 1 the use of 'such as' is incorrect. Option 4 is incorrect because of the error in parallelism. The word 'unfulfilled' should be preceded by the word 'so' in keeping with the preceding phrase. Hence, the correction is 'so persistent, yet so unfulfilled'. Therefore only option 3 is correct in terms of grammar and usage.
    Choice (3)

13. The given sentence is erroneous because the word perceived should be followed by 'to be on'. Option 1 is erroneous because 'perceived' is followed by 'as being on'. Option 4 is incorrect because the expression 'the previous decade' should be preceded by 'that of' because the comparison is between the growth trajectory of the present and the previous decade. Hence only option 3 is grammatically correct.
    Choice (3)

14. The original sentence is erroneous because the expression '_ _ _ seeing things in their roundness and wholeness' should be preceded by the preposition 'of'. As the reference is to two different powers the power of seeing things as they really are and the power of seeing things in their roundness and wholeness, hence 'of' should be used before both the expressions. Option 1 is erroneous because
the word failure’ should be in the plural because the preceding word ‘success’ is in the plural. Further, the reference is to many successes and failures in a person’s life. Option 4 is incorrect because the verb ‘see’ is in the simple present in the first part of the sentence and in the present continuous tense (seeing) in the second part. Therefore only option 3 is the right answer. Choice (3)

15. The original sentence is erroneous because the word ‘hypothesis’ should be in the plural because the word ‘idea’ is in the plural. Option 4 is erroneous because the word ‘life’ should be in the plural because the reference, here, is to the lives of human beings in general. Only option 1 is right. Choice (1)

16. The given sentence is erroneous because of the preposition ‘among’. In this sentence the comparison is between 2 entities (that is individuals and groups of individuals) hence this should be denoted using the preposition ‘between’. Option 1 is incorrect because the verb ‘depend’ should agree with the noun ‘functioning’ which is the subject here. Option 2 is a repetition of the original sentence. Option 4 is incorrect because the word ‘functioning’ should be followed by ‘of’. Only option 3 is correct in terms of grammar and usage. Choice (3)

17. The given sentence is erroneous because the word control should not be followed by ‘in’. Also ‘mankind’ is singular. Option 3 is incorrect because the relative pronoun ‘who’ does not agree with the subject ‘being’. Option 4 is incorrect because the word ‘mankind’ is always taken as singular. Hence, only option 1 is grammatically correct. Choice (1)

18. The original sentence is erroneous because the word ‘price’ should be in the plural because there is a rise in the price of not only wheat but also other staple crops. Option 1 is erroneous because the word ‘pose’ does not agree with the subject ‘rise’ which is singular. Option 3 is not right because the word threat should be followed by ‘to’ and not ‘for’. Choice (4)

19. The word ‘associate’ should be followed by the preposition ‘with’. Hence the given sentence is erroneous. In option 1 the word ‘associate’ should be followed by ‘from’. The correction is ‘_ _ _ associate themselves with or dissociate themselves from’. Option 3 is incorrect because of the use of ‘can’ before ‘either’ which necessitates the use of ‘can’ before ‘or’ also. Only option 4 is correct in terms of grammar and usage. Choice (4)

20. The given sentence is erroneous because the conjunction ‘not only’ should not be placed after the verb ‘involve’ as the verb applies to both the noun phrases ‘minimizing the impact _ _ _’ and ‘enhancing positive feelings_ _ _. Hence ‘not only’ should be placed after the verb ‘involves’. Option 1 is erroneous because of the inappropriate positioning of not only and ‘but’ should be followed by ‘also’ because ‘not only _ _ _ but also’ is the correct conjunction. Option 4 is incorrect because ‘not only’ should be followed by ‘but also’ and not ‘so also’. Choice (3)

21. The given sentence is incorrect because ‘as’ cannot be followed by ‘like’. The correction is ‘_ _ _ as _ _ _ _ _’. Option 3 is erroneous because of the conjunction ‘so _ _ as’. The correction is ‘as _ _ _ _ _’. Similarly in option 4 the use of ‘as and like’ is incorrect. The correction is brought out by ‘as _ _ _ _ _’. Only option 1 is grammatically consistent. Choice (1)

22. The given sentence is erroneous because the word ‘plants’ cannot be in the plural because the word ‘animal’ is also singular. Hence the correction is ‘plant and animal species’. Option 3 is erroneous because of the preposition ‘between’ since the reference here is to several species of plants and animals it should be denoted by ‘among’ and not ‘between’. Option 4 is erroneous because the word edible should not be followed by to, the correction is edible for (that is for human consumption). Hence only option 1 is right. Choice (1)

23. The original sentence is erroneous because the verb ‘emphasizes’ does not agree with the subject ‘studies’ which is a plural word. Hence the correction is ‘_ _ _ _ _ studies emphasized’. Option 3 is erroneous due to the inappropriate positioning of the adverb ‘almost’. The adverb should be placed before the words ‘all studies’. Option 4 is incorrect because the word emphasize cannot be followed by ‘on’. Only option 1 is correct in terms of grammar and usage. Choice (1)

24. The original sentence is grammatically wrong because the pronoun ‘his’ does not agree with the subject ‘one’. Hence his should be replaced by ‘ones’. Option 3 is erroneous because of the inappropriate positioning of the adverb ‘_ _ _ beforehand’. The correction is ‘no matter how much one has read before _ _ _ _’. Option 4 is erroneous because of the words ‘what-ever much’. Since the reference here is to reading something, it should be denoted by ‘no matter how much one has read’. Hence among the given options only option 1 is correct in terms of grammar and usage. Choice (1)

25. The given sentence is erroneous because of the preposition ‘to’ which follows the expression ‘racial history’ which does not agree with the word equates. Option 3 is erroneous because of the similar reason (the expression ‘equate native Africans to blacks’ is erroneous), the correction is ‘equate native Americans with blacks’. Option 4 is erroneous because of a similar reason. Choice (1)

26. The given sentence is erroneous because of the inappropriate positioning of the adverb ‘hitherto’. The correction is ‘_ _ _ _ _ hitherto unknown stores of knowledge’. Statement 2 is a repetition of the original. Option 3 is incorrect because the word ‘opened’ should be followed by ‘up’. The phrase ‘open up’ means to remove restrictions. The sentence implies that knowledge of English has made certain areas accessible which were earlier difficult to access. Hence the phrasal verb ‘opened up’. This is denoted by the phrasal verb ‘opened up’ which is precise in the context. Option 4 is incorrect because of the phraseal verb ‘opened out’ which is inappropriate. Therefore only option 1 is grammatically consistent. Choice (1)

27. The given sentence is erroneous because the word ‘forbidding’ should be followed by ‘from’ and not against. Option 1 is incorrect because the word discriminated should be followed by ‘against’. Option 4 is erroneous because of the preposition ‘with’ which follows the word ‘villages’. The correction is ‘_ _ _ _ _ leaving their villages in traditional dress’. Choice (3)

28. The original sentence is incorrect because the verb ‘is’ does not agree with the subject ‘living conditions’ which is a plural verb. Choice 1 is erroneous because the word ‘billion’ should be preceded by the article ‘a’, in order to mean ‘one billion’. Option 4 is erroneous because of the inappropriate placement of the adverb ‘today’. The word ‘today’ qualifies living conditions hence it should follow ‘living conditions’, therefore only option 3 is correct. Choice (3)

29. The given sentence is erroneous because the expression ‘western culture’ should be preceded by the article ‘a’ because the reference here is to a particular culture. Option 1 is erroneous because the verb ‘seem’ does not agree with the subject. Option 3 presentation is erroneous
30. The original sentence does not make sense because the expression 'have proved' is ambiguous as it is not clear as to what the humans have proved. The expression 'have proved' should be followed by 'to be' in order to mean that they have proved themselves to be. Option 1 is incorrect because the word 'hundred' should be preceded by 'a' in order to mean one hundred years ago. Option 4 is erroneous. The word 'systematic' should be preceded by the adjective 'more' in order to maintain parallelism in the sentence as the preceding adjective is also in the comparative. Choice (3)

31. The original sentence is erroneous due to the inappropriate placement of the adverb 'sufficiently'. The correction is '- - - seem to be sufficiently met - - -'. Option 1 is erroneous because of the inapt positioning of the adverb. Further, the expression 'his ideals' should be preceded by the preposition to. Option 3 is incorrect because the word 'met' should be followed by the preposition by. Only option 4 is correct in terms of grammar and usage. Choice (4)

32. The given sentence is erroneous because the word 'improvement' should be followed by 'of'. Option 1 is incorrect because the word 'two third' should be in the plural. Further the word 'seem' does not agree with the subject 'aim' which is singular. Hence '- - - seems to be - - -'. Option 4 is incorrect because the pronoun 'its' does not agree with the subject 'mankind' which, in this context, is not taken as a single entity but the reference is to different individuals of a group. Hence '- - - mankind - - - their'. Choice (3)

33. The incorrect tense 'are aware' in the original sentence, makes it erroneous. The correction is 'have been aware'. The reference, here, is to an action which began in the past and is still continuing (that is, they had been aware in the past and they are still aware) the present perfect tense should be used. In option 1 the use of the past perfect tense is incorrect. The correction is '- - - - have been aware - - - '. Option 3 is also incorrect due to the use of simple past tense. Only option 4 is grammatically consistent. Choice (4)

34. The original sentence is erroneous because of the preposition 'into' after origin 'driving to' not 'into'. Option 1 is incorrect because of the preposition 'on'. Option 4 is incorrect because of the usage of the present continuous in the last part of the sentence which does not make sense. Only option 3 is grammatically consistent. Choice (3)

35. The original sentence is erroneous because the verb 'insists' does not agree with the subject 'pessimists' which is a plural word. Further, the word 'cope' cannot be followed by 'up'. Option 1 is incorrect because of the same reason. In option 3 the word 'billion' is given in the plural, which makes it erroneous. Option 4 is grammatically correct in terms of grammar and usage. Choice (4)

36. The given sentence is incorrect because of the conjunction 'yet', the contrast in the sentence is best brought out using the conjunction 'but', therefore 'yet' is erroneous. Choice 3 is incorrect because the verb 'perform' does not agree with the subject 'each'. Hence the correction is '- - - each of which performs - - - '. Choice 4 is erroneous due to the phrase '- - - yet by being'. Only choice 1 is grammatically consistent. Choice (1)

37. The original sentence is erroneous because the word 'marker' cannot be followed by the preposition to, it has to be followed by 'of / for'. If something is a marker of or for something it means that it is a sign that shows the position of something. Option 1 is incorrect because the word 'held', in this context, should be followed by 'up'. The phrasal verb 'hold up' means to use or present somebody or something as an example. Option 3 is incorrect because the word 'brutish' should be followed by 'ones' or states in order to make sense. Only option 4 is grammatically consistent. Choice (4)

38. The positioning of the adverb 'fiercely' makes the given sentence erroneous. The correction is '- - - - - fiercely anti-American'. Option 1 is incorrect because of the word 'it's'. Here, the use of the apostrophe is incorrect. Option 4 is incorrect because the use of the pronoun 'they' in the latter part of the sentence is redundant. The correction is '- - - - - aspiring democrats who if allowed to vote freely, would - - - -'. Hence only option 3 is grammatically consistent. Choice (3)

39. The original sentence is incorrect because the word 'agreed' should be followed by the preposition 'on or upon'. Option 3 is not correct because the verb should be in the present perfect tense because the reference, here, is to a past action which has a bearing even in the present. Hence the correction is '- - - - has had a mixed reaction'. Option 4 is erroneous because the word 'agreed' should be followed by 'on or upon' but not 'with'. Choice (1)

40. 'Concern' is an uncountable noun, therefore it cannot be used in the plural, hence the original sentence is erroneous. Option 1 is incorrect because the tense of the verb should be in the present perfect because the effect of the past action is still being felt. Hence the correction is '- - - - has risen'. Option 3 is incorrect because '- - - - far from being new' is an incorrect expression. Choice 4 is grammatically correct. Choice (4)

**VOCABULARY EXERCISES**

**Practice Exercise 1**

1. 1 2 2 3 3 4 3
2. 6 4 7 2 8 3
3. 2 10 11 3 12 3
4. 1 14 2 15 2 16 4
5. 18 3 19 3 20 1

21. 'Farrago' is a confused mixture of different state of things. 'Motley' collection too is a collection of things that are all very different. Hence, the pair AB in option (1) is the correct choice. Caveat, a warning is unrelated to havoc. Choice (1)

22. A 'genius' is a very clever person. A 'mastermind' is also a clever (or cunning) person, who is responsible for planning and organizing something. The others are unrelated. Choice (4)

23. 'Virtue' and 'miscalculation' are unrelated. 'Clamour' is din or a racket. So, is 'clangour'. Hence A and B are synonymous. Choice (2)

24. A 'crown'swornthethehead', So, is a coronet, A pebble and a jewel are unrelated. Choice (4)

25. 'Scroffer' is someone who thinks something is ridiculous or inadequate. A 'doubter' also is a cynic who does not think something is adequate or true. The other two are unrelated. Choice (2)

26. A 'lanky' person is 'tall'. One who is bilious is bad-tempered. Choice (2)

27. Something that is foreign is not familiar and therefore it is 'strange'; 'dire' meaning dreadful and 'puny' are not related to any of the other words. Choice (4)

28. A room that is 'dinky' is dark, dull and 'gloomy'. A 'dingly' is a small, boat. Choice A and B are synonyms. Choice (3)
29. To ‘collate’ is to collect or ‘assemble’. ‘Vend’ is to sell. Choice (2)

30. A ‘firebrand’ is a radical or revolutionary. A ‘touchstone’ is a test or criterion for genuineness or quality. A benchmark is a standard for quality. Choice (1)

31. Something that is dank is ‘damp’ or wet. ‘Lank’ mean limp or lifeless. A person who is ‘forlorn’ is sad. Choice (2)

32. ‘Trash’ and ‘chaff’ are junk. So, A and D are synonymous. ‘Twist’ and ‘style’ are unrelated. Choice (3)

33. ‘Treachery’ is a specific crime and ‘nonentity’ is non-existence. ‘Obloquy’ is condemnatory. ‘Benign’ is something benign. Choice (3)

34. ‘Philippic’ is a ‘tirade’ or verbal onslaught. So, A and C are synonymous. ‘Twist’ and ‘style’ are unrelated. Choice (1)

35. Something that is ‘pedestrian’ is dull. ‘Avalanche’ is a flood. Hence its opposite is ‘cogitate’ or something that is opposite to ‘inception’ is its antonym. ‘Elan’ is style. Lack of style or clumsiness is ‘natty’. Choice (2)

36. Sorority is a social organization for women. An ‘association’. Choices B and C are similar. The others are unrelated. Choice (4)

37. ‘Hallowed’ is something holy and ‘sacred’. Hence, its opposite is to ‘harrow’, that is subject to physical or mental pain or make one suffer. Its opposite is to ‘console’ or calm the person. B and C are antonyms. To ‘extol’ is to praise someone and ‘allude’ is to refer to something covertly. Choice (4)

38. ‘Pett’ is to throw and so is ‘lob’. Choice (3)

39. ‘Treachery’ is a specific crime and ‘perfidy’ is also a specific crime. Crime is a much broader concept and too general to be close to either of them. Hence, choices A and B are closer to each other. Paroxysm is spasm or convolution and is unrelated. Choice (2)

40. Something that is ‘noisome’ is unpleasant or ‘obnoxious’. The pair A – C is synonymous. Agile and noisy are unrelated. Choice (4)

--- PRACTICE EXERCISE 2 ---

1. 2 2. 3 3. 1 4. 4
2. 1 6. 2 7. 3 8. 1
3. 9. 2 10. 3 11. 4 12. 2
4. 13. 3 14. 4 15. 1 16. 1
5. 17. 3 18. 2 19. 4 20. 3
6. 21. 1 22. 2 23. 2 24. 4
7. 25. 3 26. 1 27. 2 28. 4
8. 29. 3 30. 1 31. 1 32. 2
9. 33. 3 34. 4 35. 2 36. 4
10. 37. 3 38. 2 39. 3 40. 1

--- PRACTICE EXERCISE 3 ---

1. 3 2. 1 3. 2 4. 1
2. 5. 2 6. 4 7. 1 8. 4
3. 9. 1 10. 3 11. 2 12. 1
4. 13. 3 14. 1 15. 3 16. 4
5. 17. 3 18. 1 19. 2 20. 4

21. A ‘polymath’ is a scholar and an ‘ignoramus’ is a daft or a stupid person. B and D are antonyms. Choice (2)

22. To ‘harrow’ is to torture, that is subject to physical or mental pain or make one suffer. Its opposite is to ‘console’ or calm the person. B and C are antonyms. To ‘extol’ is to praise someone and ‘allude’ is to refer to something covertly. Choice (4)

23. Something that is ‘disparate’ is heterogeneous or essentially different in kind. Hence, its opposite is to ‘cognate’ or something that is related. So B and C are antonyms. Something that is ‘quotidian’ is something that is ordinary. Choice (3)

24. Something that is ‘incorporeal’ is not something that is very ordinary. Choice (1)

25. ‘Aboriginal’ is native or indigenous. Hence, its opposite would be something that is foreign or imported. When someone, or something is ‘exalted’, it is familiar or important. Something that is prescient is one that is predictable. Thus A – D is the required pair. Choice (1)

26. One who is ‘natty’ is smart or well groomed. Therefore, one who is unkempt is its opposite. One who is ‘diabolical’ is cruel and one who is ‘intrepid’ is fearless. Choice (3)

27. Something that is ‘pedestrian’ is dull. Hence ‘exciting’ in (C) is its antonym. ‘Palid’ is colourless. Choice (4)

28. To ‘disburse’ is to pay out and so it does not belong to one. Hence, its opposite is to ‘claim’ something as one’s own. Hence A – B is the required pair. To ‘impute’ is to allege. Choice (1)

29. Morbidity is related to death or what is gloomy. Its opposite is cheerfulness. ‘Dotage’ is feebleness of mind and ‘cadence’ is intonation or rhythm. Choice (2)

30. To ‘efface’ something is to erase or wipe out something. The opposite is ‘embalm’ or preserve something. To bestow is to give something and to ‘interdict’ is to ban something. Choice (1)

--- PRACTICE EXERCISE 4 ---

1. 3 2. 4 3. 1 4. 3
2. 5. 1 6. 4 7. 2 8. 3
3. 9. 2 10. 1 11. 3 12. 1
4. 13. 2 14. 2 15. 3 16. 1
5. 17. 2 18. 3 19. 2 20. 1
6. 21. 1 22. 2 23. 4 24. 4
7. 25. 2 26. 2 27. 3 28. 2
8. 29. 1 30. 4 31. 1 32. 2
9. 33. 3 34. 3 35. 3 36. 2
10. 37. 1 38. 2 39. 2 40. 3

--- PRACTICE EXERCISE 5 ---

Solutions for questions 1 to 30:

1. ‘Facilitate’ is to make easy while ‘licitate’ is to congratulate. Option (A)
2. 'Faint' is to lose consciousness. 'Feint' is to pretend, especially in sport which confuses the opponent. Option (A) is appropriate. 'Vice' means defect, or fault. Option (B) is appropriate. 'Disease' is seriously ill. Option (A) is appropriate. 'Knock' at is to draw attention. Option (B) is appropriate. 'Prey' refers to being harmed. Option (B) especially to give thanks or ask for help. 'Pray' refers to speaking to God, title or special powers. 'Investment' is the action of investing money. Option (B) is appropriate. 'Diseased' is dead. 'Deceased' is dead. 'Investiture' means a ceremony at which something is proposed. 'Agenda' is a list of things to be done. Option (B) is appropriate. 'Shoot at' is the act of trying to do or achieve something. (A) is therefore appropriate. 'Faucet' is a tap while 'facet' refers to any of several sides or aspects of something. In this context option (A) is appropriate. ABAAB Choice (1)

3. 'Investiture' means a ceremony at which somebody formally receives an official title or special powers. 'Investment' is the act of investing money. Option (B) is appropriate. 'Pray' refers to speaking to God, especially to give thanks or ask for help. 'Prey' refers to being harmed. Option (B) is appropriate. 'Dessert' which refers to sweet food is appropriate. 'knock down' is to make somebody fall to the ground. To 'knock' at is to draw attention. Option (B) is appropriate. BBBA Choice (4)

4. 'Draft' refers to a flow of cool air in a room. 'Drought' refers to a long period of time when there is little or no rain. Since the sentence speaks about food crisis 'draught' is appropriate. 'Speculate means to form an opinion about something without knowing all the details. 'Evaluate' means to form an opinion after thinking about it carefully. Evaluate is a strong word in the given context. Option (A) is correct. 'Wary' means cautious. 'Weary' means very tried. It is more appropriate to use 'wary' when we talk about the unexpected shift the generative PC produces 'Contemplative' means thinking quietly and seriously about something. 'Contemporary' is belonging to the same period. Option (B) is appropriate. ABAAB Choice (3)

5. 'Set down' refers to record in writing while 'set in' means become established. Option (A) is appropriate. The correct preposition in this context is 'up', as take up means become engaged or interested in while 'take on' will mean undertake work. Option (B) is appropriate. 'Luxuriate means to relax in comfort. 'Luxury' is choice or costly surrounding. In the context 'luxury' is appropriate. 'Fetid' means stinking while 'feted' refers to honouring some one or entertaining lavishly. Option (B) is appropriate. ABAB Choice (3)

6. 'Depreciate' is to express disapproval. 'Depreciate' is diminish in value. Option (A) is appropriate. The context shows that it is urgently needed. 'Badly' is appropriate. Option (B) is correct. 'Principal' refers to a person first in rank or importance while 'principle' refers to a fundamental truth or law. Option (A) is appropriate. 'Proportional means in proportion 'Equipoise' refers to equilibrium. Proportional is appropriate. ABBAA Choice (3)

7. 'Opinion' is what we think about a particular subject, situation, problem etc. 'View' is what we think or what we believe about something, especially an official matter. In this context 'opinion' is appropriate. Option (A) is correct. A 'record' is information that is collected over a period of time by an official organisation. A 'dossier' is a set of papers containing a lot of information, especially secret official information, about some one or something. In the given context dossier is appropriate. Option (A) is correct. 'Nourishment' does not collocate with 'light'. 'Out of range' is too far to away to be hit. 'Out of reach' is too far to away to pick up. Out of reach is appropriate. AABBA Choice (4)

8. 'Universal' is something used by everyone. 'Unanimous' is something every one agrees with. Unanimous (Option B) is appropriate. 'World wide' is happening, existing or having an effect in all parts of the world. 'All over the world' means every part of the world, used especially to say how much a particular idea, organisation etc. has spread. 'All over the world' (Option B) is appropriate. 'Compulsive' means difficult to control. Complicated is difficult to understand. Complicated is the appropriate choice. A 'feverish' activity refers to an activity which people are hurrying to finish. A 'frantic' activity is when people are rushing around in a confused way, especially because they are worried that they will not have time to do something or get something. 'Feverish' (option B) is appropriate. Choice (1)

9. Lassy found it difficult to forget John. Option (B) is correct. 'Affect' means to produce an effect on something or some one, so that they change in some way. 'Effect' is to have influence on some one or something. 'Effect' (option B) is appropriate. 'Hangling' is more appropriate in the context. 'Native land' refers to the country where one is born. This is the appropriate choice. BBBA. Choice (2)

10. 'Anoint' means apply oil as a religious ceremony. Not an appropriate choice. So (A) 'Override' means to intervene and make ineffective. 'Over run' is to conquer. Option (A) is correct. 'Step down' which conveys the desire to resign is the appropriate option (B). 'Raise' refers to increasing consciousness, hopes, awareness etc. 'Rise' is to increase gradually. In the context option (B) is appropriate. ABBB Choice (2)

11. 'Turbid' is generally used with a liquid and means 'cloudy or opaque' 'Turgid' means tedious. Turgid is appropriate 'Entice'-A means to persuade some one to do something by offering them something pleasant if they do it. 'Persuade' is appropriate in the given context. Option (A) Exacerbate' meaning to make a bad or difficult situation even worse. 'Exaggerate' is to make it seem larger or greater than it actually is. (A) 'Antisocial' means contrary to social customs. 'Unsocial' means socially inconvenient since the sentence speaks about laws, antisocial is a more appropriate word (A). AAAA Choice (3)

12. Although both the words denote how fast something or some one travels or moves, 'momentum' is a technical word meaning the force or power contained in a moving object, so it is more appropriate. Option (B) is correct. 'Antique' refers to old and valuable whereas 'ancient' is used to describe something that has existed for a long time. 'Ancient' is more appropriate. Option (A) is correct. 'Successive' is coming or following one after the other. 'Serial murders' would mean killing one after another by the same killer. Option (B) is appropriate. 'Exciting' means arousing great interest. A 'Nail biting' situation makes people extremely nervous and excited, especially because they are waiting for a result or decision. Option (A) is correct. ABBA Choice (1)

13. 'Presumptive' is to offer grounds for presumption. 'Presumptuous' unduly or overbearingingly confident. Option (A) is correct. 'Shimmering' is to shine with a faint or diffused light. 'Simmering' suggests a state of suppressed anger or excitement Option (B) is appropriate. 'Sedulent' means persevering, 'seductive ' refers to alluring. In the context option (B) is correct. 'In sanitary' means dirty while 'insanity' refers to foolish, irrational. Option (A) is correct. ABBB Choice (2)

14. 'Chastise' means reprimand severely, 'Chasten' refers to being subdued or restrained. Option (B) is correct. 'Hubris'
refers to being arrogant. ‘Debris’ refers to scattered fragments, especially of something wrecked or distorted. In the given context ‘hubris’ is more appropriate. A ‘Luxuriant’ is the appropriate adjective as the reference is to vegetation. Option (A) is correct. ‘Confirm’ means to provide support for the truth or correctness. ‘Conform’ refers to complying with rules or general custom. Option (B) is correct. Choice (1)  

15. ‘Inequities’ is bias ‘Inequality’ refers to lack of equality in any respect. Option (A) is correct ‘Equable’ is not varying equitably is appropriate. Option (A) is correct. ‘Ravenous’ refers to being famished. ‘Raving’ is used as an intensifier. Sanction is authoritative approval ‘Sanctions’ refers to enforcing obedience to a rule. Option (B) is appropriate. ABBB. Choice (4)  

16. The sentence speaks about rude behaviour by the clerk so insolent option (A) is appropriate. The clerk was rebuked for his insolent attitude. ‘Reproach’ is therefore appropriate. ‘Rapprochement refers to reunion of harmonious relations. Option B is appropriate. ‘Palaver’ suggests fuss and bother especially prolonged. ‘Pallor’ refers to paleness. Option (A) is appropriate ‘Going an steam’ suggests moving with vigour. Option (A) is appropriate. ABAA. Choice (3)  

17. ‘Insipid’ is lacking vigour. ‘Intrepid’ is brave. In the given context insipid option (B) is appropriate. The middle class are badly affected because of soaring prices. ‘Soar’ is rise high. Option (A) is appropriate ‘Prevailing’ suggests existing, ‘pertaining’ which means related is more appropriate. Servitude means ‘slavery’ servility is being like a slave. Both the words have similar meaning. the context of the sentence makes option (B) more appropriate. BABB. Choice (3)  

18. ‘Beautiful’ is to make it beautiful. ‘Beaty’ is to formally declare a dead person ‘blessed’, a step towards canonisation option (B) is correct. ‘Reckoned’ is to count or compute. Option (A) is correct. ‘Contemptuous’ means scornful. Contemptible is something that deserves contempt. Option (A) is appropriate. ‘Hype’ means extravagant or intensive publicity. Hyperbole is an exaggerated statement. In the given context option (A) is appropriate. BAAA Choice (3)  

19. ‘Inception’ suggests from the beginning. Option (A) is appropriate ‘Genius’ is the right choice as ‘genus’ which means taxonomic grouping is not relevant to the context. Option (B) is correct ‘edgy’ which means irritable is appropriate (B). ‘Chadade’ means an absurd pretence. ‘façade’ means an outward appearance or front which is a deception one. In the context option (B) is appropriate. ABBB. Choice (2)  

20. ‘Hedge’ means a protection against possible loss or diminution. In the context option (B) is appropriate. ‘Responsive’ means sympathetic. In the context responsible is more appropriate. (B) ‘Performance’ is a noun so ‘performing’ which is an adjective is more appropriate. (A) ‘cannon’ refers to a large gun where as ‘cannon’ means rule or a general law. Option (B) is correct. BBAB Choice (1)  

21. ‘Embezzle’ means to divert company or public funds fraudulently to one’s own use. Option (B) embraced is appropriate. ‘Dramatically’ is unexpectedly. ‘Vulnerable’ suggests something that some one may be wounded or harmed. Option (B) is correct. ‘Spirit’ is more appropriate to maintain the subject + verb agreement. Option (A) is more appropriate. ‘Adapt’ is to adjust. ‘Adopt’ which means choose to follow is the appropriate choice (B) BBAB. Choice (4)  

22. ‘Comforting’ means consoling. ‘Comfortable’ meaning at ease is the appropriate choice. Option (A) is correct. ‘Art’ is human creative skill. When used in plural ‘Arts’ it is preceded by the and refers to those branches of learning like languages, literature etc. In the context art is appropriate. A ‘Intelligence’ is a noun. So intellectual (adjective) is more appropriate (B). ‘Revealed’ means to have good time. So ‘revealed’ (show) is more appropriate. ABBB. Choice (4)  

23. To maintain the parallel structure of the sentence ‘to unite’ is appropriate. Option (B) is correct. ‘Abrogate’ is to abolish a law or a custom. ‘Abominate’ is to defect. Option (A) is appropriate. ‘Annex’ means to add as a subordinate part. ‘Annexes’ refers to a separate or added building. Option (B) is appropriate. Choice (2)  

24. ‘Aural’ is the appropriate choice. ‘Fictitious’ is imaginary. ‘Fictional’ is an invented idea. Option (B) is correct. ‘Defuse’ means reduce tension. The correct option is (A) ‘Averse’ is opposed and ‘adverse’ means contrary. ‘Averse’ is appropriate (B). BBAB. Choice (1)  

25. ‘Gambit’ means an opening move. ‘Gamble’ refers to range or scope of something. Option (A) is appropriate. ‘Insane’ refers to senseless ‘Insane’ refers to unsound mind, mad. Option (B) is correct. ‘Practicable’ is something that can be done. ‘Practical’ is concerned with practice rather than theory. Option (A) is appropriate. ‘Venal’ means corrupted ‘Venial’ means pardonable. So AAAB. Choice (2)  

26. ‘Inventors’ is appropriate option. Option (A) is correct. ‘Humane’ means benevolent. ‘Human’ is more appropriate. Option (B) is correct. ‘Personnel’ refers to a body of employees. ‘Personal is the right option. ‘Delicious’ means tasty. Option (A) is correct. ABAA Choice (2)  

27. ‘Teeming’ means full of or swarming with. Option (B) is correct. ‘Allusion’ is an indirect or passing reference. ‘Illusion’ is deception. Option (B) is correct. ‘Cope’ is used without a preposition. Option (B) is correct. ‘Suddenly’ refers to something, unexpected while ‘immediately’ refers to something done without delay (A). BBBA. Choice (4)  

28. ‘Coup’ refers to a successful move. ‘coupe’ refers to a car with a hard roof. Option (A) is correct. ‘Justly’ means according to justice. ‘Justifiable’ something that can be defended or justified. Option (B) is appropriate. ‘Trail’ is a track left by a thing or person. ‘Trial’ is a judicial examination and determination of issues. Option (B) is correct. In the context resisting is logical. Option (B) is correct. ABBB. Choice (2)  

29. ‘Routes’ which refers to methods or ways is appropriate. Option (B) is correct. ‘Exude’ means display an emotion freely or abundantly. ‘Exult’ is to be greatly joyful. ‘Exuded’ is the appropriate option (B). ‘Back drop’ is the appropriate choice, option (B) A ‘facilitator’ is one who makes thing easy. Option (B) is correct. BBBB Choice (1)  

30. ‘Differentiate’ refers to constituting a difference. Option (A) is correct. ‘Behavioural’ is the correct option as we have operational. Option (B) is correct ‘Neighbourhoods’ is correct A ‘Oblivious’ means unaware so not relevant in the context. ‘obvious’ means easily seen. Option (B) is correct. ABAB. Choice (2)  

**Practice Exercise 6**

1. 3 2 4 3 2 4 1  
5. 3 6 2 7 2 8 4  
9. 1 10 4 11 3 12 3  
13. 1 14 1 15 3 16 2  
17. 3 18 3 19 3 20 1  
21. 3 22 4 23 2 24 3
25. 2  26. 1  27. 3  28. 4  
29. 1  30. 4  31. 3  32. 4  
33. 2  34. 3  35. 1  36. 3  
37. 4  38. 2  39. 3  40. 2

### GENERAL VERBAL ABILITY

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**Practice Exercise 1**

**Solutions for questions 1 to 40:**

1. The given words are ANTONYMS. Options 1 and 2 and are antonyms. We, can, eliminate these choices because they don not indicate a negative or positive tone like the key words. ‘Create’ is a positive word while ‘destroy’ is negative. The tone is positive in ‘advance’ and ‘retreat’ (going back) is slightly negative. Hence, option (3) is the best fit.

Choice (3)

2. The ‘hand’ is part of the ‘body’ Likewise, the wheel is part of an automobile.

Choice (3)

3. ‘Mercenary’ is a person who fights because he wants ‘money’. Likewise, Midas is a mythical character who wanted gold.

Choice (4)

4. A polymer has cells. A chain has links.

Choice (4)

5. Property can be mortgaged. Money can be lent.

Choice (1)

6. A cheque may be negotiable. An asset may be frozen.

Choice (1)


Choice (3)

8. The dead body of an animal is called a cadaver. The dead body of a man (human being) is called corpse.

Choice (1)

9. A pistol has a trigger. A motor has a switch. ‘Trigger’ and ‘switch’ are used to start a ‘pistol’ and a ‘motor’, respectively.

Choice (1)

10. Cabin is a room in a ship. Galley is a kitchen on a ship.

Choice (2)

11. Poetry has rhyme. Mystery has suspense.

Choice (2)

12. Computer has RAM, while a book has pages.

Choice (1)

13. Chromosome is a part of a cell. Likewise, oxygen is a constituent of air.

Choice (4)

14. Radium was discovered by Madam Curie. Graham Bell invented the telephone.

Choice (3)

15. Ocean gives saline water whereas rain gives fresh water.

Choice (2)

16. An agency is an organization. A mother is a parent.

Choice (2)

17. Fur keeps the animal warm. Sweater is used by humans to keep warm.

Choice (1)

18. Proverbially every rose has a thorn as every cloud has a silver lining.

Choice (3)

19. Cane comes from bamboo. Timber comes from trees.

Choice (2)


Choice (2)

21. Cogent and convincing are synonyms as are laconic and pithy.

Choice (2)

22. Retrospection is analysis of something related to the past. Prognostication means prediction, which is related to the future.

Choice (3)

23. Eulogise means praise, whereas lambast indicates criticism. Hence, option (3) is the answer as this choice also has a pair of antonyms. ‘Invigorate’ means ‘to energise’ and ‘debilitate’ means to ‘weaken’.

Choice (3)

24. A group of lions is referred to as a ‘pride’, whereas a group of pups (puppies) is called ‘litter’.

Choice (2)

25. Antonyms

Choice (3)


Choice (4)

27. Antonymous relationship

Choice (2)


Choice (4)

29. A munificent person is generous (not stingy) Likewise, any argument which is articulate is very clear (not obscure).

Choice (3)

30. Cryptic and enigma are also synonymous. In both the first is an adjective and the second a noun.

Choice (4)

31. Tenuous is not substantial just as fringe is not central.

Choice (4)

32. A coward is cravenly. A cheat is duplicitous.

Choice (4)

33. A diffident person is shy. A lacklustre performance is dull.

Choice (1)

34. Antonymous relationship

Choice (2)

35. Synonymous relationship

Choice (2)

36. Rigor is onerous (burdensome). Tedium is boring.

Choice (2)

37. Synonymous relationship

Choice (4)

38. ‘Veracity’ (‘truthfulness’), is opposite of ‘chicanery’ (‘trickery’). So also loyalty and perfidy.

Choice (3)

39. ‘Suave’ means sophisticated, polished, urbane.

Choice (2)

40. An exacting task is very demanding.

Choice (2)

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**Practice Exercise 2**

**Solutions for questions 1 to 40:**

1. ‘Import’ and ‘export’ are antonyms as also are all the choices except ‘inspire’ (fill with an urge) and ‘expire’ (die).

Choice (3)

2. A milkmaid delivers milk. A postman delivers letters. A newspaper boy delivers newspaper while a vendor could deliver sweets. All these people – milkmaid, postman and a vendor are mobile people who deliver an article. The exception is a baker who bakes biscuit but is not known for delivering biscuits.

Choice (2)

3. A pigeon does not stay in a burrow.

Choice (4)

4. Lair or den is the place where a wild animal (including a lion) stays.

Choice (4)

5. ‘Calif’ is the young of a ‘cow’, ‘sheep’ is not the young of ‘goat’.

Choice (2)

6. ‘Galaxy’ is a collection of ‘stars’. ‘Row’ is not a collection of ‘soldiers’.

Choice (3)

7. Hustling indicates jostling, forcing or hurrying. All the other relationships are sound oriented.

Choice (4)

8. All the pairs are the masculine and feminine combination except ‘dear’ and ‘darling’.

Choice (2)

9. All the pairs give the person and the thing he studies except (4). Ichthyology is the study of fishes not fossils.

Choice (4)

10. All the pairs have synonymous meaning except “articulate” and “obfuscate” which are antonymous.

Choice (4)

11. All the pairs are masculine and feminine except ‘lion’ and ‘tiger’.

Choice (4)

12. ‘Palm’ is connected to ‘fingers’, head to hairs, chain to hook and watch to strap. While computer is connected to technology it is not a physical connection or relationship.

Choice (3)

13. A whale is in the water, clouds are in the sky. Hangar is the place where planes are kept. Kennel is the place where dogs are kept.

Choice (1)

14. Each pair gives the designation of people who work together in a hierarchy except employee and employment.

Choice (2)

15. Philology (not philosophy) is the study of language.

Choice (3)
Practice Exercise 3

Solutions for questions 1 to 50:

1. ‘Polemical’ refers to getting involved in a dispute or controversy. In the context it is an appropriate word. The other options do not collocate well. ‘Propriety’ which means rights fits well in the second blank.

2. The words ‘whiled away’ in the sentence indicate that the first blank needs a negative word. ‘Feckless’ which means ineffective is appropriate. ‘Meretricious’ which refers to being ‘falsely attractive’ also fits the second blank appropriately.

3. ‘Maudlin’ means tearfully sentimental. Since the sentence refers to the well-wishers being careful, ‘maudlin’ is an appropriate choice for the first blank. The other words do not convey the right meaning. ‘Torrent’ which means rushing water also conveys the appropriate meaning as the reference is to overflow of tears.

4. The meaning conveyed is that – he is angry with his sons for wasting his wealth. The word ‘chagrin’ conveys this idea.

5. ‘Discerning’ means having good insight. The other words carry no relevance to the context.

6. The second blank needs a word which suggests ‘excess’. ‘Surfeit’ which suggests ‘tiredness or boredom because of excess use’ is the appropriate choice. ‘Milleu’ refers to environment.

7. The words ‘coarse’ ‘grotesque’ and ‘square’ do not match the words ‘modest tone’ so can be ruled out self-deprecating refers to the ‘act of belittling oneself. The word serves well in bringing out a contrast to the meaning vainglorious.

8. ‘Juxtaposes’ which places things side by side is appropriate in the context. ‘Licentiousness’ means immoral, especially in sexual relations.

9. The context is about the candidate not testing the nature of his job. The words ‘meandering’ nomadic’ and ‘cushy’ are out of context. ‘Peripatetic’ which means going from place to place is appropriate for the second blank.

10. ‘Scarce’ is the appropriate word for the second blank because only then the value of the land will increase.

11. The context of the sentence needs a negative word in the first blank. On this count option 4 can be ruled out. The word which is used to fill the second blank must convey disregard to judiciary. The word ‘impunity’ is therefore appropriate.

12. ‘Tenet’ which means principle is the appropriate word. ‘Accord’ is the right word for the second blank.

13. ‘Expurgate’ which refers to removing matter thought to be objectionable from a book etc is the appropriate word to fill the first blank. ‘Salacity’ means lustful.

14. The context of the sentence is that he is a strong advocate of pragmatism. In this context the words ‘deft’ ‘dext’ and ‘mettelome’ do not convey that meaning. ‘Staunch’ which means strong is the appropriate word. ‘Entrenched’ means ‘not easily modified’.

15. The second blank needs a word which will suggest the meaning of ‘measuring something’. The word ‘gauged’ which refers to ‘standard measure’ is appropriate. ‘Profundity’ which refers to ‘depth’ is also appropriate in the first blank.

16. The reference is to purity. So ‘Pristine’ which means ‘fresh as if new’ is the right word for the first blank. ‘Quagmire’ refers to a soft area that gives way underfoot.
17. ‘Cloture’ which means closed is not appropriate in the context because political parties cannot be closed. ‘Downfall’ is appropriate. Choice (4)

18. The fact that Brooks had to face and over come two handicaps, suggests that the word for the first blank must be something which will denote her strength. ‘Braved’ which means ‘encounter bravely’ is an appropriate word. Choice (2)

19. In the given context ‘inevitably’ and ‘dominating’ are appropriate words. Choice (4)

20. The word ‘glueing’ suggests a technique for remembering something permanently. ‘Evanesce’ refers to things which ‘fade from sight’. It is the appropriate word as it suggests that glueing helps to remember words which fade from sight. Choice (1)

21. The word ‘foreseen’ indicates something that is about to happen. Hence ‘imminent’ suits the first blank. In the second blank, we should use a word that describes bad weather. Choices (3) and (4) are eliminated as the weather is not ‘impending’ or ‘dangerous’. ‘Imminent’, which means ‘soon to happen’, and ‘inclement’, which means ‘severe/stormy’ completes the meaning of the sentence. Choice (1)

22. ‘Asphyxiants’ interfere with oxygen supply. In the second part of the sentence, the clause “gases that are chemically inactive” should take a word that conveys a similar meaning. ‘Inert’ fits the blank. Choice (3)

23. The words ‘against’ and “encourages” are clues which make it imperative that the blanks should be filled with contrasting words. We can eliminate choices (1), (2) and (3), as the words match. Only option (4) has contrasting words. Choice (4)

24. The word ‘sycophants’ in the sentence points directly to ‘obloquy’ which means bad reputation, and ‘obsequious’ in option (1). The others are irrelevant. Hence only option (1). Choice (1)

25. A ‘mendicant’ meaning a beggar is out of context. The word ‘liar’ after the blank makes ‘mendacious’, meaning untruthful, redundant. Both ‘nefarious’ meaning wicked and ‘nebulous’ meaning vague are not appropriate to describe a liar. ‘Invertebrate’, meaning compulsive, fits the first blank. The second word fallacious which means ‘false’, in option (3) fits the second blank. Choice (3)

26. The words ‘secession’ and ‘resistance’ do not fit into the context. For the second blank the word ‘holding’ is more appropriate than anchoring. Choice (2)

27. Energies cannot flow ‘illusorily’. So option 1 is not appropriate. From the given options ‘disowned’ and ‘freely’ fit into the context appropriately. Choice (4)

28. ‘Abdication’ is the appropriate choice for the second blank as it means to give up or renounce the throne. ‘Off-guard’ blends with the idea of a ‘surprise invasion’. Choice (1)

29. ‘Global’ and ‘despotical’ are appropriate words. ‘World wide’ also means ‘global’ but the word ‘ruthless’ makes option (2) inappropriate. Choice (3)

30. The clue lies in the words ‘separated into elements’. According to this ‘analytical’ is the appropriate word. Choice (4)

31. The word ‘sustains’ which means support, bear the weight of is the right word for the first blank. ‘Moral’ is the appropriate word for the second blank as the context is about rejection of dishonesty. Choice (4)

32. The words ‘peripheral’ and ‘sensational’ are appropriate words. Choice (1)

33. The sentence is about the importance of foktales in Eskimo culture. ‘Sedentary’ refers to much setting and little physical exercise since it is a fok tale the narrator’s, ‘imaginative’ skill is important. Choice (2)

34. The context draws a difference between the reader and the listener. The options ‘unlike’ and ‘in-acquainted’ are suitable words. Choice (3)

35. ‘Speculative’ converting and ‘prosecuting’ are irrelevant words. ‘Proselytizing’ is to convert a person from one opinion, creed to another. In the context it is an appropriate word. Choice (4)

36. The words ‘participatory’ and ‘intimately’ are appropriate words. Choice (2)

37. ‘Exiguousness’ means scanty ‘extant’ refers to still surviving. In the given context these words convey the right meaning. Choice (1)

38. ‘Kinesthetic’ refers to movement. The word ‘intelligible’ which means meaningful is appropriate for the second blank. Choice (4)

39. ‘Posterity’ refers to ‘all succeeding generations’ ‘couched’ is to express in works of a specified kind. Choice (1)

40. The physical components of environments are relatively ‘predictable’. Option (2) is appropriate. Choice (2)

41. The appropriate words are ‘abstract’ and ‘imitate’. Choice (3)

42. The blank needs a word which means ‘hate’ or dislike. ‘Abhor’ means detest, regard with disgust and hatred. Option (2) is appropriate. Choice (2)

43. The appropriate words are ‘shimmering’ and ‘flopped’. ‘Shimmering’ means to shine with a faint or diffused light. Choice (4)

44. The word ‘advanced’ indicates that ‘attitudes’ and ‘infrastructure’ are inappropriate options. ‘Serendipitous’ means to become happy because of an unexpected discovery. It has no relevance to the context. ‘Whimsical’ which means ‘odd or quaint is appropriate. Choice (1)

45. ‘Triumph’ and ‘support’ are appropriate words. The words blend into the given context. Choice (4)

46. The words ‘breeding’ ‘behaviour’ and ‘barriers’ do not collocate with the context given. the right words are ‘boundaries’ and ‘transgression’. Choice (4)

47. ‘Sentient’ means to have the power of perception by the senses ‘Abeyant’ refers to state of temporary disuse. In the given context option 4 is appropriate. Choice (4)

48. The words ‘non-physical and ‘genes’ fit into the context well. Choice (2)

49. ‘parlance’ means to speak in a particular way. Option (1) is appropriate. Choice (1)

50. The words ‘feebly’ and ‘succumb’ are appropriate words to fill the blanks in the given context. Choice (2)

--- Practice Exercise 4 ---

Solutions for questions 1 to 50:

1. Option (3) is the right choice. To adopt a new attitude, plan or way of behaving is to begin to have it; espouse. To grovel is to crawl on the ground, especially to find something. It means that we should not assume superiority and look down on others. Option (1) is ruled out because of the second word loitering, which means to stand or wait somewhere especially with no obvious reason. Option (2) – to endorse is to support, approve of. To stouter is to have difficulty speaking because you cannot stop yourself from repeating the first sound of some word several times; stammer. Option (4) is ruled out as merely ‘accepting a philosophy is not what is being talked about, in the sentence. To ‘adopt’ is one step ahead. Also, to flounder is to struggle to move. Choice (3)

2. ‘Shallow’ and …… indicates that the word in the first blank is synonymous to it and ‘but’ indicates that the word in the
second blank is synonymous to it. Hence, frivolous, which means superficial fits into the first blank and profound, which means deep, weighty fits into the second blank. Hence, choice (1) is the right option. Option (2) is ruled out as upright, the word in the second blank does not fit into the context. Upright – honest, respectable. Option (3) is ruled out. Volatile – unpredictable, variable. The second word is not synonymous to volatile. Cogent means compelling, forceful. Option (4) is also ruled out even though the two words are synonymous to each other as they do not gel with the sentence. Choice (1)

3. The sentence clearly talks about the importance of language. It says that it would be wrong to hold a view that people can do without language. Hence, illusion and incidental fit into the blank. An illusion is a false idea or belief. Something that is incidental is less important accidental. ‘Mere’ in the sentence points to the word in the second blank. Option (1) is ruled out. Delusion is synonymous with illusion but fictional means imaginary and does not fit into the second blank. Option (2) is also ruled out. Misconception can also be considered synonymous with illusion but it does not collocate with imagine. Something is a misconception. Trifling – unimportant. Overstatement – exaggeration. Customary – usual, normal. Choice (3)

4. To ‘hollow something out’ means to remove the inside part of it. The sentence suggests that the content or the essence has been removed, without disturbing the framework or skeleton. Hence, choice (2) is the right answer since substance means essence and something that is intact is complete and has not been damaged. Option (1) is ruled out as the second word – steadfast means loyal; staunch; firm. Option (3) is ruled out as the foundation is not hollowed out. Option (4) does not fit in as ‘effects’ does not fit into the first blank, even though untouched can fit into the second blank. Choice (2)

5. The right choice is option (1). It means that those values that were nurtured in the past are no longer relevant in an age deeply influenced by science etc. To ‘nourish’ means to foster, maintain. To be steeped in something is to have a lot of a particular quality. Option (2) is ruled out as ‘deluged’, does not collocate with ‘in’, it is used with ‘with’. Also, it does not fit into the context. Option (3) is also ruled out. To embroil oneself is to become involved; entangled especially in a difficult situation. Option (4) also is not apt. To rationalize is to find a logical reason to explain. It does not collocate with ‘in’. Choice (1)

6. The fact that functioning is resumed shows that it is temporarily suspended. Moreover, ‘from within’, suggests that it happened naturally. Hence, spontaneously, which means – happening naturally, without being made to happen is the right word in the second blank. Therefore, choice (3) is the right option. Option (1) is ruled out as thwart, which means prevent does not fit in because of ‘resume….’. Option (2) is also ruled out. To inhibit also means the same as thwart. Also, the second blank cannot accommodate prompt which means done or acting without delay. Option (4) – To terminate means to make something end completely and hence cannot fit into the first blank, even though instinctively fits the second. Choice (3)

7. Far from being ‘weakened’ indicates that the laws gained strength. Hence, vigour, which means energy, force or enthusiasm fits into the first blank. The tendency to favour ‘oldness’ is also brought out in the sentence. Hence, prejudice which means bias fits into the second blank. Hence option (3) is the right choice. Option (1) is ruled out as esteem collocates with ‘for’. Option (2) is ruled out as ‘leaning’ is used with towards and hence does not fit into blank two. Option (4) is ruled out as a facet is a particular part or aspect of something and is used with ‘of’. Choice (3)

8. The right option is (2). The key word in the sentence is ‘perform’. Hence, only ‘function’ – a special activity or purpose of a person fits in, as it collocates with perform. To eject which means ‘to oust, expel’, also fits In-Justifications are made and not performed, obligations are met. Option (4) is ruled out because of ‘evinced’. To evince, means to reveal or indicate. Choice (2)

9. The correct option is (2). To resist means to oppose. The words ‘dared’ and ‘non-confirmist’ point to the answer. Proclaim is to declare. That means that they were looked upon, as the enemies of people. Option (1) is ruled out as to reproach is to blame or criticize. Merely criticizing will not make them non-confirmists. Option (3) is also ruled out for the same reason, though both declared and dubbed can fit into the second blank. Option (4) is ruled out as to entitle is to give a title to a book, play etc. Hence, it does not fit into the context. Choice (2)

10. While indicates that there is a contrast. ‘Similarities’ and ‘which’ indicate that the word in the first blank refers to the differences. Hence, diverse, which means ‘made up of a wide variety of things’; various, divergent, different fits into the first blank. Also, striking, which means obvious, marked collocates with similarities. Hence, option (4) is the right option. Option (1) is ruled out as diffuse means spread out, scattered. Option (2) is also ruled out as diverting which means amusing, delightful does not fit into the blank. Option (3) does not fit in even though divergent, which is a synonym of diverse fits into the first blank, because analogous, which means – parallel or similar becomes redundant when used with similarities. Choice (4)

11. Option (2) is the right choice. The root of something is the basis, core, essence. The ‘essential’ ideas control our intellectual life that is, they are very important (essential ideas). Option (1) is ruled out as facilitate which means to make smooth, easier does not collocate with intellectual life. Option (3) is also ruled out as regulate means to control, by means of rules and hence does not fit into the second blank. Option (4) – determined means to decide and it does not gel with ‘intellectual life’. Crux, pivot and core, all fit into the first blank. Choice (2)

12. ‘Degrading’ indicates that the word in the second blank is negative. Also, science and technology points to the answer. The right option is (1). To relieve somebody of something is to help, by taking something heavy or difficult from them. Drudgery is hard boring work. Hence it fits into the context perfectly. Option (2) is ruled out as ‘freed’ does not collocate with of and also weariness – tiredness does not fit into the second blank. Option (3) is not the answer as redeem – save does not collocate with ‘of’. To deprive someone of something is to take away things that are necessary and hence does not fit in. Labour and toil fit into blank two. Choice (1)

13. Option (1) is ruled out as zeal, which means enthusiasm collocates with ‘for’ and not towards. Option (2) is ruled out as ‘proactivity’ which means inclination collocates with for. Option (3) will not work as motivation ‘to’ do something or ‘for’ something is the right usage and not towards. Option (4) fits in best as ethic means principle or concept and drive, which means impulse, motivation, fits into the second blank. Choice (4)
14. Option (1) is the right choice. If something is derived from another thing it is developed from that or the first thing resulted in the second. To institute is to introduce a system, policy etc; to establish. Option (2) and (4) are ruled out as merely examining or suggesting new forms would not lead to any progress by itself. It is only when it is acted upon, that progress takes place. To emanate from is to come from. To fabricate is to invent or create. It is ruled out for the same reason as (2) and (4).

Choice (1)

15. The right option is (2). Orientation is the act of directing your aims towards a particular thing; attitude. It means that his perspective is broad and that he does not depend on specific or particular circumstances as suggested by the word ‘universalistic’ and also the conjunction ‘than’ which suggests that there is a contrast. Option (1) is ruled out as ‘limited’ does not gel with circumstances. Option (3) is ruled out as ‘structure’ cannot be used since we are referring to a person and not to organisation. Option (4) is ruled out as ‘external’ is irrelevant to the context.

Choice (2)

16. Option (2) fits in best. Subsequent learning would mean all the other levels of education that follow primary education as subsequent means ‘happening after something else’. Also, ‘mastery of’ is an objective or purpose of primary education. Hence, goal is the right word. Consequently would mean ‘happening as a result of something’. Hence, option (1) is ruled out. Most important factor ‘in’ would be right. Hence, (3) is ruled out. Option (4) is ruled out as to say ‘reading skills’ are the basis of influential theories is too far-fetched.

Choice (2)

17. The right option is (3). ‘different areas’ points to the word distinct. Option (1) is ruled out because of the word ‘concurrent’, which means parallel, as opposed to distinct. Option (2) is ruled out as ‘human rights’ cannot be called a system and also because of the word ‘expression’. One is a matter of... and the other..., means that the second blank also requires a word that means issue or matter. Hence ‘expression’ does not fit in. Option (4) is ruled out as something is ‘conceived of’ as.. and not just conceived as. Also, ‘consideration’ – something that has to be thought about, especially when you are planning or deciding something does not fit into the second blank. A ‘question’ in option (3) means the same as matter, issue.

Choice (3)

18. The right option is (4). If something gains ground, it becomes more powerful or known. Hence, it fits into the first blank – the manifestations are increasing. Also, racism etc. are forms of intolerance or bigotry. Option (1) is ruled out. If the manifestations are put to an end, there is no need to renew efforts. Option (2) is ruled out as racism etc are not types of indignity – shame, loss of pride. Option (3) is ruled out as they are not representations and also of savagery – violence. Choice (4)

19. The right option is (2). Option (1) – ‘advocated’ and as a ‘human right’ do not go together. Also, it is not mandatory or compulsory, it is necessary or required, that is the basis. Also mandatory prerequisite is redundant. Option (3) is ruled out as it is not a ‘natural’ gateway. Also, gateway ‘to’ something is a means of getting or achieving something. It does not fit into the context. Option (4) is ruled out as a premise is a statement or idea that forms the basis for a reasonable line or argument; a hypothesis. Hence, universally acknowledged or recognised... condition fits in.

Choice (2)

20. The right option is (1). The ‘fact’ makes it inevitable.... everyone has to ..... conduct. Option (2) is ruled out as ‘placed’ .... should be followed by ‘on’. Same is the case with confines. Also, ‘exhibit’ does not gel with line of conduct. Hence, option (3) is ruled out. Option (4) is also ruled out as to ensue is to resut or follow. It does not fit into the sentence. Also ‘principle’ does not suit the context.

Choice (1)

21. The word required for the first blank should be positive. Hence, ‘seditious’ in option (1) and ‘drastic’ in option (3) are ruled out. Between options (2) and (4), the latter is ruled out as ‘peace’ in option (4) is contradictory and so distorts the meaning of the sentence. Thus, only option (2) is appropriate.

Choice (2)

22. Option (1) is ruled out because ‘in the name of’ suggests something derogatory hence praise cannot fit in the second blank. We can say someone has achieved or earned fame but not ‘drawn’ fame. This rules out option (2). So is option (3) as splendour too does not collocate with the verb ‘drawn’. Option (4) is the appropriate answer choice.

Choice (4)

23. The clue is “by disputes...”. Hence, the second blank is a negative word. So, ‘palliated’ meaning alleviated or improved in option (3) and ‘nullified’ in option (4) are clearly ruled out. Though the words in options (1) and (2) for the first blank can fit in, the phrase ‘disputes and mistrust’ implies the need for a consensus in the political arena. Hence, ‘political’ renders option (2) more apt than option (1).

Choice (2)

24. The clue is the word ‘fear’ the word for the first blank should match with it. ‘Incredulity’ in option (1) meaning ‘disbelief’ does not go with ‘fear’ (which can only stem from some belief that something will affect the person). Option 3 is ruled out for the same reason. ‘Discretion’ meaning ‘tact’ or caution ruled out fear. Option (2) is ruled out for the same reason ‘Uncertainty’ goes with ‘fear’ because fear may be caused by uncertainty. Thus, only option (4) is appropriate.

Choice (4)

25. It is clear that the second blank needs a negative word. ‘Eulogised’ in option (1), having a positive connotation, rules it out. ‘Impute’ is always followed by the preposition ‘to’. This rules out option (2). ‘Accused’ in option (4) is followed by the preposition ‘of’. Thus, only option (3) renders the sentence meaningful and grammatically correct.

Choice (3)

26. The word ‘covetous’ (which is disapproving) is the clue. Hence, option (2) though it gives sense to the sentence, is ruled out as it’s not in tune with the tone of the sentence. The word ‘media’, in option (4), gives a neutral sense. Hence this too is ruled out for the same above given reason. ‘Logic’ in (3) does not collocated with ‘beautiful’. Choice (1) is apt. Choice (1)

27. ‘Literary work’ does more than just reporting. This rules out option (1) while ‘scientific’ work is for the sole purpose of reporting thus it makes sense. In option (3), ‘poetic’ is ruled out by the word ‘report’. Option (4) is clearly ruled out. The purpose of a rhetoric is to emphasise or exaggerate and not summarise. This makes option (2) correct.

Choice (2)

28. The conjunction ‘and’ in the sentence requires that the two words for the blank should be matching. The word ‘enlightenment’ in option (3) does not collocate with the verb ‘rules’ and so is eliminated. Though the first word in options (2) and (4) seems to fit in the blank, the word ‘fashion’ renders ‘designing’ and ‘development’ irrelevant. Only option (1) makes sense in the sentence.

Choice (1)

29. ‘Correlation’ is totally irrelevant. ‘Rectifying’ is rendered incorrect by the word repeal. So is ‘circumvention’. It is obvious that in order to decide to change,
30. The sentence talks of people who pass “destructive laws”. Hence the word required should be a negatively connoted word. Further the other word for the second blank should be a positively connoted word. Hence, ‘Potentates’ meaning kings being a neutral word is a misfit for the first blank. The remaining three are possible. ‘Narrow-minded’ being a negatively connoted word is ruled out. So is ‘light-hearted’ which is out of context. Option (1) is appropriate in the context. Choice (3)

31. The two clues are ‘but’ and “uncertainties” which make it imperative that both the words required for the blanks should be negative. So, ‘promoting’ in option (1) rules it out and in option (3), ‘escalating’ rules it out. “Maturity” in option (4) renders the sentence incorrect. Also, the word ‘but’ renders ‘maturity’ incorrect. Only option (2) is apt as if renders the sentence meaningful and correct. Choice (2)

32. Option (1) is eliminated as the word ‘vision’ in it does not collocate with the word ‘garner’. The clues are ‘lack of _ _ _ and absence of _ _ _’ hence the word for the first blank should be negative. This rule out ‘simple’ in option (2), option (3) is the answer choice that is logical and makes sense in the context. ‘Pertinacious’, being a positive word, is ruled out. Option (3) is apt. Choice (3)

33. The phrases ‘will not be free of’ and “excessive power” shows that the tone of the sentence is negative. This rules out ‘guidance’ which is a positive word, the sentence talks of statisticians who provide statistics. In the context, ‘repel’ in option (1) is made irrelevant by the word ‘enhance confidence’. ‘Follow’ in option (3) would distort the sentence as ‘confidence is enhanced’ only if what the statisticians do is bettered and not replicated. Option (2) would mean that even legislation will not make statistics free from interference and the statisticians can still be directed (that is, dictated). Choice (2)

34. It is understood from the sentence that the word for the first blank should be negative. Hence, all the words except for ‘slower’ in option (4) are misfits. Thus only ‘slower’ and ‘disaster’ in option (4) are appropriate in the context. Choice (4)

35. It is understood from the sentence that Ivan Illich is a writer. From the options, only ‘critic’ in option (1) is close. The remaining three are irrelevant in the context. Choice (3)

36. ‘To crib’ is to grumble. Here people always grumble saying that life has become stressful. Choice (2)

37. Learning or studying the earth is no doubt interesting. But it is also a ‘challenge’ or a demanding task. Choice (4).

38. Doping is ‘prevalent’ or ‘common’ or ‘widespread’ in certain fields of athletics in India. But some of these athletes have been wrongly ‘accused’ or ‘charged with this crime’. Choice (2)

39. The hunger made me consume the food quickly and greedily or ‘devour’ the food. Choice (3)

40. A person becomes ‘debilitated’ (weakened) by a long bout of fever but not ‘aprehensive’ (fretful), ‘salubrious’ (healthy), ‘flummoxed’ (confused) or ‘sprightly’ (lively). Choice (2)

41. Only the word ‘artlessness’ (sincerity, straight forwardness) conforms with the phrase ‘childlike simplicity’. The words ‘charisma’ (charm) ‘impudence’ (disrespect), ‘innancy’ (foolishness) and ‘frivolity’ (childishness) are not logically appropriate in the given context. Choice (4)

42. Only in a ‘secular’ (non-religious) society people belonging to different religions live in mutual harmony and ‘tolerance’. The other choices are not logically appropriate in the given context. Choice (4)

43. The woman was attractive. So the man went to her ‘actually’ to take her phone number and address but pretending to ask for the time or ostensibly asking for the time. Choice (1)

44. The first words of all the four choices can fit into the first blank. But choices 2, 3 and 4 can be eliminated because the words ‘relinquished’ (surrendered), ‘expended’ (consumed) and ‘abandoned’ (forsaken) do not logically fit into the second blank. Choice (1)

45. A person feels ‘groggy’ (dazed) only if he has had a ‘fitful’ (intermittent) sleep the previous night. The remaining options are inappropriate. Choice (3)

46. Only option (1) brings the contrast between the herbs that grow in excess and palatable vegetables which are in shortage. Choice (1)

47. The word ‘pass’ shows that he tried to use something that is not real. Option (2) brings out this idea effectively. Choice (2)

48. The word ‘ridicule’ shows that the blank needs a negative word. From option 2, 3 and 4 we can say the person can be ‘worried’, or ‘chagrined’ is more appropriate than the other two words. Choice (3)

49. ‘Dextrous’ is skill in handling and ‘clumsy’ is lack of it option (4) is appropriate. Choice (4)

50. Option (2) is appropriate. ‘Emaciated’ is thin and weak. Choice (2)

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**Practice Exercise 5**

**Solutions for questions 1 to 40:-**

1. The view that is talked about in the sentence is that of a person. Hence the sentence should start with ‘according to _ _ ’. Therefore C, which says “for singer” starts the paragraph. D follows as it introduces the view. A form a pair as A comments on the view. E comes after them as it is an extension of the previous sentence. The sentence ends with B as it finally states the author’s opinion. Hence CDAEB is the right sequence. Choice (2)

2. It is clear that A and E cannot start the sentence. C is general in nature and it starts to talk about an idea which is elaborated in the rest of the sentence. B states the idea and is followed by E which says that the idea seems particularly relevant to _ _ _ and hence, E should follow CB. A is an extension of E since it is relevant to two things. It is relevant - because the present situation is stated in D and hence, it concludes the sentence. There fore CBEAD is the right sequence. Choice (1)

3. B and D clearly form a pair as one talk about a debate and the other starts with ‘over’ - debate over something. Also, D and A also form a pair because D ends with augmenting water supply and A talks about how that can be done. Hence BDA form a sequence. C starts the sentence as it talk about when the debate exploded. E should precede D as episode here refers to the debate. Hence, the right order is CEBDA.

4. C starts the sentence as it talks about an ‘idea’ which is elaborated in the rest of sentence E has to follow as A as ‘which’ refers to the idea. It is followed by D as which here too refers to the idea. B comes next as what the idea does is stated in it. A concludes the sentence as it finally states the idea. Hence, CEDBA is the right sequence.

5. B is opening part as BE together talk about the negative impact of enmity and conflict. DAC form a set as they state what happens inspite of the enmity. D to A is a link - integrate _ _ _ in _ _ _ also
A to C is a link - intimate realms of marriage - hence the right sequence is BEDAC. Choice (2)

6. D is the opening part of the sentence as it talks about the particular setting in which the argument is relevant. It is followed by A, which talks about some exceptions (isolated cases). It is followed by C which continues to talk about the cases. It is then followed by B and E as both talk about the general trend. The words 'and punishments' indicate that B is a continuation of C. Hence EB form a pair. The right sequence is DACEB. Choice (3)

7. The sentence starts with B as it introduces the subject of the sentence. E follows as it states what the values the person firmly believes in. It is followed by C which states the name of the person and through a conjunction of contradiction provides a link to A and D. Nevertheless believed that. Hence C and A form a pair A and D are linked as 'crucial for'. Hence, BDACE is the right sequence. Choice (1)

8. The sentence starts with B as it introduces the topic - increase in power shortage. It is followed by D as it states the reason for that. A follows as 'while' indicates a contrast - capacity targets. It is followed by C and E which talk about the failure of the plans in ensuring that targets are met. Hence BDACE is the right sequence. Choice (4)

9. C opens the sentence as 'lack of information about women's lives' is the subject. The consequence of this is stated in the rest of the sentence. ED go together to give one consequence (perpetuatations - contribution). A is the second (implies -) and B the third (promotes -). The sequence therefore is CEDAB. Choice (3)

10. The sentence begins with D as "the habit of obedience" is what is discussed in the rest of the sentence. A follows as 'upon' in D is linked with 'the impressive nature of a child'. E talks about what the habit does not develop, hence it follows it is followed by C as it talks about what it develops instead. The paragraph ends with B which is a continuation or a consequence of what is stated in C. Hence DAECB is the right order. Choice (2)

11. B is the opening part of the sentence as it introduces the view of the Malthusian league. It is followed by D as 'point out' and 'that' are linked. It is followed by C as 'take account' is linked with 'of' and what was neglected is stated in C. It is followed by A as it talks about the consequences of 'pressure of population'. E follows as it talks about another aspect it neglected. Hence BDCAE is the right sequence. Choice (1)

12. The sentence starts with D as it talks about one's view. It is followed by C and E is lined to E as E talks about the consequence. It is followed by A as 'understand' is linked with 'an opponent's point of view'. In A. It ends with B as 'our experience' shows a solution. Hence DCEAB is the right sequence. Choice (2)

13. The sentence starts with C. It states one possibility and indicates that there is another. It is followed by B as E states the reason for extinction. It is followed by A, which states that there is another important problem which is mentioned in D. It is followed by B as there is a link between contamination and 'with substances'. Hence, the right sequence is CEADB. Choice (1)

14. B is the opening part as it introduces subject of the sentence. D follows as 'in what sense' is described in D. It is followed by C as 'even though' is linked to what is stated in C. It is followed by E as it is linked to 'those' in B. In between, how they realized themselves is described in E is followed by A as 'service of a human purpose' is linked to 'larger themselves'. Hence, BDCEA is the right sequence. Choice (2)

15. B begins the sentence as it introduces the view. D and A cannot follow as both have 'himself' and 'he', which refer to 'human being', in E. Hence BE forming a pair. E is followed by D 'squarely' is linked to 'the fact that' in D. That is followed by C as it talks about what else a human being should do. The sentence ends with A. Hence, BEDAC is the right sequence. Choice (1)

16. B introduces the view; hence it is the first part of the sentence. It is followed by D as that states the view. C follows as it explains what is said in D. Next comes A, which talks about what you are likely to do, if you hold that view. AE form a pair as judge as inferior work in hence, BDCAE is the right order. Choice (4)

17. C is the only part which talks about 'an argument' in general terms. Hence it opens the sentence. It is followed by D as 'are' refers to arguments. It is followed by A, which is a continuation. E follows as 'it' refers to 'the arguments' in A. The sentence ends with B hence, CDAEB is the right sequence. Choice (1)

18. B opens the sentence as it introduces the sentence - the large number of street children. A is a continuation. It is followed by D as it states what it in the present condition of the kingdom. E and C together form the conclusion. C is followed by E as 'deserve praise and for a preserver' go together. Therefore, BADEC is the right order. Choice (2)

19. B opens the sentence as it introduces the focus of the sentence - the Great War. It is followed by D as 'which' in D refers to the war. C follows as it is a continuation, E is linked to B (D and C provide an additional piece of information), E is followed by A - 'denied' is linked to 'by any student'. Hence BDCEA is the correct sequence. Choice (3)

20. C should begin the sentence as the name of the lady who gave a particular warning is introduced. A follows as it provides the warning and also when E follows as how fast it is decreasing is talked about in E, in the form of a comparison. It is then followed by D, which is a continuation, 'win back', suggests that the statement which talks about the decrease in functions should come before D. It is followed by B, which talks about the consequence if they do not win back work (in D). Hence CAEDB is the right sequence. Choice (4)

21. The sentence starts with C as it is introductory in tone. It talks about how women are judged. It is followed by A - there is a link between 'regard' and 'as a'. Why it is a mistake is talked about in DE and B and D is linked by E. What is stated in D and 'to be sure' are connected. E also presents a contrast - 'but' which is stated in B. The right sequence is CAEB. Choice (2)

22. The sentence should start with C as it introduces the topic - our experience being psychological. It is followed by A, which is the beginning of the explanation. A is followed by E. E is followed by D. 'It' in D refers to what we receive by the sense. The sentence ends with B - which is a continuation of 'the sense - mind' in D. The right order is CAEB. Choice (1)

23. C is the introductory part as it talks about a particular judgment and what it did not do. It is followed by E, which talks about what it did "It" in E refers to the judgment. It is followed by B as B has the result of what is stated in E. The sentence ends with D, 'which' in D refers to 'universal attention' in B. Hence, the right sequence is CAEBD. Choice (2)
24. E is the introductory part, as indicated by its tone. It is followed by B which gives the reason or the setting in which they appear redundant. It is followed by D as it is a comparison - 'as _ _ _ 'so _ _ _ '. It is followed by C, which takes this worldly tone out of context. 'As a legend' and 'as a window'. So D should follow E. Only option (3) is logically correct. Choice (3)

25. B opens the sentence as it talks about an 'act', which is elaborated in the rest of the sentence. It is followed by D, which gives a condition. It is then, followed by A which states the act. C and E explain it further and the sequence is CE as B has a concluding tone - it states the intention. Hence, the right order is EBDA Choice (1)

26. C opens the sentence as it talks about a 'conviction or belief'. E follows as it states the conviction. A follows as it talks about how it is contrary to religious belief, and is followed by D. The structure not only to _ _ _ but also to _ _ _ B concludes the sentence. The right sequence is CEADB. Choice (3)

27. C is the opening part - it is the introduction followed by E and A. E is an additional piece of information. C and A are linked. Hence, CEA form a group. It is followed by B - which qualifies what is stated in A. It ends with D 'Demonstration' and 'of' form a link. Hence, CEADB is the correct sequence. Choice (2)

28. C is the beginning of the question which is talked about in the rest of the sentence. It is followed by a - actions of _ _ _ parts and E, which is a continuation as it talks about the result. D comes next as it says 'we still are clearing' about what is stated in the first part of the sentence. The sentence ends with B. The correct sequence is CAEDB. Choice (3)

29. B is the opening part as it introduces the topic. It is followed by D 'its' refers to the child. It is followed by C, which gives an example to illustrate what is stated before. It is then followed by A which talks about what B and D tell us. The sentence ends with E. Hence BDCAE is the right sequence. Choice (2)

30. The sentence starts with B - it introduces the subject - tyranny of man. It is followed by E - arguments _ _ _ forward. It has a link with D. 'Prove that _ _ _ the two sexes _ _ _ '. It is followed by C, which states that the same thing can be put more straight forwardly and that is talked about in A. Hence BEDCA is the right sequence. Choice (1)

31. The verb ‘survived’ requires an object. That is, what is that which something (or someone) has survived. The words ‘the ravages’ in A provide it. BA as an opening pair makes the sentence logical. The conjunction ‘and’ joins the two phrases – ‘as a legend’ and ‘as a window’. So D should follow E. Only option (3) is logically correct. Choice (3)

32. The verb ‘passed on’ should be near to the phrase ‘to the next generation’ so B must follow C. makes CB a pair. This rules out option (1). The conjunction ‘or’ makes DE a pair. The position of A is appropriate after DE as it has the pronoun ‘it’. Thus DEABC is meaningful as well as grammatically correct. Choice (3)

33. It can be seen that the conjunction ‘if’ in A needs a clause to make it meaningful as well as grammatically correct. Either C or D can follow it. This rules out option (1) and (4). Option (2) is a logical sequence. Choice (2)

34. Option (3) is ruled out as DA as a pair is grammatically incorrect. We see that B and C as a pair does not convey any meaning, while CB does. This rule out option (2). Option (1) is ruled out as the sequence does not make any sense. Option (4) is meaningful, hence is the correct choice. Choice (4)

35. We see that A cannot follow C. A ‘tendency’ can be ‘natural’ but not a ‘key’ to anything. Thus CA, being a pair, rules out option (2) and (4). Option (3) is incorrect as it is an incomplete sentence. Thus, only option (1) which is logical is the correct choice. Choice (1)

36. A cannot begin the sentence as it is awkward. Option (3) is therefore ruled out. It can be seen that AB is a pair joined by ‘and’. The preposition ‘on’ requires that C follows D. DC is missing in option 1, so it is ruled out. E makes the sentence logical if it precedes DC while the sentence is rendered meaningless if it follows DC. Thus option (2) appropriate. Choice (2)

37. Both A and C can open the sentence. We see that the pronoun ‘it’ in B stands for the rainforests. Further ‘species’ in C, which is in the plural should be followed by the verb ‘rely’ in B. Therefore, it is clear that CB is a pair. This ruled out options (1) and (2). Between options (3) and (4), the latter is ruled out as the word ‘renders’ makes the sentence grammatically incorrect. Option (3) is logically as well as grammatically correct. Choice (3)

38. The verb ‘ignores’ in E requires an object. While either C or D can follow E, we see that the sequence in option (1) does not make sense if D follows E. C after E is meaningful. This rules out option (1). From the remaining options, we see that AD and EC are pairs. Further, B cannot precede AD as it would then refer to the clause ‘it would mean’ and alter the meaning of the sentence. From the construction point of view, ‘supremacy over parliament’ is ‘unacceptable’. Hence B modifies AD and so should follow it. This rules out option (4). EC is better as the opening pair than as a concluding pair. Thus, between options (2) and (3), the latter is logical. Choice (3)

39. It is understood from the sentence that the welfare of the rural population is associated with a faster pace of growth of rural economy. Thus, we see that A modifies D and so DA is a pair. This rules out option(2) and (3) as AD makes the sentence incorrect because of its awkward construction In option (1), E after DA renders the sentence grammatically incorrect. Only option (4) is both logical and correct. Choice (4)

40. It is illogical for authorities to murrmur their protests. This rules out (3) and (4). Option (2) is an awkward construction. Only Option (1) makes sense logically. Neither the drivers nor the passengers could do anything more than murrmur their protests as the authorities (presumably the traffic authorities) noted down their vehicle numbers. Choice (1)

Practice Exercise 6

Solutions for questions 1 to 10:

1. Commitment of employees is a critical factor for corporate ‘success’ the word ‘commitment’ makes it mandatory that the blank needs to be filled with a positive word. Choice (1)

2. Work atmosphere should not be tiring. Infact it should be such that the employees are involved in what they are doing. Choice (3)

3. Employee needs to be connected with the goals and objectives of the organization. Choice (4)

4. Office environment must be in the right spirit. For this the management must take the necessary steps to create such an environment. Choice (3)

5. The appropriate word is ‘motivate’. Choice (4)

6. When the employees are motivated in a proper direction human ‘expertise’ can be retained. Choice (1)
7. The context is about retention so ‘compensation’ is the appropriate option.
   Choice (1)
8. The context is about a positive force. So the word ‘driving’ fits well. Choice (4)
9. ‘Switch’ means ‘change’ so an appropriate word in the given context. Choice (2)
10. Several organization follow the policy of equaling the pay with the performance, of the employee. It is called as ‘pay for performance’ model. Choice (2)
11. The tone of the sentence suggests surprise. ‘Dismay’ which means the same is the appropriate option. Choice (3)
12. A city is fighting for its ‘survival’. The other words do not collocate with the sentence. Choice (4)
13. The words ‘acceptable’, ‘accessible’ and ‘admissible’ do not hold any relevance to the context. ‘Vulnerable’ which suggests susceptibility is the right word. Choice (3)
14. ‘Surrounded’ is the appropriate word. Choice (1)
15. ‘Detained’, ‘maintained’ and ‘prevented’ are not relevant. Protected is the right word. Choice (1)
16. ‘Breach’ is to make an opening in a barrier the right word. Choice (2)
17. ‘Filling up’ is the right phrase. Choice (3)
18. It may take months before it becomes normal. ‘Gets’ is the right choice. Choice (1)
19. ‘Fled’ is the appropriate word. It means to escape from something. Choice (1)
20. Options 1, 2 and 3 have no relevance. The right option is (4). Choice (4)
21. Option (3) is appropriate ‘Ingredients’ refers to things that are used to make up something. Choice (3)
22. To draw someone’s attention to something is to make them aware of it or make them think about it. The appropriate choice is ‘attention’. Choice (1)
23. The appropriate word is ‘making’. Choice (1)
24. ‘Selling’ is the appropriate word. In the context it refers to gathering support. Choice (2)
25. The clue word is ‘interview’. ‘Appearing’ is the right choice. Choice (4)
26. ‘Infuse’ which means to fill with is the right choice. Choice (4)
27. ‘Charm’ which suggests attractive is the right option. Choice (4)
28. ‘Fundamental’ which means basic or primary is the right option. Choice (4)
29. ‘Personality’ is the right option. Choice (4)
30. The voice of a person indicates his physical, emotional and mental health. ‘Indicator’ is the right option. Choice (3)
31. ‘Residents’ which refers to people who live in a home or area is the right option. Choice (3)
32. The blank needs a word which will convey the meaning ‘progress’. ‘Advance’ is the right option. Choice (1)
33. With advancement, physical activity in developing nations takes a downward trend. The word ‘declines’ is appropriate. Choice (2)
34. ‘Influences’ is the appropriate choice. Choice (2)
35. Cars take the place of walking in developing nations. ‘Replace’ conveys this idea. Choice (1)
36. The words ‘pleased’, ‘engaged’ and ‘rehabilitated’ are not relevant. ‘Occupied’ is the right choice. Choice (4)
37. ‘Incidence’ which means frequency with which something occurs is the appropriate word. Choice (4)
38. ‘Implications’ is the appropriate choice. Choice (2)
39. ‘Daunting’ means fear of something. The right option. Choice (4)
40. ‘Access’ is the appropriate choice. Choice (2)
41. The word ‘depicts’ is inappropriate in this context because to ‘depict’ something means to portray by drawing. The word ‘delineates’ is irrelevant. The word ‘extirpate’ which means root out or destroy is irrelevant. Therefore the word ‘manifests’ which means ‘reveals’, is the most appropriate in this context. The clue is “in different forms” which means “manifests”. Choice (3)
42. The word ‘apathy’ which means lack of concern is the most appropriate in the context. The other words are irrelevant. Choice (1)
43. The words preceding the blank talk about the hunger for wealth, and misplaced prestige, hence the word ‘competitive’ is more appropriate than the rest of the options. Choice (3)
44. The word ‘degeneration’, which means deterioration, is the most appropriate in this context. The words – ‘fortification’ – enrichment, ‘veneration’ – respect, ‘perversion’ – wickedness/ corruption’ – are all inappropriate in this context. Choice (2)
45. The words ‘distorted’ which means ‘misconstrued, ’stripped’ which means deprived and ‘depraved’ which means perverted, are all irrelevant in the given context. Only ‘declined’ which means deteriorated is appropriate. Choice (1)
46. The keywords here are ‘twenty-first century’ and ‘historians’. The word that best fits is ‘tagged’. Choice (2)
47. The statement here is trying to establish the link between terrorism and Islamic groups and hence the right word is ‘involvement’. Choice (1)
48. The statement says that the alarming frequency of such terrorist attacks could negate all other achievements of this century. ‘Overshadow’ is the word that best conveys this and hence it is our answer. Choice (3)
49. The blank here takes a negative word that best expresses the mindless acts of violence being perpetrated; hence ‘abomination’ is the right choice. Choice (3)
50. The statement says that western leaders assert that Islam is a religion of peace and that extremists have gone against this basic tenet. The word that conveys this meaning is ‘usurped’ which means to wrongly assume or seize. Choice (2)
51. Both ‘resorts’ and ‘haunts’ fit in the blank. ‘Resort’ is a holiday place. ‘Haunt’ is a place of frequent visit since it is enjoyable. Keeping in mind the tone of the passage and the words ‘clubs of colonial affectations’, ‘haunts’ will be the most appropriate word. Choice (3)
52. ‘Galling’ and ‘exasperating’ can be ruled out since they mean ‘annoying’. The passage is not discussing, ‘erudite’ or learned people but it refers to the ‘privileged’ people which means respected and admired, and ‘hallowed’ conveys this meaning. Choice (3)
53. After the word ‘hallowed’, the only word that would suit the blank is ‘urbane’. It means polished and high-class. The other three words do not pertain to the paragraph. Choice (4)
54. The word that suits the context is ‘inertia’. It means to be unwilling to move or be active. It is in keeping with the idea of ‘haughty resistance to criticism’. It also takes the preposition ‘against’ after it. Choice (2)
55. ‘Abjuring’ and ‘abdicking’ can easily be ruled out. They mean renounce or give up.
59. ‘Ensconsed’ conveys this idea. Choice (2)

60. The paragraph refers to the outstanding performance of Pele, hence transcends (surpasses) is the right word here. Choice (3)

61. ‘Infectious’ is the only word that can be used to qualify ‘joy’ since it means ‘likely to spread to or influence others’. Choice (3)

62. Text messaging gives children an opportunity to learn spellings and sounds of words in a playful way. The word ‘illustrious’ means very famous and much admired. The word is inappropriate in the context. The word calculating means ‘crafty’. Not a suitable word because the word has a negative connotation. ‘Candidate’ means to say what you think openly or honestly. This is not an appropriate option. Imaginative is having or showing new and exciting ideas. Children learn to use imaginative ways in learning sounds and spellings of the language. Choice (4)

63. Text messaging helps to use words economically. It improves the skill of expression. The word ‘overflow’ means to be so full that the contents go over the sides. This is an inappropriate choice. ‘Locale’ means a place where something happens. It is not an appropriate choice. ‘Plentiful’ means amount that is greater than is needed or can be used. This is not a suitable word in the present context. It is not suitable. The word ‘economy’ means to use something that is available in a way that avoids waste. Text message helps to improve children’s skills in economy of expression.

64. Text message gives children an opportunity to learn spellings and sounds of words in a playful way. The word ‘ilustrious’ means very famous and much admired. The word is inappropriate in the context. The word calculating means ‘crafty’. Not a suitable word because the word has a negative connotation. ‘Candidate’ means to say what you think openly or honestly. This is not an appropriate option. Imaginative is having or showing new and exciting ideas. Children learn to use imaginative ways in learning sounds and spellings of the language. Choice (4)

65. It is interesting to know that the more one uses text message the better is his/her literacy score. The word ‘preparing’ means to make something ready to be used. ‘Cunning’ is to look for an opportunity to attack. ‘Predicting’ is to say that something will happen in future. These options are not appropriate. ‘Beginning’ means to start doing something. It is therefore not surprising that studies are beginning to show that the more you text the better your literacy scores will be. Choice (4)

66. The paragraph is about people residing at Goru Gotu in Ethiopia. They suffer the effects of famine. They are unable to stave off (stop something bad from happening) starvation. ‘Anathema’ means a strong dislike. This option is inappropriate because the paragraph is not about likes or dislikes. ‘Anorexia’ is a kind of illness in which a person has an overwhelming fear of becoming fat, so refuses to eat enough and becomes thinner and thinner. This option is illogical in the present context. People living in Ethiopia may become anaemic due to lack of food. ‘Anaemia’ is a medical condition in which there are too few red cells in the blood causing one to feel tired and look pale. This is not a right option. ‘Starvation’ means extreme suffering or death caused by lack of food. The word ‘famine’ in the next sentence further confirms that this is the right option.

67. Ethiopia is thickly populated. ‘Crowded’ means a lot of people. While talking about the density of a particular country it is not appropriate to use the word ‘crowded’. We can say a ‘crowded’ place but not a ‘crowded’ country. ‘Seething’ means full of people. This adjective is appropriate to talk about a huge gathering. We can say ‘seething crowd’ but it is inappropriate to say ‘seething country’. ‘Populist means a person who express populist views. Not a right option. A country or area which has a lot of people living in it is ‘populous’. This is the right option.

68. Labourers who live in Goru Gotu struggle hard to keep their families alive. The word ‘revile means to hate something intensely. If this word is used it will mean labourers hate something but continue to till the land. It gives no meaning. The word ‘revil’ is inappropriate here. It means to enjoy something very much. The labourers have nothing to enjoy. The word ‘shudder’ is inappropriate. ‘Shudder’ means to shake with fear, horror or disgust. It also means to shake in cold. The word ‘survive means to manage to live or continue to live inspite of difficult circumstances. Labourers survive in that place tilling soil by hand and bear all the problems to keep their families alive. Choice (1)

69. The fury of nature has left Goru Gutu starving. All their efforts to keep their families alive did not bear fruits. It is inappropriate to use the word ‘doldrums’. It means it is very quiet and nothing new or exciting is happening. ‘Amiss’ means something wrong. There is nothing wrong with the labourers efforts. It is the fury of nature which causes problems to the labourers. ‘Sham’ means not real or not really what it seems to be. Their efforts are not a sham. So it is inappropriate to use this word. ‘Vain’ is used to describe an attempt or action that fails to achieve what was intended. All their efforts have been in vain because of the fury of nature. Choice (2)

70. A famine affects human beings and animals alike. ‘Warp’ is when something gets damaged by bending or curving often because of the effect of heat or water. This is not an appropriate option. To use the word ‘replete’ is irrelevant because it means full of food and drink. The animals are not in an ‘aggressive’ mood. Not a correct option. Because of starvation animals get thinner. Choice (3)

71. The paragraph is about the Israel Philharmonic Orchestra. The orchestra is very well known. Israel is the home for many classical musicians. There is a competition for funds, though. The orchestra is called as one of the country’s cultural jewels. ‘Legitimate means that which is approved by the society or acceptable to the society. This is not the right option. ‘Off stage’ is used to describe the behaviour of actors or entertainers in real life.
The paragraph is not about the behaviour of the musicians. It is not an appropriate choice. The Israel Philharmonic Orchestra is not a privileged one. It does not enjoy an advantage or opportunity that the other orchestras do not have. The orchestra is called as a cultural jewel. The option ‘glittering’ which means something that is very impressive or successful is effective to describe the popularity of the orchestra. Choice (4)

72. The orchestra travelled to the battle fields in war time to keep the spirits of the soldiers high. The word ‘rebellion’ is inappropriate. The orchestra has no intention of organizing a violent action to change the country’s political system. During the war time the orchestra has not travelled to the battle fields to discuss the principles and values concerning people’s behaviour. So to use the option ‘morality’ to fill in the blank is inappropriate. ‘Decorum’ means the behaviour that people consider to be correct, polite and respectable. This is not an appropriate choice. The orchestra wishes to entertain the soldiers and keep their ‘morale’ high. ‘Morale’ means the amount of confidence and cheerfulness that a group of people have. This is the right option. Choice (1)

73. The Israel Philharmonic Orchestra is well known. ‘Milieu’ means a group of people or activities that one lives among or is familiar with. This is not an appropriate choice. ‘Scrummage’ is a group of people who are close together and push against each other. Not a right option. The orchestra has not built a false outward appearance. It has a genuine fame and name. To use the word ‘façade’ is therefore not correct. So to use the word ‘chauvinism’ which means that is not correct. The orchestra is well known and is remembered for its performance. The right option is ‘reputation’. The orchestra built a reputation as one of the world’s leading orchestras. Choice (2)

74. Israel is a country which is stuffed to the rafters with classical musicians. Because of this there is always a stiff competition for funds. ‘Principled’ means some one with strong principles. This is an incorrect option as we are not talking about principles to be maintained. ‘Punitive’ means actions that are intended to punish people. This is not a right option. ‘Inflammatory’ means to say something which is likely to make people react very strongly. It is inappropriate to use this option. To use the word ‘constricted’ to fill the blank is also not correct. The word suggests that actions are controlled and people cannot do what they want. ‘Inevitable’ means it is certain to happen and cannot be prevented or avoided. Israel has many classical musicians so competition for funds is inevitable and it is increasingly bitter. Choice (1)

75. The management at the Philharmonic is not satisfied with the funds allotted because it was sanctioned less money than in the previous years. So it decided to launch a protest. ‘Condemnation’ is the act of saying that something or some one is very bad and unacceptable. The management has no intention of condemning the government. It only wants to demand mere funds. ‘Divergence’ which means a difference between two or mere things, attitudes or opinions is not an appropriate option. The management at the Philharmonic has no intention of creating a situation that interferes with the rights of the government. So to use the option ‘infringement’ is incorrect. It wants to plan a set of activities over a period of time in order to achieve more funds from the government. ‘Campaign’ therefore is the right option. Choice (4)

76. The paragraph is about the Tata Management Training centre, its objectives, and achievements. The Tata Management Training centre was set up by the famous JRD Tata. ‘Catchpenny’ means superficially attractive and there is no substance. To say this about JRD Tata is inappropriate. JRD Tata is not ‘dissentient’, because he is not disagreeing with a majority or official view. It is not correct to call him an ‘ignoble’ person because he is not dishonourable, mean or base. He is ‘legendary’. This is the right option. Choice (2)

77. The main objective of TMTC is to function as a learning institution and to contribute towards the economic development of the country. ‘Debilitating’ is to weaken or enervate something. TMTC has no intention of weakening the economy of the country. So it is a wrong option. ‘Curtailing’ is to cut short or reduce. This is not an appropriate choice. When an event is judged or determined even before the evidence is examined it is ‘fore judging’. This option will not be appropriate in this context. The practice of making things less difficult is known as ‘facilitating’. TMTC as a learning institution is helping to groom individuals into professional leaders. The right option is ‘facilitating’. Choice (4)

78. TMTC is one of the foremost management training facilities in the country. It is a famous organization. To say it is ‘timorous’ would mean it is easily alarmed or timid. This is not an appropriate adjective to describe the popularity of the organisation. The organization has definite goals. To say it is ‘Wanton’ will mean it is motiveless. So it is not a correct option. ‘Obsquous’ means obedient or attentive. TMTC is a famous and celebrated organisation. The option ‘renowned’ which means famous is the right choice. Choice (1)

79. ‘Transpersonal’ means transcending the personal. It is not a right option. ‘Unilateral’ means performed by or affecting only one person or party. TMTC is not a unilateral organization. ‘Statuesque’ is having the dignity or beauty of a statue. These options are not correct. TMTC has become famous because of the respect derived from its achievements. So the option ‘prestigious’ is the correct choice. Choice (4)

80. TMTC provides professionals with the right opportunities. ‘Orgreat’ is a cooling drink. So irrelevant option. ‘Eirenicon’ is a proposal made for achieving peace. ‘Siege’ means a military operation. Not a right operation. It is not a right choice. ‘Expedience’ means a good chance of attaining goals. This is an appropriate choice. Choice (3)

81. ‘Obsession’ is the appropriate word. The first two lines of the passage which talk about mass murder of unborn girls suggest that from the age-old days, people are ‘obsessed with’ the idea of the male child (sons). Choice (3)

82. The passage talks about Manu’s treatise which has become ‘acceptable’ through tradition and belief. Hence ‘legitimized’ is the right word. Choice (1)

83. The passage says that obsession with sons has ‘passed through’ or ‘percolated down’ from the past ages to 21st century India. Choice (3)

84. ‘Torn apart’ is the right option. The passage says that India which is said to be in the process of growth is actually ‘torn apart’ that is it is ‘ripped apart’ or ‘torn into pieces’ from within. Choice (4)

85. The passage finally says that when issues like dowry and atrocities against the minorities in the society have not been taken to court. Then there is no surprise if the ‘perpetrators’ that is the people who carry out the crime are not punished. Choice (2)

86. ‘Exhortation’ is the appropriate word. ‘Exhortation’ is a piece of advice given earnestly. The context in the passage talks about Christ’s advice to his followers. Choice (3)
87. ‘Stoically’ is the appropriate word. The context conveys the idea that Mahatma Gandhi submitted himself to the beatings of white aggressors that is “he endured pain and hardship without showing his feelings”. This is in keeping with the words “turn the other cheek”. The other options are not suitable. Though ‘unemotionally’, ‘insouciantly’, and ‘dispassionately’ are synonymous, they are not suitable in the context. ‘Unemotionally’ means not ‘expressing any strong feelings’; ‘insouciantly’ means ‘casually unconcerned’; ‘dispassionately’ means ‘not influenced by strong emotions’.

Choice (3)

88. Further, the passage says that one can not change man’s ‘convictions’. A ‘conviction’ is a firmly held belief or opinion. The passage earlier refers to aggressors. But it does not talk about ‘man’s behaviour’ or ‘outlook’. Hence they are ruled out.

Choice (2)

89. Violence ‘embitters’ (that is makes bitter) its victims. It does not infuriate, or agitate, exacerbate or worsen its victims.

Choice (1)

90. ‘Reconcile’ is the most appropriate word. It is used in the sense of bringing people together or to agree with each other. The strength that would enable them to do this is the strength of God. ‘Propitiate’ is to please; ‘persuade’ is to force. ‘Reunite’ and ‘reassure’ also do not fit in the context.

Choice (1)

91. ‘Accords’ is the right word which means ‘assigns’ or ‘designates’ Choice (2)

92. ‘Revered’ or respected is the right word in the blank.

Choice (4)

93. ‘Enables’ which means ‘assists in’ is the right word.

Choice (2)

94. Repose which means place is the right word.

Choice (3)

95. ‘Imparts’ which means to pass or convey knowledge is the right word in this blank.

Choice (1)

96. One can not ‘device’, develop, or ‘detest’ the ‘effect’ while we can “determine” the effect. Thus collocation wise, only option 3 is possible.

Choice (3)

97. For the same reason given in Q 41, only option 2 fits in the blank as the energy can only be either ‘mental’ or ‘physical’.

Choice (2)

98. Except for ‘behaviour’ in option 4, which is appropriate, all the others are irrelevant in the context. Hence option (4).

Choice (4)

99. The last sentence compares the responses of the two groups of people, that is one being ‘active’ and the other being ‘calm’. Further the word ‘even’ implies comparison in degree of intensity. Hence, collocation – wise, ‘quite active’ is the most appropriate.

Choice (2)

100. ‘And’ in the sentence speaks of continuation of the idea, that is the responses of the people which were ‘active’ and ‘calm’. Therefore, ‘calm’ and ‘sleepy’ in option I is the only other response that is appropriate in the blank.

Choice (1)

Solutions for questions 1 to 40:

1. ‘D’ is the introductory sentence as it talks about the concerned topic and the people who are related to it – Americans. B continues what is said in D, both mention time periods and B talks about the pendulum swinging to one side, the reference being made to ‘weight loss’ mentioned in D. A further explains what that attitude mentioned in B has caused. C concludes the paragraph by summing up the ‘culture of slimming’. Hence, DBAC is the right sequence.

Choice (2)

2. A and D clearly form, a pair. ‘The results of the restrictions imposed’ in A, are talked about in D, that is cause and effect relationship. B is a concluding sentence as it says ‘if all relevant considerations………….’ The considerations are mentioned in A, C and D. They are weighed and a conclusion is arrived at, in option B and is also stated in it. Hence, C has to be the opening sentence. It introduces the topic of discussion – distress of work …… on animal subjects. Hence, DBAC is the right sequence.

Choice (2)

3. D is the opening sentence as it talks about science programmes and what they should include. C follows as it says, unfortunately, the current programme content is not up to the mark. Hence DC form a pair. How they a should be taught is given in A and it also provides a specific example. B concludes the paragraph by saying that it is a good idea for children to learn about the environment since it is an educational experience according to A. Hence, DCAB is the right sequence.

Choice (1)

4. B is the opening sentence as it is general in nature and talks about science in a broad sense. B is followed by D as it supports B by talking about the fact that something new has been learnt about neurological process – ‘identifying……. processes’. It also talks about ‘science’, which provides a link with B. A, which talks about stimulants follows D. How they alter brain cells is talked about in it.

That is linked to neurological processes mentioned in D. C, continues A as it talks about modification, which is an explanation of the alteration, mentioned in A. Hence, BDCA is the correct sequence.

Choice (3)

5. B is an opening sentence as it is general in nature. It also introduces the topic. As B talks about equality, D follows it as it also talks about overcoming divisions within the human family that is, becoming equal. C follows D as optimism – hopefulness or confidence about the future, refers to what is stated in D (overcoming divisions ……). A concludes by saying that instead of helping dissolve divisions, progress has added to them or has made the situation worse. Hence BDCA is the correct sequence.

Choice (3)

6. C is the opening sentence as it talks about the ‘selfish gene notion’. The rest of the paragraph explains that concept. ‘selfish gene’ indicates the place of the gene in the scheme of things and that it is of great importance. Only D can follow C as the rest of the sentences do not continue the idea. D also talks about the ‘gene’. D says that only the ‘gene’ exists for a long time. It has to be followed by A, which talks about how everything else is temporary. The paragraph concludes with B, which states that the ‘gene’ is immortal as opposed to other things, which are mortal or impermanent (as mentioned in option A). Hence BDCA is the right sequence.

Choice (3)

7. C is the opening sentence as it introduces the topic – how the past influences behaviour. Stone age here represents the past. Hence, D, which explains the topic or states it clearly is what follows C. D and B are clearly a pair as both talk about the past. This in B refers to the ‘past’, mentioned in D. A concludes the paragraph and this notion in it refers to the statement D. Hence, CDBA is the right sequence.

Choice (2)

8. C is the opening sentence as it introduces the topic – new borns and their eyesight. Also, it specifically talks about their in-ability to focus well. D follows C as it introduces another problem when it comes to eyesight their visual acuity being limited. A follows D as it illustrates that through an example. B follows A as it also talks about ‘seeing unclearly’ across distances. (A mentions distances). Hence, CDBA is the right sequence.

Choice (3)

9. D is the opening sentence as it talks about ‘piece of land and a house………’, introducing to us, indirectly, the topic. A follows D
and clearly states the topic – reality. It talks about the craze for reality, hence proving to be forming a link with D, once again (pennant in D and craze in A). B follows A as it elaborates on how the craze is all-pervasive. C concludes as it says ‘such’ is the predominance …….. Hence, the right sequence is DABC.

Choice (2)

10. B is the opening sentence. The whole paragraph talks about managing work and home. This sentence introduces the concept. It says that it is not just juggling parenting and work, it is much more than that. C follows B as it talks about what else it means. C also talks about ‘care and women’. A follows C as it talks about caregivers. C also talks about ‘care and women’. A follows B as it talks about what else ‘it means’. It says that it is not just juggling parenting and work, it is much more than that. C follows as it talks about how foods high in sugar were considered bad and that they were ‘dubbed as ……..’. D follows B as these terms refers to “junk foods etc” of the previous sentence. Hence, BD is clearly a pair. E connects CA and BD as it takes what C and A state forward by saying attacks escalated or increased, which is what, is explained in B and D. Hence CAEBD is the right sequence.

Choice (4)

11. D is the opening sentence as it draws attention to the topic of discussion - science. It says that science has disturbed our universe. It has to be followed by B. B talks about how eminent people in the filed and their theories have constantly disturbed us (relocated ……..). It is followed by A, in which ‘such disturbance’ refers to what is stated in D and B. Also, it is clear that C and E form a pair. C - ‘No period ……..’ and E - ‘yet, no period’. Even though the period was so dependent on science, it was most uneasy about it. Hence, the right sequence is DBACE.

Choice (1)

12. E is the opening sentence as it introduces two areas which are discussed in the paragraph – ‘different cultural outlooks or orientations’ and ‘views of the world’. B should follow E as it talks about giving meaning to the world or ‘how people view the world’. It also says it is easy to be critical of people who have a view different from that of yours. D should follow B as these differences in D refer to what is stated in E and B. Also, it is clear that C and E form a pair. C - ‘No period ……..’ and E - ‘yet, no period’. Even though the period was so dependent on science, it was most uneasy about it. Hence, the right sequence is DBACE.

Choice (3)

13. B is the opening sentence as it introduces ‘Kenya’ and the maladies that plague it. D follows as it states one of those maladies - poverty. The rest of the paragraph talks about ‘poverty’ C follows D as it also talks about poverty. E cannot follow D as it says ‘the continents’, which is a reference to Africa and not to Kenya. A and E form a pair as A talks about poverty in Africa ad E says ‘the continents’. Hence the right sequence is BDCAE.

Choice (2)

14. C is the opening sentence as it says - ‘sugar’ for the ‘first time’, which is introductory in nature. It talks about how ‘sugar’ got a bad name. A also is on similar lines, it is an extension of C. Hence CA is a pair. B talks about how foods high in sugar were considered bad and that they were ‘dubbed as ……..’. D follows B as these terms refers to “junk foods etc” of the previous sentence. Hence, BD is clearly a pair. E connects CA and BD as it takes what C and A state forward by saying attacks escalated or increased, which is what, is explained in B and D. Hence CAEBD is the right sequence.

Choice (4)

15. C is the opening sentence as it brings out the topic of discussion – that technology alone is not enough to find solutions to everything. A follows as it also talks about ‘purely technological solutions’, which is what C talks about. E follows A as it also talks about the argument of scientists - that sole reliance on technology will give us all the answers. B follows E as it gives an alternative way of finding solutions. D follows B as ‘that would mean’ is an extension of the alternative way mentioned in B. Also B says – ‘better understanding of humans’ and D says - ‘emphasis on psychology ……..’. Hence CAEBD is the right sequence.

Choice (1)

16. Look at the choices and notice that either A or B is the likely ‘opening’ sentence. We can rule out D as the concluding statement. Therefore, option 1 is ruled out. D cannot follow A. So options 2 and 3 are also ruled.

Choice (4)

17. The choices indicate that either C or D is the first sentence. However, the word ‘the’ in D indicates that this is not the first time that leaders are being mentioned. So, only C can start a sentence. A follows C. Also D follows A because of the ‘check upon the people in power’. So, C.

Choice (2)

18. The choice start with B or C. However, only C can start the argument as it states the subject – the system of dowry. B follows C. Only, choice 3 has this combination.

Choice (3)

19. The choice indicates C or D as the first sentence. B has to follow A. Therefore, either 1 or 2 is the right answer. D is a better opening statement while C is a good closing statement.

Choice (1)

20. The choices start with B or C. D cannot follow B. Therefore, option 4 is ruled out. Also, A has to follow C. D follows A.

Choice (3)

21. C cannot start the argument because of the word ‘these’. Therefore, options 2 and 3 are ruled out. Also, D must precede B.

Choice (4)

22. The choices indicate that we have to look at B or C as the opening statement. B cannot start the argument. The words ‘that is why’ show it as an explanation. B follows C. D must precede A.

Choice (1)

23. C must precede B. Also, the topic under discussion is ‘compulsory sports’ Hence, D follows B as ‘disinclination’ in option D springs from ‘compulsory sports’ in ‘C’.

Choice (2)

24. A gives the example of a farmer to elaborate what is stated in ‘C’. ‘B’ is concluding in tone.

Choice (2)

25. C must follow A linked by ‘infrastructure’. B must follow C. This happens in choice 4. Also, D is suitable as the opening sentence.

Choice (4)

26. The question posed in statement A is being answered in D. Therefore, D must follow A. This happens in choices 1 and 2. B and C do not logically precede A. Therefore, we rule out option 1.

Choice (2)

27. A, C and D cannot be the opening statements. Therefore, the Choice is 2.

Choice (2)

28. C must follow D. The subject ‘animation films being overlooked’ in D is followed by ‘In a bid to revitalize’ …….. ‘In C. Option 1 is the answer since BA cannot precede DC.

Choice (1)

29. Either B or C can start the argument because they have the proper noun ‘Sanjana’ in them. Also, A follows D. Hence, option 3 is the answer.

Choice (3)

30. One reading of the sentences makes it clear that Jesse Owens is the subject here. Therefore, D would be the first statement. B follows D. Two choices – 2 and 4 – have this order. We now have to determine whether A comes before C or vice versa. A precedes C because you first ‘see’ someone/something which makes you ‘nervous’ thereafter.

Choice (4)

31. B and D cannot be the opening statements because of ‘adults’, ‘sometimes’ in these sentences which indicate a continuation. Therefore, we narrow down to two choices 2 and 3. C follows A logically. (smile …….. happy-looking). Therefore, choice 3 is the answer.

Choice (3)

32. Science is the general theme of the paragraph. “Inventions, Information technolo-
Solutions for Language Comprehension

**Practice Exercise 8**

**Solutions for questions 1 to 30:**

1. AB is about patience. CD about rusting. AB goes together as also CD. Choice (1)
2. Sentence ‘B’ is the subject of the paragraph. ‘A’ ‘C’ and ‘D’ follow logically. Choice (1)
3. A is the opening sentence as it introduces the subject WTC. B, C, D follow giving different features of the building. Choice (1)
4. Sentence ‘C’ states the subject of the paragraph, followed by ‘A’ ‘B’ and ‘D’ which elaborate on it. Choice (4)
5. ‘B’ states the subject. ‘D’ expands what is stated in ‘B’ followed by ‘A’ and ‘C’ which comment on the subject. Choice (1)
6. Sentence ‘B’ describes the word ‘glossing’, followed by ‘A’ which adds to its meaning. D and C are linked by the word ‘meaning’. Choice (3)
8. D follows B logically. A follows C as it answers the question raised in C. Choice (3)
9. ‘B’ begins the para as it describes the subject. ‘A’ describes the man followed by more description in D and conclusion in C. Choice (4)
10. Sentence ‘B’ sets the tone of the passage, ‘A’ and ‘C’ describe the scene while D is a comment on it. Choice (1)
11. Only C can begin the paragraph. D follows – ‘it’ in D refers to ‘redecorating’ in C. B follows linked by ‘But’. A logically follows B. Choice (2)
12. BD go together logically and linked by ‘But’. AC are linked by ‘Consequently’. Choice (1)
13. Sentence E introduces us to the idea of technological progress and economic growth. The result of this is given in sentence A. The effects of this growth are given in sentences B and C. Sentence D concludes the passage. While B could draw attention as a possible opening sentence, B and A have no link between them and hence would be inappropriate. Choice (2)
14. Options (2), (3) and (4) are ruled out because B cannot follow D, nor can A come after D. Also, there is no logical connection between A and D. B can be the opening statement. A can follow B because the theme remains ‘Russia’ and the ‘space programs’. Also, the idea of the collapse of the Soviet Union is further explained in D. Hence, D comes after A and C follows D. Choice (1)
15. Statements C and D go together, because the ‘them’ in D refers to the Britons who are not going out and spending money. D and B go together because both of them deal with ‘the government’s take’ on the situation. Therefore option (3) is the answer. Choice (3)
16. Option (1) is ruled out because C and E have no co-relation. C refers to a time while E talks about people. Similarly, option (2) is ruled out. Option (3) is more logical. In E, the word ‘they’ refers to people. Hence, B can precede E. The idea of moving slowly is further explained in C. A is a perfect sequel to C. And D can be the closing statement. Choice (3)
17. A is the opening statement since it mentions an event that is discussed in the other sentences. C follows A – ‘it’ in C refers to the broken arm in A. Hence, we narrow down to options (1) and (2) only. E explains the effect of the injury. D further explains it and B is a good closing statement. Choice (1)
18. The adjective ‘earlier’ in ‘D’ and the conjunction ‘but’ in ‘C’ state that these sentences are continuations of ‘B’ which introduces the topic ‘textile industry’ in Gujarat. Sentence ‘A’ is just an explanation of ‘B’ citing Ahmedabad, one of the cities of Gujarat, where the first composite mill was established in 1958. ‘Earlier’ of ‘D’ refers only to ‘dates even further back’ of ‘C’ which refers to ‘as early as 1958’ of ‘A’. Hence the correct sequence is 3. Choice (3)
19. The pronoun ‘they’ in ‘A’ and the opening words - ‘on the other hand’ and ‘on the one hand’ of the sentences ‘C’ and ‘D’ respectively suggest that statements ‘A’, ‘C’ and ‘D’ cannot open the paragraph. Hence ‘B’ is the appropriate sentence to open the paragraph. Choice (4)
20. ‘the atrocities’, ‘the all-Dalit village’, ‘the caste related clashes’ are nothing but the references to ‘black chapter’ and ‘a remote village’ of ‘C’. Hence the opening sentence is ‘C’ but not ‘B’. ‘It seeks legal proceedings’ of ‘D’ is a further explanation of ‘particularly of the district’ ‘losing faith in the impartiality of police and the administration’. Choice (3)
21. D is the introductory sentence as it is general in nature – it talks about a language, meaning any language. B follows as ‘such grammars’ refer to the ‘grammar’ of all languages, ‘quite a number of languages’ is also general in nature. E follows as hypotheses ……, there is something else. C follows as here too’ would refer to the new insight. Here ‘too’ there is …… progress as the hypotheses first referred to are well-founded (B). A is the concluding sentence. It also talks about ‘universal grammar’ mentioned in E. E and A are linked and C is just an additional piece of information. Hence, DBECA is the right sequence. Choice (3)
22. E is the introductory sentence as it talks about what a corporation wanted to do.
Solutions for questions 1 to 30:

1. The key points in the paragraph are:
   1. We are unique in some ways
   2. Our very uniqueness has landed us in the mess
   3. Over exploitation of resources has led to extinction of some species.

   The points are captured in Choice 2. Choice 1 and Choice 3 are not right because they say that extinction of species is 60 per cent whereas as per the passage 60 per cent of the ecosystem services are being degraded. Choice 4 is wrong because the Millennium Ecosystem Assessment does not show that we are unique. Choice (2)

2. The main points covered are:
   1. Format change of a newspaper needs consensus within the organisation.
   2. Managers must explain the need for change and the potential for growth.
   3. The tone must be positive.

   Choice 1, 2, and 4 leave out the fact that we are talking of a newspaper. Choice 2 gives examples which are generally avoided in summaries. Choice 4 leaves out valid information. Choice (3)

3. The main points covered are:
   1. Immigration is the key issue in the pre-election scenario.
   2. People, including Labour party supporters, want tougher laws on immigration.

   Choices (3) and (4) do not mention the elections. Hence they are incorrect. Choice (2) is factually wrong since it is the supporters of the Labour party and not the party itself that wants tougher laws. Choice (1)

4. The main points are:
   1. France has suggested global tax to raise funds to meet the Millennium Development Goals.
   2. The developed and developing countries agreed to a small tax on trade and air transport.

   Choice 1, 2, and 3 do not mention what are to be taxed. Choice 2 says it is the only way, which may not be true. Choice 3 does not mention France which is the key player. Choice (4)

5. The main points are:
   1. Rajiv Gandhi’s passion for modernisation of minds and attitudes.
   2. The things he cared for are the challenges facing Indian society.
Choice 1 can be discounted because its conclusion (he was passionate about the challenges facing Indian society) changes the originally intended meaning. Choice 3 leaves out the second main point while choice 4 concludes wrongly that he tried to find answers to the challenges facing Indian society. Choice (2)

6. The main points are:
1. Giving up smoking is not just about will power.
2. It may be genetically influenced.
3. Finding the gene will help in finding the right quitting programme.

Choice 2 leaves out the 3rd point Choice 3 is wrong because it says nicotine dependence cannot be overcome. Choice 4 is totally skewed. Choice (1)

7. The main points are:
1. Decision of the government of EU to review the Bolkestein directive.
2. What the Bolkestein directive means
3. The decision is a victory for social model against liberalisation.

The points are captured in Choice 3. Choice 1 leaves out point 3. Choice 2 does not explain the Bolkestein directive and Choice 4 does not talk of the success of social model. Choice (3)

8. The main points made here are:
1. You can not argue with a person whose belief is based on faith.
2. Science establishes truth by appealing to evidence and logic.

Choice 2 captures the point. Choice 1 says faith will lead to heinous crimes, which is wrong. Choice 3 does not talk about science. Choice 4 says only a person with faith commits crimes, which is wrong. Choice (2)

9. The main points are:
1. Claymation has been around for a century.
2. The winning of Oscars brought it to prominence.
3. It has been in India for 6 years and has a long way to go.

Choice 1 is wrong as it says India has not achieved quality in claymation. Choice 2 leaves out what the scenario in India. Choice 3 wrongly says that the BBC film was on claymation. Choice 4 captures the points appropriately. Choice (4)

10. The paragraph raises the question: Is the end of the BPO industry near at hand? As evidence it points to
1. Absenteeism and high attrition that have always troubled the industry.
2. Even reputed BPO losing business.

Choices 1 and 4 make the mistake of including Sykes among those that have lost business to Asia Pacific region whereas Sykes is the call centre that has cut its work force in India. Choice 2 does not talk about the possible end of BPO in India. Choice 3 captures the points accurately. Choice (3)

11. The main points are:
1. The liver has sensors that can detect sugar and amino acids in the blood.
2. It sends signals to the brain through nerve cells.
3. The information contributes to the feeling of hunger.

Choice 1 captures all the points.
Choice 2 omits point 1
Choice 3 omits point 2
Choice 4 omits point 1 Choice (1)

12. The main points are:
1. The Manas river enters India at Mathanguri and splits into two.
2. It has a variety of fish depleted through poaching.
3. It is the source of water for the fauna. 

Choice 1 does not include point 3.
Choice 2 misses out point 2.
Choice 3 is too long
Choice 4 is appropriate. Choice (4)

13. The main points are:
1. Subir Raha is ONGC’s Chairman.
2. ONGC is India’s largest profit making company and largest in terms of market capitalisation.
3. He has moved from control to free market economy.
4. He has made a global presence through acquiring property in other countries under its subsidiary, ONGC Videsh.

Choice 1 leaves out point 4.
Choice 3 misses out point 3.
Choice 4 does not include point 4. Choice (2)

14. The main points made are:
1. Spirituality is no longer a taboo in the world of science and medicine.
2. A preliminary study says belief in god may improve a person’s health
3. The involvement of a major university shows the importance of spirituality.

Choice 2 is too long, misses out point 2 and states erroneously that universities are ‘prepared’ whereas they are already into it. Choice 3 is wrong in saying that link between belief in God and good health has been established. Choice 4 has a flippant tone. Choice (1)

15. The main points are:
1. India and China are two of the fastest growing economies of the world.
2. Large neighbouring countries usually have huge bilateral trade.
3. India and China with their huge population have a lot of scope for cooperation.

Choice 1 misses out points 1 and 3. The conclusion in Choice 2 (must increase trade as they also have huge population) is not in tune with the tone of the original. Choice 3 captures the points. Choice 4 misses out point 1. Choice (3)

16. The main points are:
1. High number of air crashes.
2. VIP deaths have not changed safety standards.
3. Crashes in general aviation are far more than those in civil aviation.

Choice 1 is wrong as it says air crashes have been increasing which is not stated in the passage. Choice 2 captures all the points. Choice 3 omits point 3. Choice 4 omits point 2. Choice (2)

17. The main points are:
1. India’s security policies have changed as a response to change in environment.
2. External factors – end of cold war, collapse of Soviet Union, emergence of USA as the sole superpower.
3. Internal factors – economic and political crises.

Choices 1 and 2 leave out the changes in the internal conditions. Choice 3 misses out point 2. Choice (4)

18. The main points are:
1. Per capita-related development is linked to level of literacy.
2. India has 200 million adult illiterates.
3. The development of computers based functional literacy methods to tackle the problem has given positive results.

Choice 1 fails to cover point 2 and the fact that the new method has given positive results. Choice 2 talks of the ‘short comings’ of the missions which is not mentioned in the passage. Choice 4 misses point 3. Choice (3)

19. The main points are:
1. Industries cause pollution.
2. India does not have comprehensive laws on environmental protection.
3. Nevertheless companies have woken up to the need to do their bit:

Choice 1 fails to mention that companies are doing what they can to reduce pollution. Choice 3 makes it more specific to
SAIL whereas the original is generalised with SAIL given as an example. Choice 4 is wrong as it says companies do not bother about their bottom lines. Choice (2)

20. The main points are:
1. Expenditure on education – quantity versus quality.
2. Spending not reaching the intended beneficiaries.

Choice 1 covers the points. Choice 2 does not mention quality, says it is only wasted. Choice 3 quotes figures, which are not required in a summary. Choice 4 misses on some points.

Choice (1)

21. The given passage has the following important points:
1. Dacher Keltoer is specialized in the study of facial expressions.
2. A smile is one of the most useful tools of human behaviour because it helps build kinship, strengthen social relations and makes one feel good.

Only choice (1) has these points. Choice (2) distorts the meaning of the passage as it says that we can build kinship because a smile releases positive brain chemicals but the passage says it helps release.

Choice (3) is incorrect, because it repeats the word ‘attitude’, three times and fails to mention important details like the superiority of man due to his thinking abilities. Choice (2) is incorrect because it distorts the meaning of the original text by saying that the passage depicts the partial nature of God. Choice (3) cannot be called a best summary because it mentions the words caste, creed and race, which are redundant after “all successful people”.

Choice (4)

22. The important points that the passage deals with are:
1. Realty is thriving in Singapore
2. Millionaires are queuing up to buy high-end properties.
3. Of them, Indian millionaires are becoming dominant with their rising contribution.

Choice (2) has these points. Choice (1) is wrong because it says millionaires are “queuing up… themselves” but the passage says that they also hire people to buy properties for them. Choices (3) and (4) are ruled out because it is not clear whether ‘contrary to…’ refers to queuing up or acquiring high-end properties. Choice (2)

23. The important points in the passage are:
1. Production and distribution are basic economic activities.
2. They change their institutional features under the changing social conditions.
3. Under feudalism, agriculture was the most dominant productive activity and distribution played more important role than ownership over land.
4. Under capitalism, a small section of the people capture means of production and control others.

Only choice (1) has these points. Choice (2) is wrong because it says capitalism physically a minority, which distorts the meaning of the passage because capitalism as a concept cannot do that. Choice (3) is ruled out as it leaves out important points. Choice (4) is also wrong because it says the means of production help a minority to control others but the passage says it is minority’s capture of the means of production that helps.

Choice (1)

24. The most important points expressed in the passage are:
1. Real India does not any more reside in villages, it resides in cities.
2. Cities offer many opportunities and a variety of attractions.
3. Urban India contributes most to the nation’s GDP.

The focus of the passage is essentially on real India residing in cities now. Only choices (3) and (4) reflect this idea. Again choice (4) can be eliminated because it has repetitive statements. All the above mentioned points are focused in option (3). Choice (3)

25. Option (1) does not qualify as the best summary because it mentions trivial details and examples. Choice (2) cannot be the best summary because it does not mention that doctors are unable to extend the best treatment to all because modern medicine is expensive and best treatment cannot be available to all due to paucity of funds. Option (3) is not a best summary because it mentions that the best treatment is available to only those who are wealthy, thereby distorting the original passage.

Choice (4)

26. Main points - different countries and regions grow different things that are used together thus leading to interdependence.

Choice (2) does not qualify as the best summary because examples have been used. Choice (3) is incorrect because the meaning of the text has been distorted here, since it has been erroneously mentioned here that nature has been ‘partial’. Choice (4) cannot be considered as the best summary because the main point, which is ‘interdependence’ has been mentioned in terms of trade.

Hence, choice (1) is the best summary.

Choice (1)

27. Main points - coalitions were earlier considered incongruous. However they are now viewed as something that can provide stability. Choice (2) does not qualify as the best summary because it only mentions that coalitions help monitor vital issues but it fails to mention what those issues are. Choice (3) is incorrect because it says that coalitions were unknown in the past. Choice (4) is incorrect because it does not mention the fact that coalition formations are helpful in monitoring vital issues pertaining to the stability of a nation.

Choice (1)

28. Main points – it is man’s attitude that makes success possible by enabling him to use the power of the mind. Choice (1) is incorrect because it repeats the word ‘attitude’, three times and fails to mention important details like the superiority of man due to his thinking abilities. Choice (2) is incorrect because it distorts the meaning of the original text by mentioning that the passage depicts the partial nature of God. Choice (3) cannot be called a best summary because it mentions the words caste, creed and race, which are redundant after “all successful people”.

Choice (4)

29. Main points – Bullying is unethical but is increasingly being seen as appropriate behaviour in some business situations. Choice (1) is incorrect because it distorts the meaning of the original text by mentioning that bullying in commercial establishments is justified. Choice (2) is incorrect because it states that bullying one’s entire staff is better than victimising one or two persons, which is incorrect. Choice (4) is incorrect because here it is erroneously stated that bullying is permissible in commercial establishments.

Choice (3)

30. Main points – workers have always been treated poorly and this continues in some Third World countries. Choice (2) cannot qualify as the best summary because of the emphasis on words like capturers, vendors, etc., and it is also distorted. Choice (3) is incorrect, because it focuses only on slavery and fails to capture the other ideas in this para. Choice (4) is incorrect because it distorts the meaning of the text by mentioning that employers shared a close rapport with their employees. Choice (1) conveys the idea completely.

Choice (1)
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3. The author is averse to those who are interested in making money alone. Choice (3)

4. The bourgeois is likely to turn the power of the government against the proletariat to keep the latter out of its way. [Refer the last line of para 2]. Choice (3)

5. The tone of the passage is likely to appeal to a philanthropist. Choice (1)

Solutions for questions 6 to 10:

6. According to the passage leasing out unused land was strongly resisted by various government departments which led to further problems for the Delhi Transport Corporation. [Refer para 6]. Choice (3)

7. The author’s experience taught him that essence of financial rectitude involved in distancing oneself from any plan that may conceivably benefit private entrepreneur. [Refer para 3]. Choice (3)

8. The author is referring to the family silver of the public institutions. [Refer para 4]. Choice (1)

9. According to the passage, when a public system suffers from financial crisis, the situation calls for painless and quick disposal of all white elephants. Choice (3)

10. The author suggested that they have an agreement with the private operator allowing him to use the owned surplus machines in exchange for price concession. [Refer para 1]. Choice (1)

Solutions for questions 11 to 14:

11. Refer to the first sentence of para 4. In the context, to safeguard means storing the seeds so that they will come handy in case of a disaster. This is brought out in option (1), Option (4) is incorrect. The purpose is to ‘safeguard’ and not to ‘experiment.’ The words ‘to control’ in option (2) renders the first sentence of para (4) incorrect. The passage states that the more the diversity of the plant life, the better it is in different ways. Option (3) is incorrect for the same reason. Choice (1)

12. Refer to para (4). Option (3) is a distortion of ‘resistant to diseases’. Choice (3)

13. Refer to para (7). Because of plausible climate changes, the vault for storing seeds is necessary as there might be an extinction of plant life. Choice (1)

14. From question (4), it can be understood that option (3) is the closest. Choice (3)

Solutions for questions 15 to 19:

15. Refer to paragraph one Choice (4)

16. In the passage, the author quotes the definition to poetry as many as twenty times. Majority of the times he comes up with an expression of disapproval placed either before the definition or after. Hence, option 2 is the correct one. Choice (2)

17. At the beginning of the second paragraph of the passage, the author cautions the reader not to get swept away by the definitions given by various people. Choice (2)

18. At the very beginning of the second paragraph of the passage, the author says “Apart from such formal definitions...” This should mean that all the definitions mentioned in the first paragraph of the passage are formal ones. Therefore the correct choice is 3. Choice (3)

19. Option 1 ‘excitedly’ is acceptable, as hysterical refers to a state of uncontrolled excitement. Choice (1)

Solutions for questions 20 to 25:

20. It is understood from para 3 that option 3 is the answer choice because it means that within the society rules change from time to time option 1 is out of context. So are options 2 and 4. Choice (3)

21. Refer to para-5. It renders option (4) correct. Choice (4)

22. Refer to the last sentence of para 2 and the first 2 sentences of para 3. These point to option (3). Choice (3)

23. Through out the passage the author tries to analyse the sense of right and wrong prevailing in society. Option (4)

24. Refer to the first and last sentence of para 7 On the tablets of stones are the objective morality that has been practiced for generations. The word ‘traditions’ in option (1) brings that out. Choice (1)

25. In the sixth paragraph of the passage the author himself states that he is from Europe. Hence, option 3 is the correct choice. Choice (3)

Solutions for questions 26 to 30:

26. Refer to the last sentence of the passage of the last para. It implies that man is inclined to treat things of his own making in a casual way. In this context the first sentence of the last para clearly points out that land too cannot be treated similarly. This makes option (3) as the only correct option. Options (1) and (2) are against the author’s views. So is option (4) Choice (3)

27. Refer to sentences 2 to 5 of para (4) which means the same as option (3). Option (2) is the wrong answer as it does not address the question. It is the reason why there is a deviation from the classification. Option (4) is ruled out as it merely adds to option (2). The word ‘gains’ renders option (1) irrelevant. Choice (3)

28. Refer to the first para. It can be understood that option (1) is the answer choice (with which the author disagrees). Though option (3) also seems to be correct, it is only as a consequence of the belief that “man-kind can survive...” and is not the focus. Hence option (3) is ruled out. Option (2) is what the author believes and here, he disagrees with Eugene Rabinowitch Option (4) is again the result of option (2) Choice (1)

29. Refer to the last sentence of para 3, sentence 4 of para 4 and the third sentence of the last para. They point to option (4). The other options distort the author’s view. Choice (4)

30. Sentence 3 of the last para renders option (1) and (4) and sentence 4 of para (4) renders option (2) correct. The author would not agree with only option (3) Choice (3)

Solutions for questions 31 to 35:

31. Refer to the first sentence of para-5 Choice (2)

32. It is understood from para 4 that both option (1) and (2) are necessary for an industry to achieve more. (i.e its growth) But as the choices do not have both factors, the question then obviously, refers to achievement in terms of efficiency if not in terms of more production and less usage of raw materials. Refer to the first sentence of para 5-Efficiency can only be improved, if option (3) takes place. Choice (3)

33. Refer to the first sentence of the last para. Choice (1) is the answer. There can be economy with resources and production as well but though true, the focus of the passage is on ‘growth’. Option (1) is stated in the passage. Such an economy need not necessarily be successful. In order for an economy to be successful, growth is necessary. Choice (1)

34. Though it can be understood from the passage that option (1) and (2) together are true, the given options do not provide for such a choice. Refer to the last sentence of para 3. Option (3) is stated and is the answer choice. Choice (3)

35. While option (1), (2) and (4) are implicit and most definitely true, they are not the focus.
Solutions for questions 46 to 50:

46. According to the author the lesson that excellent companies can teach their employees is to make them feel that they are winners. [Refer para 2, line 3]. Choice (2)

47. In the passage the author takes an example of employees solving puzzles to prove that employees are motivated by a self-perception that they are indeed doing well. [Refer para 5]. Choice (3)

48. The reason for poor performance according to the author lies in the designing of systems in a manner which demoralizes the employees. Choice (3)

49. According to the author our basest emotions are attributed to an underdeveloped right half of the brain. [Refer para 7]. Choice (1)

50. According to the passage, attribution theory attempts to explain the manner in which we assign causes for success or failure. [Refer para 4]. Choice (2)

Solutions for questions 51 to 55:

51. In the last sentence of the first paragraph the author explicitly mentions as to what is necessary to make a transition period possible. Option 2 is polar opposite of the requirement. Option 1 distorts the information given in the passage. Option 3 is unrelated to the context of the question. The correct choice is 4. Choice (4)

52. In the second paragraph, the author describes rhythm of socialization to be a process in which an individual changes from being a supporter of individualism to becoming a part of the society supporting social solidarity. Option 3 captures this correctly. Choice (3)

53. The phrase ‘two movements’ is mentioned in the third paragraph. It refers to the movements of individualism and socialization mentioned in the immediately preceding paragraph. Therefore, the correct choice is 2. Choice (2)

54. The role of the fourth paragraph is to prove that science arises out of practice. Choice 1 is the correct choice. Choice (1)

55. In the fifth paragraph the author mentions that a given individual is convinced about the facts formulated through his/her experience. But unless they are tested and judged to become generalizations, they are not valid. The author explicitly mentions in the last sentence of the paragraph as to what is required to be done to get the prestige of generalization to one’s conclusions. Option 4 talks about the process. Choice (4)

Solutions for questions 56 to 63:

56. Refer to the second sentence of para one. ‘…… a scientist working anywhere……’. Choice (2)

57. Refer to the third sentence of para one. ‘In addition to…… detailed genom-ic………’. Choice (5) is wrong because it helps in predicting the functions of proteins. Choice (1)

58. Paragraph 4 suggests that there are no means of preventing the use of genetic data to create novel pathogens. Choice (4)

59. Refer to the first sentence of para three. Choice (3)

60. Refer to the last sentence of para 4. Choice (4)

61. Refer to the last sentence of para 4 and the first sentence of para 5 which led to the commissioning of such U.S. agencies. Choice (2)

62. Refer to para 5 which says that it was established to advise the government on technical issues. Choices 2 and 3 can be eliminated as it says it would ‘convene a scientific panel to evaluate and recom-
Solutions for questions 76 to 80:

76. The author is of the viewpoint that the variations in societies or individuals in the visible physical features are not a sure guide to differences in ancestry. In other words, racial classifications are a myth. Thus options (1) and (2) are completely contradictory. Only option (4) supports the above view. Choice (4)

77. Refer to the first sentence of para (5). The phrase ‘biologically alien’ means those societies or individuals who do not have a common ancestor and it refers to races, thus, it means that race was usually not the reason for any antagonism between political parties or religions. Choice (2)

78. Refer to the first sentence of para (4). Option (4) is not the causative factor for cultural variations. Choice (4)

79. The reason for strife between religions or between political bodies in the past could be because of culture and tradition. Choice (2)

80. According to the passage, cultural variations did not arise from physical inheritance from their ancestors. [Refer para 4]. Choice (4)

Solutions for questions 81 to 88:

81. As per the passage, the Indian industry so far has thrived in a protected environment. [Refer para 2]. Choice (1)

82. It is true that globalisation of economy would bring in frontal global competition. [Refer para 3]. Choice (1)

83. Investment decisions should be based on quality of management, productivity of organization, innovation of organization. [Refer para 4]. Choice (4)

84. Of the companies given in the passage, the productivity level of a worker is highest in Toyota. [Refer para 5]. Choice (4)

85. It is not true that the choice available to investors in terms of kinds of instruments available in capital and money markets could get limited. Choice (3)

86. The number of components produced in house by GM and Toyota is more than 50 per cent and 25 per cent respectively. [Refer para 6]. Choice (3)

87. Indian investors have always had the fancy for companies manufacturing import substituting products. [Refer para 3]. Choice (3)

88. Money markets will see changes in terms of introduction of credit risk related debt investments, more challenge entering the market, introduction of variable interest rate investments. [Refer para 9]. Choice (4)

Solutions for questions 89 to 96:

89. According to the passage rhythm is the creative force in the hand of the artist. [Refer para 3]. Choice (2)

90. According to the passage all the statements mentioned (1, 2 and 3) are true. [Refer para 2, 4]. Choice (4)

91. Statements 1, 2 and 3 are all true statements. Choice (4)

92. The difference between a king and his subjects is in the different metres of their situation and circumstances. [Refer para 2]. Choice (3)

93. ‘The meaning of rhythm’ is an appropriate title. Choice (3)

94. According to the author, life is an incessant explosion of freedom. Choice (1)

95. When a rose is pulped the image is lost. Choice (1)

96. In one’s effort to capture life as expressed in living tissue we literally find carbon, nitrogen and many other things utterly unlike life, but never life itself. [Refer para 1]. Choice (4)

Solutions for questions 97 to 100:

97. The hard work put in to meet security need is short lived because once the security need is satisfied, employees tend to relax. [Refer para 1]. Choice (4)

98. The achievement need of employees be satisfied by providing autonomy to them. [Refer para 2]. Choice (3)

99. Choice (3) is the best one. Choices (2) and (4) are tangential. While choice (1) is tempting, the actual reason is clearly mentioned in (3) alone. Observe lines 5 and 10 of para 1. Choice (1)

100. The best choice is (2) Line 3 – 5 in para 2. Choice (2)

Solutions for questions 101 to 105:

101. The best choice is (3). The last 2 lines in para 3 bear evidence to this. Choice (3)

102. The best choice is (1). Observe the lines 6-10 of para 4. Choice (4) contradicts it. Choice (3)

103. The best choice is (4). Read Lines 2 and 3 in para 1 and lines 1 and 2 in para 2. Choice (4)

104. The significance of Einstein’s special principle of relativity is that there are limits to which experimentation can be used to understand some physical phenomena. [Refer para 4]. Choice (3)
105. The statement ‘New knowledge about natural phenomena builds on existing knowledge’ captures the theme of the passage.  

Choice (4)

Solutions for questions 106 to 110:

106. A computer virus spread infection when it actually replicates itself on to other programme disks or memory. [Refer para 3].  

Choice (1)

107. All antivirus programmes look for codes with suspicious patterns, cannot offer complete protection and need to be updated continuously.  

Choice (4)

108. A suspicious looking code can be called a virus only when it carries instructions that copy the virus code to another host. [Refer para 1].  

Choice (1)

109. We may unknowingly activate camouflaged virus along with the mail when we open one of our email messages. [Refer para 3].  

Choice (2)

110. A proactive approach is better because no antivirus programme can be termed successful even in eliminating the listed viruses completely.  

Choice (4)

Solutions for questions 111 to 115:

111. The author preaches truthfulness.  

Choice (1)

112. The belief that life is all about materialism is a lie.  

Choice (4)

113. The most important task to be done as we start on our spiritual journey is to try being true to our own higher nature.  

Choice (1)

114. It can be found in Mahanirvana Tantra that truthfulness is the highest moral virtue.  

Choice (3)

115. The author accuses politicians of lying and cheating, business sector of justifying being untrue as a way of making profits and the tendency towards materialism of meaning as away from the spiritual path.  

Choice (4)

Solutions for questions 116 to 121:

116. The central thrust of the passage lies in the belief that India is gearing up for a new awakening. [Refer para 4].  

Choice (2)

117. According to the passage, it is seldom understood that development is difficult to manage.  

Choice (4)

118. The idea of a splendid Indian past is a heady intoxicant that appeals to Indians but is not firmly grounded in historical realities.  

Choice (1)

119. The author is of the view that civilized behaviour is a function of the emergence of institutions and the faith and trust that they can generate among the people.  

Choice (4)

120. The capital of Vijayanagar illustrates that it takes centuries to recover from a war.  

Choice (1)

121. The author does not believe in revolution because it is not a tea party.  

Choice (1)

Solutions for questions 122 to 125:

122. Third generation robots are characterized by built-in intellectual capacity.  

Choice (4)

123. ‘Artificial intelligence’ is about understanding the situation and reacting suitably. [Refer 5th paragraph]  

Choice (2)

124. From the passage we can conclude that mechanical arms are a part of any generation of robots. [Refer para 2].  

Choice (2)

125. The mechanical arm of a robot is comparable to a human arm, has a gripper which most probably does work similar to that done by our fingers., has many joints, each of which is provided with an independent motor. [Refer para 2].  

Choice (4)

Solutions for questions 126 to 133:

126. If the managing agents handled firms and industries on the companies under their management the companies will be milked and exploited to the greatest extent. [Refer para 4].  

Choice (3)

127. ‘Going public’ means to become public limited. This is to raise funds from the general public in the open market.  

Choice (1)

128. Carefully investigating the viability and prospects of new projects require ‘origination’ according to the passage. [Refer para 6].  

Choice (4)

129. According to the passage ‘private placement’ means not offering the issue to the public for subscription, but placing it privately with big financial. [Refer the last para].  

Choice (2)

130. Providing liquidity to existing securities is not a function of the primary market.  

Choice (4)

131. The passage confirms that managing agencies are owned by both European and Indian business houses.  

Choice (3)

132. According to the passage, the distributive capacity of stockbrokers normally determines the extent of public participation in new issue. [Refer last para].  

Choice (2)

133. It is not true of a rights issue that it closes the way for companies to convert some of their reserves to their capital.  

Choice (1)

Solutions for questions 134 to 140:

134. According to the passage anything self-referential is paradoxical. [Refer para 5].  

Choice (2)

135. From the passage it can be inferred that to understand a system, we should investigate both within and beyond its boundaries.  

Choice (4)

136. According to the Humpty Dumpty one imports to a word the meaning one intends.  

Choice (3)

137. According to the passage when some people say ‘bad’, they mean the opposite.  

Choice (1)

138. According to the passage, words are packets of meaning.  

Choice (2)

139. Crawling/walking by a kid was used by the author as an analogy to counter somebody who may say ‘why give the word a meaning at all if accepting it is suspect”?  

Choice (2)

140. The author meant it as a paradox.  

Choice (4)

Solutions for questions 141 to 145:

141. A primary motivation for the economic cooperation with the EC is Europe’s decline in world economic standing and fear of conflict among its member nations.  

Choice (3)

142. The most important outcome of the Single European Act is likely to result from lower costs, improved efficiency, exploitation of economics of scale, reallocation of resources and innovations. [Refer the last paragraph].  

Choice (4)

143. The sense of mission of the European Community is expressed by activities in many other fields, concern for welfare of disadvantaged people , concern for the needs of future generations and creation of new programmes.  

Choice (1)

144. The European Community felt that the best way to tackle its economic problem was to integrate the vast resources of its member countries.  

Choice (4)

145. The economic standing of the European Community has been in decline for most of the early 1980s compared to that of the US and Japan. [Refer para 1].  

Choice (4)

Solutions for questions 146 to 150:

146. The main reason for promoting renewable and alternate sources of energy in India is the severe impact of oil prices on the economy. [Refer para 1].  

Choice (3)

147. The central issue discussed in the passage is that EDA should market solar
148. Rural households are more likely to use solar cookers because they are not pressured for time and there is plenty of private open space with direct sunshine. [Refer last para]. Choice (1)

149. Carrying of food utensils around is a habitual practice in rural areas because the kitchen is detached from the living rooms. [Refer last para]. Choice (2)

150. The author recommends that EDA should target rural agricultural households for marketing solar cookers. Choice (2)

PRACTICE TESTS

TEST PAPER 1

Solutions for questions 1 to 10:

1. Referring to the first paragraph we can deduce that the choice (1) is the answer. Choice (2), (3) are the consequences of their success in business. Choice (3) is out of the context. Choice (1)

2. While choice (1), (2) and (3) portray the contrast, choice (4) talks about ‘the way’ which is a distortion of information. Choice (4)

3. From the first and last lines of second paragraph we can conclude that the answer is choice (3). While choice (1) and (4) are subsets to it choice (2) is a wrong inference. Choice (3)

4. Choice (4) is out of the context of the question, as it is not connected to the responsibilities of American business. It is more connected to the worry about the power of the corporations. Choice (4)

5. Referring to the last paragraph, we find that “the process of change and the outcome are tinged with a high degree of uncertainty” – is restated in choice 2. The other 3 choices are distortions of the ideas in the paragraph. Choice (2)

6. Option (1) is just a perception of the Tasmanian Devil. Option (3) is eliminated since it is an opinion of the author, thus cannot be categorized under ‘true statements’, option (4) is a distortion of the information given in the first paragraph, option (2) is true as can be inferred from the second paragraph. Choice (2)

7. While the choices (1) and (3) are just supporting ideas, choice (2) can be eliminated since it is a distorted piece of information. Choice (4) is the proper choice since the reviewer himself seems interested in the subject and gives extra information on the subject. Choice (4)

8. Option (2) can be ruled out with reference to paragraph 3, last sentence Option (3) is ruled out since Devils rely on communal scavenging, the spread of the disease cannot be curbed. Option (4) is also a distortion since ‘dubbed himself’ means ‘called himself’. Choice (1) can be inferred as the correct choice from paragraph 1, 5 and 6. Choice (1)

9. A ‘Veterinarian’ cannot be a potential reader since the reference to the disease is just a subset to the main idea in the book. Option (2) can be ruled out since the author himself remarks that the book has ‘far wider appeal’ in the second paragraph. Choice (3) is just a reference and is not relevant to the readers of the book. Archeology does not relate itself to living things. Option (4) is the correct choice since ‘Natural History’ refers to an account of the plant and animal life in a particular place. Choice (4)

10. Option (1) can be inferred as true from paragraphs 1, 5, 6, option (2) from 1, 5 and 6, option 3 from 3, Option (4) is distorted since Tasmanian aboriginals are not alive anymore. Choice (4)

Solutions for questions 11 to 14:

11. The error is in part 4. We obey someone or something. We need not use ‘to’. Choice (4)

12. The error is in part 2. Despite is not followed by ‘of’. ‘The rains came despite the firing - - -’. Choice (2)

13. The error is in part 3. The use of preposition ‘up’ with cope is incorrect. Choice (3)

14. The adjective ‘enlightened’ is misplaced. It must be placed before the noun it qualifies ‘fisherman’. The error is in (1). Choice (1)

Solutions for questions 15 to 18:

15. ‘Rivulet’ is a small stream. ‘River’ is a copious stream of water. The relation is that of small to big. ‘Ringlet’ is a little ring. Choice (1) is correct. ‘Trench’ and ‘moat’ are synonyms. ‘Torrent’ is a great downpour, whereas ‘drizzle’ is light rain falling in fine drops. We eliminate this as the relation is in the reverse. Choice (1)

16. ‘Datum’ is the singular form of ‘data’. ‘Axis’ is the singular form of ‘axes’. The relation is that of plural to singular. Choice (4)

17. ‘Xenophobia’ is fear of ‘foreigners’. ‘Pyrophobia’ is fear of ‘fire’. The words in the pairs (2), (3) and (4) do not match correctly. Choice (4)

18. A ‘Geologist’ studies the ‘earth’s crust’ and an ‘ornithologist’ studies birds. The relation is that of a professional to the subject of his study. ‘Science’ is the subject of study of a scientist but it is too broad in context. Choice (4)

Solutions for questions 19 to 22:

19. ‘Cognizance’ means knowledge or awareness. The phrase ‘take cognizance of’ means to take note of. Hence, choice (2) is the answer. The other words given in the choices are inapt. Choice (2)

20. ‘Accentuated’ means made prominent. ‘Contour’ means an outline, esp. representing the shape or form of something. Choice (4)

21. The underlined word ‘alleviation’ means reduction and it conveys the meaning of the sentence correctly. ‘Destruction’ and ‘prevention’ do not collocate with ‘poverty’. Banks cannot eradicate ‘poverty’. Choice (1)

22. ‘Niche’ means a comfortable or suitable position in life or employment. This is the most appropriate word in the context. Choice (2)

23. 1 24. 2 25. 3 26. 4

Solutions for questions 27 to 30:

27. (1) Incorrect – The statement contradicts what goes in the earlier part. “Disinclined to believe the worst” means an optimist.

(2) Incorrect – “believe the best” again is contrary to the tenor of the statement.

(3) Incorrect – gives the notion of magnanimity which is erroneous.

(4) Correct – Blends with the rest of the statement. Choice (4)

28. (1) Incorrect – Freedom of mind can never be “not comfortable”. Also “exhaustive” means thorough and is not appropriate here. It should be “exhausting”.

(2) Incorrect – “not comforting” is incompatible. Also “aspires for” means aiming for an object. The correct preposition should be “aspire to”.

(3) Incorrect – “not a comfort” is absurd. Also “fight” means with some external forces.

(4) Correct – All the words harmonize, including “struggle” which means an internal conflict with one’s own self. Choice (4)

Solutions for Language Comprehension
29. (1) Incorrect – “temporary regularity”, is not consonant with “modern machine civilization”. Also “punctual by the clock” is meaningless.
(2) Incorrect – “punctured by the clock” is absurd.
(3) Correct – The message, that the clock governs the life of the modern man and is relentless in its rule, is brought out clearly.
(4) Incorrect – “temporal frequency” is again an absurd phrase. Also “punctilious describes a person and here it is inappropriate. Choice (3)

Solutions for questions 31 to 34:

31. The idiom ‘root and branch’ means completely. Choice (2)
32. ‘With open arms’ means with a warm welcome. Choice (4)
33. The idiom ‘Tooth and nail’ means with great energy. Choice (1)
34. ‘Spread like wild fire’ means spread rapidly. Choice (3)

Solutions for questions 35 to 38:

35. The most appropriate choice is ‘amnesty’ because the given question stands as a definition for that. ‘Solicitation’ means asking for something from someone, ‘arbitration’ means the settlement of a dispute by an arbitrator. ‘Allusion’ refers to an indirect reference to something. Choice (2)
36. The appropriate choice is ‘morphology’; ‘philology’ is ‘the science which studies the history and development of languages’. ‘Anthropology’ is ‘the study of the origin and physical and cultural development of mankind’. ‘Geology’ is ‘the science that studies the crust of the earth’. Choice (2)
37. The given statement defines the word ‘mollycoddle’. Choice (1)
38. Something that is ‘noxious’ is ‘harmful’. ‘Contumacious’ means ‘insubordinate’ or ‘stubbornly’ or ‘willfully disobedient’. ‘Outlandish’ means ‘strange’, ‘bizarre or unfamiliar’. Choice (2)

Solutions for questions 39 and 40:

39. The key points in the paragraph are
1. We are unique in some ways
2. Our very uniqueness has landed us in the mess
3. Over exploitation of resources has led to extinction of some species.

The points are captured in Choice 2. Choice 1 and Choice 3 are not right because they say that extinction of species is 60 per cent whereas as per the passage 60 per cent of the ecosystem services are being degraded. Choice 4 is wrong because the Millennium Ecosystem Assessment does not show that we are unique. Choice (2)
40. The main points covered are:
1. Format change needs consensus within the organisation.
2. Managers must explain the need for change and the potential for growth.
3. The tone must be positive.

Choice 1, 2, and 4 leave out the fact that 2 gives examples which are generally avoided in summaries. Choice 4 leaves out valid information. Choice (3)

TEST PAPER 2

Solutions for questions 1 to 5:

1. The passage shows that the author is concerned about what is happening in the world today. There is no bitterness – hence it is not cynical. The author does not express any hatred – so it cannot be called hostile. The author is not desperate nor is he stubborn or arrogant. Choice (4)
2. Paragraph 5 shows that even the poorest place has all the material affluence (beyond wants). So the question at the end of the Paragraph is rhetorical (does not require an answer as the answer is obvious). When the author asks the question, the answer implied is that the rich nations have successfully met the basic needs of the people. Choice (1)
3. Paragraph 8 makes it clear that the rich buy products not for the benefit they would get from it, but as a means to set themselves apart from the crowd. This is why they are never satisfied and the destination keeps shifting. Choice (4)

4. In paragraph 1 the author is critical of economists as the latter believe that only material things have value whereas there are many things like nature, which are invaluable. But while he is critical his tone is not sharp. Hence he is ‘sarcastic’ but not scathing or indignant. Choice 4 can be ruled out as the author does not act superior. He is sure of his position and is critical of the economists’ stand. Choice (2)

5. Paragraph 9 together with Paragraph 8 shows the author ridiculing the rich who are ready to go to any length (however foolish) to maintain their exclusive status. Choice 1 – (To say that he is ‘overly critical’) would imply that there is some logic in what the rich are doing – which is not the case. Choice 3 is ruled out because the author is not ‘advocating rationality’ – he is pointing to the folly of their behaviour. The author is neither obsequious (fawning, excessively attentive) nor contemptuous (scornful). Choice (2)

Solutions for questions 6 to 10:

6. At the beginning of the passage, the author is sad, gloomy, despondent but not pessimistic critical or desperate (rules out 1, 3 and 4). At the end he is philosophic, optimistic and accepting but not euphoric. Choice (2)
7. The author’s recounting is poignant (moving). It is not patetic because if we say that his recounting is pathetic it would mean that the author hasn’t expressed himself well. Choices 3 and 4 are obviously incorrect. Choice (1)
8. When the author asks ‘Why should this happen to us?’ he is dejected or in low spirits. He is far from arrogant or abusive; he is not hopeless. Choice (3)
9. The author refers to Indianapolis 500-car race to show that these children are as intrepid as the drivers of the car race and the audience enjoyed the event as much. He is not belittling the race, nor is he exaggerating. Choice (4)
10. The passage may be described as motivating because though the author is gloomy at first, by the end he has learnt to ‘celebrate life’ and this motivates the readers to feel the same. Choice (1)

Solutions for questions 11 to 14:

11. In the first sentence the usage of ‘of’ is redundant because of and about cannot be used together. Option 2 is erroneous because of the same reason. Options 4 is incorrect because the relative pronoun
Solutions for questions 15 to 18:

15. The expression as old as indicates equality of age, but the sentence indicates that the temples predate the Dravidian structures. Statement 4 makes the point of comparison clear. It also uses the correct adjective supposed, rather than supposedly (an adverb) to modify the noun phrase Dravidian predecessors. Choice (4)

16. In this sentence, Ben Jonson the dramatist can be compared to Shakespeare the dramatist. His plays can not be. Only choice 4 brings out the correct comparison. Choices 1, 2 and 3 make illogical comparisons. Choice (4)

17. Each choice but 3 contains errors of agreement. The singular subject each takes a singular verb has and not have. Choice 4 is very awkwardly constructed and conveys a very absurd idea. Choice 2 is wordy and contains the unnecessary ‘each of’. Choice 3 maintains subject verb agreement (sons have made) and provides a clear structure. Choice (3)

18. In this sentence, “benefits of exercises such as……and aerobics” should be followed by a plural verb are and not is (that are strenuous). Similarly, in the second part of the sentence, underestimate that is incorrect. The reference is to the plural “benefits of exercises” and the pronoun to be used is those not that. In choices 3 and 4 the use of when nonsensically suggests that benefits of strenuous exercises are underestimated when they are derived from lighter exercises Choice 2 uses the correct pronoun those. Besides, ‘strenuous exercises’ is more concise and solves the Subject Verb agreement problem. The phase ‘strenuous exercises’ is also parallel to lighter exercises. Choice (2)

19. 2 20. 2 21. 4 22. 1
23. 2 24. 3 25. 1 26. 3
27. 3 28. 2 29. 4 30. 4

Solutions for questions 31 and 32:

31. The main points covered are:
1. Immigration is the key issue in the pre election scenario.
2. People, including Labour party supporters, want tougher laws on immigration.

Choice (3) and (4) do not mention the elections. Hence they are incorrect. Choice (2) is factually wrong since it is the supporters of the Labour party and not the party itself that wants tougher laws. Choice (1)

32. The main points are:
1. France has suggested global tax to raise funds to meet the Millennium Development Goals.
2. The developed and developing countries agreed to a small tax on trade and air transport.

Choice 1, 2, and 3 do not mention France which is the key player. Choice (4)

Solutions for questions 33 to 36:

33. ‘Jinx’ refers to some thing or some one that is considered to be unlucky. ‘Gibe’ refers to a rude or insulting remark. Option (B) is appropriate.

34. ‘Stiffened’ means prevent from continuing. ‘Stiffened’ is to be firm. Option (A) is appropriate.

35. ‘Pared’ is to back down or reduce. Option (B) is appropriate.

36. ‘Queer’ is to feel strange. Queasy is feeling sick with a sensation of vertigo or dizziness. ‘Queer’ is the correct choice. Option (B) is appropriate.

Solutions for questions 37 to 40:

37. ‘Adulation’ which means uncritical admiration.

38. Anecdote is the meaning story about a person or event.

39. ‘Barricade’ is a time of objects placed across a road to stop people from getting past.

40. A ‘reminder’ is kept as a reminder of a place, occasion etc.
Solutions for Mathematical Skills

**EQUATIONS**

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**PRACTICE EXERCISE**

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**Solutions for questions 1 to 10:**

1. (a) $6x + 14y = 2$ and $6x + 27y = 15$; Solving, we get $y = 1$ and $x = -2$ Choice (4)

(b) $2007x + 2008y = 10038 \Rightarrow (1)$; $2008x + 2007y = 10037 \Rightarrow (2)$

$(1) + (2) \Rightarrow 4015 (x + y) = 20075 \Rightarrow x + y = 5 \Rightarrow (3)$; $(2) - (1) \Rightarrow x - y = -1 \Rightarrow (4)$

Solving (3) and (4), we get $x = 2$ and $y = 3$. Choice (2)

2. $\frac{1}{a} = \frac{r}{a + p + q} \Rightarrow \frac{1+a}{a} = \frac{p+q+r}{a+p+q}$

3. (a) $a_1 = 3, b_1 = 4, a_2 = 2, b_2 = 3$

4. $2x - y + 3z = 9\Rightarrow (1)$; $x + y + z = 6 \Rightarrow (2)$

5. (a) $\frac{a_1}{a_2} = \frac{3}{4}$ and $\frac{b_1}{b_2} = \frac{6}{p}$; For a unique solution, $\frac{a_1}{a_2} \times \frac{b_1}{b_2} \Rightarrow P \neq 8$

6. Let there be a total of x cows and goats and y hens in the farm.

7. From the data, $4x + 2y = 184 \Rightarrow (1)$ and $x + y = 66 \Rightarrow (2)$

8. Let the number of monkeys on T1 be x and the number of monkeys on T2 be y

9. Let the fraction be $\frac{x}{y}; \frac{x + 2}{y + 4} = \frac{2}{3} \Rightarrow 3x = 2y + 2$

10. Let the present age of the man be x years

11. Let the number of Rs 5, Rs 10 and Rs 50 notes be x, y and z respectively.

12. Given $u + v + w = 6720 \Rightarrow (a)$ and $u = \frac{1}{3} (v + w) \Rightarrow (b)$

13. Let the two-digit number be xy. $10x + y + 10y + x = 110 \Rightarrow x + y = 10 \Rightarrow (1)$ and Given $x - y = 4 \Rightarrow (2)$

14. Possible numbers are 108, 801; 207, 702; 306, 603; 405, 504 and 900. 504 – 405 ≠ 297; 603 – 306 ≠ 297

15. Let the present ages of Tarun, Aakash and Rohit be T, A and R respectively.

16. Let the three consecutive numbers be $x - 1, x, x + 1$

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23. Let the costs of an apple, an orange and mango be Rs x, Rs y and Rs z respectively.

\[ 4x + 5y + 7z = 115 \] (1) and
\[ 9x + 7y + 3z = 161 \] (2)

Substituting (1) and (2) we get
\[ x + y + z = 23 \] Choice (4)

24. Total distance travelled by Narad = 120 km. Distance travelled by him on walk = \[ \frac{3}{10} \times 120 = 36 \text{ km} \]

Let distance travelled by boat = b. Let distance travelled by him by bicycle = c

\[ \begin{align*}
&\vdots \ b = 3c \\
&\Rightarrow 36 + b + c = 120 \Rightarrow 36 + 3c + c = 120 \\
&\Rightarrow c = 21 \text{ km} \end{align*} \] Choice (1)

25. Le there be x chocolates \(\Rightarrow\) Each friend got \(\frac{x}{4}\) chocolates.

After eating 3 chocolates each, the total number of chocolates with them =

\[ 4 \left( \frac{x}{4} - 3 \right) = x - 12. \]

\[ \Rightarrow x = 24 \]

\(\therefore\) Total number of chocolates with them initially = 24. Choice (3)

26. Let the number be xy

\[ 10x + y + 10y + x = 99 \]

The number is 405 Choice (2)

Solving equations (1) and (2) we get \(x = 7\) and \(y = 13\) (Choice (2))

27. Let the present ages of Amar’s father, mother, and Amar be f, m and s respectively.

When Amar was born, the ages of his father and his mother were \((f – s)\) years and \((m – s)\) years respectively.

\[ \begin{align*}
3m – f & = 40 \rightarrow (1); m + f = 80 \rightarrow (2); \\
\rightarrow f – s & = 2(m – s) \rightarrow (3)
\end{align*} \]

by solving (1), (2) and (3) we get \(s = 10\) Choice (3)

28. Let the number of marbles with Ramesh and Suresh be x and y respectively.

From the data, \(x + 3 = y – 3 \Rightarrow x – y = -6 \) (1) and \(4 (x – 3) = 4x – y = 15 \) (2)

Solving (1) and (2), \(x = 7\) and \(y = 13\) Choice (3)

29. Let there be n persons in the group. Amount received by each person = Rs \(\frac{2640}{n}\).

If 3 more persons were there, amount received by each person = \(\frac{2640}{n+3}\); From the given data, \(\frac{2640}{n+3} = \frac{8}{3}\)

\[ \Rightarrow \frac{2640}{n} = \frac{8}{3} \]

\(\Rightarrow n (n + 3) = 30 \times 33; \)

\(\therefore\) \(n = 30\) Choice (4)

30. \(3x + 4y + 2k = 20 \rightarrow (1) x + 2y + k = 8 \rightarrow (2)\)

Multiplying equation (2) by 2 and subtract it from (1) we get \(x = 4\). Choice (1)

31. Let the number of mango trees and banana trees in his garden be m and b respectively, \(m = b + 1\).

Total number of fruits = \(2(m + b) = 62 \Rightarrow m + b = 31 \Rightarrow b + 1 + b = 31 \Rightarrow b = 15\) Choice (4)

32. Let the fraction be \(\frac{x}{y}\)

\[ \frac{x + 1}{y + 1} \Rightarrow 2x + 1 = y \rightarrow (1) \]

\[ \Rightarrow x = 9 \]

Substituting \(x = 9\) in equation (1) \(y = 19\) Choice (3)

33. Let the larger part be Rs x and smaller part be Rs \((200 – x)\),

\(\therefore\) Larger part is always greater than Rs 160. Choice (2)

34. \(A + B + C + D = 110 \rightarrow (1), A = 2D \rightarrow (2), A + C = B \rightarrow (3), C = D + 20 \rightarrow (4)\)

Substitute (2), (4) in (3) we get \(2D + D + 20 = B \Rightarrow B = D + 10\) Choice (3)

35. Let the cost of each pen, each sharperner and each eraser be Rs p, Rs s and Rs e respectively.

\[ 9p + 11s + 14e = 107 \rightarrow (1); 8p + 13s + 16e = 119 \rightarrow (2); 11p + 7s + kr = 83 \rightarrow (3)\]

Subtracting \(2 \times (2)\) from \(3 \times (1), 11p + 7s + 10r = 83 \rightarrow (4)\) it follows that if \(k = 10\), the equations (1), (2) and (3) would not be independent of each other.

\(\therefore\) They would not yield an unique solution. Choice (4)

36. Let the numbers be \(x – 1, x, x + 1\)

\[ 3x = 45 \Rightarrow x = 15; \therefore\] the numbers are 14, 15, 16 (16\(–\)14\(=\)14) \(\rightarrow\) (256 – 196) \(=\) 46 \(= 60 – 4 = 56\) Choice (2)

37. Let the number of questions left unanswered by Vinod be x. Number of questions attempted by him = 200 – x.

Number of questions he marked wrong = x. Number of questions he marked correct = \(200 – x = x \Rightarrow 200 = 2x\)

\(200 – 2x) 2 - x \left( \frac{1}{2} \right) - x \left( \frac{1}{4} \right) = 134 \Rightarrow x = 56\)

\(\therefore\) Number of questions attempted = 200 – 56 = 144 Choice (1)
38. Let the distance A and B travel in 1 hour be x and y respectively; 3x = y ⇒ (1) 5x = 2y – 1 ⇒ (2) 
Solving (1) and (2) we get x = 1, y = 3 
In 15 hours A can walk 15 km whereas B can walk 45 km. 
∴ Difference between the distance travelled by A and B = 30 km Choice (4) 

39. Let the number of vehicles capable of carrying 10 and 15 voters be x and y respectively. 
Given, x + y ≤ 90 ⇒ (1) and 10x + 15y = 1200 
⇒ 2x + 3y = 240 ⇒ (2) 
Using (2) in (1) we get y ≥ 60 
To get maximum votes by second candidate, y = 60 
∴ Number of voters of second candidate = 60 × 15 = 900 
⇒ Number of voters of first candidate = 1200 – 900 = 300 
The minimum difference = 900 – 300 = 600 Choice (4) 

40. 2p + 3s + 4e = 35 and 4p + 6s + 7c = 66 
(35 – 4e) + 7c = 66 ⇒ 70 – e = 66 
⇒ e = 4 Choice (3) 

RATIO, PROPORTION 
AND VARIATION 

Practice Exercise 

Solutions for questions 1 to 40: 
1. A : (B + C) = 2 : 5; A : (A + B + C) = 2 : 7 
∴ A = 2(2 + B + C) = 2 × 350 = 2 × 50 = 100 Choice (2) 
2. (1/a + b) / (1/a – b) 
= a + b / b – a; Substitute a = 3x 
and b = 4x; 3x + 4x / 4x – 3x = 7 Choice (3) 
3. A : B = 100 : 75 = 4 : 3; B : C = 2 : 1 
A : B : C = 8 : 6 : 3; Earnings of A = 8/3 × 4200 = 11,200 Choice (2) 
4. 21x² + 28y² = 16x² + 8y²; 5x² = 20y² 
x²/y² = 4/1; (x/y)² = 4/1 ⇒ x/y = 2/1 
Let x = 2k, y = k, 5x + y / 3x – y = 11/5 Choice (1) 
5. 
<table>
<thead>
<tr>
<th>White box</th>
<th>Red box</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of chocolates</td>
<td>3y</td>
</tr>
<tr>
<td>Number of biscuits</td>
<td>3x</td>
</tr>
</tbody>
</table>

Total number of chocolates and biscuits in the white box = 3x + 3y and the total number of chocolates and biscuits in the red box = 4x + 2y; Given, 
3x + 3y = 35 
4x + 2y = 16 
3x + 3y = 15n ⇒ (1); 4x + 2y = 16n ⇒ (2) 

On solving (1) and (2), we get x = 3n and y = 2n. 
∴ Total number of chocolates = 4x + 3y = 4(3n) + 3(2n) = 18n 
Total number of biscuits = 3x + 2y = 3(3n) + 2(2n) = 13n 
Required ratio = 18n : 13n = 18 : 13. Choice (2) 
6. 2a² + 8b² + 5c² = 2c(a + 6b) + c² + 16b² + 9c² = 24bc = 0 
∴ (2a – c)² + (4b – 3c)² = 0; 
∴ a : c = 1 : 2 and b : c = 4 : 3 Choice (3) 
7. The ratio of the ages of two persons is 5 : 7. Let the ages of the two persons be 5k and 7k. 
So 5k – 18/7k – 18 = 8/13 ⇒ k = 90; The age of the younger one = 5k = 5 × 10 = 50 years Choice (1) 
8. (a) 22 : 32 = 4 : 9; B = 4 : 3 Choice (2) 
(b) 2 : 1 = 8 : 1 Choice (2) 
(c) √16 : √9 = 4 : 3 Choice (3) 
(d) √4/9 × 16/25 = 8/15 = 8/15 Choice (1) 
9. Let the monthly income of A and B be 4x and 3x. 
Savings of each of them = Rs 600 
Expenses of A = 4x – 600 and Expenses of B = 3x – 600 = Rs 600 ⇒ x = 600 Choice (1) 
10. a : b = 1 : 2 = 3 : 6; b : c = 3 : 5 = 6 : 10 
a : b : c : d = 3 : 6 : 10 : 8 Choice (2) 
11. Let the density of metal z be h. 
∴ Density of metal x = 15h and density of metal y = 8h 
Let the metals x and y be mixed in the ratio k : 1 ⇒ 15h(k) + 8h(1) = 13h(k + 1) ⇒ 15k – 13k = 13 – 8 ⇒ 2k = 5 ⇒ k = 5/2. 
The required ratio = 5 : 2 Choice (4) 
12. Given 
\[
\frac{p}{a(q + r)} = \frac{q}{a(p + r)} = \frac{r}{a(q + p)} \Rightarrow \frac{p}{b} = \frac{q}{q + r} = \frac{r}{p + r} = \frac{1}{b} \Rightarrow a = \frac{p + q + r}{q + r + p + r + p + q} = \frac{a}{b} \Rightarrow a = \frac{b}{2} \]
Choice (3) 
13. Let the numbers be 2k and 3k. When 5 is added to both 2k + \frac{5}{3} , \frac{5}{7} \Rightarrow 2k = 20 Choice (1) 
14. Let the numbers of boys, girls be 2x, 3x respectively 
2x – 5 / 3x + 5 = 1 / 2 \Rightarrow x = 15; 
Choice (1) 
15. Total amount = Rs 5625. 
A + B + C = Rs 5625 ⇒ (1); A = \frac{1}{2}(B + C) ⇒ (2) 
B = \frac{1}{4}(A + C) ⇒ (3); From (1) and (2) 
⇒ A = Rs 1875; From (1) and (3) \Rightarrow B = Rs 1125 
A – B = 1875 – 1125 = Rs 750. Choice (2) 
16. 9 + 11 = 20 is not a factor of 75. So we cannot divide medals in the ratio of 9 : 11. 
Choice (4) 
17. Let Ram gave Rs 5x and Rs 7x to Lava and Kusha respectively; 
Given share of Lava = 5x + \frac{1}{6}(5x + 7x) = 560 \Rightarrow x = 80. 
Choice (3) 
18. A : B 
Income = 5x 4x 
Expenditure = 2y 3y 
Savings = 5x – 2y 4x – 3y 
Given 5x – 2y = 3y \Rightarrow x = y 
∴ ratio of savings of A and B = 5x – 2y : 4x – 3y = 3 Choice (2) 
19. Let the amount B gets be Rs x. 
.: The amount received by A is x + 600 
C = \frac{2}{3}(A + B) = \frac{2}{3}(x + x + 600); B = 3(A – C); 
\Rightarrow x = 3 \left[ \frac{x + 600}{\left(\frac{2}{3}(x + 600)\right)} \right] \Rightarrow x = 300 
.: A’s share is 300 + 600 = Rs 900 Choice (4) 
20. Let the ages of the three persons in years be 5x, 7x, and 9x 
Given (7x)² + (9x)² = 3250 \Rightarrow x = 5; The ages in years are 25, 35, 45 Choice (4) 
21. The ratio of 1 rupee, 50 paisa, 25 paisa coins is 5 : 6 : 8 
.: Let the number of 1 rupee coins be 5x. 
So, the number of 50 paisa that is \frac{1}{2} rupee coins = 6x and the number of 25 paisa that is \frac{1}{4} rupee coins = 8x
20. Choice (4)

22. Choice (1)

23. Choice (3)

24. Choice (3)

25. Choice (2)

26. Choice (4)

27. Choice (1)

28. Choice (4)

29. Choice (4)

30. Speed of A to that of Horse B = \((7 \times 6 : 5 \times 9)\) = 42 : 45 = 14 : 15

31. Let the fixed charge be Rs x and the charge per kilolitre be Rs y.
Given, x + 100y = 300 \(\Rightarrow\) \(x = 300 - 100y\)
Amount charged when the consumption is 300 kilolitres = Rs \((x + 300y)\)
and the amount charged when the consumption is 400 kilolitres = \((x + 400y)\)
\[\frac{x + 300y}{6} = \frac{5}{6}\]
\(\Rightarrow\) y = 1 and x = 200.
Choice (4)

32. Let the capacity of the three casks be 3x, 2x, 6x.
Quantity from third cask = \((2/3) \times 6x\) = 4x
Quantity from first cask = \((1/3) \times 3x\) = x
4x - x = 18 \(\Rightarrow\) x = 6
\(\therefore\) Capacities of original three casks is 18, 12, 36 litres.
Choice (3)

33. \(E \propto m v^2\) \(\Rightarrow\) E = kmv^2
Where E is the energy possessing by a moving body, m is the mass v is the velocity, and k is constant proportionality.
When E = 40, m = 10 kg, v = \(2\sqrt{2}\)
\(.40 = k \times \left(2\sqrt{2}\right)^2 \Rightarrow k = \frac{1}{2}\)
When E = 4000 and mass is 80 kg;
4000 = \(\frac{1}{2} \times 80 \times v^2\) \(\Rightarrow\) v = 10 m/s
Choice (4)

34. Let the weight of each piece be 2x, 3x and 5x respectively.
Total weight \((w)\) of the stone = \((2x + 3x + 5x) = 10x\)
Value \(\propto \) weight \(\Rightarrow\) V = Kx^2
20000 = K (10x)^2; 20000 = 100 Kx^2 \(\Rightarrow\) Kx^2 = 200
V_1 = K(w_1)^2 = K \((2x)^2\) = 4 Kx^2 = 4 \times 200 = 800,
V_2 = K \((w_2)^2\) = K \((3x)^2\) = 9 Kx^2 = 9 \times 200 = 1800,
V_3 = K \((w_3)^2\) = K \((5x)^2\) = 25 Kx^2 = 25 \times 200 = 5000
Total value of the broken stone = 800 + 1800 + 5000 = Rs 7600; Loss = 20000 - 7600 = Rs 12400
Choice (2)

35. \(E = k_1 N + k_2\) where E is expenditure and N is the number of inmates. \(k_1\) is the expenditure of each inmate and \(k_2\) is the constant expenditure.
When inmates are 200, 1300 + 200k_1 + k_2 \(\Rightarrow\) \(k_2 = 2\)
When inmates are 250, 1200 + 250k_1 + k_2 \(\Rightarrow\) \(k_2 = 1\)
Subtracting (1) from (2) \(k_1 = 6; 1300 - 1200 = k_1 \Rightarrow k_1 = 100\)
Now, when the inmates are 300 the expenses are \(300 \times 100 = 1800 + 100 = 1900\)
Choice (4)

36. \(x \propto y \Rightarrow x \propto \frac{1}{y^2} \Rightarrow x \propto y/z^2\)
\(x_1/x_2 = y_1/y_2 \times z_2^2/z_1^2\)
\(60/x_1 = (4/8) \times 6/6 = 3 \Rightarrow x_2 = 30\)
Choice (1)

37. Given, B, C; \(C = \alpha t^2\); \(B = \beta t\) when \(t = 5\)
\(\alpha = B + C = \beta t + \alpha t^2\)
When \(t = 3, 9 = (3k_1 + 9k_2) \Rightarrow 3 = k_1 + 3k_2 \Rightarrow (2)\)
Subtracting (2) from (1), \(-2 = 2k_2 \Rightarrow k_2 = -1\)
Putting \(k_2 = -1\) in equation 2, \(3 = k_1 - 3 \Rightarrow 6 = k_1; \) \(\therefore\) A = 6t - t^2.
Now, when \(t = \frac{9}{2}, A = 6 - \frac{9}{2} = -\frac{9}{2}\)

38. Given \(x^2y^2\) and \(x \propto \frac{y^2}{z}\)
Combining both, we have \(x \propto \frac{y^2}{z} \Rightarrow xz \propto y^2\)
\(\Rightarrow x_2z_2 = \frac{y_2^2}{y_1^2} \Rightarrow \frac{8 \times 3}{x_1 \times 6} = \frac{4}{16} \Rightarrow x_2 = 16\)
Choice (4)

39. \(S \propto R \Rightarrow S = K_1R\) and \(T = \frac{K_2}{R}\) where \(R = 200\)
\(S = 40\) and \(T = 10; 20 = \frac{K_2}{20} \Rightarrow K_2 = 2 \times 10 \Rightarrow T = \frac{K_2}{R}\)
\(= \frac{200}{10} = 20\)
Choice (4)

40. \(H = \frac{Volume}{(radius)^2} \Rightarrow H \propto \frac{V}{r^2} \Rightarrow Hr^2 \propto V\)
\(\Rightarrow \frac{H_1 r_1^2}{H_2 r_2^2} = \frac{V_1}{V_2}\)
\(\Rightarrow\) Given \(V_1, V_2 = 1:2\) and \(r_1 = 1:3 \Rightarrow H_1(1) = 2 \Rightarrow H_1 x_1 \times \frac{1}{2} \Rightarrow H_1 = \frac{9}{2}\)
Choice (3)

PERCENTAGES

Practice Exercise 1.
Let A's salary be 100x. B = 80x and c = 120x
The required percentage = \(\frac{20x \times 100}{120x} = \frac{1600}{120} = 15\frac{1}{2}\%\)
Choice (2)
2. Let length = 10 units, breadth = 10 units; 
Area = 100 units 
Later, length = 11 units, Breadth = 9 units; 
New Area = 99 units. 
Decrease in area = \( \frac{1}{100} \times 100 = 1 \) per cent 
Choice (4)

3. Let total number of votes be 100; 
:: Number of valid votes = 65 
Let the number of votes polled in favour of X = x. Let the number of votes polled in favour of Y = y 
\( \Rightarrow x + y = 65 \rightarrow (1) \); \( \frac{x}{100} = \frac{60}{100} \Rightarrow 5x = 3y; \frac{x}{y} = \frac{8}{5} \rightarrow (2) \) 
From (1) and (2), x = 40 and y = 25 
:: The required percentage = \( \frac{40}{100} \times 100 = 40 \) per cent 
Choice (3)

4. Let 1st number be 100; 2nd number is 125 and 3rd number is 150; x per cent of 125 = 150 \( \Rightarrow x = 120 \) per cent 
Choice (4)

5. Let the number of units be 100, the cost of each unit be Rs 100. 
:: Total expenditure = Rs 100 \( \times 100 = Rs 10000 \). Let the number of units to be purchased be x 
:: 125 per cent of (Rs 100) \( \times \) x = 90 per cent of (Rs 10000) 
\( \Rightarrow x = \frac{9000}{125} = 72 \). The consumption must be reduced by 28 per cent. Choice (2)

6. Let the cost of the article be Rs 100. Cost of the article after increasing by 25 per cent and decreasing by 25 per cent is 100 \( \left( \frac{1 + 25}{100} \right) \left( \frac{1 - 25}{100} \right) = 93.75 \) 
:: Net change = 100 – 93.75 = 6.25 per cent less 
Choice (2)

7. Let the maximum marks be x. In case of the first student pass marks = 30 per cent of x + 30 \( \rightarrow (1) \) Also, pass marks in case of second student = 40 per cent of x \( - 10 \rightarrow (2) \) 
Solving (1) and (2); x = 400; Pass mark = 30 per cent of 400 = 300 = 120 + 30 = 150. 
Choice (2)

8. a per cent \( (a + b) + b \) per cent \( (b + a) = (a^2 + b^2) \) per cent of 1 + ab per cent of x 
\( \frac{a}{100} \left( (a + b) + b \right) = \frac{a^2 + b^2}{100} + \frac{ab}{100} ; x = 2 \) 
Choice (2)

9. Let the number of students be 100. 
:: Number of students passed = 70 
The number of boys passed = 40 per cent of 30 
\( \Rightarrow \frac{2}{5} \times 30 = 12 \) 
The total number of students passed = 70 per cent of 100 = 70 
:: The number of girls passed = 70 – 12 = 58; The required percentage = \( \frac{58}{70} \times 100 = 82.86 \) per cent 
Choice (1)

10. Let the total number of votes be ‘x’. Candidate who was defeated got \( \frac{45}{100} \times x \) votes 
Candidate who won got \( \frac{55}{100} \times x \) votes; 
Given \( \frac{55}{100} x - \frac{45}{100} x = 321 \) \( \Rightarrow x = 3210 \) 
Choice (4)

11. Let the income of Mahesh be Rs 100; The amount spent on house rent = 20 per cent of 100 = Rs 20 
The amount spent on food = 30 per cent of (100 – 20) = Rs 24 
The amount spent on education = 40 per cent of (80 – 24) = Rs 22.4 
The amount spent on miscellaneous = 50 per cent of (56 – 22.4) = Rs 16.8 
Savings = 33.6 – 16.8 = Rs 16.8; The required percentage = \( \frac{16.8}{100} \times 100 = 16.8 \) per cent 
Choice (2)

12. Number of persons voted “For” the resolution = \( \frac{80}{100} \times 1500 = 1200 \) 
Total number of voters after increase is 3000. :: For the resolution to be passed, total number of voters required are 2/3rd of 3000 = 2000 
:: 800 new votes should vote “For” the resolution; 800/1500 = 53.33 per cent 
Choice (3)

13. Let B = 100 then A = 120; D will be 25 per cent less than B. :: D = (0.75)100 = 75; If D is 162/3 per cent less than C, then C will be 20 per cent more than D; :: C = 1.2(75) = 90; C as a percentage of A = \( \frac{90}{120} \times 100 = 75 \) % 
Choice (1)

14. Number of students who passed = 240; who failed = 60, Required percent = \( \frac{180}{240} \times 100 \) = 75 per cent 
Choice (2)

15. Since the winner has won by the least percentage of votes and x, y and z being integers, winner should win by 1 per cent of the total votes. The two contestants should get 33 per cent each votes. Winner gets 34 per cent of votes. 1 per cent of votes = 2432. 34 per cent of votes = \( 34 \times 2432 = 82688 \) 
Choice (1)

16. Given A got 40 per cent of total marks and got 10 marks more than the pass mark and B got 50 per cent of total marks and got 50 marks more than the pass mark. Let total marks be x, 
\( \Rightarrow \) pass mark in both the cases is \( \frac{40}{100} \times x = 50 \) per cent of \( x – 50 \) \( \Rightarrow \) per cent of \( x = 40 \) \( \Rightarrow x = 10 = 400 \) 
\( \Rightarrow x = 400 \) 
Pass Mark = 40 per cent of 400 – 10 = 160 – 10 = 150 
Choice (4)

17. \( 1 \times b = \frac{(100 + x)(100 + 20)}{100} = 150 \) 
\( \Rightarrow 100 + x = 125 \Rightarrow x = 25 \) per cent 
Choice (2)

18. Let Z = 100, Y = 90, X = 108; X is 8 per cent more than Z. 
Choice (2)

19. Number of questions attempted = 683/4 per cent of 160 = 110 
:: Number of questions which are left = 160 – 110 = 50; Number of incorrect questions = \( \frac{9}{10} \) per cent of 110 = 10. 
:: Marks scored by the student = \( (100 \times 5) – (50 \times 2) = (10 \times 4) = 360 \) 
Maximum marks = \( 160 \times 5 = 800 \); 
The percentage of marks = \( \frac{360 \times 100}{800} = 45 \) per cent 
Choice (2)

20. Total Telephone connections as a percentage of population = 40 per cent 
Illegal telephones form 12.5 per cent of total connection (as 87.5 per cent are legal connections). 
:: Illegal telephone connections of total population = 12.5 per cent of 40 \( \Rightarrow 5 \) per cent 
Choice (1)

21. Let the quantity of solution be 100 litres. Acid content is 70 litres and water content is 30 litres. 10 litres of solution is taken out, Now, Quantity of acid = \( (70 \times 10) \times \frac{70}{100} = 63 \). Quantity of water = \( (30 \times 10 \times \frac{30}{100}) = 27 \) 
If 10 litres of water is added, then it becomes 37 litres. 
:: The required percentage = 37 per cent. 
Choice (3)
22. Rs 750 pm should come from commission
⇒ 9000 p.a.
5 per cent = 9000, 100 per cent = Rs 18,000
∴ Annual sales should be Rs 18,000
Choice (2)

23. Reduction on the whole = \frac{37.5}{100} \times 2000 = Rs 750
∴ After reduction, one can buy 6 dozens for Rs 750.
Price per dozen after reduction = \frac{750}{6} = Rs 125.
∴ Price per dozen before reduction = \frac{125 \times 100}{37.5} = Rs 200.
Choice (3)

24. Given 75 per cent of \frac{5x}{4} = 25 per cent of 144 = 24; \frac{75}{100} \times \frac{5x}{4} = \frac{144}{24} \Rightarrow x = 64; 25 per cent of 64 = 16
Choice (2)

25. The numbers that end in 4 or 6 have the last digit 6 in their squares. The number of such cases from 1 to 60 are 12. The required percentage = \frac{12}{60} \times 100 = 20 per cent
Choice (2)

26. Let the initial price be Rs x; Price after increase = Rs 1.3x
Decrease in price = Rs 0.26x; Price after decrease = Rs 1.04x
2nd increase in price = Rs 0.416x; Final price = Rs 1.456x; 1.456x = 2912 \Rightarrow x = 2000
Choice (3)

27. Let the required number of matches be x.
The number of matches won by the team = 90 per cent of 40 = 36
The required success rate = 80 per cent
∴ \frac{36+x}{90} \times 100 = 80; \Rightarrow \frac{36+x}{90} = \frac{4}{5}
⇒ 36 + x = 72 \Rightarrow x = 36; \:
∴ It has to win 36 more matches from the remaining matches.
Choice (4)

28. Let the number of cows in the farm be x;
\frac{60}{100} \times x = \text{hens} = \frac{5}{3}x; \frac{8}{3}x = 48
⇒ x = 18
Choice (2)

29. Let Krishna’s original income be Rs 100x.
His original expenditure = Rs 70x. Given 70x = 17,500 \Rightarrow x = 250
Krishna’s new income = Rs 120x; His new expenditure = 70x + 7x = Rs 77x
his new savings = 120x – 77x = Rs 43x = 43 \times 250 = Rs 10,750.
Choice (3)

30. Difference of the population between 3rd year and 2nd year = \frac{1000000000}{100} – \frac{1000000000}{100} = 12,80,000
Choice (2)

31. Since Mandara spends 20 per cent towards rent, remaining income = 80 per cent.
Amount spent towards food = 75 per cent of 80 per cent; \frac{80}{100} \times \frac{75}{100} = \frac{90}{100} \times \frac{72}{100} \times x = 97,200 where x is the total salary \Rightarrow x = Rs 2,50,000
Choice (4)

32. Girls passed = 70 per cent of Total Girls
∴ 42 = 70 per cent of Total Girls \Rightarrow Total Girls = 60; Boys failed = 4 (Girls passed) = 168;
Boys failed = 40 per cent of Total Boys; 168 = 40 per cent of Total Boys \Rightarrow Total Boys = 420
Total number of students = 60 + 420 = 480
Choice (3)

33. In 2005, let Roberts income, expenditure and savings be Rs 100x, Rs 36000 and Rs 50x.
In 2006, let his income, expenditure and savings be Rs 100y, Rs 7200 Choice (2)

34. Expenditure of X = Rs 36000; Savings be Rs 100x, Rs 60y and Rs 50x.
Given 30 per cent of x – 30 per cent of 30 = 30
⇒ \frac{30}{100} \times \frac{30}{100} \times 30 = 30 \Rightarrow x = 130;
130 per cent of x = \frac{130}{100} \times 130 = 169
Choice (3)

35. Let A = 2B = 3C = 4D = 5E = k
The required percentage = \frac{3}{k} \times 100 per cent = \frac{3}{5} per cent
Choice (2)

36. Expenditure = Rs 60000; Savings be Rs 18000, Rs 8000 and Rs 12000.
Given 140 per cent of x = 140 per cent of 140 = 140
⇒ x = 100
Choice (3)

37. Let initial salary of A, B, C and D be Rs 2000, Rs 950, Rs 750 and Rs 600 respectively.
A’s salary after hike = \frac{110}{100} \times 2000 = 119.90;
B’s salary = \frac{111}{100} \times 950 = 119.88;
C’s salary = \frac{112}{100} \times 750 = 119.84; D’s salary = \frac{113}{100} \times 600 = 119.78;
∴ D got the least hike.
Choice (4)

38. Given 30 per cent of x – 30 per cent of 30 = 30
⇒ \frac{30}{100} \times \frac{30}{100} \times 30 = 30 \Rightarrow x = 130;
130 per cent of x = \frac{130}{100} \times 130 = 169
Choice (3)

39. Let A = 2B = 3C = 4D = 5E = k
The required percentage = \frac{3}{k} \times 100 per cent = \frac{3}{5} per cent
Choice (2)

40. Let the length and the breadth be 100 m each initially. Increase in length = 40 m; New length = 140 m. Decrease in breadth = 20 m; New breadth = 80 m
Original area = 10000 m²; Final area = 11200 m²
Percentage increase in the area = \frac{11200 – 10000}{10000} \times 100 = 12 per cent
Choice (2)

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**PROFIT AND LOSS**

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**Practice Exercise**

**Solutions for questions 1 to 40:**

1. C.P. = S.P. \times \frac{100}{(100 + P)} = \frac{840 \times 100}{(100 + 20)} = Rs 700
Choice (2)

2. Let the cost price of the article be Rs C; C = 243 \Rightarrow C = Rs 324
The selling price of the article as to gain 25 per cent profit = 324 + \frac{25}{100} \times 324 = Rs 405
Choice (3)

3. Let the cost prices of two articles be Rs 100x and Rs 100y.
The selling prices of the two articles are Rs 120x and Rs 95y. Given that, 120x = 95y
⇒ \frac{x}{y} = \frac{95}{120} = \frac{19}{24}; Let x = 19k, y = 24k
CP₁ = 1900k, CP₂ = 2400k; Profit on first article = 380k and Loss on the second = 120k
Overall profit = 380k – 120k = 260k;
Overall profit percent = \frac{260k}{4300k} \times 100 = \frac{260}{43} = 6 per cent
Choice (2)
4. Let number of pens bought be LCM of 9, 6 = 18 pens 
∴ C.P of 18 pens = 10 \times 2 = Rs 20 
∴ S.P of 18 pens = 7 \times 3 = Rs 21 
∴ Gain percentage = \frac{100 \times 10}{21} = 5 \text{ per cent} \quad \text{Choice (2)}

5. Selling price of each article = Rs \frac{7}{6}; Selling price of 20 articles = 20 \times \frac{7}{6} = Rs \frac{70}{3} 
CP = 18; SP = \frac{70}{3}; Profit percent = \frac{\frac{70}{3} - 18}{100} \times 100 \equiv 30 \text{ per cent} \quad \text{Choice (1)}

Let C.P of 1 article be Rs 1
∴ S.P of 10 = Rs 11; ∴ S.P of 1 article = Rs 1.1
∴ Gain percentage = \left(\frac{1.1 - 1}{1}\right) \times 100 = 10 \text{ per cent} \quad \text{Choice (1)}

7. Let the C.P be Rs 100x. Due to under valuation \frac{75}{100} (SP) = 120x ⇒ SP = Rs 160x
If it is over valued by 25 per cent; SP = \frac{125}{100} \times 160 \times = Rs 200x; Profit = Rs 100x; 
CP = Rs 100x; 
Profit is 100 per cent. \quad \text{Choice (1)}

8. Cost per dozen = x/12, S.P per dozen = x/6; Profit percentage = \frac{\frac{x}{6} - x/12}{x/12} \times 100 = 100 \text{ per cent} \quad \text{Choice (2)}

9. Overall gain = 20 per cent of 30 = Rs 6. 
Selling price of 80 per cent of fruits = Rs 36; Selling price per kg = \frac{36}{80} \times 100 = Rs 45
\quad \text{Choice (4)}

10. Cost = 90000 + 30000 = Rs 120000, After Depreciation cost = \frac{75}{100} \times 120000 = Rs 90000; 
SP = Rs 1,00,000 
∴ Profit = 10000, percentage of profit per cent = (10000/90000) \times 100 = 11.11 \text{ per cent} \quad \text{Choice (3)}

11. Let the C.P be Rs 100. Given that, \frac{3}{4} \times SP = (100 - 19) ⇒ SP = 108 
\frac{2}{3} (SP) = 72; Loss incurred on A and B = \frac{3}{4} \times 28 = 47 
In order to gain 10 per cent on the whole, on each of the three articles there should be 10 per cent gain. that is, 3 \times 10 = 30 
And the loss of 47 has to be recovered. Overall gain should be 30 + 47 = 77 
C should be sold at 77 per cent gain. \quad \text{Choice (4)}

12. MP = 360, S.P. = 288, Loss = 4 per cent. 
∴ C.P = 300 
∴ Marked up percentage = 60/300 \times 100 = 20 \text{ per cent} \quad \text{Choice (1)}

13. Let the C.P be Rs 100x. SP = 65x = 1755 
⇒ 100x = \frac{65}{1755} \times 1755; ∴ CP = Rs 2700 
In order to recover the loss, the second article should be sold at Rs 945 more than 
Rs 2700 = 2700 + 945 = Rs 3645. B selling price is more than A by \frac{3645 - 1755}{1755} \times 100 = 107.4 \text{ per cent} \quad \text{Choice (3)}

14. Let cost price be Rs 100 ⇒ S.P = 114.75 = M.P(0.85) = 0.9 
M.P. = \frac{11475 \times 10}{85 \times 9} = Rs 150 ⇒ Mark up 
percentage = 50 \text{ per cent} \quad \text{Choice (3)}

15. Let the original cost price be Rs 100x. 
Original SP = Rs 110x. New CP = Rs 90x 
New SP = 90x + \frac{1}{6} (90x) = 105x; 
But 105x = 110x - 20 ⇒ x = 4 
Original CP = Rs 100x = Rs 400 
Choice (3)

16. 10 per cent loss + 7 per cent profit = Rs 85 
⇒ 17 per cent of C.P. = Rs 85 ⇒ CP = Rs 500 
Choice (1)

17. Cost price of the article for Ramesh = 500 \times \frac{85}{100} \times \frac{75}{100} = Rs 3187.50 
Cost price of the article that Mohit purchased = 5000 \times \frac{90}{100} \times \frac{85}{100} = Rs 3251.25 
The required difference = 3251.25 - 3187.50 = Rs 63.75 
Choice (2)

18. CP = Rs 100; Loss = 10 per cent; 
∴ SP = Rs 90; 3/4 (Actual SP) = 90; 
∴ Actual SP = Rs 120 
Profit percentage = \frac{[120 - 100]}{100} \times 100 = 20 \text{ per cent} \quad \text{Choice (3)}

19. Let the cost price of the article be Rs 100. 
Marked price = 100 + 40 = Rs 140; 
Selling price = 100 + 12 = Rs 112 
Discount percent = \frac{140 - 112}{140} \times 100 = \frac{28}{140} \times 100 = 20 \text{ per cent} 
If the article is marked 50 per cent above the C.P., then MP = 150. 
SP = 150 \times \frac{80}{100} = 120; Profit = 120 - 100 = 20 \text{ per cent} \quad \text{Choice (4)}

20. Let the marked price and cost price of the article be Rs m and Rs c respectively 
⇒ m \left(1 - \frac{3}{10}\right) = 840 \quad \text{(given)} \Rightarrow m \left(1 - \frac{3}{6}\right) = 840 
\Rightarrow m = 1008 \Rightarrow c (1 + \frac{50}{100}) = m = 1008 
(given) \Rightarrow c = Rs 672 \quad \text{Choice (1)}

21. Let the marked price fixed by Amarendra be Rs 100. 
SP = Rs 80. Cost price = \frac{80}{1.25} = Rs 64. 
Cost price for Parmesh and Amarendra.
∴ CP = Rs 80; Selling price for Parmesh = Rs 80\left(\frac{1}{2}\right) = Rs 96 
Cost price for Maninder = Rs 96. The required percentage = \frac{96 - 64}{64} \times 100 = 50 \text{ per cent} \quad \text{Choice (1)}

22. Let the cost price of the article A and B be Rs x and Rs \(6000 - x\) given 20 per cent of article A = 40 per cent of article B. 
∴ \frac{20}{100} \times x = \frac{40}{100} (6000 - x) ⇒ x = Rs 4000 
Choice (3)

23. SP of walkman = Rs 810; Loss per cent = 10 per cent 
90 per cent of CP = 810 ⇒ CP = Rs 900; 
Gain per cent = 10 per cent \∴ SP = 110 \text{ per cent of } 900 = Rs 990 
Choice (2)

24. 25 dozen at Rs 12 per dozen ⇒ Total cost price Rs 300 
Sales : 10 dozen at Rs 18/dozen = Rs 180 
As 3 dozen are rotten, remaining 12 dozens at Rs 1.25 per banana. 12 dozen at (1.25 \times 12) = Rs 180; Total = Rs 360. 
Profit percentage = \frac{360 - 300}{300} \times 100 = 20 \text{ per cent} \quad \text{Choice (4)}

25. Let the cost of each article be Rs x. Cost of 25 articles = Rs 25x. 
SP of 25 articles = \left(1 + \frac{2}{3}\right) \times 25x = \frac{5}{3} \times 25x = \frac{125x}{3} 
When the remaining 15 articles are sold, there is a loss, which is equal to the SP of 10 articles. 
CP of 15 articles – SP of 15 articles = SP of 10 articles. CP of 15 articles = SP of 25 articles. 
CP of 15 articles = Rs 15x, SP of 25 articles = Rs 15x.
SP of 15 articles = \( \frac{15}{25} \times 15x = 9x \); CP of 40 articles = Rs 25x + Rs 15x = Rs 40x

SP of 40 articles = Rs \( \frac{125x}{3} \) + 9x = \( \frac{152x}{3} \); Overall profit = \( \frac{152x}{3} \) - 40x = \( \frac{32x}{3} \)

Overall profit percent = \( \frac{\frac{32x}{3} \times 100}{x} = \frac{32x \times 100}{3x} = \frac{32x}{3} = 10.67 \text{ per cent} \) Choice (1)

26. Let CP be Rs 100. MP = 130;
Credit SP = 90/100 \times 130 = 117; Cash SP = 90/100 \times 117 = 105.3; x = 100 \times 106/5.3 = 2000
CP of the product is Rs 2000 Choice (1)

27. Let the C.P of 1 gm of goods be = Re.1
Total C.P of 960 gm = Rs 960; Total of S.P of 960 gm = Rs 1000
Gain percentage = \( \frac{960 - 900}{900} \times 100 = \frac{60}{900} \times 100 = \frac{6}{9} \times 100 = 6.67 \text{ per cent} \) Choice (3)

28. Let SP be Rs 100. Profit percentage = 25 per cent
P = Rs 25 \( \Rightarrow \) CP = Rs 100 - 25 = Rs 75; His correct profit percentage = \( \frac{25}{75} \times 100 = 33\frac{1}{3} \text{ per cent} \) Choice (3)

29. Cost of 25 kg of sugar = 25 \times 35 = Rs 875
Cost of 15 kg of sugar = 15 \times 15 = Rs 225; C.P. per kg of mixture = \( \frac{875 + 225}{25 + 15} = \frac{1100}{40} = Rs 27.5 \)
Required selling price = 130 per cent of 27.5 = \( \frac{130}{100} \times 27.5; \) S.P of each kg of sugar = Rs 35.75 Choice (3)

30. Cost price = \( \frac{6.30 \times 100}{90} = Rs 7, \) S.P. = 7 \times 1.2 = Rs 8.4, M.P. = \( \frac{8.4 (100)}{84} = Rs 10 \) Choice (3)

31. Let the total number of apples be 90. The number of apples are sold at a gain of 20 per cent \( \frac{1}{3} \times 90 = 30 \)
Let the CP of one apple be Rs 1. CP of 30 apples = Rs 30
SP of 30 apples = Rs 36 (\( : \) gain = 20 per cent of 30); The number of apples sold at 20 per cent loss = \( \frac{1}{3} \times 90 = 30 \)
For the next 30 apples, CP = Rs 30, SP = Rs 24
For the next 30 apples, as the apples are spoiled CP = Rs 30; SP = Rs 0. Total CP = Rs 90;
Total SP = Rs 60; Loss per cent = \( \frac{30}{90} \times 100 \text{ per cent} \) Choice (3)

32. Let the CP be Rs 100. MP = 150; SP = Rs 135 (at 10 per cent discount).
The difference of Rs 15 is equal to Rs 100.
The difference of Rs 105 = \( \frac{105}{100} \times 100 = Rs 105; \) CP = Rs 700 Choice (2)

33. Let the SP of each article be Rs 1.
SP of 25 articles is Rs 25; Gain = S.P of 5 articles = Rs 5; CP of 25 articles is Rs 20
Profit percent = \( \frac{5}{20} \times 100 = 25 \text{ per cent} \) Choice (2)

34. Let the cost prices of articles A and B be a and b respectively. Given, 125 per cent of a + 87.5 per cent of b = 12000 \( \rightarrow \) (1)
and b respectively. Given, 125 per cent of a + 87.5 per cent of b = 12000 \( \rightarrow \) (2)
Solving (1) and (2), we have b = Rs 8000 Choice (3)

35. Let the marked price be Rs 100; SP after three successive discounts = \( \frac{95}{100} \times \frac{90}{100} \times \frac{85}{100} = Rs 72.675 \)
Selling price after single discount of 30 per cent = Rs 70
Given that 2.675 per cent of M.P. = Rs 149.80;
M.P. = \( \frac{149.80 \times 100}{2.675} = Rs 5600. \) Choice (2)

36. Let the cost price = Rs 100; . . . M.P = Rs 160
Given discount percentages are 20 and 10
\( . . . \) Selling price = \( \frac{160 \times 80}{100} \times \frac{90}{100} = Rs 115.20 \)
Profit percentage = \( \frac{115.20}{100} \times 100 = 15.2 \text{ per cent} \) Choice (2)

37. Let he can buy x articles each of Rs 50. Total cost price = Rs 50x. Discount = 40 per cent of 50x.
50x - \( \frac{40}{100} \times 50x = 2000 \Rightarrow x = 66.66 \)
\( . . . \) At the maximum he can buy 66 articles. Choice (3)

38. Loss percentage = 20/100 = 4 per cent loss Choice (4)

39. Selling price = \( 250 \times \frac{100 - x}{100} \times \frac{100 - x}{100} = \frac{(100 - x)^2}{40} \)
\( \Rightarrow 250 \times \frac{(100 - x)^2}{40} \text{ Discount} = MP - SP = 97.9 \)
\( \Rightarrow x = 22 \text{ per cent} \) Choice (4)

40. C.P. = 360 \times 100/90 = Rs 400, S.P. = 550 - 550/11 = Rs 500 (91/11 per cent Discount)
Profit percentage = (500 - 400)/400 \times 100 = 25 per cent Choice (3)

**PARTNERSHIPS**

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Solutions for questions 1 to 25:

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1. Ratio of Profits = 5 \times 4 : 6 \times 5 : 8 \times 6 = 10 : 15 : 24; Given that 24x = 8880 \( \Rightarrow \) 5x = \( \frac{8880}{24} = Rs 366.66 \) Choice (4)

2. A’s Share = (6/21) \times 6300 = Rs 1800; B’s Share = (7/21) \times 6300 = Rs 2100; C’s Share = (8/21) \times 6300 = Rs 2400 Choice (4)

Net profit = Total profit - Total expenses = Rs 5,13,200 - Rs (9 \times 5000) = Rs 4,68,200
Nagnadh’s share of profit = \( \frac{1150}{2341} \times 468200 = Rs 2,30,000 \)
Total income of Nagnadh = 2,30,000 + 45,000 = Rs 2,75,000 Choice (3)

4. (6 : 5 : 4) \times (x : y : z) = 4 : 5 : 8; Ratio of time periods = 4/6 : 5/5 : 8/4
(2/3) : 1 = 2 : 3 : 6; \( \therefore x : y : z = 2 : 3 : 6 \) Choice (3)

5. The total investment of Sainath for the 1st year = 5,000 + 45,000 + 45,000 + 45,000 = 1,00,000;
The total investment of Sekar for the first year = 1,00,000 + 95,000 + 90,000 + 45,000 = 1,18,500
The total investment of Sekar for the first year = 5,000 + 10,000 + 45,000 + 45,000 = 1,10,000
The total investment of Sekar for the 1st year = 5,000 + 45,000 + 45,000 = Rs 87,000 Choice (3)
Ratio of investments = 87 : 123 = 29 : 41;  
Share of profit of Sainath = \( \frac{29}{70} \times 140000 \)  
= Rs 58000  
Choice (4)

6.  
10000 × 12 = 15000 × x  
⇒ x = 8  
∴ Ajay left the business after 8 months.  
Choice (4)

7.  
Shyam’s profit share = \( \frac{4}{9} \) (81000) = Rs 36000.  
Shyam’s profit share if his salary is excluded = \( \frac{3}{5} \) (45000) = Rs 27000.  
Shyam’s salary = 36000 – 27000 = Rs 9000.  
Choice (4)

8.  
Given P, Q and R’s capital ratio = 3 : 2 : 4  
and Pavan = 24000 – 4800 = Rs 19200  
∴ The share of Q = \( \frac{5}{14} \) (12.6) lacs = 0.45 lacs = Rs 45000  
Choice (2)

9.  
Y withdrew an amount of Rs 2000 from his investment after 6 months. ⇒ His investment is Rs 8000 for 6 months and Rs 6000 for remaining 6 months. Also given, Z joined the business after 6 months with an investment of Rs 6000;  
Ratio of their investments = \([12 \times 5000]\) : \([6000 \times 6]\) : \([6000 \times 6]\) = 60 : 84 : 36 = 5 : 7 : 3  
∴ Y’s share = \( \frac{7}{15} \times 9615 \) = Rs 44871  
Choice (3)

10.  
The ratio in which Chiru and Pavan share the profits is 1 : 1;  
Let the total profit be Rs x  
\( \frac{20}{100} \) (x) = 4800 (given) ⇒ x = Rs 24000;  
The profit that is to be shared between Chiru and Pavan = 24000 – 4800 = Rs 19200  
∴ The difference in the shares of the profits of Chiru and Pavan = \( \left( \frac{3}{4} - \frac{1}{4} \right) \times 19200 \)  
= Rs 9600  
Choice (3)

11.  
Given that, Investment made by Subash = 9 (x) = Rs 9x  
Investment made by Harsha = 12 (y) = Rs 12y;  
profits earned are equal ⇒ investments must be equal ⇒ 9x = 12y  
⇒ \( \frac{x}{y} = \frac{12}{9} \)  
⇒ x : y = 4 : 3  
Choice (3)

12.  
Let the investments of P, Q and R be Rs (x – 9) lacs, Rs (x – 3) lacs and Rs x lacs  
Given, x – 9 + x – 3 + x = 42 ⇒ x = 18 lacs  
∴ The ratio in which P, Q and R share the total profit is (x – 9) : (x – 3) : x = (18 – 9) : (18 – 3) : 18  
= 9 : 15 : 18 = 3 : 5 : 6  
\( \times \) The share of Q = \( \frac{5}{14} \) (1.26) lacs = 0.45 lacs = Rs 45000  
Choice (2)

13.  
Y withdrew an amount of Rs 2000 from his investment after 6 months. ⇒ His investment is Rs 8000 for 6 months and Rs 6000 for remaining 6 months. Also given, Z joined the business after 6 months with an investment of Rs 6000;  
Ratio of their investments = \([12 \times 5000]\) : \([6000 \times 6]\) : \([6000 \times 6]\) = 60 : 84 : 36 = 5 : 7 : 3  
∴ Y’s share = \( \frac{7}{15} \times 9615 \) = Rs 44871  
Choice (3)

14.  
The share of Bal is 1/3 of total profit as he invested 1/3 of capital. So Bal’s share = \( \frac{1}{3} \times 75000 \) = Rs 25000  
Choice (2)

15.  
Market value of 1 share = Rs (25 + 20) = Rs 45;  
Income from 1 share = 20 per cent of 25 = Rs 5  
Number of shares to be bought to get Rs 1200 income = \( \frac{1200}{5} \) = 240;  
∴ Amount to be invested = Number of shares × Market value of 1 share = 240 × 30 = Rs 7200  
Choice (3)

16.  
50000 × 12 : 60000 × (12 – x) : 70000 (12 – x) = 20 : 18 : 21;  
Simplifying \[50000 \times 12: 60000 \times (12-x): 70000 \times (12-x)\]  
⇒ x = 3  
Choice (2)

17.  
Let Tushar’s rate of return be \( r_1 \) per cent p.a.  
and Bhupesh rate of return be \( r_2 \) per cent.  
r_1 = 100 × 900/15000 = 6 per cent  
r_2 > r_1, Bhupesh’s investment is better.  
Choice (2)

18.  
Let the total profit be Rs x  
\( \frac{20}{100} \) (x) = 4800 (given) ⇒ x = Rs 24000;  
The profit that is to be shared between Chiru and Pavan = 24000 – 4800 = Rs 19200  
∴ The difference in the shares of the profits of Chiru and Pavan = \( \left( \frac{3}{4} - \frac{1}{4} \right) \times 19200 \)  
= Rs 9600  
Choice (3)

19.  
Face value of 1 share = Rs 100;  
Market value of 1 share = Rs (100 + 15 per cent of 100) = Rs 115  
Face value × dividend rate = Market value × Rate of return ⇒ 100 × x = 115 × 10  
⇒ x = 11.5 per cent  
Choice (4)

20.  
A’s total investment = 50000 × 6 + 60000 × 6 = Rs 660000  
B’s total investment = 50000 × 6 + 60000 × 6 = Rs 660000  
Ratio of profits = 660000 : 660000 = 1 : 1  
Choice (2)

21.  
We have, Face value × Rate of dividend = Market value × Rate of return.  
Let market value be Rs x  
\( \Rightarrow 100 \times 12 \times x \times 15 \Rightarrow x = \frac{100 \times 12}{15} = 80 \)  
Choice (2)

22.  
x investment for four quarters = 1000 + 3000 + 5000 + 7000 = Rs 16000;  
y investment for four quarters = 4000 + 3000 + 2000 + 1000 = Rs 10000;  
Ratio of investment of x and y is 16000 : 10000 = 8 : 5  
x’s share = 8/13 × 39000 = Rs 24000;  
y’s share = 5/13 × 39000 = Rs 15000  
Choice (3)

23.  
Face value of 1 share = Rs 100;  
Dividend = 12 per cent  
⇒ Income from 1 share = Rs 12  
∴ Total income from 140 share = Rs 140 × 12 = Rs 1680  
Choice (1)

24.  
Profit after salary and commission = 87000 – 12000 – 7500 = Rs 67500  
Ratio of incomes of earth, moon and sun = 3 : 5 : 7  
Moon’s share in the profit of Rs 67500 = \( \frac{5}{15} \times 67500 \) = Rs 22500  
Income of Moon = 22500 + 7500 = Rs 30,000  
Choice (4)

25.  
We have, Face value × Rate of dividend = Market value × Rate of return;  
Let rate of return be \( r \) per cent p.a.  
Market value = \( \left( \frac{100 + 60}{100} \right) = Rs 160 \)  
⇒ 100 × 12 = 160 × \( r \) ⇒ \( r \) = 7.5 per cent  
Choice (2)
5. Let the sum borrowed be Rs n.
   Rate of interest = \( \frac{25}{4} \) per cent
   Let the time be n years \( \Rightarrow 2 = \left( \frac{17}{16} \right)^n \)
   \( \Rightarrow \) Interest is \( 2x - x = x \)
   \( \therefore x = \frac{25n \times x}{400} \Rightarrow n = 16 \)  Choice (1)

6. (Interest at 16 per cent) – (Interest at 12 per cent) = 500
   \[ \frac{P \times 2 \times 16}{100} - \frac{P \times 2 \times 12}{100} = 500 \]
   \[ \Rightarrow \frac{P \times 2 \times 4}{100} = 500 \Rightarrow \frac{P \times 50}{4} = Rs 6250 \]  Choice (3)

7. Let the sum borrowed be Rs x. Let rate of interest = number of years be n.
   Interest for n years is \( \frac{9}{16} x \)
   \( \therefore \frac{9}{16} \times \frac{x \times x \times x}{100} \Rightarrow x = \frac{15}{2} = 7 \frac{1}{2} \)  Choice (1)

8. Let each instalment be Rs 100. Present values of Rs 100 each at the end of the 1st, 2nd and 3rd years will be equal to Rs 120, Rs 110 and Rs 100 respectively. Annual instalment of 100 discharges a debt of Rs 330. Annual instalment of \( x \) discharges debt of Rs 1650.
   \( \therefore x = 1650 \times 100/330 = Rs 500 \)  Choice (1)

9. Interest paid at the end of the five years = \( \frac{10}{100} \times 2,00,000+\frac{10}{100} \times (1,80,000)+\frac{10}{100} \times (1,40,000)+\frac{10}{100} \times (1,20,000) = Rs 80,000 \)  Choice (3)

10. \( P = \frac{1 \times 100}{N \times R} \times 1050 \times 100 \Rightarrow P = 1000. \)
    \( \therefore \) Rs 1000 will fetch an interest of Rs 1050  Choice (2)

11. Let the rate of simple interest be R per cent p.a. Let the sum be Rs p. Let the required time be t yearRs
    \[ 2p - p = p \left( \frac{R}{100} \right) (10) \Rightarrow R = 10; \]
    \[ 3p - p = p \left( \frac{R}{100} \right) \times t \Rightarrow t = 20 \)  Choice (4)

12. Let each instalment be Rs 100. Present values of Rs 100 each at the end of the 1st, 2nd and 3rd years will be equal to Rs 120, Rs 110 and Rs 100 respectively. An annual payment of 100 discharges a debt of Rs 460. What annual payment discharges a debt of Rs 2300; Annual payment = \( (2300/460) \times 100 = 500 \)  Choice (3)

13. Let the sum be Rs \( x \).
    \( S_{11} = \frac{x \times 3 \times 6}{100} = 18x \)
    \( S_{12} = \frac{x \times 3 \times 8}{100} = 24x \)
    \( \frac{500}{6} = 12500 \)  Choice (3)

14. Given that \( S_{12} - S_{11} = 750 \Rightarrow 24x - 18x = 750 \Rightarrow 6x = 750 \Rightarrow x = \frac{750 \times 100}{6} = 12500 \)

15. Total amount \( A = P \left[ 1 + \frac{R}{100} \times T \right] = \frac{50000}{100} \left[ 1 + \frac{3 \times 10}{100} + \frac{2 \times 5}{100} + \frac{3 \times 8}{100} \right] = Rs 82000. \)  Choice (1)

16. \( P \) becomes 2P in 9 years. 2P becomes 4P in another 9 years. 4P becomes 8P in another 9 years. 8P becomes 16P in another 9 years. \( \therefore P \) becomes 16 times in 36 years.  Choice (4)

17. Cost price of scooter = Rs 25000;
    Down payment = Rs 9600; Balance = Rs 15400
    Let Rate of interest be = x per cent
    From shopkeeper’s side, total value = \( 15400 + 15400 \times \frac{10}{12} \times \frac{x}{100} \)
    \( 15400 + 15400 \times \frac{10}{12} \times \frac{x}{100} = 15400 + 15400 \times \frac{x}{12} \Rightarrow (1) \)
    From Buyer’s side, total value = \( 1650 \times 10 + 1650 \times \frac{x}{12} \times \frac{1}{100} \times 45 = 16500 + 1650 \times \frac{3}{8} \Rightarrow (2) \)
    Equating (1) and (2), \( 16500 + \frac{165 \times 3x}{8} = 15400 + 15400 \times \frac{x}{12} \Rightarrow x = 15.6 \)  per cent

18. Let the sum be 100. 5 per cents at the end of 1st year Rs 100 amounts to Rs 105 6 per cents at the end of 2nd year Rs 105 amounts to Rs 111.3 10 per cents at the end of 3rd year Rs 111.3 amounts to Rs 122.43 100 amounts to Rs 122.43. \( ? \) amounts to Rs 12243 \( \Rightarrow x = \frac{12243}{122.43} \times 100 \Rightarrow 10000 \)  Choice (1)

19. Let \( x \) be the amount paid at the end of the third year.
    \( 25,000(1.3) = 10,000(1.2) + 10,000(1.1) + x \Rightarrow x = Rs 9500. \)  Choice (3)

20. Let principal be Rs 100; \( 100 \times 1 \times 10/100 = 10 \) (Interest for 1st six months).
    \( 110 \times 1 \times 1/100 = 11 \) (Interest for 2nd six months); Total interest = \( 10 + 11 = 21 \)  Choice (1)

21. The sum borrowed by Raju = Rs 15,000;
    After 3 years, Raju has to pay an amount equal to \( 15000 \left( 1 + \frac{3 \times 15}{100} \right) = Rs 21750 \)
    Interest gained by Mahesh = \( 21750 - 15000 = Rs 6750 \)
    Let the sum lent by Raju at 20 per cent p.a. be Rs \( x \). Then the sum lent at 12 per cent p.a. would be Rs \( (15000 - x) \);
    \( \frac{x \times 20 \times 3}{100} + (15000 - x) \times 12 \times 3 \times 100 = 6750 \Rightarrow x = 5625 \)  Choice (1)

22. Interest = 12 per cent per year; Interest per quarter = \( \frac{12}{4} = 3 \) per cent; Interest for 2 quarters or six months = \( 3 \) per cent + \( 3 \) per cent + 3 per cent = 3 per cent of 3 per cent = 6 + 0.09 per cent = 6.09 per cent
    6.09 per cent of 5000 = \( \frac{6.09 \times 5000}{100} = Rs 304.50 \)  Choice (3)

23. \( \frac{P \times R \times T}{100} = 2P \Rightarrow R \times T = 2 \Rightarrow R = \frac{200}{15} = 131/3 \) per cent  Choice (3)

24. Difference between second and third years interest = \( 216 \Rightarrow 216 \) interest on Rs 1440 for 1 year
    \( 216 = \frac{1440 \times r}{100} \Rightarrow r = 15 \) per cent  Choice (3)

25. Let the rate of interest be R per cent p.a.
    Extra simple interest = \( (10000) \left( \frac{R}{100} \right) \)
    \( 2) = 2000 \Rightarrow R = 10 \)  Choice (3)

26. SI for 1 year at 4.5 per cent p.a. = \( \frac{50000 \times 4.5}{100} = Rs 2250; C.I per annum \)
    = 4 per cent; C.I. every six months = \( 4/2 = 2 \) per cent
    Total C.I. for the period = 2 per cent + 2 per cent + 2 per cent = \( 2 \times 4.04 \) per cent
    \( C.I \) for 1 year compounded every 6 months = \( \frac{50000 \times 1 \times (4.04)}{100} = Rs 2020 \)
    B loses 2250 – 2020 = Rs 230  Choice (1)
27. Let the difference be R per cent; (2000) 
   \( P \left( \frac{R}{100} \right) = 20 \Rightarrow R = 0.5 \) Choice (1)

28. Let the Individual shares of X & Y be x and y.
   \( x_1(1 + 4/100)5 = y(1 + 4/100)3 \)
   \( x = 13010 \times 625/1301 = 6250 \)
   \( y = 13010 \times 676/1301 = 6760 \) Choice (2)

29. We have, \( T = 37.25 \times 25 \times \frac{10}{30/2009} = 1.25 \) 

30. Let Rs 100 be principal. Interest for half-year = 5 per cent.
    \( A = 100(1 + 5/100)2 = Rs 105.25 \)

31. \( 2315.25 = 2000 \left( 1 + \frac{R}{100} \right) \Rightarrow R = 5 \) per cent Choice (3)

32. A's interest = \( \frac{PTR}{100} = \frac{5840 \times 3 \times 1}{100} = Rs 1752 \)

33. Let the sum borrowed be Rs x. 31,360 = \( x \left( 1 + \frac{R}{100} \right)^2 \) \( \Rightarrow \frac{31360}{31636} = \frac{1 + R}{100} \)
    \( R = 12 \) per cent

34. Let the sum be Rs p. Let the rate of interest be R per cent p.a.
    \( P \left( 1 + \frac{R}{100} \right)^2 = 4320 \Rightarrow (1); \)
    \( P \left( 1 + \frac{R + 10}{100} \right)^2 = 5070 \Rightarrow (2) \)

35. \( P = 80,000; R = 7 \) per cent p.a. Amount at the end of first year, \( 80000 \left( 1 + \frac{7}{100} \right) = Rs 85600 \)
    Amount paid = Rs 15000; Balance = Rs 30250

36. \( P = 12800 \left( 1 + \frac{25}{100} \right)^2 = 12800 \left( 1 + \frac{25}{100} \right)^2 = Rs 12800 \)
    Total interest for first two years = \( 12800 \left( 1 + \frac{25}{100} \right)^2 - 12800 = Rs 7200 \)

38. Let R be the sum invested at C.I be Rs x
   \( \therefore Phase = x \left( 1 + \frac{10}{100} \right) = x + \frac{121}{100} = 1.21x \)
   Let the sum invested at simple interest be y.
   Amount received after 2 years at 10 per cent = \( y + \frac{20}{100} \times y = 1.2y \)
   It is given that the amounts he received from both the places are equal.
   \( \therefore 1.21x = 1.2y \Rightarrow \frac{x}{y} = \frac{1.2}{1.21} \)

39. Amount after 2 years = \( 25,000 \left( 1 + \frac{10}{100} \right)^2 \)
    = Rs 30250
    Amount paid = Rs 15000; Balance = Rs 15250
    Amount to be paid to clear the loan = \( 15,250 \left( 1.1 \right)^2 = 12525 \times 1.21 = Rs 18,452.50 \)

40. \( I = \frac{9}{16} P \; A = \text{principal} + \text{Interest} = P + \frac{9}{16} P = \frac{25}{16} P \)
    \( A = P \left( 1 + \frac{r}{100} \right)^3 \) \( \Rightarrow \frac{25}{16} P = P \left( 1 + \frac{r}{100} \right)^3 \)
    \( \Rightarrow 1 + \frac{r}{100} = \frac{25}{16} \Rightarrow r = 25 \) per cent p.a.

### Numbers

#### Practice Exercise

**Solutions for questions 1 to 30:**

1. \( 2562 + 1442 + 2 \times 256 \times 144 - 256 \times 144 = \left( 256 + 144 \right)^2 - \left( 16 \times 12 \right)^2 = 66000 - 36864 = 123136 \) Choice (1)

<table>
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<tr>
<th>Number</th>
<th>Sum of odd place digits (1)</th>
<th>Sum of even place digits (2)</th>
<th>Difference between the sums (1) and (2)</th>
<th>No. to be added to make it divisible by 11.</th>
<th>Choice</th>
</tr>
</thead>
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<tr>
<td>(a)</td>
<td>35126</td>
<td>10</td>
<td>3</td>
<td>8</td>
<td>(3)</td>
</tr>
<tr>
<td>(b)</td>
<td>256345</td>
<td>13</td>
<td>12</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>
3. 53 is a prime number. \[ \therefore \] All numbers between 67 and 87 are co prime to 53. Choice (2)

4. (a) \[ x^2 - y^2 \] is always divisible by \( x - y \). Hence \( 9^2 - 1 \) is always divisible by 8 (= \( 9 - 1 \)), for all values of \( n \). Choice (3)

(b) \[ x^2 + y^2 \] is divisible by \( x + y \), when \( n \) is odd.

(c) \[ x^2 - y^2 \] is divisible by \( x + y \), when \( n \) is even.

5. The given number is divisible by both 16 and 3.

6. odd, when divided by 8, remainder is 3

7. All perfect squares have an odd number of factors. There are 9 positive perfect squares less than 100. Choice (1)

8. \[ \frac{2^{87}}{9} = \frac{(2^3)^{\frac{87}{3}}}{9} \]

Let \( 23 = x \); By Remainder theorem, when \( x^n \) \((x + 1)\), remainder is \( f(-1) \)

\[ f(-1) = (-1)^n = -1 \Rightarrow -1 + 9 = 8 \text{ Choice (3)} \]

9. \[ \sum x = \frac{x(x + 1)}{2} \Rightarrow 120 = \frac{(15)(16)}{2} \]

210 = \( \frac{(20)(21)}{2} \); 465 = \( \frac{(30)(31)}{2} \); Choice (4) cannot be expressed in the form of \( \frac{x(x + 1)}{2} \). Choice (4)

10. By using pattern method when 21, 22, 23 and 24 are divided by 5, the remainders obtained are 2, 4, 3 and 1 respectively.

11. 576 = 242 = (23 \times 3)2 = 26 \times 32

(i) Number of different ways of expressing 576 as a product of two factors = \( \frac{1}{2} \) \[ \text{Number of factors of 576 + 1} \]

\[ \frac{1}{2} \cdot (6 + 1)(2 + 1) + 1 \]

Choice (2)

(ii) If the factors are distinct, number of ways = \( \frac{1}{2} \cdot (6 + 1)(2 + 1) - 1 \)

Choice (2)

12. \[ 6 \times 5 \times 3 \] Number = \[ (1 \times 5 + 1)6 + 1 \]

37. 1 1 1

37 when divided by 18 leaves the remainder 1. Choice (1)

13. Let \( a = 0.48 \), \( b = 0.42 \) and \( c = 0.4 \).

The required value is

\[ \frac{a^3 + b^3 + c^3 - 3abc}{a^2 + b^2 + c^2 - ab - bc - ca} = \left( \frac{a + b + c}{a^2 + b^2 + c^2 - ab - bc - ca} \right) = \frac{3}{1.3} \text{ Choice (2)} \]

14. 560 = 24 \times 51 \times 71. For a number to be a perfect square all the prime factors should have an even exponents. Hence multiply 24 \times 51 \times 71 to make the powers even. Hence 560 should be multiplied with 35\((= 5 \times 7)\) to make it a perfect square. Choice (3)

15. Let \( f(x) = x^{40} + kx^{39} + x^{38} + 2x^{37} - 2 \); \( f(x) \) is divisible by \( x - 1 \).

\( f(1) = 0 \)

\( f(1) = 1 + k = 0 \Rightarrow k = -1 \text{ Choice (2)} \)

16. (a) \[ 66 \times 435 + 66 \times 565 = 66 \times 1000 = 66000 \]

Choice (4)

(b) \[ (3 + 2 - 5 + 2) + (6/24 + 18/24 - 20/24 + 20/24) = 2 + 4/24 = 2 + 1 = 3 \]

Choice (2)

(c) \[ \frac{105}{3} \times \frac{9.1}{2.6} = 1.225 \text{ Choice (3)} \]

17. Units digit of 53427 \( 12345 = \) units digit of \( \frac{7^{(24)}}{12} \)

= units digit of \( 7^{(4)} \times 7^{(20/4)} = \) units digit of \( 7^4 = 7 \)

\( \therefore \) Powers of 7 follow a cycle of 4

Units digit of 7612 = units digit of \( 2^4 \)

As the power of 2 is divisible by 4, units digit of 7612 is 6.

\( \therefore \) Required units digit = 1. Choice (4)

18. \[ 0.479 = \frac{479}{990} = \frac{475}{990} = \frac{95}{198} \text{ Choice (3)} \]

19. Number of times the keys have to be pressed to type the single digit natural numbers = 9. Number of times the keys have to be pressed to type the two digit natural numbers = \( 90 \times 2 = 180 \).

There are 101 three-digit natural numbers. Number of times the keys have to be pressed to type the three digit natural numbers = \( 101 \times 3 = 303 \).

\( \therefore \) Total number of times the keys to be pressed = 492. Choice (3)

20. \[ 615 \times 925 \times 546 \]

Here 6 is an even number. Every number \times 5 \times 5 = 10. \( \therefore \) The units digit is zero. Choice (2)

21. \[ 24 = 3 \times 23 \]

Largest power of 24 = Smallest common power of 3 and 23. As the power of 23 in 400! will be less than the power of 3, required power = largest power of 21.

\( 2^{31} = 2(2)^{15} \)

\( \therefore \) Largest power of 24 = 132. Choice (2)

22. A pair of numbers is relative prime if their HCF = 1

(a) For 36, 35, HCF = 1

\( \therefore \) They are relative primes.

(b) For 119, 255, HCF = 17.

\( \therefore \) They are not relative primes.

(c) 36, 54324 are divisible by 4.

\( \therefore \) They are not relative primes.

(d) For 221, 300; HCF = 1.

\( \therefore \) They are relative primes.

(e) For, 65, 93 HCF = 1

\( \therefore \) They are relative primes. Choice (4)

23. \[ 54N - 44N = 625N - 256N \]

It is divisible by 625 = 51 = 369 = 9 \times 41. So it is divisible by 9 and 41. Choice (3)

24. When 50 is successively divided by 3, we get the quotients as 16 and 5 respectively. Choice (3)

25. Three digit perfect cubes are 125, 216, 343, 512 and 729.

As ABC as well as CAB are perfect cubes, ABC can be 125 only. Choice (4)

26. Let the number be \( qk + 16 \). Twice the number is \( 2qk + 32 \).

\( \therefore \) Divisor is \( (32 - 5) = 27 \). Choice (4)

27. \( N(2N - 1) = (N - 1)N(N + 1) \) = product of three consecutive natural numbers. The product of any three consecutive natural numbers is divisible by 6, but not necessarily by any greater number. Choice (4)

28. Number of consecutive zeroes is the highest power of 5 in \( 200! = 40 + 8 + 1 = 49 \)

Choice (1)

29. 120 = \( 31 \times 23 \times 51 \); The different number of rectangles = Number of ways 120 can be represents as a product of two numbers = \( \frac{1}{2} \cdot (1 + 1)(3 + 1)(1 + 1) = \frac{1}{2} \times 2 \times 4 \times 2 = 8 \text{ ways} \) Choice (4)

30. \[ 2940 = 22 \times 3 \times 5 \times 7 \]

For a number to be a perfect cube the powers of all the prime factors should be divisible by 3. Hence, multiply \( 22 \times 3 \times 5 \times 7 \) with \( 2 \times 3 \times 5 \) to make the power divisible by 3. Hence 2940 should be multiplied with 3150 (= \( 2 \times 3 \times 5 \times 7 \)) to make it a perfect cube. Choice (3)
L.C.M. AND H.C.F.

Practice Exercise

Solutions for questions 1 to 30:

1. Let the two numbers be 12a and 12b where a and b are co-prime.
   \[ 144ab = 12 \times 1800 \Rightarrow ab = 150 \]
The possible pairs are (1, 150) (2, 75) (3, 50) (5, 36) (6, 25) Only four possible pairs can exist. Choice (1)

2. (a) \[ 24 = 3 \times 8 = 3 \times (3 \times 2) = 3 \times 3 \times 2 = 3^2 \times 2 \]
   \[ \text{HCF} = 2 \times 3 = 6 \] Choice (2)

3. \[ 99 = 3^2 \times 11; 165 = 3 \times 11 \times 5 \]
   \[ \text{HCF} = 3 \times 11 = 33, \text{LCM} = 3^2 \times 5 \times 11 = 495 \] Choice (3)

4. \[ \text{LCM} = \frac{\text{LCM} (5, 4, 6)}{\text{HCF} (6, 7, 11)} = \frac{60}{1} = 60 \] Choice (2)

5. \[ \text{LCM} = \frac{\text{LCM} (7, 41, 71)}{\text{HCF} (8, 7, 9)} = 462 \] Choice (1)

6. \[ \text{HCF} (6, 7, 11) = 1 \] Choice (3)

7. Let the least four digit number be N.
   Each of the first two divisors exceeds the remainder it leaves by the same value which is 3.
   \[ \Rightarrow \begin{cases} N = 10k \\ \text{LCM} (10, 11) = 110 \\ \text{HCF} (10, 11) = 1 \end{cases} \]
   \[ \Rightarrow 100 < 30k + 3 \leq 1000 \]
   Least possible value of k = 10
   \[ \Rightarrow \text{Minimum number of chocolates he had} = 210 \] Choice (2)

8. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

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10. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

11. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

12. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

13. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

14. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

15. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

16. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

17. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

18. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

19. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

20. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

21. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

22. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

General form of the number = KLCM (9, 7) + 26 = 63K + 26 where K is a natural number.
Largest three digit number is obtained when 63K + 26 < 1000 and K is maximum.
\[ \Rightarrow K < \frac{1000 - 26}{63} \Rightarrow K = 15 \]
Largest three digit number = 971. Choice (1)

23. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

24. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

25. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

26. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

27. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

28. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

29. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

30. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

31. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

32. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

33. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

34. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

35. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

36. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

37. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)

38. \[ \text{LCM} = \frac{\text{LCM} (8, 6, 22)}{\text{HCF} (12, 15)} = 60 \] Choice (2)
Given, \( l = 12h \), we have, \( l \times h = a \times b \Rightarrow 12h^2 = 84b \Rightarrow h^2 = 7b \) → (1)

Also, \( l + h = 364 \) ⇒ 13h = 364 ⇒ h = 28;
Substituting in (1), \( b = \frac{28 \times 28}{7} \Rightarrow b = 112 \) Choice (4)

23. \( 3078 - 3 = 3075, 3906 - 6 = 3900. \) ∴ The greatest number is the HCF of 3075 and 3900 = 75. Choice (2)

24. LCM of (8, 12, 16) = 48, 1854/48 remainder = 30;
∴ Smallest number that must be added to 1854 = (48 – 30) + 3 = 21. Choice (1)

25. Let the general form of the number be N. \( N = K(\text{LCM} (11, 13, 39)) + 6 \) where K is a natural number = 429K + 6; Required number has the minimum possible value of K satisfying 429K + 6 > 10000

K > 23 \frac{127}{429} \Rightarrow \) Minimum value of K = 24
∴ Required number = (429) (24) + 6 = 10302. Choice (2)

26. Final dividend = (18) (2) = 36
Final but one divisor = Final dividend = 36
Final but one dividend = (Final but one divisor) (Final but one quotient) + (Final divisor) = (36) (1) + 18 = 54

Final but two divisor = Final but one divisor = 54.
Final but two dividend = (Final but two divisor) (Final but two quotient) + (Final but one divisor) = (54) (4) + 36 = 252; First divisor = Final but two dividend = 252.
First dividend = (First divisor) (First quotient) + Final but two divisor = (252) (1) + 54 = 306
Choice (1)

27. Given numbers are 5-1, 5, 5-2, 52, 5-3 that is, 1/5, 5, 1/25, 25, 1/125
Required L.C.M =
\[
\text{LCM of (1, 5, 1/25, 125)} = \frac{25}{1} = 25 \text{ Choice (4)}
\]

28. From the given conditions, 1, 5, 7, 11, 13, 17, 19 and 23 are co-prime to 24.
Choice (4)

29. Let the required least number be N. Least number which is exactly divisible by 6 and 8 = LCM (6, 8) = 24.
∴ N must be 1 more than this least number in order to yield 1 as the remainder when divided by 6 or 8. Choice (4)

30. LCM of 3, 4, 5, 6, 7, 8 is 840 seconds = 14 minutes. They will toll together after 14 minutes that is, at 11.29 am. Choice (2)

AVERAGES – MIXTURES – ALLIGATIONS

Practice Exercise

Solutions for questions 1 to 40:

1. Taking averages as 15, we get deviations
-4 – 3 – 2 – 1 + 0 + 1 + 2 + 3 + 4 = 5/10 = 0.5 (or).
Average = 15 + 0.5 = 15.5 Choice (2)

2. Third number = (3)(20) – 22 – 26 = 12 Choice (3)

3. Total Sales = \( \frac{12}{2} \times 5000 + (12 - 1) \)
\[ 1000 = 126000 \]
Average monthly sales = 126000/12 = 10500 units
Alternative, his sales in February is 6000 units,
In December is 16000 units.
Average = \( \frac{5000 + 16000}{2} = 10,500 \) units. Choice (4)

4. Let the temperatures in the city from Sunday to Saturday be x°C, (x + 1)°C, (x + 2)°C,…, (x + 6)°C.
Average temperature in the city
\[
\Rightarrow \frac{x + x + 1 + x + 2 + x + 3}{4} = 30.5 \text{ C} 
\]
\Rightarrow x = 29
∴ Required average = \( \frac{x + 4 + x + 5 + x + 6}{3} = 34°C \) Choice (2)

5. Sum of the ages of the students = (18 × 18) + (12 × 12) + (8 × 8) = 552 + 144 + 64 = 760 years. Choice (4)

6. The sum of all the 11 members is 330. The sum of the first 6 members is 198.
∴ The sum of the last 5 numbers is 132 and their average is 132/5 or 26.4. We should find out the minimum value, the greatest of these numbers can have (the 6th number would have to be greater than that value). The greatest of the least five numbers (that is, the 7th number) has to be greater than 26.4. If it is 27 or 28, we can not have 5 numbers whose average is 26.4. It has to be 29. (The numbers could be 22, 26, 27, 28, 29)
∴ The least value of the 6th number is 30. The first 6 numbers could be 30, 31, 32, 34, 35, 36. Choice (4)

7. Batma’s new average
\[
\Rightarrow \frac{18 \times 36 + 12 \times 35.75}{18 + 12} = 35.9 \text{ Choice (2)}
\]

8. Total of the top 7 scores = (7) (60) = 420;
Total of the least 6 scores = (6) (50) = 300
Total score of all = (12) (55) = 660; 7th highest score = (420 + 300) – 660 = 60
Choice (3)

9. New average cost = \( \frac{14 \times 57 + 3 \times 63 - 66 - 51}{14 + 3 - 2} = 58 \). New average cost is Rs 58 Choice (1)

10. Let the number of boys be b.
Total weight of all students = (56.8)(b) + (53.2)(462) = (54.6)(b + 462) \Rightarrow b = 294 Choice (2)

11. Let x be the strength of the class. Due to correction total marks increased by 150.
Now they have 45x + 150 = 50x \Rightarrow x = 30
Choice (2)

12. Total cost of 15 items = (15)(56) = Rs 840
Total cost of the purchased items = (3)(52) = Rs 156
Total cost of the returned items = (6)(36) = Rs 216
New total cost = 840 + 156 – 216 = Rs 780;
New average cost = \( \frac{780}{12} = Rs 65 \) Choice (3)

13. New total score = \( 27 \times 54 - 6 \times 60 + 9 \times 58 = 1620 \)
New strength = 27 – 6 + 9 = 30
New average points = \( \frac{1620}{30} = Rs 65 \) Choice (3)

14. Let the strength of the class be x. Total mark of the class = (x)(80) = 80x.
Total mark of the failed students = (8)(35) = 280; Total mark of the remaining students = (x – 8)(90)
80x = 280 + (x – 8) 90 \Rightarrow x = 44
Choice (4)

15. Average earnings of the first 3 months = Rs 6000
Earning in the 4th month = Rs 7500, earning in the 5th month = Rs 10500
Average earnings of the first 5 months = Rs 7200, Earning in the 6th month = Rs 9000
Average earnings of the first 6 months = 45000/6 = Rs 7500 Choice (2)

16. Let the cost of the cheapest pen be Rs c.
Cost of the costliest pen = \( \frac{1.5c}{1+ \frac{25}{100}} = Rs 1.2c \)
\Rightarrow c = 60 Choice (4)

17. Let x be the average consumption on the last 2 days of the week.
\[
\frac{250 \times x + 400 \times \frac{x}{2}}{7} = 350 \Rightarrow 1500 + 2x = 2450 \Rightarrow x = 450 \text{ kg Choice (4)}
\]
18. Let the number of students in the class be $N$.
Let $d$ be the decrease in average.
Sum of the ages of the students = 15 $N$
\[15N - 23 - 17 = 15 - d \Rightarrow 10 = d(N - 2)\]
d is prime and a factor of 10; $d = 2$ or $5$; If $d = 2$, $N = 7$; If $d = 5$, $N = 4$ Choice (4)

19. New average =
\[
= \frac{18x + 36 + (5x36+63)-33-41-37}{20} = 39
\]
Choice (2)

20. Total score of 30 students = (30) (60) = 1800
Let the top and bottom scores be $t$ and $b$ respectively.

1800 – $(t + b)$ = (28) (60 – 1) = 1652 $\Rightarrow t + b = 148$ → (1)
The difference in the highest and lowest scores is given by $t - b = 90$ → (2); Solving (1) and (2), $t = 119$ and $b = 29$. Choice (4)

21. SP of the mixture is Rs 24 per kg and profit per cent = 20 $\Rightarrow$ CP of the mixture is $24 \times 100 / 120$ = Rs 20
Using alligation rule, the ratio of quantities is $(x - 20) : (20 - x)$
$x - 20 : 2 : 1 : 1 \Rightarrow x = 22$ Choice (4)

22. Let the initial quantity of mixture be $x$ litres. Initial quantity of alcohol = $4x / 7$ litres.
Final quantity of alcohol = $3 / 7 (x + 7)$ litres
\[\frac{4}{7}x = \frac{3}{7}(x + 7) \Rightarrow x = 21\]
Choice (4)

23. Resultant concentration of spirit =
\[\frac{0.5 \times 2 + 0.75 \times 3}{2 + 3} \times \frac{2 + 3}{5} = \frac{3.25}{5} = 0.65;\]
\[\therefore \text{Concentration of water = 0.35.}\]
\[\therefore \text{Ratio of spirit and water = 0.65 : 0.35 = 13 : 7.}\]
Choice (1)

24. Let S.P. of 1 litre of milk and water = Rs 1
\[\therefore \text{C.P.} = \frac{1 \times 100}{120} = \frac{5}{6};\]
Using alligation rule, the ratio of milk and water is $5 : 1$
\[\text{per cent of water contained in the mixture} = \frac{100}{6} = 16\frac{2}{3} \text{ per cent}\]
Choice (1)

25. Resultant concentration =
\[\frac{25 \times 3 + 35 \times 6 + 55 \times 1}{10} = \frac{75 + 210 + 55}{10} = \frac{340}{10} = 34 \text{ per cent}\]
Choice (2)

26. Using alligation rule, the ratio of solutions of alcohol is
\[5 \rightarrow 75\]
\[4 \rightarrow (x)\]
\[x = \frac{4 \times 75}{5} = 60\]
\[\therefore \text{60 litres of alcohol should be added}\]
Choice (1)

27. Ratio Milk part Water part Qty
I 3 : 2 3/5 2/5 1
II 4 : 1 4/5 1/5 3
III 2 : 1 2/3 1/3 2
Ratio of quantities 5:6:8

28. In order to form 1 kg of the third alloy, 0.5 kg of alloy A must be mixed with 0.5 kg of alloy B. Weight of copper in 0.5 kg of A = $3 \times (0.5) = \frac{3}{14}$ kg. Weight of copper in 0.5 kg of B = $\frac{4}{9} \times (0.5) = \frac{2}{9}$ kg. Weight of copper in 1 kg of the third alloy = $\frac{3}{14} + \frac{2}{9}$
\[= \frac{55}{126} \text{ kg.}\]
Choice (1)

29. Concentration of milk in the resultant solution = \[\frac{A - B}{A} = \left(\frac{200 - 20}{200}\right) \times 100 = 72.9 \text{ per cent}\]
Choice (2)

30. Weight of I bag = 2k + 3k + 4k = 9k; Weight of II bag = 4k + 5k + 9k = 18k. As they mixed in 1:1 ratio; Weight of I bag = weight of II bag.
\[\therefore \text{Ratio of I bag = 4 : 6 : 8; \ there = resultant mixture ratio = (4 + 4) : (5 + 6) : (9 + 8) = 8 : 11 : 17}\]
Choice (3)

31. Using alligation rule, the ratio of the quantities of milk and water is
\[\text{1 part --- 7 (x);} \]
x = 20lt Choice (4)

32. Let the quantity of milk to be added be $x$ litres by allegation, $\frac{x}{20} = \frac{15 - 10}{10 - 0} \Rightarrow x = 10$
Choice (3)

33. Cost of the mixture $= 3 \times (100 / 120) = Rs 2.50$
Using alligation rule, the ratio of two quantities is
\[\frac{2.25}{2.80} = \frac{3}{4}\]
Choice (4)

34. Applying the rule of alligation, Quantity of wheat costing Rs 12
Quantity of wheat costing Rs 15
\[\frac{15 - 13}{2} \Rightarrow \frac{25 - 12.5}{x} = \frac{12.5}{1} \Rightarrow \frac{25}{x} \Rightarrow x = \frac{25}{2} = 12.5\]
Choice (1)

35. Ratio of quantities $= 2 : 3 : 1$; Concentrations of milk in these three vessels are 3/5, 8/15 and 7/10 respectively.
Overall concentration of milk in the mixture $= \frac{2 \times 3/5 + 3 \times 8/15 + 1 \times 7/10}{6} = \frac{35/10 \times 1/6}{6} = \frac{35}{60}$
Ratio of milk to water = $35 : 25 : 7 : 5$
Choice (2)

36. Using alligation rule, the ratio of milk and water is $3 : 1$
\[\frac{4}{5} \quad \frac{3}{5} \quad \frac{1}{5} \quad \frac{4}{5}\]
\[1 / (3 + 1) = 1/4 \text{ or 25 per cent of mixture should be removed}\]
Choice (2)

37. Using alligation rule, the ratio of quantities mixed is $\frac{3}{5} : \frac{4}{5} : \frac{3}{5} = 3 : 1$
Total Quantity $= 100$; Quantity of water to be added $= \frac{1}{4} \times 100 = 25$ litres
Choice (3)

38. Let the capacities of A, B and C be 3x, 4x and 5x.
Quantity of milk in $\frac{3x}{2} = \frac{2}{3} \left(\frac{3}{2} \times \frac{3}{2}\right) = x$
Quantity of milk in B = $\frac{3}{4} \left(\frac{4}{3} \times x\right) = x$
Quantity of milk in C = $\frac{3}{5} \left(\frac{5}{3} \times \frac{3}{4} \times x\right) = \frac{3}{4} x$
8. The student who copied the co–efficient of x in correctly must have copied the constant term correctly. 
For the equation, \( x^2 + bx + c = 0 \), the constant term \( c \) = Product of the roots = 16 \times 6 = 96, the student who copied the constant term in correctly must have copied the coefficient of x correctly. The coefficient of x = b. 
As the sum of the roots = (– coefficient of x) = 11 + 9 = 20 
Hence the correct equation is \( x^2 - 20x + 96 = 0 \). 
Choice (2) 

9. As per the given equation, the sum of the roots = \( \frac{2m}{k + m - \ell} \); product of the roots = \( \frac{\ell + m - k}{k + m - \ell} \) from the above, we observe that \( (k + m - \ell) \) is the denominator. Only choice (2) has \( (k + m - \ell) \) as the denominator. Choice (2) 

10. Let the roots be \( \alpha \) and \( \alpha' \). Then, \( \alpha + \alpha' = -p \) and \( \alpha \beta = -q \) 
\( \therefore (\alpha + \alpha')^2 = -p^2 \Rightarrow \alpha^2 + (\alpha')^2 + 3\alpha\alpha' = -p^2 \Rightarrow q^2 + 3pq = -p^2 \Rightarrow p^2 + q^2 = q(1 - 3p) \) 
Choice (2) 

11. \( \alpha + \beta = -1 \) and \( \alpha\beta = 2; \) 
\( \frac{\alpha^n + \beta^n}{\alpha^n - \beta^n} = \frac{\alpha^0 + \beta^0}{(1/\alpha)^0 + (1/\beta)^0} = \frac{(\alpha\beta)^0}{1} = (2)^{16} = 1024 \) 
Choice (3) 

12. Let \( \sqrt{56 + \sqrt{56 + \sqrt{56 - \infty}}} = p \) \( \Rightarrow \sqrt{56 + p} = p \) 
\( p^2 - p - 56 = 0 \Rightarrow p = 8 \) or \( p = -7; \) \( p \) is positive; 
\( \therefore \alpha = 8 \) 
Choice (1) 

13. Let the roots of the equation be \( \alpha \) and \( \alpha' \). Sum of the roots is \( a + b = \frac{-r}{p} \) 
Product of the roots is \( \alpha\beta = \frac{r}{p} \) 
\( \Rightarrow \sqrt{(\alpha/b) + \sqrt{(\alpha/b)}} = (\alpha + b)/\sqrt{ab} = -\frac{r}{p} \times \frac{1}{\sqrt{\alpha}} = \frac{1}{\sqrt{\alpha}} \times \frac{\sqrt{r/p}}{1/\alpha} = -\sqrt{(r/p)} \) 
Choice (2) 

14. Sum of the coefficients = \( p = q - r + q - r + p - q = 0 \) 
\( \therefore 1 \) is the root of the equation. Since the roots are equal the other root is also 1. 
\( \therefore \) Product of the roots = \( \frac{r(p-q)}{p(q-r)} = 1 \Rightarrow pq - pr = pr - qr \Rightarrow pq + qr = 2pr \Rightarrow \frac{1}{r} + \frac{1}{p} + \frac{2}{q} \) 
Choice (1) 

15. Let the ‘x’ be the number of dozen’s of apples. \( \therefore \) Number of dozen’s of bananas = \( (50 - x) \) 
Cost of 1 dozen of bananas = Rs. \( x \) 
Cost of 1 dozen of apples = Rs. \( (50 - x) \) 
Given, \( x = 50 + x \times (50 - x) = 1050 \Rightarrow x = 15 \) or 35 
As the price of an apple is more than that of a banana, the number of bananas are 35 dozen. 
Choice (3) 

16. The given quadratic expression is \( 4x^2 - 3x + 4 \), \( a = 4 \) (> 0) The minimum value of the given quadratic expression = \( \frac{4ac - b^2}{4a} = \frac{4 \times 4 \times 4 - (-5)^2}{4(4)} = \frac{64 - 9}{16} = \frac{55}{16} \) 
Choice (2) 

17. Sum of the roots = \( 3/a \). Product of the roots = \( k/a \). 
Given that \( 3/a = k/a; \therefore k = 3 \) 
Choice (2) 

18. \( \ell + m = \frac{q}{p}; \ell m = \frac{r}{p} \) The equation whose roots are \( \frac{1}{\ell} \) and \( \frac{1}{m} \) is \( x^2 - \left( \frac{1}{\ell^2} + \frac{1}{m^2} \right)x + \frac{1}{\ell^2m^2} = 0 \) 
\( x^2 - \left( \frac{m^2 + p^2}{r^2} \right)x + \frac{p^2}{r^2} = 0 \) 
\( \Rightarrow r^2x^2 - (q^2 - 3mpr) x + p^3 = 0 \) 
Choice (4) 

19. Let the price of each chair be \( x \) and the number of chairs Ramesh bought for Rs. \( 2400 \) be ‘\( y \)’. According to the problem \( x \times 20 = 2400; (y - 20) \times (y + 20) = 2400 \) 
\( \Rightarrow 2400 = 20y \Rightarrow y = 120 \) or \( y = -120 \) 
\( \Rightarrow 120 = 0 \Rightarrow y = 30 \or -40; y > 0; \therefore y = 30 \) 
Choice (2) 

20. Let \( \alpha \) and \( \beta \) be the roots of the equation 
\( \therefore \) Given, \( (\alpha + \beta)^2 = \left( \frac{1}{\ell^2} + \frac{1}{m^2} \right)^2 \) 
\( \Rightarrow \beta^2 + \alpha^2 = \left( \frac{1}{\ell^2} + \frac{1}{m^2} \right)^2 - 2\alpha\beta \) 
\( \Rightarrow 2\alpha\beta = \left( \frac{1}{\ell^2} + \frac{1}{m^2} \right)^2 - \frac{1}{(\alpha + \beta)^2} \) 
\( \Rightarrow \frac{2\alpha\beta}{(\alpha + \beta)^2} = \frac{1}{(\alpha \beta)^2} \Rightarrow S^2 = \frac{2p^2}{1-p^2} \) 
Choice (1) 

21. Let one root be \( \alpha \) and the other root be \( \alpha' \). 
\( \therefore \) Given; \( a = \alpha^2 = -64 \Rightarrow a = -4 \) 
Also \( \alpha + \alpha' = k; (-4) + (16) = k \Rightarrow k = 12 \) 
Choice (3)
22. Since the given equation has equal roots.

\[ b^2 - 4ac = 0 \Rightarrow 4 \Rightarrow (k + 2)^2 = 4 \cdot 9k \Rightarrow k^2 - 5k + 4 = 0 \]

\[ k = 4 \text{ or } k = 1 \quad \text{Choice (1)} \]

23. Let the total number of apes be 'x'.

Number of apes playing + remaining apes = total number of apes.

\[ (x/2)^2 + 12 = x \Rightarrow x = 48 \text{ (or) } x = 16 \]

Choice (3)

24. Now \( a^2 + b^2 = (a + b)^2 - 2ab = \frac{b^2 - 2ac}{a^2} \)

Now \( a^2 + b^2 = (\alpha^2 + \beta^2)^2 = \frac{2a^2 \cdot 2a^2}{a^2} = \frac{2a^4}{a^2} = a^n \)

Choice (2)

25. Let Eswar’s present age be ‘x’ years.

\[ (x - 3)x = 27 \Rightarrow x^2 = 27 \Rightarrow x = \sqrt{27} \approx 5.4 \]

Since number of years cannot be negative, \( x = 6 \)

Choice (2)

### PROGRESSIONS

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**Practice Exercise**

**Solutions for questions 1 to 25:**

1. \( a = 3, d = 7 - 3 = 4; t_n = a + (n - 1)d = 63 \Rightarrow 3 + (n - 1)4 = 63 \Rightarrow n = 16 \) Choice (3)

2. Given \( a = \frac{19}{2} \) \( t_n = a + (n - 1)d = 190 \)

\[ a + 9d = 10 \Rightarrow a = 4 \] Choice (1)

3. \( t_n = a + 4d = 15 \Rightarrow (1), t_{19} = a = 8d = 23 \Rightarrow (2) \]

\( \text{Solving (1) & (2), we get } \ a = 7, \ d = 2 \)

\[ t_n = a + (n - 1)d = 7 + 13x = 33 \] Choice (2)

4. Let the maximum number of terms be 'N'.

Nth term \( = 60 + (N - 1)(-3) = 63 - 3N \)

\( N \geq 0 \) for the sum to be maximum

\[ N \leq 21 \]

\[ N = 21 \] Choice (3)

5. Series is 11, 16, ..., 96; Sum = \( 18(11 + 96)/2 = 963 \) Choice (1)

6. The number of terms which are divisible by 6 from 400 to 900 is 84. The number of terms which are divisible by 8 is 63. The number of terms which are divisible by 6 and 8 is 21.

The number of terms which are divisible by either 6 or 8 = 84 + 63 - 21 = 126

Choice (4)

7. \( t_n = S_n - S_{n-1} = 6n^2 - 2n - (6n - 1)^2 = -2(n - 1) = 12 + 8 \Rightarrow d = 12 \) Choice (4)

8. \( S_{33} = \frac{33}{2} (2a + 32d) = \frac{1089}{2} \Rightarrow 2a + 32 = 33 \)

Second term + thirty second term = 33

\[ \Rightarrow \text{ Thirty second term } = 33 - 2 = 31 \] Choice (3)

9. The given equation can be written as

\[ \frac{1}{4} \left( \frac{1}{16} \right) + \frac{1}{4} \left( \frac{1}{16} \right) + \frac{1}{4} \left( \frac{1}{16} \right) \]

\[ = \left( \frac{1}{16} \right) + \left( \frac{1}{16} \right) + \left( \frac{1}{16} \right) \]

\[ = \frac{1}{16} \]

Choice (3)

10. Let \( a = 3, a + 1 = b, a + 3 = c \)

\[ (a - 3)b + a + a + 3 = 3^2 = 9 \]

\[ \Rightarrow b = 3 \] Choice (1)

11. \( a = 147, d = -7; \ t_n = a + (n - 1)d = 0 \Rightarrow 147 - 7(n - 1) = 0 \Rightarrow n = 22 \]

Choice (2)

12. In the given sequence, \( n = (3n - 2) (5n) = 15n^2 - 10n \)

\[ S_n = \sum (15n^2 - 10n) \]

\[ = 15(n(n + 1)(2n + 1)) - 10n(n + 1) \]

\[ = 10n(n + 1)2 + 15 \]

\[ \Rightarrow n = 15 \Rightarrow S_n = 17400 \] Choice (3)

13. The terms \( x, y, z \) are in G.P. \( \Rightarrow y^2 = xz \)

\[ \Rightarrow y = x(2.56)x \Rightarrow y = 1.6x \] Choice (2)

14. Given, \( a + r = 15 \) \( \frac{4}{4} \) \( 4a + 15 = 15 \Rightarrow (1), \)

\( a + r = 3.2 \Rightarrow (2) \)

Solving (1) & (2) we get \( a = 3 \) and \( r = 1 \) Choice (1)

15. \( a = 5; r = 2; \text{ sixth term } = ar^5 = 5 \times 32 = 160 \) Choice (1)

16. Let the numbers be \( a \), \( r \) and \( a^2 \) where \( r > 1 \).

\[ a + ar + r^2 + 117; a + (1 + r^2) = 117 \Rightarrow (1) \]

If \( r = 2 \), it is not a natural number. If \( r = 3 \), \( a = 9 \)

Choice (2)

17. \( 1 + 16 + 256 + 4096 + \ldots = 1000 \). Thus, in the above series, the sum to four terms is greater than 1000 Choice (2)

18. Given, \( a(a + r) \ldots \ldots \ldots a + r^8 = 2048 \)

\[ a(1)(1 + 1) = 2048 \]

\[ r = 2 \Rightarrow a + r^2 = 2 \] Choice (2)

19. Let the total number of apes be 'x'.

\( \Rightarrow \frac{p^2 - 1}{r - 1} = 11111; r = 10, \text{ satisfies the above equation.} \)

Choice (1)

20. Let the first term and the common ratio be 'a' and 'r' respectively.

\( a, ar, ar^2 \ldots \ldots = a \cdot r^1 = 4096 \)

\[ a^2 + ar^2 + r^4 = (a + r)^4 = 4 \Rightarrow a \cdot r^1 = 4 \Rightarrow (1) \]

\[ ar^2 = 4 \Rightarrow r = 2 \]

Let \( a = x, ar = y, \text{ then } x + y = 5; xy = 4 \Rightarrow x = 4 \text{ or } 1 \]

Choice (4)

21. Let \( x_1, x_2, \ldots, x_6 \) be the six harmonic means. Then \( x_1, x_2, \ldots, x_6 \) are in A.P.

\[ H.P. \Rightarrow \frac{1}{3} \frac{1}{x_1} \frac{1}{x_2} \ldots = 23 \]

Choice (4)

22. Given \( a_1 = h_1 = 3 \) and \( a_n = h_n = 39; \) We have \( a_n = a_1 + (n - 1)d; 39 = 3 + 6d; d = 6 \)

\( a_n = a_1 + (n - 1)d = 3 + 6 	imes 6 = 21; \) Now, \( h_n = 39 \)

\( \Rightarrow \frac{1}{3} + 6d = \frac{1}{39} \Rightarrow d = \frac{-2}{39} \Rightarrow \)

\( \Rightarrow \frac{1}{h_4} = \frac{1}{3} + 3 \times \frac{-2}{39} = \frac{7}{39} \Rightarrow h_4 = 39 \cdot \frac{7}{39} \]

Choice (4)

23. Let the numbers be \( P \) and \( Q \).

\[ P \cdot Q = 36 \Rightarrow (1) \]

\[ 2P + Q = \frac{24}{5} \]

\[ P + Q = 15 \Rightarrow (2) \]

Solving (1) and (2), we have \( P, Q = 12, 3 \) Choice (3)

24. \( a, b, c \) are in arithmetic progression

\[ b = \frac{a + c}{2} \]

\( b, c, d \) are in geometric progression. \( c \cdot e = bd; \)

\( c, d, e \) are in harmonic progression

\[ d = 3 = \frac{2ce}{c + e} \]

If \( a = 2 \) and \( c = 18, b = \frac{2 + c}{2} = \frac{36c}{c + 18}; \)

\[ c \cdot e = \frac{2 + c}{2} \cdot \frac{36c}{c + 18} \]

\[ \Rightarrow c = 4 \]

\[ \text{For } c = 6, b = 4 \text{ and } d = 9 \]

\[ \text{For } c = -6, b = -2, d = -18 \]

Choice (2)

25. Since \( x, y, z \) are in harmonic progression

\[ \frac{1}{x}, \frac{1}{y}, \frac{1}{z} \]

Choice (1)
TIME AND WORK

Practice Exercise

Solutions for questions 1 to 40:

1. \[ \frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2} \]
   \[ \Rightarrow D_2 = \frac{30 \times 24 \times 6 \times 1800}{1500 \times 18 \times 8} = 36 \text{ days.} \]
   Choice (1)

2. Let the number of men in the group be \( m \).
   \[ (m) (12) = (m + 5) (10) \]
   \[ m = 25 \]
   Choice (2)

3. Men  
   Days  
   Time
   15  
   30  
   1
   12  
   ?  
   \[ D = \frac{15 \times 30 \times 1 \times 4}{12 \times 5} = 30 \text{ days} \]
   Choice (4)

4. We have \[ \frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2} \]
   \[ \Rightarrow \frac{120 \times 25 	imes 9}{1500} = \frac{150 \times d_2 \times 6}{1800} \]
   \[ \Rightarrow d_2 = 36 \text{ days} \]
   Choice (1)

5. \[ 1500 \times 30 = 1500 \times 26 + 300 (26 - x) \]
   \[ \Rightarrow x = 6. \]
   The new men joined after 6 days. Choice (2)

6. Let the number of men be \( x \) and the number of days in which they can complete the job be \( y \).
   \[ \text{Job} = xy \text{ mdays} = (x - 5) (y + 20) \text{ man days} \]
   \[ \Rightarrow xy = (x - 5) (y + 20) \]
   Subtracting (2) from (1), \( x = 15 \)
   Choice (1)

7. \[ \frac{M_1 D_1 H_1}{W_1} = \frac{M_2 D_2 H_2}{W_2} \]
   \[ \Rightarrow \frac{1200 \times 30 \times 1}{600 \times D_2 \times 4}{1500 \times 18 \times 3} \]
   \[ \Rightarrow d_2 = \frac{1200 \times 30 \times 18 \times 3}{15 \times 600 \times 4} = 54 \text{ days} \]
   Choice (1)

8. 100 men completed the remaining work in 18 days.
   As the work remains the same, 80 men would have taken \[ \frac{100 \times 18}{80} = 22.5 \text{ days} \]
   to do that work.
   If additional men had not joined they would have taken \[ 22.5 - 20 = 2.5 \text{ days} \] more. Choice (4)

9. 30 women - 36 days
   \[ \Rightarrow ? \text{ women} - 24 \text{ days} \]
   Number of women = \[ 30 \times 36/24 = 45 \]
   45w = 15w + 30w. 15 women and 15 men (30w) are required to do work in 24 days.
   Women’s earnings = \( (1/3) \times 60000 = Rs \) 20000; Men’s earnings = \( (2/3) \times 60000 = Rs \) 40000
   Difference between the shares of men and women is Rs 20000 Choice (2)

10. Let the numbers of units completed by a woman and a man in a day be \( w \) and \( m \) respectively.
    Job = \[ 2 (w + 4m) \]
    Job = \[ 8 (w + 1m) \]
    \[ \Rightarrow 3m = 5 \]
    Choice (4)

11. \( 4 (6m + 9w) \)
    can do the work in 1 day.
    Similarly, \( 8 (4m + 3w) \)
    can do the work in 1 day.
    \[ 8 (4m + 3w) \]
    can do the work in 1 day.
    \[ 2m = 3w \]
    Choice (4)

12. \[ 150 \times 30 \times 1 \times 4 = 12 \times 5 \]
    \[ 30 \text{ days} \]
    Choice (4)

13. Part of work finished by all of them in one day = \[ (1/16) + (1/20) + (1/30) = 35/240. \]
    They can do the new work in \[ \frac{240 \times 7}{35} = 24 \text{ days} \]
    Choice (3)

14. Let the number of days required to complete the work be \( x \) days.
    Work done by P in \( (x - 3) \) days + work done by Q in \( (x - 2) \) days + work done by R in \( x \) days = 1
    \[ \Rightarrow \frac{x - 3}{6} + \frac{x - 2}{12} + \frac{x - 1}{18} = 1 \]
    \[ \Rightarrow x = 12 \]
    Choice (2)

15. Let the work be completed in \( x \) days. A, B & C work for \( (x - 2) \) and \( (x - 1) \) days respectively.
    \[ \frac{x}{6} + \frac{x - 2}{12} + \frac{x - 1}{18} = 1 \Rightarrow x = 4, \]
    Choice (2)

16. Let the time taken by X to complete the job be \( x \) days. Time taken by Y to complete it \( \frac{x}{2} \) days.
    And time taken by Z to complete the job is \( \frac{x}{3} \) days
    \[ \frac{1}{x} + \frac{1}{x/2} + \frac{1}{x/3} = \frac{1}{20} \Rightarrow x = 120 \]
    Choice (4)

17. Let the work be completed in \( x \) days.
    \[ \Rightarrow A, B \text{ and } C \]
    \[ \Rightarrow (1/P) + (1/Q) + (1/R) = 1/24 \]
    \[ \Rightarrow \frac{x}{18} + \frac{x}{36} + \frac{x}{54} = 1 \Rightarrow x = 11 \]
    \[ \Rightarrow \text{They have to work for } 11 - 5 = 6 \text{ days more.} \]
    Choice (4)

18. Let B’s one day work be \( \frac{1}{x} \).
    A’s one day work = \[ \frac{1}{100} \]
    \[ \Rightarrow \frac{1}{x} + \frac{1}{120} = \frac{6}{5} \Rightarrow \frac{5}{x} = \frac{11}{120} \Rightarrow x = 24 \]
    Choice (2)

19. Let A takes \( x \) days to complete the work.
    B takes 26 days \[ \Rightarrow \frac{3C \times x}{C + x} = 2x \Rightarrow C = 2x \]
    \[ (1/x) + (1/2x) + (1/2x) = 1/30 \Rightarrow x = 60. \]
    \[ \Rightarrow A, B, C \text{ take } 60, 120 \text{ and } 120 \text{ days respectively to complete the work.} \]
    Choice (2)

20. Let time taken by A and B to complete the work be \( x \) days.
    \[ \Rightarrow \frac{1}{x + 18} + \frac{1}{x + 32} = \frac{1}{x} \Rightarrow \frac{2x + 50}{(x + 18)(x + 32)} = \frac{1}{x} \Rightarrow x^2 = 576 \Rightarrow x = 24 \]
    Choice (3)

21. \[ (1/P) + (1/Q) = 1/24 \rightarrow (1); \]
    \[ (12/P) + (42/Q) = 1 \rightarrow (2) \Rightarrow P = 40 \text{ and } Q = 60 \]
    Choice (1)

22. Work done by Suresh = \[ 1 - \frac{15}{24} = \frac{3}{8} \]
    \[ \Rightarrow \text{total work. Share of Suresh} = \frac{3}{8} \times 2400 = Rs 900 \]
    Choice (3)

23. Work done by P in one period of two days = \[ \frac{1}{15} + \frac{1}{10} = \frac{11}{30} \Rightarrow \frac{5}{18} \]
    \[ \Rightarrow \text{of the work} \]
    \[ \Rightarrow \text{They can complete the job in } 6 \text{ periods. Working on alternate days they take } 6 \times 2 = 12 \text{ days.} \]
    Choice (1)
24. Part of the job completed by P and Q in one day if they work together would be completed in two days if they work on alternate days.

\[ \frac{1}{15} \text{ of the job will be completed by P and Q in 2 days.} \]

\[ \therefore P \text{ and Q can complete the job in (2)} \]

\[ (15) = 30 \text{ days. Choice (2)} \]

25. Let the work be completed in \( x \) days.

\[ P, Q \text{ and R work for } x, (x-1) \text{ and } (x-5) \text{ days respectively.} \]

\[ \frac{x}{18} + \frac{x-1}{36} + \frac{x-5}{54} = 1 \Rightarrow x = 11 \text{ days} \]

Choice (2)

26. Let the time taken by leakage to empty the tank be \( x \) minutes. In one minute the water in the tank is

\[ \frac{1}{12} - \frac{1}{x} = \frac{1}{192} \Rightarrow \frac{1}{x} = \frac{15}{192} - \frac{5}{64} = x = 12\frac{2}{3} \text{ minutes} \]

Choice (4)

27. Let tap B empty the tank in \( x \) hours.

\[ \therefore \text{ tap A will fill the tank in } (x-3) \text{ hours.} \]

\[ \frac{1}{x-3} - \frac{1}{x} = \frac{1}{6} \Rightarrow x = 6. \]

\[ \therefore \text{ The second tap can fill the tank in 6 hours.} \]

Choice (1)

28. Let the capacity of the tank be \( x \) litres.

In one minute the part of the tank filled by the taps is

\[ \frac{x}{15} + \frac{x}{12} = \frac{8x}{75} \]

Total water filled in 150 minutes = \( 150 \times \frac{8x}{75} \rightarrow (1) \)

Water discharged by the outlet pipe in 150 minutes = \( 150 \times 150 \text{ litres} \rightarrow (2) \)

\[ \therefore 8x \times 2 - 80 \times 150 = \Rightarrow x = 800 \text{ litres.} \]

Choice (2)

29. Amount of water filled in the cistern in 5 minutes = \( \frac{5}{1} + \frac{5}{15} = \frac{5}{12} \)

\[ \therefore 1 - \frac{7}{12} = 5/12 \text{ of the cistern is empty when pipe P is closed, which has to be filled up by pipe Q alone.} \]

Time taken to fill the tank is \( \frac{5}{12} \times 20 = 8\frac{1}{2} \text{ minutes} \]

Choice (1)

30. Let the time taken to fill the tank be \( x \) minutes.

Volume of water filled by the three taps is

\[ \frac{x}{12} + \frac{x}{15} + \frac{x}{18} = 1 \Rightarrow 37x = 222; \]

\[ \therefore x = 6 \]

Choice (2)

31. If there had been no leak, the amount of water filled in one hour would be \( 1/3 \)rd of tank. But, because of the leak, in one hour, only \( 1/4 \)th of tank is full. The difference gives the effect of leakage which is

\[ 1/3 - 1/4 = \frac{4 - 3}{12} = \frac{1}{12} \text{th of tank. It takes 12 hours for the tank to be emptied.} \]

Choice (3)

32. Let Q be opened for \( x \) hours.

\[ \frac{12}{15} + \frac{x}{30} = 1 \Rightarrow x = 6 \text{ hours} \]

\[ \therefore \text{ Q has worked only for 6 hours and hence it was closed at 4:00 a.m. + 6 hours} \]

\[ = 10:00 \text{ a.m. Choice (1)} \]

33. Both pipes together can fill the cistern in \( \frac{1}{10} + \frac{1}{15} = \frac{5}{30} = \frac{1}{6} = 6 \text{ minutes.} \]

Time taken for cistern to be emptied

\[ = \frac{5}{5} - \frac{1}{6} = \frac{2}{5} \Rightarrow 1/30; \text{ Answer is 30} \text{ minutes.} \]

Choice (1)

34. Let the times taken by P and Q to fill the tank be \( p \) hours and \( q \) hours respectively.

Part of the tank filled = \( \frac{1}{p} + \frac{1}{q} \)

\[ \Rightarrow \frac{(p-q)^2}{2pq} > 0 \Rightarrow \text{ Part > 1 } \text{ Choice (4)} \]

35. As A is taking least time to fill and D can fill only \( 1/4 \)th of tank is full. The difference is

\[ \frac{1}{10} - \frac{1}{12} = \frac{2}{60} \text{ per cent} \text{ Choice (3)} \]

36. Part of tank filled by two inlet pipes in one minute = \( \frac{1}{10} \times \frac{2}{40} = \frac{1}{8} \)

So inlet pipes were open for 8 minutes.

Part of tank filled by both the inlet pipes in 2 minutes = \( \frac{2}{8} = \frac{1}{4} \)

\[ \Rightarrow \frac{1}{4} \text{ of tank in 8 minutes} \]

It can empty the tank in \( \frac{4}{1} \times 8 = 32 \text{ minutes} \]

Choice (4)

37. Clearly pipe A is open for 6 minutes, and B for 3 minutes.

Let C is open for \( x \) minutes

\[ \left( \frac{6}{12} + \frac{3}{18} + \frac{x}{24} \right) = 1 \Rightarrow x \times 24 = 1 \]

\[ = \frac{1}{12} + \frac{1}{6} \Rightarrow x \times 24 = 6 \Rightarrow x = 8 \text{ minutes} \]

Choice (4)

38. Part of the tank filled by A and B in an hour = \( \frac{1}{1} \times \frac{1}{12} = \frac{1}{12} \times \frac{1}{4} + \frac{1}{18} \Rightarrow 2t^2 + 20t = \frac{1}{4}t^2 + 20t + 36 \]

\[ \Rightarrow t^2 = 36. \]

\[ \therefore t = 6 \]

Choice (2)

39. A, B and C fills in 10, 15 and 20 minutes respectively.

Part of tank filled by A, B and C all together in 1 minute = \( \frac{1}{10} + \frac{1}{15} + \frac{1}{20} = \frac{13}{60} \)

\[ : \text{ In 5 minutes, } 5 \times \frac{13}{60} = 65/60 \text{ is filled} \]

\[ \therefore \text{ volume of water overflown } = \left( \frac{15/60}{1} \times 100 \right) = 8\frac{1}{3} \text{ per cent} \text{ Choice (3)} \]

40. Time taken by C to empty the tank

\[ = 2 \left( \frac{1}{48} + \frac{1}{48} \right) = 48 \text{ minutes } \rightarrow (1) \]

Part of the tank filled by A, B and C in a minute = \( 2 \left( \frac{1}{48} - \frac{1}{48} \right) \)

\[ \therefore \text{ The tank will be filled in 48 minutes.} \]

Choice (3)

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**TIME AND DISTANCE**

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**Practice Exercise**

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**Solutions for questions 1 to 50:**

1. Let the speed of Vinay be \( x \) kmph.

\[ \frac{300}{x} - \frac{300}{x + 2.5} = \Rightarrow x = 37.5 \text{ Choice (2)} \]

2. Let the total distance travelled be 24 km.

\[ \left( d/30 \right) + \left( d/50 \right) = 8 \Rightarrow d = 150 \text{ Choice (2)} \]

3. Let the usual time taken be \( x \) minutes.

At 5/4th of usual speed Raju would have taken 4/5th of his usual time.

\[ \Rightarrow x - \frac{4x}{5} + 20 \Rightarrow x = 100 \text{ Walking at 3/4th of his usual speed, Raju would have taken 4/3rd of his usual time, So he would be late by } \frac{4}{3}x - x = 33\frac{1}{3} \text{ minutes} \]

Choice (3)

4. Average speed = \( 5 \times 60 + 40/\left(60 \times 2 + 40 \times 3\right) = 50 \text{ km/hr} \)

Choice (3)

5. Total distance between Tirupati and Hyderabad = 50x km

\[ \text{Remaining distance } = 50x \left( \frac{1 - 2}{3} \right) = 50x/3 \]

km; Remaining time = \( x - \frac{3x}{4} = x \text{ hours} \)

\[ \text{Required speed } = \frac{50x/3}{x/4} \text{ kmph } = \frac{200}{3} \text{ kmph } \]

Choice (4)

6. \( \left( x/50 \right) - \left( x/60 \right) = 30/60 \Rightarrow x = 150 \text{ km} \)

\[ : \text{ The distance between his house and office is 150 km.} \]

Choice (1)
7. Let the forward speed be \( s \) km/h. Return speed = 3\( s \) km/h.
   Its average speed = \( \frac{2(s)(3s)}{s + 3s} = 24 \) \( \Rightarrow s = \) 16. \( \text{Choice (1)} \)

8. Let \( x \) be the speed of the car be \( x \). (300/x) – 300/(x + 10) = 1 \( \Rightarrow x = 50 \) km/hr
   \( \text{Choice (2)} \)

9. Speed of \( A \):
   \[ \text{Speed of } B = \left( \frac{\text{Time taken by } B \text{ to reach } P \text{ from the meeting point}}{\text{Time taken by } A \text{ to reach Q from the meeting point}} \right) \times x \]
   \[ x = \left( \frac{5}{9} \right) = x = 12 \text{ kmph} \] \( \text{Choice (4)} \)

10. Let his usual speed be \( s \) km/h. Return speed = 3\( s \) km/h;
    Distance covered in 3\( \frac{1}{2} \) hrs = 20\( \times \)3.5 = 70 km
    \( \text{Choice (2)} \)

11. (a) In the same direction, Relative speed = 20 km/hr;
    Distance covered in \( \frac{3}{2} \) hrs = 30 \times 3.5 = 70 km
    (b) In the opposite direction, Relative speed = 180 km/hr;
    Distance covered in \( \frac{3}{2} \) hrs = 630 km
    \( \text{Choice (4)} \)

12. When the owner started, the thief was 60 \( \times \)2 = 120 km away from the theft point. Time taken by them to meet = Distance initially between them
    \[ \text{Relative speed} = \left( \frac{120}{80 - 60} \right) = 6 \text{ hours}. \text{So they met at 4:00 p.m.} \]
    \( \text{Choice (3)} \)

13. Actual time between the two shots being fired = 25 minutes. If the car were stationary, the person in the car also would have heard the shots with an interval of 25 minutes. But since the car is moving, he heard the second shot after 24 minutes itself. That is, the distance travelled by the car in 24 minutes = Distance travelled by the sound in 1 minute (or 60 seconds).
    Therefore, distance travelled by the car in 24 minutes = 60 \times 330 metres.
    Distance travelled by the car in 60 minutes (that is, speed of the car) = \( \frac{60 \times 330}{24} = \frac{60 \times 1000}{2} = \frac{99}{2} \) kmph
    \( \text{Choice (2)} \)

14. Let Prasad ’s speed be \( X \) kmph. Pavan’s Speed = 1.4\( X \)
    Since Pavan was faster than Prasad, it would be expected that he reached B first. But it is given that both reached B simultaneously and one person halted for 30 minutes.
    \( \therefore \) Pavan must have halted \( \frac{140}{X} = \frac{140}{1.4X} \)
    \( \frac{30}{60} \) \( \Rightarrow X = 80 \) kmph. Pavan’s speed = 1.4 \times 80 = 112 kmph
    \( \text{Choice (4)} \)

15. Let the distance be \( D \) km \( \Rightarrow (D/9) – (D/12) = 40/60 \) \( \Rightarrow D = 24 \) km. Using \( D = 24 \) km in \( \frac{D}{9} = \frac{1}{3} \), we find \( t \) and then \( s = \frac{102}{3} \) km/ch
    \( \text{Choice (2)} \)

16. Let the speed of the train be \( s \) m/sec.
    \[ \frac{L + 370}{s} = 51 \Rightarrow L + 370 = 51s \rightarrow (1); \]
    \[ \frac{L + 480}{s} = 62 \Rightarrow L + 480 = 62s \rightarrow (2), \]
    Solving \( L = 140 \). \( \text{Choice (3)} \)

17. Speed of first train = 150/10 = 15 m/sec.
    Let the length of the second train be \( L \) mts.
    \( \frac{L}{s} = \frac{570 + L}{58} \Rightarrow L = 300 \) m. \( \text{Choice (2)} \)

18. When it stops in one hour, it travels for 100/120th of an hour.
    \( \therefore \) Stoppage time = \( \left( 1 - \frac{100}{120} \right) \) th of an hour = \( \frac{1}{6} \) hours = 10 minutes. \( \text{Choice (4)} \)

19. Let ‘\( x \)’ be the length of the each train and \( y \) be the speed of train B;
    \( 2x/(30 - y) = 72 \rightarrow (1) \) and \( 2x/(30 + y) = 24 \rightarrow (2) \), Solving (1) and (2) we get \( x = 150 \) mts, \( y = 15 \) km/hr
    \( \text{Choice (2)} \)

20. Distance between the two persons when the train crossed the second person
    \[ (72 \times \frac{10}{60}) - (6 \times \frac{10}{60}) = 11 \text{ km} \]
    At 6:10 a.m., the distance between the two persons = 11 km
    Time taken by both the persons to meet = \( \frac{11}{9 + 6} = \frac{11}{15} \) hours = 44 minutes.
    Both persons will meet at 6:54 a.m.
    \( \text{Choice (4)} \)

21. They will meet at = First starting time + \( \frac{\text{Sum of times}}{\text{Time taken by first (2nd arrival time - 1st starting time)}} \)
    \[ = 3 \text{ pm } + \frac{6 (8 - 3)}{(6 + 3)} = 3 \text{ pm } + (30/9) \text{ hrs} = 6.20 \text{ pm} \]
    \( \therefore \) The ratio of their speeds is 1 : 2, hence the ratio of their distances covered is 1 : 2.
    \( \text{Choice (4)} \)

22. Distance covered by the car in 3 minutes = 200 + Distance covered by the man in 3 minutes = 200 + \( \left( \frac{3}{60} \right) \times 1000 \) m = 200 + 300 = 500 m.
    Its speed = \( \frac{500}{(1000 + 200/60)} \) kmph = 10 kmph
    \( \text{Choice (2)} \)

23. \( (189/x) - \left( 189/(x + 36) \right) = 4 \Rightarrow x = 27 \) km/hr
    \( \text{Choice (1)} \)

24. Let the distance travelled at 50 km/h be \( x \) km
    Distance travelled at 68 kmph = \( (x + 44) \) km
    Average speed = \( \frac{\text{Total distance}}{\text{Total time taken}} \)
    \[ \Rightarrow \frac{2x + 44}{x} = \frac{50 \times 68 + 50x + 2200}{68x + 50x + 2200} = 58 \Rightarrow x = 500 \text{ km}. \]
    Total distance travelled = 2\( x + 44 \) = 1044 km.
    \( \text{Choice (2)} \)

25. Distance covered by the first train in one hour = 60 km. Distance covered by the second train over the first train in one hour = 75 – 60 = 15 km. The second train will gain 60 km in 4 hours (for both trains to be together). They will meet after 4 hours from 7:00 a.m. \( \therefore \) They will meet at 11 a.m. Distance travelled in 4 hours = 4 \times 75 = 300 km.
    \( \text{Choice (4)} \)

26. Let all the three trains meet t hours after 8:00 a.m. 120t = 80 (t + 2) \( \Rightarrow t = 4 \).
    In 4 hours distance covered by \( B = 120 \times 4 = 480 \) km. This 480 km was covered by \( C \) in 3 hours. So speed of \( C = \frac{480}{3} = 160 \) kmph.
    \( \text{Choice (3)} \)

27. Speed of Train T1 \( S1 = 45 \times 5/18 = 25/2 \) m/sec
    Let the Length of second train be \( T2 \) m.
    Speed of \( T2 = 27 \times 5/18 = 15/2 \) m/sec
    Time taken to cross each other in opposite direction \[ \Rightarrow \frac{300 + T2}{(25/2) + (15/2)} = \frac{300 + T2}{40} = 35 \Rightarrow T2 = 350 \] m.
    \( \text{Choice (4)} \)
28. Let the speed of the slower train be $s$ m/sec. The speed of the faster train = 1.5 $s$ m/sec.

\[
\frac{300 + 200}{1.5s - s} = 50 \Rightarrow s = 20. \text{ The required time} = \frac{500}{2.5(20)} = 10 \text{ seconds.} \quad \text{Choice (3)}
\]

29. Required time = Length of Train, $+\text{Length of Train, Relative Speed}$

\[
\frac{(250 + 350)}{(108 - 18) \times 5/18} = 24 \text{ seconds} \quad \text{Choice (3)}
\]

30. P would stop at the stations it come across after travelling 10 km, 20 km, 30 km, 40 km, and 50 km. Hence between the two stations the number of stations is 5. So P train stops for a total of 50 minutes. Time taken to travel 60 km = $\frac{60}{10} = 6$ hours. So A reaches B in 6 hours 50 minutes after 5:00 a.m. that is at 11:50 a.m.

\[\text{Choice (2)}\]

31. Downstream speed = $x + y = 12/3 = 4$ km/hr.
Upstream speed = $x - y = 12/6 = 2$ km/hr.
Speed of man in still water = 3 km/hr.
Speed of stream = 1 km/hr.
Difference in distances = $3 \times 5 - 2 \times 5 = 5$ km

\[\text{Choice (3)}\]

32. The upstream speed of the boat = $\frac{6}{2} = 3$ km/h. The downstream speed of the boat = $\frac{15}{3} = 5$ km/h.

\[\text{The required time} = \frac{30}{5} + \frac{30}{3} = 16 \text{ hours.} \quad \text{Choice (3)}\]

33. $s/(x + y) = (2/3) \Rightarrow s/(x - y) \Rightarrow x = 5y \rightarrow (1)$

\[\text{Given} \ xy = 45 \rightarrow (2); \text{Solving (1) and (2) we get} \ x = 15 \text{ km/hr; } y = 3 \text{ km/hr} \quad \text{Choice (1)}\]

34. Let the speed of the boat upstream be $x$ km/h and its speed downstream be $y$ km/h.
\[
\frac{24 + 36}{x} = 6 \rightarrow (1); \quad \frac{40 + 24}{y} = 7 \rightarrow (2)
\]

\[\text{Solving (1) and (2), } x = 8 \text{ and } y = 12. \text{ Speed of the stream} = \frac{1}{2}(12 - 8) = 2 \text{ km/h} \quad \text{Choice (3)}\]

35. With the help of the tide, time taken to cover 10 km = 1 hr
With the reversal of the direction of the tide, time taken = 5 hr. Time he would have saved = 4 hrs. \[\text{Choice (1)}\]

36. Let speed of John be $x$ km/h. Wind speed = 5 kmph

\[\text{S}_1 = \text{distance covered in} \ t \text{ sec when going against the wind.} \quad \text{S}_2 = \text{distance covered in} \ t \text{ sec with the wind.} \]

\[\text{Since} \ \text{S}_1 = 2\text{S}_2 \Rightarrow 2(x - 5)t = (x + 5)t \\Rightarrow \ x = 15 \text{ kmph.} \quad \text{Choice (1)}\]

37. Let the speed of the person in still water be $x$ km/h. Then, speed upstream = $(x - 5)$ km/h; speed downstream = $(x + 5)$ km/h

\[\text{If he has travelled for “t” hrs, upstream and “t” hrs downstream we have Down stream distance} = 2 \times \text{Upstream distance.} \quad \text{Therefore,} \ t(x + 3) = 2t(x - 3) \Rightarrow x = 9 \quad \text{Choice (2)}\]

38. Let its downstream journey time be $t$ hours. Its upstream journey time = $(t + 1)$ hours.
Downstream speed = $7 + 1 = 8$ km/h. Upstream speed = $7 - 1 = 6$ km/h. Distance between the two points = $8t = 6(t + 1) \Rightarrow t = 3 = 8t = 24 \text{ km} \quad \text{Choice (1)}$

39. Let the length of the race be $x$ m. Let the speed of B be $y$ m/s. Speed of A = $\frac{4y}{3} \text{ m/s}.$ A and B finish the race simultaneously. So time taken by A to cover $x$ m is the same as that taken by B to cover $(x - 120)$ m.

\[\frac{x}{4y/3} = \frac{x - 120}{y} \Rightarrow \frac{3x}{4y} = x - 120 \Rightarrow \frac{3x}{4} = 4(x - 120) \Rightarrow x = 480 \quad \text{Choice (2)}\]

40. \[\text{A}\quad \text{R}\quad \text{Q}\quad \text{B}\quad \text{C}\quad \text{P}\quad \text{D}\]

\[\text{PQ} = \text{Speed (m per min) in still water} = 30 \quad \text{QR} = \text{Speed (m per min) of river} = x \quad \text{(say)} \quad \text{PR} = \text{Speed (m per min) w.r.t bank} = 32.5 \quad \text{Choice (2)}\]

42. Let the time taken by Prakash to run the race be $t$ seconds. Time taken by Rakesh to run the race = $(t + 90)$ seconds. Time taken by Suresh to run the race = $(t + 90 - 30) = (t + 60)$ seconds.

\[\text{The ratio of the speeds of Prakash and} \quad \frac{1000}{t} + 60 = \frac{1000}{t} - \frac{200}{4} \Rightarrow t = 240 \quad \text{Choice (2)}\]

43. A beats B by 100 m in a 1000 m race
\[\text{If} A = 1000 \text{ m, B = (100 - 100) = 900 m} \quad \text{Choice (3)}\]

44. It is given that Akhil is $\frac{11}{4}$ times as fast as Anil. It means Akhil will cover 5 metres for every 4 metres Anil covers. So, Akhil will have an advantage of 1 metre for 5 metres he travels. To cover up 45 metres, Akhil must travel $(45 \times 5) = 225$ metres.

\[\text{At a distance of 225 metres from the starting point Akhil will meet Anil.} \quad \text{Choice (4)}\]

45. A : B : C = 1000 : 900 = 10 : 9; If B covers 1000 m, C covers (1000 – 150) = 850 m
B : C = 1000 : 850 = 20 : 17; A : B : C = 20 : 18 : 153
If A covers 200 m, C covers 153 m. If A covers 1000 m, C covers = $(1000 / 200) \times 153 = 765 \text{ m}$

\[\text{A beats C by (1000 - 765) = 235 m} \quad \text{Choice (4)}\]

46. Let the length of the race be $L$ m. When Alok finishes the race, Bala must have run $(L - 200)$ m and Dinesh must have run $(L - 400)$ m. In order for Bala to finish the race, he must have run another 200 m.

\[\text{For the same time Dinesh would have run less than 200 m.} \quad \text{Bala beats Dinesh by more than 200 m.} \quad \text{Choice (4)}\]

47. A and B meet for the first time after 250/10 = 45 sec

\[\text{Choice (3)}\]

48. Let the length of the track be $L$ m. Let the speeds of Aman, Pavan and Sekhar be a m/sec, b m/sec and c m/sec respectively.

\[\text{Required time to meet} = \text{LCM} \left( \frac{L}{a}, \frac{L}{b}, \frac{L}{c} \right) \quad \text{Choice (3)}\]

49. A and B meet for the first time after 200/8 = 25 sec; A and C meet for the first time after 200/5 = 40 sec

\[\text{Choice (1)}\]

50. \[\text{Solution Manual}\]

51. \[\text{Sol/856}\]

52. \[\text{32.5} \]

53. \[\text{A} \rightarrow \text{R} \rightarrow \text{Q} \rightarrow \text{B} \rightarrow \text{C} \rightarrow \text{P} \rightarrow \text{D} \]

54. \[\text{Option (2)}\]

55. \[\text{H.C.F(a,b,c) H.C.F(2b,b,6b)}\]

56. \[\text{L = H.C.F(a,b,c) H.C.F(2b,b,6b) = 2 minutes} \quad \text{Choice (2)}\]

57. \[\text{Option (1)}\]
50. Let the speed of B be x m/s. Speed of A = 3x m/s.
When A met B for the first time at that
time A covered one round more than B.
5 (3x) = 5 (x) = 100 → x = 10 m/s; Time
taken by B to complete the race = \( \frac{600}{10} \)
= 60 sec 
Choice (2)

GEOMETRY

Practice Exercise

Solutions for questions 1 to 40:

1. AB II GF and CB II DE \( \Rightarrow \angle BCD = \angle CDE = 60^\circ \) (alternate angles)
\( \Rightarrow CD II GF \Rightarrow \angle CDE + \angle DEG = 180^\circ \)
\( \Rightarrow \angle DEG = 180^\circ - 60^\circ = 120^\circ \) Choice (2)

2. \( \angle ADE = \angle ABC \); \( \angle AED = \angle ABC \)
From (1), \( \angle ADE = \angle AED \Rightarrow \angle DAE + \angle ADE + \angle AED = 180^\circ \)
\( \angle DAE + \angle DAE + 30^\circ + \angle DAE + 30^\circ = 180^\circ \)
\( \Rightarrow \angle DAE = 40^\circ \) Choice (2)

3. AC = 5 cm, In a right triangle, median drawn
to the hypotenuse, is half the hypotenuse.
\( \therefore BD = 1/2 \times \text{Hypotenuse} = 5/2 = 2.5 \text{ cm} \)
Choice (4)

4. Let AG = AF = 1
In triangle PGA, \( \angle G = 90^\circ \), \( \angle A = 60^\circ \), \( \angle P = 30^\circ \)
Since, \( AG : GP : PA = 1 : \frac{\sqrt{3}}{2} : 2 \)
\( GP = \sqrt{3} \); GD = 2 and PD = 2 = \( 7/\sqrt{3} \)
\( \therefore \ GP = \frac{\sqrt{3}}{2} \) Choice (1)

5. \( \angle AEC + 50^\circ = 180^\circ \); \( \angle AEC = 130^\circ \)
\( \angle ACD + \angle DCE = 240^\circ \Rightarrow \angle ACD + 130^\circ = 240^\circ \)
\( \Rightarrow \angle ACD = 110^\circ \); \( \angle ACD + \angle AEC = 180^\circ \Rightarrow 110^\circ + \angle AEC = 180^\circ \Rightarrow \angle AEC = 70^\circ \)
\( \angle A + \angle B + \angle C = 180^\circ \Rightarrow 50^\circ + \angle B + 70^\circ = 180^\circ \Rightarrow \angle B = 60^\circ \) Choice (3)

6. PD = 3 cm, PQ = 3.3 cm; PE = 7 cm, PR = 7.8 cm.
By the basic proportionality theorem,
if DE is parallel to BC, \( \frac{PD}{PQ} = \frac{PE}{PR} \) \( \Rightarrow \frac{3}{3.3} = \frac{7}{7.8} \)
So, DE is not parallel to QR.
\( \therefore \ DE \neq \frac{1}{2} \) QR Choice (2)

7. \( \angle B = 100^\circ \)
\( \angle A + \angle B = 180^\circ \) (sum of exterior angles on the same side of the transversal)
\( \therefore \angle A = 80^\circ \)
\( \therefore \angle A = 80^\circ \Rightarrow \angle B = 100^\circ \)

8. We know that the sum of any two sides of a
triangle is greater than the third side.
\( \angle AP + \angle BP > 3.5 \text{ cm and } \angle CP + \angle DP > 4.8 \text{ cm} \)
\( \Rightarrow \angle AP + \angle BP + \angle CP + \angle DP > 8.3 \text{ cm} \)
Choice (4)

9. \( \angle 1 = \angle 3 = \angle 5 = \angle 7 = 40^\circ \)
\( \angle 2 = \angle 4 = \angle 6 = \angle 8 = 140^\circ \) Choice (3)

A right angled \( \triangle \) is the maximum area
when it is isosceles. Each of the perpendicular
sides = \( \frac{12}{\sqrt{2}} \) cm
Area = \( \frac{1}{2} \times \left( \frac{12}{\sqrt{2}} \right)^2 \)
= 36 \text{ cm}^2. \) Choice (2)

15. \( \angle BOC = 90^\circ + (1/2) \angle A \Rightarrow \angle A/2 = 120^\circ \)
\( \rightarrow 90^\circ \)
\( \Rightarrow \angle A = 60^\circ \) Choice (3)

16. Let the bisectors of \( \angle P \) and \( \angle Q \) meet at the
point T on SR.

Let \( PQ = 2x \) and \( \angle Q = 2y; PS = QR = a \text{ cm} \)
\( \angle QTP = \angle PTS \left( \frac{PQ}{SR} \right) \); \( \angle QTR = \angle QTR \left( \frac{PQ}{SR} \right) \)

From the figure, PS = QR = ST = TR = a
\( \Rightarrow PQ = SR = 2a \)
Perimeter of PQRS = 13.5 cm (given)
\( \Rightarrow 6a = 13.5 \text{ cm} \Rightarrow a = 2.25 \text{ cm} \).
Choice (2)

17. By ASA congruency, the areas of both the
triangles are equal.
area of each triangle = \( 1/2 \) (Area of quadrilateral) = \( 1/2 \times 36 = 18 \text{ cm}^2 \) Choice (1)

18. AC parallel to SR. In triangle PSR,
\( \frac{PA}{PC} = \frac{PS}{PR} \) \( \Rightarrow \frac{PS}{PR} \)
By the basic proportionality theorem,
\( \angle DAPC \) is similar to \( \angle ASPR \). \( \frac{PA}{PC} = \frac{PS}{PR} \)
Area of triangle \( \triangle \) APC : Area of triangle
\( SPR = 2^2 : 5^2 = 4 : 25 \)
Area of \( \triangle \) APC : Area of \( \triangle \) SACR = 4 : 21
Choice (4)

19. In triangles ABC and DEC, \( \angle C \) is common
\( \angle CDE = \angle CAB \) (corresponding angles)
\( \angle CED = \angle CBA \) (do-)
\( \therefore \) Triangles ABC and DEC are similar
\( \Rightarrow DE = 1/2 \) AB.
Area of \( \triangle \) ABC = 64 \text{ cm}^2;
Area of \( \triangle \) EDC = \( (1/2) \times 64 = 16 \text{ cm}^2 \)
Area of \( \triangle \) ADE = \( 64 - 16 = 48 \text{ cm}^2 \)
Choice (3)

20. \( 2\angle EBC + 3\angle BCF = 460^\circ \) \( \Rightarrow \)
\( \angle EBC + \angle BCF = 180^\circ \) \( \Rightarrow \)
Solving (1) and (2), we have \( \angle EBC = 80^\circ \)
\( \angle ADC = \angle EBC = 80^\circ \) (exterior angle of a
cyclic quadrilateral is equal to the inte-
rior angle opposite to it) Choice (1)
21. Construct a line BX parallel to 1 and m and passing through B. \( \angle ABX = 60^\circ \) (alternate angles); \( \angle CBX = 50^\circ \) (alternate angles), \( \angle ABC = \angle ABX + \angle CBX = 60^\circ + 50^\circ = 110^\circ \). Choice (1)

22. In triangle ADP, \( AP^2 = AD^2 + DP^2 \) (by Pythagoras theorem).

\[
AP^2 = 24^2 + 10^2 \Rightarrow AP^2 = 576 + 100
\]

\( AP = 26 \text{ cm} \rightarrow (1) \); In triangle PCQ, \( PC = DC - DP = 15 - 10 = 5 \text{ cm} \)

As triangles ADP and QCP are similar, \( \frac{PC}{DA} = \frac{DP}{QD} \)

\( \frac{5}{QC} = \frac{10}{24} \Rightarrow QC = 12 \text{ cm} \rightarrow (2) \)

In triangle PCQ, \( PQ^2 = PC^2 + QC^2 = 5^2 + 12^2; PQ = 13 \rightarrow (3) \)

\( AQ = AP + PQ = 26 + 13 = 39 \text{ cm} \) [From (1) and (3)] Choice (4)

23. Clearly, \( 3x = z \)

\( z = 180^\circ - 75^\circ = 105^\circ \)

\( \therefore 3x = 105^\circ = 35^\circ \) Choice (2)

24. Let the number of sides be \( N \).

Number of diagonals = \( \frac{N(N - 3)}{2} \)

\( \frac{N(N - 3)}{2} = 9N \Rightarrow N(N - 21) = 0 \Rightarrow N = 21 \)

Choice (2)

25. Interior angle = \( \frac{(2n - 4) \times 90^\circ}{n} = \frac{12}{8} \times 90^\circ \)

\( = 135^\circ \)

\( \therefore \) Exterior angle = \( 360^\circ / 8 = 45^\circ \)

Choice (3)

26. Let the interior angle be \( 0^\circ \); Exterior angle = \( 180^\circ - 0^\circ \)

\( 20 + 3(180^\circ - 0^\circ) = 420^\circ \Rightarrow 0 = 120^\circ \)

Choice (2)

27. The number of diagonals = \( \frac{n (n - 3)}{2} = \frac{10 \times 7}{2} = 35 \)

Choice (1)

28. Radius of the larger circle is 5 cm and the distance between centres is 4 cm.

\[
\Rightarrow BC = 8\sqrt{5} \text{ cm} \quad \text{Choice (2)}
\]

29. In an equilateral triangle, Inradius = \( \frac{a}{2\sqrt{3}} \)

\( \Rightarrow a = 6 \text{ cm} \).

Side of \( \Delta PQR = 6 \text{ cm} \Rightarrow \text{Perimeter of } \Delta PQR = 18 \text{ cm} \).

Choice (4)

30. \( \angle AOC = 2 \angle ABC = 2 \times 60^\circ = 120^\circ \)

\( \angle ADC = \angle ABC = 60^\circ \) (angles in the same segment are equal).

Choice (3)

31. Let \( O \) be the centre of the circle and \( OB \perp PQ \)

As \( XY = PQ \Rightarrow \triangle XA = PA \Rightarrow \angle XAP = \angle APX = 30^\circ \) and \( BP = \frac{PQ}{2} = 9 \text{ cm} \).

[Perpendicular from centre to chord bisects the chord]

In \( \Delta OBP \),

In triangle \( \triangle AOB \), \( \angle O = 30^\circ \), \( \angle A = 30^\circ \), \( \angle B = 90^\circ \),

\( \Rightarrow AB : OB : OA = 1 : \sqrt{3} : 2 \)

\( OA = \frac{2}{\sqrt{3}} \Rightarrow OA = \frac{18}{3} = 6 \text{ cm} \).

Choice (4)

32. \( BC^2 = (24)^2 - (16)^2 = (40)(8) = 320 \)

33. \( \angle XTA = \angle ABT \) (by alternate segment theorem)

\( \Rightarrow \angle ABT = 35^\circ \); \( \angle AOT = 2\angle ABT = 2 \times 35^\circ = 70^\circ \)

Choice (2)

34. \( \angle AOB = 180^\circ \Rightarrow \angle AOD = 90^\circ \)

Circumference of circle is \( 10 \pi \); Length of arc \( \text{AD} = 1/4 \pi = 5\pi/2 \text{ cm} \) Choice (3)

35. \( AB^2 = (BC)(BD) \Rightarrow 8\times(4) = BD \Rightarrow BD = 16 \text{ cm} \Rightarrow DC = BD - BC = 12 \text{ cm} \)

Choice (4)

36. \( r_1 + r_2 > d \)

If \( r_1 + r_2 > d \), then two intersecting circles are formed. Hence two common tangents can be drawn. Choice (1)

37. \( OB = OA = \text{radius} \); Given \( AB = 2\sqrt{2} \text{ cm} \)

\( \Rightarrow OAB \) is an isosceles right triangle \( \Rightarrow \angle OBE = 45^\circ \)

Choice (3)

38. Radius makes a right angle with the tangent.

Hence \( \triangle ABO \) is a right angled triangle.

\( \Rightarrow AB \perp BO \)

\( AB = 12 \)

\( 12 = AB \times 3 \Rightarrow AB = 4 \)

\( AB^2 + BO^2 = AO^2 \Rightarrow AO = \sqrt{4^2 + 4^2} = 5 \).

Choice (2)

39. \( (RQ)(RP) = (RS)(RT) \)

\( (RQ)(RP) = (6)(RT) \)

\( \Rightarrow RT = 16 \text{ cm} \)

Choice (1)

40. \( PX.PY = PQ.PR; PX = PQ \Rightarrow PY = PR \)

\( \Rightarrow PX + XY = PQ + QR \Rightarrow XY = QR = 5 \text{ cm} \)

Choice (2)
MENSURATION

**Practice Exercise**

**Solutions for questions 1 to 40:**

1. When the centres of the three circles are joined with one another an equilateral triangle with side, $(7 + 7) = 14$ cm is formed. Area of the shaded portion = (Area of the equilateral triangle with side $14$ cm) – (3 × area of one sector with $60^\circ$ angle)  = $(\sqrt{3}/4) \times 14 \times 14$ – $3 \times (60^\circ/360^\circ) \times \pi \times 7 \times 7 = 8.77$ cm$^2$. Choice (3)

2. Area of ABG = $1/2$ base $\times$ height = $24 \times 16 = 384$ cm$^2$. Choice (2)

3. Number of square tiles = Area of the floor   
   Area of each square tile = Area of the floor   
   (side of each tile)   
   Number of square tiles is minimum when the side of each square tile is maximum. Maximum side = HCF(4.8, 3.6) = 1.2 m   
   Minimum number of square tiles = $(4.8/3.6)^2 = 12$   
   Choice (1)

4. Area of floor = $12^2 = 144$ m$^2$. Length of the carpet required = $144$   
   $(60/100) = 240$ m   
   Cost = $240 \times 305 = Rs\ 73200$. Choice (2)

5. Radius of the cricket field with the pavement = $80 + 8 = 88$ cm   
   Area of part (pavement) = $\pi (R^2 - r^2) = \frac{22}{7} (R + r) (R - r) = \frac{22}{7} \times 168 \times 8 = 4224$   
   Total cost = $4224 \times 8.45 = Rs\ 35692.8$   
   Choice (3)

6. Considering the shaded region enclosed between four adjacent circles, and joining the centres of the four circles, a square of side $10$ cm is formed. The shaded region = (Area of square) – (Area of circle) = $(10)^2 - \pi (5)^2 = 100 - 25\pi$   
   There are four such shaded regions = $4$   
   $(100 - 25\pi)$ cm$^2$. Choice (1)

7. Required area = Area of quarter circle with radius $7$ cm   
   $(A) = \frac{1}{4} \pi (7)^2 = \frac{1}{4} \times \frac{22}{7} \times 7 \times 7 = \frac{77}{2}$   
   $= 38.5$ m$^2$. Choice (4)

8. Lateral surface area = perimeter of base x height = $(5 + 6 + 7) \times 10 = 180$ cm$^2$. Volume = Area of base $\times$ height = $h \times \sqrt{(s-a)(s-b)(s-c)} = 10 \times \sqrt{9 \times 4 \times 3 \times 2} = 60\sqrt{5}$ cm$^3$. Choice (3)

9. Let the length and the breadth of the field be $l$ and $b$ respectively. Distance he would have walked using the direct route = $\sqrt{l^2 + b^2}$. Distance he would have walked if he walked along its edges = $1 + b - \frac{2}{5} = \sqrt{l^2 + b^2} \Rightarrow \frac{1}{b} = \frac{15}{8}$   
   Choice (2)

10. Area of $1/4$ of the circle of radius $2$ m = $(1/4) \times \pi \times (2)^2 = \pi$   
     Area of $3/4$ of the circle of radius $6$ m = $(3/4) \times \pi \times (6)^2 = 27\pi$   
     the total area of the field in which the cow grazes.   
     $\Rightarrow \pi + 27\pi = 28\pi = 28 \times (22/7) = 88$ m$^2$. Choice (2)

11. Area of the park = $240 \times 180 = 43200$ m$^2$. Area of the path running parallel to length = $40 \times 240$ m$^2$. Area of the path running parallel to breadth = $30 \times 180$ m$^2$. Total area of the path = $40 \times 240 + 30 \times 180 - 1200 = 13800$ m$^2$. Area of the park excluding the paths = $43200 - 13800 = 29400$ m$^2$. Choice (4)

12. Outer side of the photograph = $6 + 2 \times 8 = 62$ cm   
     Area of the frame = Outer Area – Inner area = $(8 \times 8) - (6 \times 6) = 28$ cm$^2$. Required ratio = $36 : 28 = 9 : 7$ Choice (3)

13. Let the side of the original cube be $a$ cm. Total surface area of the original cube = $6a^2$ cm$^2$. Total surface area of each part = $2a^2 + 4(a)$   
     $\begin{bmatrix} 3 & 4 \end{bmatrix} = 4a^2$   
     The sum of the total surface area of the two parts = $8a^2$.   
     $\Rightarrow$ Required percentage = $\frac{8a^2 - 6a^2}{6a^2} (100) = 33\frac{1}{3}$, per cent Choice (3)

14. Area of four walls = $2h(1+b) = 2 \times 3.5(8 + 5) = 91$ m$^2$. Area of two doors = $2 \times 2 \times 1.5 = 6$ m$^2$. Area of two windows = $2 \times 2 \times 1.075 = 4.15$ cm$^2$. Area of the other window = $0.75 \times 1.2 = 0.9$ cm$^2$. Area of the paper required to cover four walls of the room = $91 - (6 + 1.5 + 0.9) = 91 - 84 = 82.6$ m$^2$. Choice (4)

15. AB = $\sqrt{25^2 - 7^2} = 24$ m and BC = $\sqrt{25^2 - 20^2} = 15$ m Width of the road = AC = AB + BC = 39 m Choice (3)

16. Sum of parallel sides = $36 - 16 = 20$ cm Area = $(1/2) \times 20 \times 5 = 50$ cm$^2$. Choice (1)

17. Length of the cuboid so formed = $40 - 12 = 28$ cm Breadth = $32 - 12 = 20$ cm; Height of the cuboid = $6$ cm ∴ The required volume = $28 \times 20 \times 6 = 3360$ cm$^3$. Choice (1)

18. Number of bricks = Volume of the wall   
     Volume of each brick   
     $n = \frac{30 \times 100 \times 2 \times 100 \times 20}{12 \times 50 \times 10} = 2000$;   
     Cost = $2000 \times 5 = Rs\ 10,000$. Choice (2)

19. Area of the chess board = $(64)(5.25) = 336$ cm$^2$. Let the length of the rectangle be $l$ cm. ⇒ $(l/16) = 336 \Rightarrow l = 21$ cm Choice (4)

20. Volume of the wall = $24 \times 15 \times 1 = 360$ ft$^3$. Volume of mortar = $(25/100) \times 360 = 90$ ft$^3$. Volume of Bricks = Volume of wall − Volume of mortar = $360 - 90 = 270$ ft$^3$. Volume of one brick = $1 \times 1 \times 1 = (12 \times 8 \times 5)$ ft$^3$, inches   
     ∴ Number of bricks = $\frac{270 \times 12 \times 12 \times 12}{12 \times 8 \times 5} = 972$   
     Choice (4)

21. Let the speed of the water flowing through the aperture be $x$ m/s. Volume of water filled in the tank = $360 \times 144 \times \frac{40}{100}$ m$^3$   
     ⇒ (1);   
     Volume of water flown through the tank = $\frac{40}{100} \times \frac{30}{100} \times x \times 8 \times 60 \times 60 = \frac{40}{100} \times 144 \times 360 \Rightarrow x = 6$ Choice (1)

22. Let the height be $5x$ cm and radius be $2x$ cm Volume of the cylinder = $21560$ cm$^3$   
     ⇒ $\pi r^2 h = 21560 \Rightarrow (22/7) \times 2 \times 2 \times 5 \times 21560 \Rightarrow 2x = 14$ cm
29. Given weight of the box = 0.243 kg = 243 gm. Let the thickness of the box be x cm.
\[ \text{Volume of box} = \pi r^2 h = 243 \times 10^{-3} \times x \]
\[ \Rightarrow x = \frac{243}{100 \pi} \text{ cm} \]
\[ \Rightarrow x = 0.78 \text{ cm} \]

30. Diameter of the sphere = 400 \sqrt{3} cm. Side of this cube = diagonal = 400 \sqrt{3} / \sqrt{3} = 400 m.
Another smaller sphere is fitted in it.
Diameter of the sphere = 400 m. Side of the smaller cube = \( \frac{400 \times 400 \times 400}{400 \sqrt{3} \times \sqrt{3}} \).
Volume of larger cube = volume of smaller cube + \( \frac{400 \times 400 \times 400}{400 \sqrt{3} \times \sqrt{3}} \).
\[ \Rightarrow \text{Volume of larger cube} = \frac{3 \sqrt{3}}{1} \text{ cm}^3 \]

31. Let \( r_1 \) and \( r_2 \) be the radius of cylinder and hemisphere.
Volume of 72 cylindrical cans = \( 72 \pi r_1^2 h = 72 \pi r_1^2 (2r_1) = 144 \pi r_1^3 \text{ cm}^3 \).
Volume of hemispherical bowl = \( \frac{2}{3} \pi r_2^3 \Rightarrow 144 \pi r_1^3 = \frac{2}{3} \pi r_2^3 \Rightarrow r_2 : r_1 = 6 : 1 \)
\[ \Rightarrow \text{Volume of larger cube} = \frac{3 \sqrt{3}}{1} \text{ cm}^3 \]

32. Number of lead balls = \( \frac{36 \times 18 \times 11}{(4/3) \times \pi (1.5)^3} \)
\[ = 504 \text{ cm}^3 \]

33. If \( d = 1 \) cm
\[ \Rightarrow \text{Increase in volume} = \frac{(32 / 3) \pi r_3^3}{\pi r_1^3} \times \frac{28}{3} \times 100 = 700 \% \text{ per cent} \]

34. Volume of cylinder : Volume of hemisphere = \( (1/3) \pi r^2 h : \pi r^2 h = (1/3) \pi r^2 h : (1/3) \pi r^2 h \)
\[ = 1 : (2/3) : (1/3) = 3 : 2 : 1 \text{ Choice (2)} \]

35. Volume of ice cream is\( 63 \times 55 \times 14 \text{ cm}^3 \).
Volume of ice cream distributed to each person = volume of cone + volume of hemisphere
\[ = \frac{1}{3} \pi r^2 h + \frac{2}{3} \pi r^2 \pi r^2 (h + 2r) = \frac{1}{3} \pi r^2 \pi r^2 + \frac{6}{3} \pi r^2 \]
\[ \Rightarrow \text{The number of persons} = \frac{63 \times 55 \times 14}{2 \times \frac{22}{7} \times (1.75)^3} = 1440 \text{ Choice (3)} \]

36. Volume of cylinder = \( \pi r^2 h = (22/7) \times 7 \times 7 \times 12 = 154 \times 12 = 1848 \text{ cm}^3 \)
If it is wrongly taken as; height = 14 cm.
Diameter = 12 cm; Radius = 6 cm
Volume of the cylinder = \( \pi r^2 h = (22/7) \times 6 \times 6 \times 14 = 1584 \text{ cm}^3 \).
\[ \Rightarrow \text{Difference} = 1848 - 1584 = 264 \text{ cm}^3 \text{ Choice (1)} \]

37. Area of rectangular field = \( 50 \times 30 = 1500 \text{ m}^2 \)
Let the depth of the trench be \( d \) m.
\[ \Rightarrow \text{Volume of trench} = 15 \times 10 \times d = 150 d \text{ m}^3 \]
Area of the trench = \( 15 \times 10 = 150 \text{ m}^2 \).
Remaining area of the field = \( 1500 - 50 = 1350 \text{ m}^2 \).
\[ \Rightarrow \text{Volume of trench} = \frac{150 d}{1350} \Rightarrow d = 20 \text{ m} \text{ Choice (4)} \]

38. If the radius of the sphere is doubled, then new radius \( R = 2 \times r \) (\( r \) is original radius)
Original volume = \( (4/3) \pi r^3 \). Increased volume = \( (4/3) \pi (2r)^3 = (4/3) \pi (2r)^3 = (28/3) \pi r^3 \)
\[ \Rightarrow \text{Increased volume} = (28/3) \pi r^3 \text{ cm}^3 \text{ per cent increase} = (28/3) \pi r^3 / (4/3) \pi r^3 \times 100 = 700 \text{ per cent Choice (4)} \]

39. that is, \( \frac{\sqrt{3}}{4} a^2 = 40 \sqrt{3} \Rightarrow a^2 = 49 \times 4 \Rightarrow a = 14 \text{ cm} \)
Also given length of the side of the triangle = diameter of circle that is, \( d = 14 \text{ cm} \)
Thus the required area = \( \frac{3}{2} \times (\pi r^2) = \frac{3}{2} \times \frac{22}{7} \times 49 = 231 \text{ cm}^2 \)
\[ \Rightarrow \text{The required area is} 231 \text{ cm}^2 \text{ Choice (3)} \]

40. Volume of 1 lead shot = \( (4/3) \pi (2)^3 = 32 \pi / 3 \text{ cu mm} \)
Volume of 20,000 lead shots = \( 20,000 \times 32 \pi / 3 \text{ mm}^3 \)
The water level in the beaker is raised when 20,000 lead shots are dropped in it.
Volume increased = \( 20,000 \times 32 \pi / 3 \Rightarrow \pi r^2 h = 20,000 \times (32/3) \pi \times (1/10) \times (1/10) \times (1/10) \text{ cm}^3 \)
\[ \Rightarrow \text{Radius of cylinder} = 16/2 = 8 \text{ cm} \Rightarrow \pi r^2 h = 20 \times 32/3 \Rightarrow 8 \times 8 \times h = 20 \times 32/3 \Rightarrow h = 3.33 \text{ cm Choice (4)} \]
NUMERICAL APTITUDE

Practice Exercise

Solutions for questions 1 to 50:

1. Let $a = 3$, $b = 2$ and $c = 1$. The given expression equals

$$a^2 + b^2 - c^2 + 2ab + 2bc + 2ca$$

$$= a^2 + b^2 + c^2 - 3(ab + bc + ca)$$

$$= a^2 + b^2 + c^2 - 3(ab + bc + ca) = a + b + c = 1$$

Choice (2)

2. $2 + 4 = 6, 5 + 1 = 6, 2 + 3 = 5, 1 + 2 = 3, 3 + 1 = 4, 5 + 0 = 5$.

Choice (3)

3. Let $a = 3$, $b = 2$, and $c = 1$. The given expression equals

$$a^2 + b^2 - c^2 + 2ab + 2bc + 2ca$$

$$= a^2 + b^2 + c^2 - 3(ab + bc + ca) = a + b + c = 1$$

Choice (2)

4. $2^2 + 4^2 = (5.2 + 4.8)^2 = (10)^2 = 100$. Choice (2)

5. $2 + 3 = 5, 3 + 2 = 5, 2 + 1 = 3, 1 + 2 = 3, 3 + 0 = 3, 0 + 3 = 3$.

Choice (3)

6. $1.44^2 + 2.56^2 = 1.44 + 2.56 = 4.00, 2 + (1.44 + 2.56) = 4.00$.

Choice (2)

7. Each number is the form $\sqrt{a^2 + b^2}$ where $a + b = 0$.

$\sqrt{a^2 + b^2} = a + b + 2\sqrt{ab}$. As $a + b$ is constant, the greatest number’s square will have the greatest $2\sqrt{ab}$ that is, the greatest $ab$; $ab$ for $\sqrt{2+1, \sqrt{3+3}}, \sqrt{5+5}, \sqrt{7+7}$, and $\sqrt{9+9}$ are 22, 30, 40 and 42 respectively. The greatest of these is 42.

Choice (4)

8. $3.75^2 + 3.25^2 = \frac{3.75^2 + 3.25^2}{(3.75 - 3.25)^2 + (3.75 + 3.25)^2}$

Choice (4)

9. $2.61^2 - 0.21^2 = (1.41 + 1.21)^2 - (1.41 - 1.21)^2$

$= 2(1.41^2 + 1.21^2) + 2(1.41)(1.21) - 2(1.41)(1.21)$

Choice (2)

10. $\frac{\sqrt{240} - 4}{\sqrt{210}} = 4 Choice (3)$


Choice (1)

12. The cube root of the given number is 1.03.

Choice (2)

13. $\frac{251 + 241}{241} = (\frac{251}{241})^2 + (\frac{241}{241})^2 = [(\frac{251}{241})^2 + (\frac{241}{241})^2]$

$= 2$ that is $\geq 2$

Choice (2)

14. Tens digit of the given number is the tens digit of $24 + 31 + 31 - 68 - 60 = 86 - 128 = 58$. Choice (3)

15. As per BODMAS rule, $60 + 3 \times 6 + 23 + 1 \times 57 - 39 = 60 + 18 + 23 - 57 = 158 - 39 = 119$. Choice (2)

16. Units digits of the given number would be the units digit of $3^2 \times 6^2 \times 9^2 = 9$.

Choice (2)

17. 10 per cent of 20 per cent of 30 = 10 per cent of 20 = 20 per cent of 10 per cent of 30 = 20 per cent of 30 of 10 per cent of 10; . required value = 2 Choice (1)

18. The units digit of the given number would be the units digit of $3 \times 7 \times 9 \times 3 \times 3 = 1701$. Units digit is 1. Choice (4)

19. $3[(\frac{1}{2} + \frac{1}{2})^2 + \frac{3}{2} + \frac{1}{2} (\frac{3}{2})^2 + \frac{1}{2} (\frac{2}{2})^2]$ = $3[(\frac{1}{4} + \frac{1}{4} + \frac{3}{2} + \frac{1}{2}) + \frac{1}{4} (\frac{1}{2})^2 + \frac{1}{4} (\frac{3}{2})^2 + \frac{1}{4} (\frac{2}{2})^2]$ = 1 Choice (2)

20. Following the BODMAS rule

$a \times b \times c = \frac{3}{2} \times 5 \times 3 = 22.5$. Choice (3)

21. $\frac{35}{12} \times (1 + 3 + \frac{5}{2} - 49) \times 7 = \frac{35}{12} \times 49 \times 7$ Choice (4)

22. $5 \times \frac{3}{4} = \frac{30}{108}$

23. $\frac{5}{6} \times 5 = \frac{25}{30}$

24. $100 + 68 \times 2 - 17 = 240 - 191 = 29 Choice (3)

25. $14 - 7 + 12 + 23 - 9 + 15 = \sqrt{24} = 48$. Choice (2)

26. $\frac{26(20 + \sqrt{2})}{2(20 - \sqrt{2})}$ = $\frac{20 \times 1.414}{2 \times 1.414}$ = 36.5

Choice (3)

27. $2 + [2 + (2 + (2 + 2))] = 2 + 6 + 1/4 = 33/4$. Choice (2)

28. By applying BODMAS rule.

$\frac{51}{4} \times \frac{19}{17} + \frac{49}{6} = \frac{51}{4} \times \frac{19}{17} + \frac{49}{6}$ Choice (2)

29. $300 + 400 + 1 = \frac{3}{7} + \frac{4}{3} + \frac{1}{21} = \frac{58}{21}$ Choice (4)

30. $(2.03 + 7.06 - 1.052) \times (8.35 - 2.15) = 8 \times 6 = 48$. Answer is greater than 48. Choice (2)

31. 25 per cent of 18 + [56 + 44 + 5] = 25 per cent of 18 + [105] = $\frac{1}{4} \times 18 + \frac{105}{70} = \frac{3}{7}$ Choice (2)

32. $\frac{20}{100} \times [100 - 3] + 5(6 - 2) = \frac{20}{100} \times 98 + 5 \times 20 = \frac{20}{100} \times 30 + 5$ = 20 Choice (3)

Solutions for Mathematical Skills
33. \(5^{1/4} + 10^{1/2} + 15^{1/4} + 20^{1/4} = 50 + 1^{1/4} = 51^{1/4}\)

Choice (3)

34. \(\frac{1}{6}\) of 216 +
\[
\left[\frac{1}{3}\right]\ of \ [72 - \left(\frac{1}{4}\ of \ [64 + \left(\frac{7}{5}\ of \ [50]\right)]\right)\] - 1
\]
\[= 6 + [24 - (16 + 70 - 1)] = 6 + [24 - 85 - 1] = 6 + [24 - 86] = -56\]

Choice (3)

35. \([14 + 101 - (5 \times 29 \times 8) + 17] \Rightarrow \left(\frac{105}{1160} + 17\right) = \left(-1055 + 17\right) = -1038\)

Choice (3)

36. \(\frac{1}{7}\) of 343 + \(\frac{1}{2}\) of 108 - (109 + 48 - 7) - 4
\[= 49 + [54 - 150 - 4] = 49 - 100 = -51\]

Choice (2)

37. \((27.89)^2 + (12.09)^2 + 2 \times (27.89) \times (12.09) = \sqrt{79.94}\)
\[\Rightarrow (28)^2 + (12)^2 + 2(28)(12) = \sqrt{80}\]
\[\Rightarrow (28 + 12)^2 = \sqrt{80} \Rightarrow 40^2 = 80\]

Choice (2)

38. \[\sqrt[3]{5 \times x^2 + 5 \times x^2} \times \sqrt[3]{2 - 4} \times 5^{5/6} \times x^{2+m} \times x^{2-3} = \sqrt[3]{2} \times \sqrt{12} = 50^{\sqrt{2}}\]

Choice (2)

39. Let \(a + ?\) be \(k\)
\[\frac{815 + ?}{100} = \frac{28 \times 3}{100} \Rightarrow 815 \times 14 \times 6 = 1680\]
\[\Rightarrow 84k = 815 \times 84 \Rightarrow k = 84\]
\[\Rightarrow \left(\frac{k}{100}\right) = 84\]
\[\Rightarrow \text{Choice (2)}\]

40. \(\frac{\sqrt{27400} + \sqrt{64100} + \sqrt{29980}}{30 + 40 + 20} = 90\)

Choice (3)

41. \[\frac{(807 + 289)^2 + (807 - 289)^2}{(807)^2 + (289)^2} = \frac{2}{\left(\frac{807}{2} \times \frac{289}{2}\right)} = 2\]

Choice (3)

42. Applying BODMAS rule,
\[7 + \frac{1}{2}\ \text{of} \ [8 - 4 + 2 \times 3 - 2 + 6 - 2 \times 2] = 7 + \frac{1}{2}\ \text{of} \ [8 - 6 - 2 + 6 - 4] = 7 + \frac{1}{2}\ \text{of} \ [2] = 8\]

Choice (3)

43. \(\frac{63}{103} \times \frac{93}{63} \times \frac{101}{103} \times \frac{40}{233} \times \frac{131}{63} \times \frac{238}{233}\)

Each of \(\frac{63}{103} \times \frac{93}{63} \times \frac{101}{103} \times \frac{40}{233} \times \frac{131}{63} \times \frac{238}{233}\) is \(> 0.5\), so we have to compare \(93\) and \(101\) numerators is increasing by less than 10 per cent while denominator is increasing by approximately 25 per cent and hence \(93\) is the fourth largest.

Choice (4)

44. \(0.000126 \times 0.000735 = 0.05 \times 0.09 = 0.0045\)

Choice (4)

45. \(1 + \frac{1}{4} + \frac{1}{5} = \frac{53}{43}\)

Choice (4)

46. \(3 \sqrt{50} + 2 \sqrt{80} = 5 \sqrt{5} + 3(?)\)
\[\Rightarrow 3 \sqrt{10} + 2 \sqrt{16} = 5 \sqrt{5} + 3(?)\]
\[\Rightarrow 3(7) + 2(9) = 5(6) + 3(?) \Rightarrow ? = 3\]

Choice (2)

47. \(\frac{2625}{25} \times 7 + 15 = ? \times 3 \Rightarrow 750 = ? \times 3 \Rightarrow ? = 250\)

Choice (1)

48. \[\left(\frac{12}{5} - \frac{21}{5} - 18\right) \text{ of } 100 = \left(\frac{-47}{100}\right) \text{ of } 100 = -4700\]

Choice (4)

49. \(160 \times 300 + 400^2 - 40^2 = 48000 + 160000 - 1600 = 206400\)

Choice (3)

50. \[\text{[(10122 - 1092 - 14 + 17) = [10122 - 1092 + 3 + 17] = [10142 - 1092] = 9050}\]

Choice (3)

INDICES

#### Practice Exercise

**Solutions for questions 1 to 25:**

1. (i) The given expression can be written as \([5/3] \times [4/5] \times 5/3\)
\[\frac{1}{a^3} = \frac{a}{3^2} \text{ [expressing 25 and 9 to base 5 and 3 respectively]} = \frac{3^2}{5^2} \times \frac{4}{5} \times \frac{5^2}{3} = 5^4 \times 3^2 \times 4^2\]

Choice (4)

(ii) The given expression can be written as \(\left(\frac{x^3 \cdot y^{-3}}{x^2 \cdot y^3}\right)^3\)
\[= x^{3 \times 3} \times y^{3 \times -3} \times \left(x^4 \cdot y^4\right)^{-3}\]
\[= x^{9-6} \times y^{9-12} \times \left(2 \times \frac{y}{x}\right)^3 = 2^{3 \times \frac{y}{x}}\]

Choice (2)

2. \((x \times y) \times \left(\frac{y}{x}\right)^{3-2} = \left(x^3 \times y^2\right)\)
\[= 2 \times \left(\frac{2}{4}\right)^2 = 8\]

Choice (2)

3. \((x^3 \times y^{-3}) = \frac{x^3}{y^{-3}}\)
\[→ t = (a + b)\]

Choice (4)

4. \(\left(\frac{32^2}{256} \times (121)^{3/2}\right) = \left(\frac{2^7 \times (3^3)^{3/2}}{(16)^{3/2}} \times (11)^{3/2}\right)\)
\[= \left(\frac{2^7 \times 3^{3 \times 3/2}}{(16)^{3/2}} \times (11)^{3/2}\right)\]

Choice (3)

5. \((a + b) = \left(\frac{230^2 \times 25^2}{30^2 \times 5^2} = \left(\frac{3^2 \times 5^2}{10^2}\right)\right)\)

Therefore \(3^2 \times 5^2\) is larger. Choice (2)

6. Given \(\frac{y^3}{x^3}, \left(\frac{3}{x^3}\right), \left(\frac{x^3}{y^3}\right), \left(\frac{y^3}{x^3}\right)\)

\((3^{x^{1/2}} < \left(\frac{3}{x^3}\right)^{1/2} \text{ and } (3^y)^{1/2} < (3^3)^{1/2}\)

Ascending order is \((3^3)^{1/2}, (3^3)^{1/2}, 3^{x^{1/2}}, (3^y)^{1/2}\)

Choice (4)

7. The numbers can be written as \((3^2)^{1/4}, (4^2)^{1/4}, (2^2)^{1/4}, (5^2)^{1/4}\)

By comparison of the numbers in brackets, it is obvious that \(5^2\) is the largest ⇒ \(5^2\) is the greatest number.

Choice (4)

8. \(\left(\frac{x^y}{y^x}\right)^{y-x} = 2 \times \left(\frac{x}{y}\right)^{-y}\)
\[= 2 \times \left(\frac{2}{4}\right)^{-2} = 8\]

Choice (2)

9. \(7 \times 9 = 7 \times 9 + 15 \Rightarrow x + 2 = 6x - 15 \Rightarrow x = 17/5\)

Choice (3)
10. Given, \(3^n + 1 + 7^n = 5^{n + 2} - 5^{x + 1} \). Substituting the choices in the above equation it can be seen that only choice (3) satisfies it. Choice (3)

11. \((2)^{x + y} = (2)^{x + y} \Rightarrow 3x - 5 = 2x + 10\) 
\(\Rightarrow x = 15\) Choice (3)

12. \(2^n + 3^n = 17 \Rightarrow 2^n + 17 = 3^n \Rightarrow (1) \Rightarrow 2^n + 3^n = 43 \Rightarrow 2^n + 3^n = 43\)
\(= 2\left(2^3\right) + 3^3 = 43\)
\(3^n = 9 \Rightarrow y = 2; \) From \(2^n = 8 \Rightarrow x = 3\) and \(x + y = 5\) Choice (2)

13. \(3^n \times 5^n = 75 = 3 \times 5^2 \rightarrow (1)\)
\(3^n \times 5^n = 45 \Rightarrow 3^n \times 5^n = 9 \times 5\)
\(\Rightarrow 3^n \times 5^n = 3^n \times 5^n \rightarrow (2)\)

For both the equations (1) and (2), We get \(x = 1\) and \(y = 2\) Choice (1)

14. Let \(2^n = 4^n = k \Rightarrow 2^n = k^{1 / 2}\); \(4^n = k^{1 / 4}\); \(8^n = k^{1 / 2}\)
\(k^{1 / 2} \times k^{1 / 2} = k^{1 / 2} \Rightarrow \frac{1}{2} x = \frac{1}{y} = \frac{5}{x} \rightarrow (1)\);

Given \(\frac{1}{2} x + \frac{1}{3} y + \frac{1}{4} z = 4\)
\(\Rightarrow \frac{2 + 5}{4} x = 4 \Rightarrow x = 16\) \(\Rightarrow 7 / 16 = x\) Choice (3)

15. Given \(2^n = a; 2^m = b\) and \(2^p = c\)

Given expression \(= a^{2^n - 3} \cdot b^{2^m - 3} \cdot c^{2^p - 3}\)
\(= \frac{a^2 \cdot b^2 \cdot c^2}{4 b}\) Choice (1)

16. \(y = 6 + \frac{1}{6} + \frac{1}{6}; \) Using \((a - b)^2 = a^2 - 3 ab + 3 b^2 + b\) and \((a + b)^2 = a^2 + b^2 + 3 ab + 3 b^2\)
\(\therefore y^2 = 18y^2 + 90y = 150\) Choice (2)

17. \((102 \times 98) = (100 + 2) (100 - 2) = (100^2 + 2^2) - 2 = 100^2 - 2^4\)
Choice (2)

18. \(a = b = c\) \(\Rightarrow \frac{1}{p} \times \frac{1}{q} \times r = 1\)
\(\Rightarrow qr + pr + pq = pqr\) Choice (2)

19. For the product to be more than 1000, the decimal should be placed between 4 and 5 that is, the decimal should be moved seven places to the right hence the value of \(k = 7\). Choice (3)

20. Suppose \(p = q = 1; p + q + r = 0; \therefore r = -2\)

\(\frac{p^2}{q^2} + \frac{q^2}{r^2} = \frac{r^2}{p^2} + \frac{p^2}{q^2} + \frac{q^2}{r^2}\)

would have a value of \(-2\) for the above values of \(p, q, r\).

Alternate method:

Given \(p + q + r = 0 \Rightarrow r = -p - q \Rightarrow qr = -pq - q^2\) and \(pr = -p^2 - pq \Rightarrow r^2 = p^2 + q^2 + 2pq\)

21. \(\left[\frac{p^3}{q^3} \left(\frac{p^2}{q^2} - q^2\right)\right]^4 = \left[\frac{p^{14}}{q^{14}} \left(p^{13} - q^{13}\right)\right]^4\)

\(\Rightarrow \left[\frac{q}{p}\right]^4 = \left[\frac{p}{q}\right]^4 = \frac{p/q}{q/p}\) Choice (3)

22. Given \(x - \frac{1}{x} = 64 \Rightarrow x = \frac{1}{x} = \pm 8;\)

\(x^3 - \frac{1}{x^3} = \left(x - \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2} + 1\right) = \pm 8(67) = 536\) Choice (4)

23. \(3/2 \times 3/4 \times 3/8 \times \ldots \) 10 terms \(= 3^{1 / 2 + 1 / 4 + 1 / 8} \ldots \)

Clearly, powers are in G.P.
\(\therefore S_{10} = \frac{1 / 1 - (1 / 2)^{10}}{1 / 2} = 1 - 1/2^{10}\)
\(\Rightarrow 3^{1 / 10 - 10 / 2} = 3^{1 / 2 - 1 / 2}\) Choice (3)

24. Let \(x = \sqrt{42 + \sqrt{42 + \sqrt{42 + \ldots}}\}

\(\therefore \sqrt{42 + x} = x; \) Squaring on both sides, \(42 + x = (x - 7) (x - 6) = 0\)
\(\Rightarrow x = 7 = 0 \) or \(x = 6 = 0\) that is, \(x = 7\)

But \(x = 6\) cannot be negative (any square root must be positive) \(x = 7\) Choice (1)

25. \(x + \frac{1}{x} = 6 \Rightarrow x^2 + \frac{1}{x^2} + 2 = 36;\)

\(x^2 = \frac{1}{x^2} = \left(x^2 + \frac{1}{x^2} - 2\right) = 34 - 2 = 32\)
\(x = \sqrt{32} = 2 \sqrt{2}\)
\(x^2 - \frac{1}{x^2} = (x^2 + \frac{1}{x^2} - 2) = 6 \times 2 = 24 \sqrt{2}\)
\(\Rightarrow \frac{1}{x^2} - \frac{1}{x^2} = \left(24 \sqrt{2}\right)^2 = 1152\) Choice (2)

26. \(\text{Given } \sqrt{98 + \sqrt{80}}\}

\(= \sqrt{7 \sqrt{2} - 2 \sqrt{20}} = (\sqrt{2} - \sqrt{3})\) Choice (2)

27. \(\frac{1}{3 - \sqrt{8}} = \frac{1}{3 - \sqrt{8}} \cdot \frac{3 + \sqrt{8}}{3 + \sqrt{8}} = \frac{3 + \sqrt{8}}{3 + \sqrt{8} + \sqrt{8}}\)

Similarly \(\frac{1}{3 - \sqrt{8}} = \sqrt{8 + \sqrt{7}}\).
\[ \frac{1}{\sqrt{7} - \sqrt{6}} = \sqrt{7} + \sqrt{6}, \quad \frac{1}{\sqrt{6} - \sqrt{5}} = \sqrt{6} + \sqrt{5} \]

and \[ \frac{1}{\sqrt{5} - 2} = \sqrt{5} + 2 \]

\[ \therefore \text{Given expression} \]
\[ = (3 + \sqrt{5}) - (\sqrt{5} + \sqrt{7}) + (\sqrt{7} + \sqrt{6}) \]
\[ - (\sqrt{6} + \sqrt{5}) + (\sqrt{5} + 2) = 5 \quad \text{Choice (2)} \]

9. \[ x = 5 + 2 \sqrt{6} = (\sqrt{3} + \sqrt{2})^2 \]
\[ \sqrt{x} + \frac{1}{\sqrt{x}} = \frac{x + 1}{\sqrt{x}} = \frac{5 + 2 \sqrt{6} + 1}{\sqrt{3} + \sqrt{2}} \]
\[ = 6 + 2 \sqrt{6} \]
\[ \sqrt{x} + \frac{1}{\sqrt{x}} = 2 \sqrt{5} \quad \text{Choice (3)} \]

10. \[ 16 - 2 \sqrt{50} - 2 \sqrt{28} + 2 \sqrt{35} \]
\[ = 7 + 5 - 2 \sqrt{x} \sqrt{5} - 2 \sqrt{7} \sqrt{5} + 2 \sqrt{7} \sqrt{2} \]
\[ = (\sqrt{a} + \sqrt{b} - c) \]
\[ = a + b + c - 2 \sqrt{a} \sqrt{b} - 2 \sqrt{b} \sqrt{c} + 2 \sqrt{b} \sqrt{c} \]
\[ \therefore \quad a = 7, \quad b = 5, \quad c = 4 \]
\[ \therefore \text{The square root is } \sqrt{7} + \sqrt{5} - 2 \quad \text{Choice (3)} \]

11. Let the second surd be \( x + \sqrt{y} \).
\[ 1 + 12 \sqrt{2} + x + \sqrt{y} = 5 + 9 \sqrt{2} \]
\[ \Rightarrow x + \sqrt{y} = 9 + 6 \sqrt{2} \]
\[ \sqrt{9} + 2 \sqrt{5} = \sqrt{6} + \sqrt{5} \quad \text{Choice (4)} \]

12. \[ \frac{4}{\sqrt{2} + \sqrt{3} + \sqrt{5}} \]
\[ = \frac{4(\sqrt{2} - \sqrt{3} + \sqrt{5})}{(\sqrt{2} + \sqrt{3} + \sqrt{5})(\sqrt{2} - \sqrt{3} + \sqrt{5})} \]
\[ = \frac{4(\sqrt{3} + \sqrt{5})}{2 \sqrt{6}} \]
\[ = \frac{2(\sqrt{3} + \sqrt{5})}{\sqrt{6}} \quad \text{Choice (4)} \]

13. \[ \frac{2}{\sqrt{16} + 2 \sqrt{16 \times 12}} \]
\[ = \frac{2}{\sqrt{16} + 2 \sqrt{12}} \]
\[ = \frac{2}{\sqrt{16} + 2 \sqrt{12}} \]
\[ \Rightarrow \frac{2}{\sqrt{4 + 2 \sqrt{12}}} = \frac{2}{\sqrt{\sqrt{3} + \sqrt{7}}} \]
\[ = \frac{2(\sqrt{3} + 1)}{\sqrt{(\sqrt{3} + 1)(\sqrt{3} + 1)}} = \frac{2(\sqrt{3} + 1)}{\sqrt{3} + 1} \]
\[ = \sqrt{3} - 1 \]
\[ = -1 + \sqrt{3} = A + \sqrt{B} \Rightarrow (A, \ B) \quad \text{Choice (2)} \]

14. \[ \frac{6 + \sqrt{2}}{(\sqrt{5})^2 + \sqrt{2}(\sqrt{5} + \sqrt{3})} + \frac{6 - \sqrt{2}}{(\sqrt{5} - \sqrt{2})^2 + \sqrt{2}(\sqrt{5} - 3)} \]
\[ = \frac{8\sqrt{3} + 6 - 8\sqrt{2} - 2}{3 - 2} \]
\[ = 8\sqrt{3} + 6 - 8\sqrt{2} - 2 \]
\[ = 16\sqrt{3} - 4 = 16(1.73) - 4 = 23.68 \quad \text{Choice (3)} \]

15. \[ x = (\sqrt{5} + \sqrt{2})(\sqrt{5} - \sqrt{2}) \]
\[ = \frac{3 + 2 + 2 \sqrt{6}}{(3 - 2)} \]
\[ = 3 + 2 + 2 \sqrt{6} = 5 + 2 \sqrt{6} \]
\[ \Rightarrow 5 + 2 \sqrt{6} - 3 \times (5 + 2 \sqrt{6}) \]
\[ = (10 - 3 \sqrt{5} - 2 \sqrt{6}) = (10) - 30 = 970 \quad \text{Choice (3)} \]

16. \( (x^2 - y^2) = (x + y)(x - y) \)
\[ = \frac{\sqrt{3} + \sqrt{5}}{\sqrt{5} - \sqrt{3}} \]
\[ = \frac{\sqrt{3} + \sqrt{5}}{\sqrt{5} - \sqrt{3}} \]
\[ = \frac{2((5 + 2))}{3} \]
\[ = \frac{4 \sqrt{10}}{3} \]
\[ = \frac{14 \times 4 \sqrt{10}}{9} \]
\[ = \frac{56 \sqrt{10}}{3} \]
\[ 3(x^2 - y^2) = 3 \times 14 \times 4 \sqrt{10} \]
\[ = \frac{56 \sqrt{10}}{3} \]
\[ \Rightarrow xy = \frac{(\sqrt{3} + \sqrt{5})(\sqrt{5} - \sqrt{3})}{2} \]
\[ = 1 \]
\[ 3x^2 - 3y^2 + 4xy = 3(x^2 - y^2) + 4xy = \frac{56 \sqrt{10}}{3} + 4 \quad \text{Choice (1)} \]

17. \[ \frac{2(3 - \sqrt{7})}{(3 + \sqrt{7})(3 - \sqrt{7})} = 2(3 - \sqrt{7}) \]
\[ = \frac{2(3 - \sqrt{7})}{9 - 7} = 3 - \sqrt{7} \]
\[ x^2 - 6x + 2 = (3 - \sqrt{7})^2 - 6(3 - \sqrt{7}) + 2 \]
\[ = 18 - 18 - 6\sqrt{7} + 6\sqrt{7} = 0 \quad \text{Choice (3)} \]

18. \[ \sqrt{10} + 2\sqrt{5} + 2\sqrt{10} - \sqrt{5} - 4\sqrt{5} \]
\[ = 5 \]
\[ \frac{\sqrt{10} - \sqrt{5}}{10 - 5} = \frac{5(10 + \sqrt{5})}{10 - \sqrt{5}} \]
\[ = \frac{\sqrt{10} + \sqrt{5}}{10} \quad \text{Choice (1)} \]

19. The conjugate of \( 12 - \sqrt{80} \) is \( 12 + \sqrt{80} \)
\[ \sqrt{12 + \sqrt{80}} = \sqrt{12 + 4 \times 20} \]
\[ = \frac{12 + 2\sqrt{20}}{10} \]
\[ = \frac{12 + 2\sqrt{2}}{10} \]
\[ = \frac{12 + 2\sqrt{2}}{10} \quad \text{Choice (3)} \]

20. Applying compendio dividendo rule,
\[ \frac{x + 1}{x - 1} = \frac{2 + a + 2b}{a + b + 2a} \]
\[ = \frac{2 + a + 2b}{a + b + 2a} \]
\[ \text{Again applying compendio dividendo} \]
\[ = \frac{2 + a + 2b}{a + b + 2a} \]
\[ \Rightarrow \frac{x + 1}{x - 1} = \frac{a + 2b + a - 2b}{a + b + a - 2b} \]
\[ \Rightarrow b(x^2 + 1) = ax \quad \text{Choice (4)} \]

21. As the original method involves more steps, back substitution is the shorter method.
\[ \text{Put } x = \pm \sqrt{2} \]
\[ \therefore \quad (2 + \sqrt{3})^2 + (2 - \sqrt{3})^2 \]
\[ = (2 + \sqrt{3})^2 + (2 - \sqrt{3})^2 \]
\[ = 4 \]

22. \[ \frac{2}{\sqrt{1} + \sqrt{3}} = \frac{2(\sqrt{3} - 1)}{(\sqrt{3} + 1)(\sqrt{3} - 1)} \]
\[ = \frac{2(\sqrt{3} - 1)}{\sqrt{3} - 1} = \sqrt{3} - 1 \]
LOGARITHMS

**Practice Exercise**

Solutions for questions 1 to 25:

1. (i) \( \log_2 y = \log_2 \frac{2^9}{3} = \frac{6 \log_2 2}{3} = 2 \log_2 9 \) Choice (2)

(ii) \( \log_2 x = \log_2 \sqrt{7} \times \log_2 3 \) Choice (2)

(iii) \( \log_{10} (200 \times 500) = \log_{10} (10^5) = 5 \) Choice (3)

2. Given \( \log_b a = \frac{2}{3} \), \( \log_b c = \frac{4}{3} \) and

\[ \log_b (a) \cdot \log_b (c) \cdot \log_b (a) = \frac{2}{3} \cdot \frac{4}{3} \cdot \frac{3}{4} \Rightarrow 1 \]

\( x = \frac{16}{8} \Rightarrow x = 16 \) Choice (2)

3. (i) \( \log(x^2 - 1) = \log 2 \) (since \( \log(a) + \log(b) = \log(ab) \)).

Therefore, \( x^2 - 1 = 2 \), \( x = \sqrt{3} \) Choice (4)

(ii) \( (5x + 2)/7 = (x - 2) \)

\( 5x + 2 = 7x - 14 \Rightarrow 2x = 16 \Rightarrow x = 8 \) Choice (3)

(iii) Given, \( \log_{10} x + \log_{10} x + \log_{10} x = 27 \)

Let \( \log_{10} x = p \); Given expression becomes \( p + 2p + \frac{3p}{2} = 27 \Rightarrow 9p/2 = 27 \Rightarrow p = 6 \)

\( \log_{10} x = 6 \Rightarrow x = 10^6 \) Choice (4)

4. \( \log_a 4 = a = \log_b 1 \) \( \log_b 64a = 5 \)

\( 64a = (2b)^5 = 32b^5 \)

\( 64b^5 = 32b^5 \Rightarrow b = 0 \) or 2; \( b \) represents a base in the first equation given. Any base must be positive and other than unit \( b \neq 1 \).

5. \( \log(x^2 - 4) \cdot \log_2 x = 2x^2 - 16 = 48 \Rightarrow x^2 = 64 \Rightarrow x = 8 \) (\( \log \) is not defined for negative numbers) Choice (2)

6. \( \log q - \log p = a \Rightarrow \log q = a + 1 \).

Now \( \log_{10} (\frac{p}{q}) = \log p - \log q = \frac{1}{a + 1} \)

\( \Rightarrow \frac{a}{a + 1} \) \( \log_{10} q = \log_{10} p \) Choice (1)

7. \( 36^{1/6} \times 36^{1/6} \times 36^{1/6} \times 36^{1/6} = 6 \times 16 \times 64 \times 256 = 96 \times 6^{\log_x x^2} \equiv 96 \times 8^2 = \frac{3}{2} \) Choice (2)

8. \( \log(p + q) = \log p + \log q \) Choice (1)

\( \log 10 = \log 10 \) \( \Rightarrow(p) \Rightarrow p - q = 0 \)

Adding 1 on both sides, \( pq - p - q + 1 = 1 \)

\( p (q - 1) - 1(q - 1) = 1 \Rightarrow (p - 1) (q - 1) = 1 \) Choice (1)

9. \( \frac{1}{\log_{ab} a + \log_{ab} b} + \frac{1}{\log_{bc} b + \log_{ca} c} \)

\( = \frac{1}{\log_{ab} a} + \frac{1}{\log_{abc} b} + \frac{1}{\log_{abc} c} = \log_{abc} abc = 1 \) Choice (1)

10. Given that \( a^2 + b^2 = 7ab \); \( a^2 + b^2 + 2ab = 7ab + 2ab \)

\( a^2 + b^2 = 9ab \Rightarrow a + b = 3 \sqrt{ab} \)

\( \Rightarrow \frac{a + b}{3} = \sqrt{ab} \Rightarrow 3 = x \Rightarrow x = 3 \) Choice (3)

11. Let \( \log_a \log_b \log_c r = \log \) \( \Rightarrow \log_{abc} r \Rightarrow \log x = 3 \Rightarrow x = 2^3 = 8 \) Choice (3)

12. Let \( \log_a \log_b \log_c r = \log \) \( \Rightarrow \log_{abc} r \Rightarrow \log x = 3 \Rightarrow x = 2^3 = 8 \) Choice (3)

13. \( \log_{xy} \log_{xy} a \) \( \Rightarrow \log_{xy} \log_{xy} a \)

\( \Rightarrow \log_{xy} \log_{xy} a \)

\( = \frac{1}{\log_{xy} x} \) \( \log_{xy} y \) \( \Rightarrow \log_{xy} \log_{xy} y \)

\( = \frac{1}{\log_{xy} x} \) \( \log_{xy} \log_{xy} x \)

\( \Rightarrow \log_{xy} \log_{xy} y \)

\( = \log_{xy} a \) Choice (3)

14. We know that \( \log_{10} 210 < \log_{10} 225 \) and \( \log_{10} 180 > \log_{10} 169 \)

\( \Rightarrow \log_{10} 210 < 2 \Rightarrow (1), \Rightarrow \log_{10} 180 > 2 \Rightarrow (2) \)

From (1) and (2), \( \log_{10} 210 < \log_{10} 180 \)

\( \Rightarrow \log_{10} 210 < \log_{10} 180 \)

\( \Rightarrow \log_{10} 210 < 3 \log_{10} 180 \)

Both (1) and (2) are true. Choice (3)
15. \(3 = 3 \log_{10} y – \log_{10} x \Rightarrow 3 = \log_{10}\left(\frac{y}{x}\right)\)  
\(\left(\frac{y}{x}\right) = 10^3 \Rightarrow y = 10^3 x \Rightarrow x = \frac{y}{1000}\)  
Choice (4)

16. Given \(\log_{5} x = a\) and \(\log_{2} y = a\)  
\(\log_{5}\left(\frac{y}{x}\right) = \log_{5} y – \log_{5} x = 2a – a = a\)  
Choice (4)

17. \(\frac{\log a}{4} – \frac{\log b}{3} = \frac{\log c}{5} = k \Rightarrow a = 10^{4k}; b = 10^{3k}; c = 10^{5k}\)  
Choice (4)

18. If \(a, b\) and \(c\) are in continued proportion,  
\(\Rightarrow b/a = c/b \Rightarrow \frac{4x = \log(a, b, \log_{x} \cdot (2^3)^x)}{2} = \log_{a} x = 1 \Rightarrow 2x = 1 \Rightarrow x = \frac{1}{2}\)  
Choice (1)

19. \(\log 10 + \log (x + 5x) = 2 \log 60 \Rightarrow 10(x^2 + 5x) = 60 \Rightarrow x^2 + 5x - 6 = 0 \Rightarrow x = 1 \text{ or } -6\)  
Choice (2)

20. \(\log_{10} \frac{A^2 - B^2}{(A - B)} = \log_{10} \frac{A^2}{A - B} \)  
\(A^2 - B^2 = 2 \Rightarrow \log_{10} a = \log_{10} b, a = b; A + B = 2(A - B) \Rightarrow 3B = A \Rightarrow A = 3\)  
Choice (1)

21. \(2 \log x + \log (1+2/x) = \log 3 \Rightarrow \log (x^2 + 2x) = \log 3 \)  
\(x(x + 2) = 3 \Rightarrow x = -3, 1\). Hence, 1 is the positive value of \(x\) which satisfies the given equation.  
Choice (4)

22. \(P = \log_{10} (x^2 + y^2); Q = \log_{10} (x + y)\)  
\(2Q - P = 2 \log_{10} (x + y) - \log_{10} (x^2 + y^2)\)  
\(\log_{10} \frac{x + y}{x^2 + y^2} = 2 \Rightarrow \frac{(x + y)^2}{x^2 + y^2} = 2 \Rightarrow x^2 + y^2 + 2xy = 2x^2 + 2y^2 \Rightarrow (x - y)^2 = 0 \Rightarrow x = y\)  
Choice (1)

23. \(\log_{a}(1 + a) = 0 \Rightarrow a(1 + a) = b^a = a + a^2 = 1 \Rightarrow a^2 - 1 = -a\)  
Choice (3)

24. Number of digits in a number expressed in base \(n\) equals 1 more than the integer part of its logarithm to the base \(n\), \(\log(3^n) = 70(\log 3 = 0.47711) = 33.397\)  
Integer part of \(\log(3^n) = 33\); \(3^n\) has 34 digits.  
Choice (4)

25. \(\log_{2} \left[0.3 + 0.03 + 0.003 + \ldots\right] = \log_{2} 2 \times [1/3] = 3 \log_{2} 2 \times [1/3] = 1\)  
Choice (2)

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**TRIGONOMETRICAL RATIOS AND HEIGHTS & DISTANCES**

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**Practice Exercise**

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**Solutions for questions 1 to 25:**

1. (i) We know that \(1^\circ = \frac{\pi}{180}\) Radians.  
\(120^\circ = 120 \times \frac{\pi}{180} = 2\pi/3\)  
Choice (3)

(ii) We know that \(\pi^\circ = 180^\circ\)  
\(\frac{5\pi^\circ}{3} = \frac{5}{3} \times 180^\circ = 150^\circ\)  
Choice (4)

2. Since \(\theta\) is not in first quadrant and \(\cos \theta = \frac{40}{41}\) \(\theta\) must belong to fourth quadrant.

From the table \(\tan \theta = -\frac{9}{40}\)  
\(\sin \theta = -\frac{9}{41}\)  
\(\therefore \tan \theta - \sin \theta = -\frac{9}{40} - \left(-\frac{9}{41}\right) = -\frac{9}{1640}\)  
Choice (2)

3. \(\sin \theta + \cos \theta = 2 \Rightarrow \cos \theta = \frac{1}{2}\)  
\(\therefore \cos \theta - 2 \cos \theta + 1 = 0 \Rightarrow (\cos \theta - 1)^2 = 0 \Rightarrow \cos \theta = 1; \sec \theta = 1\)  
\(\therefore \cos \theta + \sec \theta = (1)^2 + (1)^2 = 2.\) Choice (3)

4. \(x^2 + y^2 = (a \sin \theta + b \cos \theta)^2 + (a \cos \theta - b \sin \theta)^2 = a^2 (\sin^2 \theta + \cos^2 \theta) + b^2 (\cos^2 \theta + \sin^2 \theta)\)  
\(\therefore x^2 + y^2 = a^2 + b^2\)  
Choice (3)

5. \(\cos \theta + \sec \theta = 2 \Rightarrow \cos \theta + \frac{1}{\cos \theta} = 2\)  
\(\Rightarrow \cos \theta(\cos \theta - 1)^2 = 0 \Rightarrow \cos \theta = 1; \sec \theta = 1\)  
\(\therefore \cos \theta + \sec \theta = (a)^2 + (1)^2 = 2.\) Choice (3)

6. BC = Wall; AB = Ladder

\(\cos \theta = \frac{BC}{AB} ; \cos \theta = \frac{20}{40} ; \cos \theta = \frac{1}{2} \Rightarrow \theta = 60^\circ\)  
Choice (2)

7. In \(\Delta ABC, \tan 30^\circ = \frac{AC}{BC} \Rightarrow \frac{\sqrt{3}}{3} = \frac{45}{BC}\)  
\(\Rightarrow B_C = 45\sqrt{3} \text{ m}\)  
In \(\Delta A_B C, \tan 60^\circ = \frac{AC}{B_C} \Rightarrow \sqrt{3} = \frac{45}{B_C}\)  
\(\Rightarrow B_C = \frac{45}{\sqrt{3}} = 15\sqrt{3}\)  
\(B_B = B_C + CB; 45\sqrt{3} + 15\sqrt{3} = 60\sqrt{3} \text{ m}\)  
\(\Rightarrow \frac{72\sqrt{3}}{5} \text{ km/hr}\)  
Choice (4)

8. Let \(AB = h_1, m; CD = h, m\) be the heights of the two towers and \(CM = MA = x\)  
\(\Rightarrow \frac{h_1}{x} = \frac{AB}{AM} \Rightarrow \frac{2}{\sqrt{3}} = \frac{h_1}{x}\)  
\(\Rightarrow (2 - \sqrt{3}) x = h_1\)  
In \(\Delta CMD, \tan 75^\circ = \frac{CD}{CM} \Rightarrow 2 + \sqrt{3}\)  
\(\Rightarrow \frac{h_1}{x} = (2 + \sqrt{3}) x : (2 - \sqrt{3}) x = 7 + 4 \sqrt{3}\)  
Choice (1)

9. In \(\Delta ABD, \tan 15^\circ = \frac{h}{200}\)  
\(\Rightarrow \frac{h}{x} = (2 + \sqrt{3}) x : (2 - \sqrt{3}) x = 7 + 4 \sqrt{3}\)  
Choice (1)

10. In \(\Delta CDA, \tan 2\alpha = \frac{AC}{AD} \Rightarrow \frac{2 \tan \alpha}{1 - \tan^2 \alpha} = \frac{h + 50}{200}\)  
\(\Rightarrow \frac{2h}{100} = \frac{h + 50}{200}\)  
\(\Rightarrow h^3 + 50h^2 + h(200)^2 - (200)^2 50 = 0\)  
Choice (3)
10. In \( \triangle CAB \), \( \tan \alpha = \frac{40}{80 + x} \Rightarrow x = 40(\cot \alpha - 2) \)

In \( \triangle DAB \), \( \tan 2\alpha = \frac{AB}{2} \tan \alpha \Rightarrow 2 \tan \alpha - 1 = 4(\cot \alpha - 2) \)
\( \tan \alpha = \frac{2 + \sqrt{3}}{2} \), or \( \tan \alpha = \frac{2 - \sqrt{3}}{2} \)
Since \( \alpha \) and \( 2\alpha \) are always acute. \( \therefore \tan \alpha = \frac{2 + \sqrt{3}}{2} \Rightarrow \alpha = 15^\circ \) Choice (1)

11. From \( \triangle ABC \), \( \tan \beta = \frac{230 + x}{AC} \rightarrow (1) \)
From \( \triangle DEB \), \( \tan \alpha = \frac{x}{DE} \rightarrow (2) \)

\[ \frac{1}{2} = \frac{4}{5} \Rightarrow \frac{230 + x}{x} = \frac{48}{25} = \frac{230 + x}{x} \]
\( x = \frac{25 \times 230}{25} = 250 \)
In \( \triangle DEB \), \( \sin \alpha = \frac{BE}{BD} \Rightarrow \frac{5}{13} = \frac{250}{BD} \)
\( BD = 650 \text{ m} \) Choice (4)

12. \( \because \) In \( \triangle ACB \), \( \sin \theta = \frac{40}{50} \Rightarrow \sin \theta = \frac{4}{5} \)
In \( \triangle DEA \), \( \sin \alpha = \frac{30}{50} \Rightarrow \sin \alpha = \frac{3}{5} \)
In \( \triangle ADE \), \( \tan \alpha = \frac{AE}{AD} \Rightarrow \frac{3}{4} = \frac{30}{AD} \); \( AD = 40 \text{ m} \) Choice (2)

13. Let \( AB \) pole, \( AC \) be the shadow of the pole and \( \theta \) be the angle of elevation of the sun.
\( \therefore \) Given \( AC = \sqrt{5} \) \( AB \)
In \( \triangle ABC \), \( \tan \theta = \frac{AB}{AC} \Rightarrow \tan \theta = \frac{1}{\sqrt{3}} \Rightarrow \theta = 30^\circ \) Choice (3)

14. Given \( \sin \theta = \frac{3}{5} \)
\( \therefore \) \( \tan \theta = \frac{3}{4} \)
In \( \triangle ABC \), \( \tan \theta = \frac{AB}{BC} \Rightarrow \frac{3}{4} = \frac{AB}{20} \)
\( \Rightarrow AB = 15 \text{ m.} \) Choice (2)

15. In \( \triangle ABC \),
\( \tan \alpha = \frac{h}{BC} \rightarrow (1) \)
In \( \triangle AED \), \( \tan \alpha = \frac{DE}{AE} \Rightarrow \tan \alpha = \frac{36 - AB}{BC} \rightarrow (2) \)
\( \frac{1}{2} = \frac{36 - h}{1} \Rightarrow 2h = 36 \Rightarrow h = 18 \text{ m} \) Choice (1)

16. \( \tan \alpha = \frac{h}{9} \) and \( \tan \beta = \frac{h}{4} \)
\( \tan \alpha \cdot \tan \beta = \frac{h}{9} \cdot \frac{h}{4} \)
\( x = 10 \text{ m} \)
\( \therefore \) The height of the tower = \( x + 10 = 20 \text{ m} \) Choice (1)

17. In \( \triangle ABD \), \( \tan 30^\circ = \frac{BD}{AB} \Rightarrow \frac{1}{\sqrt{3}} = \frac{BD}{300} \)
\( \Rightarrow BD = 300 \cdot \frac{1}{\sqrt{3}} = 100 \sqrt{3} \)
In \( \triangle ABC \), \( \tan \alpha = \frac{BC}{AB} \)
\( \Rightarrow \tan \alpha = \frac{200 \sqrt{3}}{300} = \sqrt{3} \)
\( \Rightarrow \alpha = 60^\circ \) Choice (3)

18. In \( \triangle ADE \), \( \tan 30^\circ = \frac{DE}{AE} \)
\( \Rightarrow \frac{1}{\sqrt{3}} = \frac{x}{AE} \)
\( \Rightarrow AE = \sqrt{3} x \)
In \( \triangle AEF \),
\( \tan 60^\circ = \frac{EF}{AE} \)
\( \frac{\sqrt{3}}{3} = \frac{10 + 10 + x}{\sqrt{3}x} \Rightarrow 3x = 20 + x \)
\( \Rightarrow x = 10 \text{ m} \)
\( \therefore \) The height of the tower = \( x + 10 = 20 \text{ m} \) Choice (1)

19. Let the altitude at which the aeroplane is flying be \( AB \).
In \( \triangle ABC \), \( \tan 45^\circ = \frac{AB}{BC} \Rightarrow \frac{AB}{BC} = 1 \)
\( \Rightarrow AB = BC = 500 \text{ m} \)
Let, \( AD = BE = x \text{ m}; \) In \( \triangle DEC \),
\( \tan 30^\circ = \frac{DE}{CE} \)
\( \Rightarrow \frac{1}{\sqrt{3}} = \frac{500}{500 + x} \Rightarrow x = 500 (\sqrt{3} - 1) \)
Required speed = \( \frac{500 (\sqrt{3} - 1)}{20} \text{ m/s.} \) Choice (2)
20. In \( \triangle ABC \), \( \tan 60^0 = \frac{30}{BC} \Rightarrow BC = \frac{30}{\sqrt{3}} \)
\( = 10\sqrt{3} \)

In \( \triangle ABD \), \( \tan 45^0 = \frac{AB}{BD} \Rightarrow AB = BD \)

AB = BC + CD \( \Rightarrow 10\sqrt{3} + x = 30 \)
\( \Rightarrow x = 10(\sqrt{3} – 1) \) m Choice (2)

21. \( \therefore CB = BA = x \) (say) \( (\because \angle ACB = 45^0) \)

In \( \triangle BCF \), \( \tan 60^0 = \frac{BC}{BF} \)
\( = 50 \)

22. Let the height of the tree be \( AB + BC = 30 \) m.
Let \( AB = x \) m;
\( BC = (30 – x) \) m

In \( \triangle ABC \), \( \sin 30^0 = \frac{AB}{BC} \Rightarrow \frac{1}{2} = \frac{x}{30 – x} \)
\( \Rightarrow x = 10 \) m Choice (3)

23. Let CD be the distance covered by the car in 10 seconds.

In \( \triangle ABC \), \( \tan 60^0 = \frac{AB}{BC} \Rightarrow \frac{1}{2} = \frac{150}{30 – x} \)
\( \Rightarrow 50\sqrt{3} \) m

In \( \triangle ABD \), \( \tan 30^0 = \frac{AB}{BD} \Rightarrow \frac{1}{\sqrt{3}} = \frac{150}{BD} \)
\( \Rightarrow BD = 150\sqrt{3} \) m

Now, \( CD = BD – BC = 100\sqrt{3} \) m
\( \therefore \) The speed of the car = \( \frac{\text{distance}}{\text{time}} = \frac{100\sqrt{3}}{10} = 10\sqrt{3} \) m/sec = 62.35 kmph Choice (1)

24. In \( \triangle AXY \), \( \tan 45^0 = \frac{XY}{AY} \Rightarrow 1 = \frac{50}{BY} \Rightarrow BY = 50 \) m

In \( \triangle AXY \),
\( \tan 30^0 = \frac{XY}{AY} \Rightarrow 1 = \frac{50}{AY} \Rightarrow AY = 50\sqrt{3} \) m
\( \therefore AB = AY + BY = 50(\sqrt{3} + 1) \) m Choice (1)

25. In \( \triangle ABD \),
\( \tan 45^0 = \frac{AB}{AD} \Rightarrow AD = h \)

In \( \triangle ACB \),
\( \tan 60^0 = \frac{AB}{AC} \)
\( \Rightarrow \sqrt{3} = \frac{AB}{AC} \)
\( \Rightarrow \sqrt{3} h = 450 = h \Rightarrow h = 225(\sqrt{3} + 1) \) m Choice (2)

Hence the given inequalities have no solution. Choice (4)

3. \( f(x) = (x – 6)(x – 2) < 0 \) . We multiply and divide the expression, with \( (2x – 1)(x + 4) \)
\( \frac{(x – 6)(x – 2)(2x – 1)(x + 4)}{(2x – 1)(x + 4)^2} < 0 \)
\( \Rightarrow (x – 6)(x – 2)(2x – 1) (x + 4) < 0 \) the denominator is positive.

as we want the expression to take a "negative sign", the solution set is the union of sections (b) and (d).
The interval notation is \( (–4, 1/2) \cup (2, 6) \) Choice (2)

4. As \( (x + 1)^2 \) is always positive the given equation becomes
\( (x + 4)(x + 6) > 0 \)
\( x \notin [–6, –4] \) Choice (4)

5. \( \frac{(x + 1)(x + 3)}{(x + 1)(x + 2)} < 0 \) ; \( x \neq –1 \)
\( \Rightarrow \frac{x + 3}{x + 2} < 0 \Rightarrow \frac{(x + 3)(x + 2)}{(x + 2)^2} < 0 \)
\( (x + 2)^2 \) being a perfect square is always greater than zero.
\( \Rightarrow (x + 3)(x + 2) < 0 \)

\( \therefore x \in (–3, –2) \) Choice (3)

6. \( (x – 2)^2 + 16 + 3 < 0 ; (x – 2)^2 + 19 < 0 \)
\( \therefore \) For no value of \( x \) the quadratic expression \( (x – 2)^2 + 19 \) is less than zero.
\( \therefore \) Solution set \( = \emptyset \) Choice (1)

7. \( x^2 + 5x – 24 < 0 \Rightarrow (x + 8)(x - 3) < 0 \)
\( x \in (–8, 3) \)
\( \therefore \) Solution set \( \{x : -8 < x < 3\} \)
\( \therefore \) Choice (4)

8. Given \( \frac{2x + 3}{x + 2} > 0 \Rightarrow \frac{2x – (x + 2)}{x + 2} > 0 \)
\( \Rightarrow \frac{x + 1}{x + 2} > 0 \Rightarrow (x + 1)(x + 2) > 0 \)
When \( x \in [–2, –1] \) the above inequation is not true.
Hence the number of integral values of \( x \) the above inequation is not true is 2.
\( \therefore \) Choice (2)

9. \( \vert x + 2 \vert + \vert x – 2 \vert = 0 \). There is no value of \( x \) that satisfies the above equation
\( \therefore \) Choice (4)

INEQUALITIES

PRACTICE EXERCISE

Solution for questions 1 to 25:

1. \( 5x + 9 > 3x + 19 \Rightarrow 5x – 3x > 19 – 9 \Rightarrow 2x > 10 \Rightarrow x > 5 \) Interval notation is \( (5, \infty) \).
\( \therefore \) Choice (3)

2. \( 13x + 4 < 5x + 20; 12x + 5 > 9x + 14 \)
\( 13x – 5x < 20 – 4 \Rightarrow 8x < 16 \Rightarrow x < 2 \Rightarrow (1) \)
\( 12x – 9x > 14 – 5 \Rightarrow 3x > 9 \Rightarrow x > 3 \Rightarrow (2) \)
The intersection of \( (1) \) and \( (2) \) that is, \( (x < 2) \cap (x > 3) \) is empty.
10. We know that when \( c > 0; \ a < b \) then \( ac < bc \). Statement (1) is true.

We know that when \( c < 0; \ a < b \) then \( ac < bc \). \( \therefore \) Statement (2) is false. Choice (1)

11. \( 6x^2 + 5x - 6 \leq 0 \) \( \Rightarrow (3x - 2)(2x + 3) \geq 0 \)

\( x \notin \left( -\frac{3}{2}, \frac{2}{3} \right) \Rightarrow x \in \mathbb{R} - (-3/2, 2/3) \) Choice (2)

12. \( (x - 3)(x + 2)(x - 2)(x - 1) < 0 \Rightarrow (x + 2)(x - 1)(x - 2) < 0 \)

\( (x - 3) < 0, \ (x - 2) < 0, \ (x - 1) < 0 \)

\( \Rightarrow (x - 3)(x - 2)(x - 1) < 0 \)

\( \therefore \) Solution is region (2) and region (4)

13. We know that \( |x| - |y| \leq |x - y| \) is always true.

14. \( |3x - 2| > |4 \Rightarrow 3x - 2 > 4 \) or \( (3x - 2) < -4 \)

\( x > 2 \) or \( x < -\frac{2}{3} \)

\( \therefore \) The solution set is \((-\infty, -\frac{2}{3}) \cup (2, \infty)\)

Choice (4)

15. \( \frac{(x - 1)(x + 2)}{(x + 3)(x - 2)} \leq 0 \; \Rightarrow \frac{(x - 1)}{(x + 3)} \leq 0 \; x \neq 2 \)

\( \Rightarrow (x - 1)(x + 3) \leq 0 \; \Rightarrow x \leq -3 \) or \( x \geq 1 \)

\( \therefore \) x belongs to \((-\infty, -3] \cup [1, \infty)\)

Choice (3)

16. \( 8 - 4x = 4 \Rightarrow 8 - 4x = 4 \) or \( 8 - 4x = -4 \)

\( 4x = 4 \) or \( 4x = 12 \Rightarrow x = 1 \) or \( x = 3 \)

\( \therefore \) x belongs to \( \{1, 3\}\)

Choice (4)

17. \( |x| \geq 2 \Rightarrow |x| \geq 2 \) or \( x = \pm 2 \)

\( \therefore \) x belongs to \( \{-2, 2, 3\}\)

\( \therefore \) Number of solutions = 4

Choice (3)

18. \( x + 8 \geq 0 \; \Rightarrow x \geq -8 \)

\( \therefore \) All values of x which are \( \geq -8 \)

Choice (2)

19. \( \frac{x - 4}{x + 4} = -2 \Rightarrow \frac{-x - 12}{x + 4} > 0 \)

\( \Rightarrow (x + 12)(x + 4) < 0 \)

\( \Rightarrow x \in (-12, -4) \)

Choice (4)

20. \( 2x + 3 < 5 \Rightarrow -5 < 2x + 3 < 5 \)

\( \Rightarrow -8 < 2x < 2 \Rightarrow -4 < x < 1 \)

\( \therefore \) Required interval : \((-4, 1)\)

Choice (1)

21. x = 2 or x = 1. The natural numbers are x = 1 and x = 2 satisfies x \( |x - 3| = 2 \).

\( \therefore \) Solution set is \{1, 2\}. Choice (3)

22. \( |x - 3| \leq 6 \Rightarrow -6 \leq 3x - 2 \leq 6 \Rightarrow -4 \leq x \leq \frac{8}{3} \)

Choice (2)

23. \( (x - 3)(x - 2) \geq 0 \Rightarrow x \notin \{2, 3\} \)

Choice (3)

24. Clearly ‘y’ is entirely positive for any value of ‘x’ and meets x-axis the point \((-1, 0)\).

\( \therefore \) The curve can be best represented by \( y = |x + 1| \)

Choice (3)

25. Clearly y is negative and x can take both positive and negative values.

\( \Rightarrow y = -|x| \)

Choice (3)

### PERMUTATIONS AND COMBINATIONS

**Practice Exercise**

**Solutions for questions 1 to 25:**

1. The number of arrangements that can be made from a group of \( n \) objects taken \( r \) at a time is \( ^nP_r \).

\( \therefore \) Required number of three letter words = \( ^nP_3 \)

Choice (3)

2. There are 3 consonants and 4 even places and the number of ways of arranging them is \( ^nP_3 \). There are 5 vowels and 5 places. Number of ways of arranging them is 5!.

\( \therefore \) Total ways are \( ^nP_3 \times 5! = 2880 \)

Choice (4)

3. Consider 7 blanks.

The first blank is always filled with T it can be done in one way.

Since the word never ends with L, so it can be filled by the remaining 5 letters in 5 ways. Now, we have 5 letters and 5 blanks. These can be filled in 5! ways.

\( \therefore \) Total number of words that can be formed as required is 5 \( \times 5! = 600 \)

Choice (4)

4. Total number of letters are 6 of which 3 are vowels and 3 are consonants. As there is no condition on the consonants, these can be arranged first in 3! ways.

\( \therefore \) Now there are 4 places for three vowels.

\( \therefore \) These can be placed in \( ^nP_3 \) ways

Total ways are 3! \( \times ^nP_3 \times 3! \times 4! \)

Choice (3)

5. A word that can be read from left to right or right to left remains the same is known as palindrome.

In a five letter palindrome only first three letters are different and the other two letters are same as first two letters in the respective places. The first three blanks can be filled in \( 6 \times 6 \times 6 \) ways.

\( \therefore \) Total number of palindromes possible is 216.

Choice (4)

6. Each letter can be posted in anyone of the five boxes in 5 ways. Hence, 8 letters can be posted in \( 5^8 \) ways.

Choice (2)

7. The word ‘NEIGHBOUR’ contain 5 consonants and 4 vowels. 3 consonants and 2 vowels can be selected in \( ^5C_3 \; \times ^4C_2 \) ways.

\( \therefore \) Total number of \( ^5C_3 \; \times ^4C_2 \) ways.

Choice (4)

9. Consider 3 blanks.

Case 1: The number contain exactly one ‘1’

This ‘1’ can be placed in any of the 3 blanks and the remaining 2 blanks can be filled with 9 numbers each. The total number of number of ways that 1 exactly occurs only one time is \( 3 \times 9 \times 9 = 243 \)

Case 2: The number contain exactly two ‘1’s. Two blanks can be filled with ‘1’ in \( ^2C_3 \) ways. Third blank can be filled in 9 ways.

\( \therefore \) The total number of times that ‘1’ occur twice is \( 2 \times 3 \times 9 = 54 \)

All the three digits contain 1 in one way.

\( \therefore \) The required number of times that 1 occurs = 243 + 54 + 3 = 300

Choice (3)

10. Given digits are 0, 1, 2, 3, 4, 5, 6, 7, 8.

Total number of 5 digits numbers formed without repetition

\( 8 \times 8 \times 7 \times 6 \times 5 = 13440 \)

Choice (3)

11. If the sum of the digits of a number is divisible by 3, then the number is divisible by 3.

\( \therefore \) The number of three digits numbers formed with (1, 2, 6) and (1, 5, 6) is \( 2 \times 3! = 12 \) and the number of three digit number formed with (0, 1, 2) and (0, 1, 5) is \( 2 \times 4 = 8 \)

\( \therefore \) Required answer = 12 + 8 = 20

Choice (2)
12. 15 persons who refuse to go to upper deck have to be sent to the lower deck and the 10 others who refuse to be in the lower deck are sent to the upper deck. Having taken care of these 25, of the remaining 85 people 40 have to be sent to upper deck and 45 in the lower deck and the number of ways of doing this is $85! / 40! / 45!$.

13. If 5 letters are placed in corresponding envelopes, then the 6th letter is also placed into corresponding envelope. The number of ways $= 0$. Choice (1)

14. Let the sides of the polygon be n. The number of diagonals in it are $n(n - 3)/2 = 2n \Rightarrow n = 7$. Choice (4)

15. The team can be selected in the following ways

<table>
<thead>
<tr>
<th>Bowlers (6)</th>
<th>Batman (10)</th>
<th>No. of ways of selecting team</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>$^6C_1 \cdot ^{10}C_{10}$</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>$^6C_1 \cdot ^{10}C_9$</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>$^6C_1 \cdot ^{10}C_8$</td>
</tr>
</tbody>
</table>

∴ Total number of ways of selecting the team is $^6C_1 \cdot ^{10}C_{10} + ^6C_1 \cdot ^{10}C_9 + ^6C_1 \cdot ^{10}C_8 = 6 + 150 + 900 = 1056$ Choice (1)

16. Total number of ways of selecting 8 boys and 4 girls from 15 boys and 10 girls is $^{15}C_8 \times ^{10}C_4$.

A, B are together in the representation in $^{14}C_7 \times ^{6}C_1$ ways. Hence, they are never together in $^{14}C_7 \times ^{6}C_1 - ^{14}C_7 \times ^{6}C_1$ ways.

∴ The required number of ways $= ^{14}C_7 \times ^{6}C_1 = 55$ Choice (1)

17. From the given data, the remaining 5 persons can be selected from 10 persons in $^{10}C_5$ ways that is 252 ways. Choice (1)

18. From 4 ladies and 5 men we need to select 5. Exactly 2 ladies and 3 men are selected in $^4C_2 \times ^5C_3 = 6 \times 10 = 60$ ways Choice (1)

19. Numbers of girls (8) Number of boys (10)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

∴ The required number of ways $= ^8C_1 \times ^{10}C_7 + ^8C_0 \times ^{10}C_10 = 960 + 45 = 1005$ Choice (1)

20. Total number of questions is 10. Each question can be handled in 3 ways – either not attempt it, or attempt choice A or choice B. Total ways are $3^{10}$ of which we remove the case of not attempting any of the questions. Hence, required ways are $3^{10} - 1$ Choice (4)

21. Man can invite one friend or two friends or all friends.

∴ Numbers of ways that he can invite at least one friend $= ^5C_1 + ^5C_2 + ^5C_3 + ^5C_4 + ^5C_5 = 5 + 10 + 10 + 5 + 1 = 31$ Choice (2)

22. Each question can be attempted in 4 ways. Hence 10 questions can be attempted in $4^{10}$ ways. Choice (3)

23. 9 beads can be arranged in a necklace in $(9-1)!$ ways that is $8! / 2$. Choice (4)

24. Since no two teachers are together it means there is a student present in between any two teachers first arrange 5 students. This can be done in $4!$ ways. Now the 5 teachers can be arranged in the 5 places in $5!$ ways. Hence total ways are $4! \times 5!$. Choice (3)

25. First book can be given to any of the 4 students, that is, in $4 \times 4 \times 4 \times 4 \times 4 = 4^5$ Choice (2)

Hence the required probability is $\frac{21 \times 5}{35C_2} = \frac{21}{65}$ Choice (1)

5. Total number of outcomes $= ^{10}C_5 = 252$;

Number of favourable cases $= ^{10}C_7 \times ^{10}C_2 + ^{10}C_8 \times ^{10}C_1 + ^{10}C_10 = 100 + 25 + 1 = 126$ Choice (1)

∴ The required probability $= \frac{126}{252} = \frac{1}{2}$. Choice (3)

6. P (both are kings or both are queens) $= \frac{\binom{4}{2} \cdot \binom{4}{2}}{221} = \frac{2}{221}$ Choice (1)

7. The total number of four digit numbers by using 1 to 5 is $^5P_4$. The number of even numbers which can be formed is $2(\binom{4}{2}) = 2 \times 4!$.

∴ Required probability $= \frac{2 \times 4!}{5!} = \frac{2}{5}$ Choice (2)

8. The probability of 5 being pink and 3 being orange is $\frac{3}{10} \times \frac{3}{10} = \frac{9}{100}$ Choice (1)

9. 5 boys can be arranged in $5!$ ways. E be the required event $E$ be the event that the two boys are always sit together. $P(E)$

$= 4! \times 2!; \ P(E) = \frac{4! 	imes 2!}{5!} = \frac{2}{5}$ Choice (4)

10. P (room is lighted) = P (at least one good bulb is selected) = $1 - P$ (all bulbs chosen are bad)

$= 1 - \frac{6}{\binom{10}{5}} = \frac{124}{120}$ Choice (4)

11. Total number of outcomes $= \binom{16}{2} = 156$;

Number of favourable cases $= \binom{14}{2} \times \binom{2}{1} + \binom{14}{3} \times \binom{1}{1} + \binom{14}{4} = 15 + 30 + 10 = 55$ Choice (1)

∴ The required probability $= \frac{55}{156}$ Choice (4)

12. There are 1926 rectangles and 204 squares on a chess board. Hence required probability is $\frac{204}{1926} = \frac{17}{158}$ Choice (2)

13. The number of squares in a $8 \times 8$ chess board = 204. The number of squares of the size 2 x 2 in a chess board = 49.

∴ The required probability $= \frac{49}{204}$ Choice (2)
14. To be able to get a maximum amount, one should have selected all five rupee coins.

The probability of this being \( \binom{9}{5} \binom{3}{2} = \frac{1}{969} \); \( \therefore \) odds in favour are 1 : 968  Choice (1)

15. Total number of outcomes = \( \binom{33}{2} \)

\[ = \frac{33 \times 32}{2 	imes 1} = 33 \times 16 \]

For the sum to be odd, one number should be even and other should be odd.

Favourable possible outcomes = \( 17 \times 16 \);

Required probability = \( \frac{17 \times 16}{33 \times 16} = \frac{17}{33} \) Choice (2)

16. The probability selecting first bag and drawing a different colour balls from it =

\[ \frac{1 \times \binom{4}{1} \times \binom{4}{1}}{\binom{8}{2}} \]

The probability of selecting second bag and drawing a different colour balls from it =

\[ \frac{1 \times \binom{4}{1} \times \binom{4}{1}}{\binom{8}{2}} \]

\[ = \frac{1 \times 4 \times 4}{\binom{8}{2}} \]

\[ = \frac{16}{28} \]

\[ = \frac{4}{7} \]

\( \therefore \) required probability = \( \frac{4}{7} \) Choice (3)

17. Let number of boys be x and the number of girls be \( \binom{10}{2} = \frac{10 \times 9}{2 \times 1} = 45 \) \( \Rightarrow \) x = 15;

\( \therefore \) The number of boys = 15.

The strength of the class is 15 + 15 = 30

\[ \therefore \] Required probability = \( \frac{1}{4} \) Choice (2)

18. The probability that the three balls are of same colour P(YYY or WWW or BBB) = \( \frac{\binom{3}{3} + \binom{4}{3} + \binom{5}{3}}{\binom{15}{3}} \)

\[ = \frac{3 + 4 + 5}{14} \]

\[ = \frac{12}{44} \]

\[ = \frac{3}{11} \] Choice (3)

19. Three members can be selected from 20 members in \( \binom{20}{3} \) ways. Number of ways of selecting one teacher, one boy and one girl is \( \binom{3}{1} \times \binom{10}{1} \times \binom{7}{1} \). Required probability = \( \frac{6 \times 10 \times 4}{\binom{20}{3}} \)

\[ = \frac{240}{1140} \]

\[ = \frac{4}{19} \] Choice (1)

20. Let p and q denotes the probability of success and failures respectively. \( \therefore \) p = \( \frac{1}{4} \), q = \( \frac{3}{4} \)

The probability of B winning the game = \( pq + qp + q^2p + \ldots = q^p(1 + q + q^2 + \ldots) \)

\[ = \frac{2q}{1 - q^2} = \frac{3 \times 4}{1 - 9} = \frac{3}{16} \]

\( \therefore \) Choice (1)

21. \( P(\overline{X} \cup Y) = P(\overline{X}) + P(Y) - P(\overline{X} \cap Y) \)

\[ = P(\overline{X}) + P(Y) - P(X) \cdot P(Y) \]

\[ = 0.1 + 0.2 - 0.1 \times 0.2 = 0.28 \] Choice (2)

22. \( P(\text{exactly one of the reaches the summit}) \)

\[ = P(A \overline{J} M) \text{ or } \overline{A} J M \text{ or } \overline{A} \overline{J} M \]

\[ = \frac{1}{3} \times \frac{3}{5} + \frac{2}{3} \times \frac{1}{3} + \frac{2}{3} \times \frac{2}{3} = \frac{13}{15} \] Choice (1)

23. A leap year has 366 days every day repeated 52 times with 2 days left. The two days may be (Sun, Mon), (Mon, Tue), …..(Sat, Sun). \( \therefore \) n(s) = 7

The year has 53 Mondays, of the two days left one of the day must be Monday.

\( \therefore \) Favourable cases = \{Sun, Mon\}, \{Mon, Tue\}, ……..\{Sat, Sun\}.

\( \therefore \) n(E) = 2

\( \therefore P(E) = \frac{2}{7} \) Choice (1)

24. \( x + y = 0.1 \) + \( x \)

\( \therefore x + P ; x = \frac{1}{2} \)

\( \therefore y = \frac{1}{2} \)

\( \therefore c = 1 \) or 2. abc has two possibilities.

\( \therefore \) Column B = 2

\( \therefore \) Column A < Column B. Choice (2)

25. Let the middle number be a and the common difference be d where d > 0. Largest of the numbers is a + d. Smallest of the numbers is a - d. The common difference is d = \( a + d \) - \( a - d \) = 2d

\( \therefore \) Column A = \( \frac{a + b}{2} \)

\( \therefore \) Column B - Column A

\[ = \frac{1}{2} (a + b) - \frac{a + b}{2} \]

\[ = \frac{a + b}{2} - \frac{a + b}{2} \]

\[ = \frac{(a + b)^2 - 4ab}{4(a + b)} \]

\[ = \frac{(a - b)^2}{4(a + b)} \]

\( \therefore a = b \), this is 0 that is, Column A = column B. Otherwise, this is positive, that is, column B > column A.

\( \therefore \) Choice (4)

26. Let x be 10a + b. 10a + b = 81 + a + b; 10a + b = 81 + a + b \Rightarrow a = 9

Column B: Let y be 10p + q; Column B = \( q - 1 \); q ≤ 9

\( \therefore \) Column B ≤ 8. \( \therefore \) Column A > Column B.

\( \therefore \) Choice (1)

27. Let the middle number be a and the common difference be d where d > 0. Largest of the numbers = a + d. Smallest of the numbers = a - d. The common difference is d = \( a + d \) - \( a - d \) = 2d

\( \therefore \) Column A = \( \frac{a + b}{2} \)

\( \therefore \) Column B: Average speed

\[ = \frac{2(a + b)}{a + b} \]

\( \therefore \) Column B = \( \frac{2ab}{a + b} \)

\( \therefore \) If \( a + b = 2a + \frac{b}{2} \) \Rightarrow Column A = column B;

\[ = \frac{2ab}{a + b} \]
9. If there are three consecutive natural numbers, one of them would be divisible by 3, another will be 1 more than a number divisible by 3 and the third will be 2 more than a number divisible by 3.

10. If \( x = 10 \) then the number of even factors and odd factors are the same. If \( x = 100 \) then the number of even factors is more than the number of odd factors. Choice (4)

11. Column A: Let the number be \( 10a + b \)
\[
\frac{10a + b}{a + b} = 1 + \frac{9}{a}.
\]
This is minimum when \( \frac{9}{a} \) is minimum that is, \( 1 + \frac{b}{a} \) when \( b \) is maximum that is, \( a \) is maximum (9) and a is minimum 1, ∴ Column A = 1.9. Column A < Column B. Choice (3)

12. Column A: Let the angle be \( x \). Its complement \( = 90° - x \)

Given that \( x^2 + 2(90° - x^2) + 3(90° - x^2) = 180° \)
\( \Rightarrow x = 67.5. \Rightarrow Column A = Column B. \)

13. Let \( \log x = z \Rightarrow \log y = \frac{1}{z} \)
\[
A = \left( z + \frac{1}{z} \right)^2 = z^2 + 2 + \frac{1}{z^2}, \quad B = \left( z - \frac{1}{z} \right)^2 + 4 = z^2 + 2 + \frac{1}{z^2}. \quad \therefore Column A = Column B \)

14. If \( N = 1 \), column A = 1 and column B = \( 1^1 = 1 \). In this case, column A = column B. If \( N = 2 \), column A = 1 + 2 = 3 and column B = \( 1^2 + 2^2 = 9 \). In this case, column A < column B. Choice (4)

15. Column A: Any two digit prime number is one more than or one less than a number divisible by 6.
\( \therefore \) It will leave a remainder of either 1 or 5 when divided by 6. \( \therefore Column A = 2. \)
\( \therefore Column A = Column B. \quad \text{Choice (3)} \)

16. If \( x = \frac{1}{4} \) then column A = \( \frac{1}{2} \) and column B = \( \frac{1}{8} \)
\( \Rightarrow A > B; \) If \( x = 4 \), then column A = 2 and column B = 8 \( \Rightarrow A < B \) Choice (4)

17. Column A: Let the length, breadth and height of the cuboid be \( l, b \) and \( h \). \( (l.b) \) (l.h) \( (l.b.h) = 36. \) \( \therefore \) Column A = column B. Choice (3)

18. If \( x = 1, x^3 = 1. \) Column A = 9 and Column B = 1.
If \( x = 5 \) then \( x^2 = 25 \), in this case column A = column B. Choice (4)

19. Column A = Rs P \( \left( 1 + \frac{R}{100} \right)^3 \)
Column B = Rs P \( \left( 1 - \frac{R}{100} \right)^3 \)
\[
\frac{1 + \frac{R}{100}}{1 - \frac{R}{100}} > \frac{1 + \frac{R}{100}}{1 + \frac{R}{100}}.
\]
because \( (100 + R)^3 > (100 + R)^3 - r^3 \Rightarrow A > B \)

20. Suppose \( R \) has an initial length \( f \) and an initial breadth of \( b \). Initial perimeter = \( 2(f + b) \)
Column A: New length = \( \left( 1 + \frac{20}{100} \right) \)
\[
= 1.2f; \text{ New breadth = } b \left( 1 + \frac{10}{100} \right)
= 1.1b; \text{ New perimeter = } 2(1.2f + 1.1b). \quad \text{Percentage increase in perimeter = } 2(1.2f + 1.1b) - 2(f + b)
\[
\frac{(100)}{2(f + b)} = 10
\]

21. Column A: \( x = \pm \sqrt{15 + \sqrt{224}} \); If \( x > 0 \), column A = column B; If \( x < 0 \), column A < column B Choice (4)

22. Let the sides of the triangles be \( a, b \) and \( c \) where \( a < b < c \).
\( a + b + c = 24; \) Let \( a < b < c \Rightarrow a + b + c < 3c, \therefore c > 8 \)
Also \( a + b > c; \therefore a + b + c > 2c; \therefore 12 > c; \) If \( c = 9, A = B; \) If \( c = 10, A > B. \)
Choice (4)

23. As the polygon is regular, each interior angle \( \leq \) each exterior angle = \( 180° - \) (each interior angle) ∴ Each interior angle \( \leq 90°. \) Let the number of sides in the regular polygon be denoted by \( N. \)
Each interior angle = \( \frac{180°(N - 2)}{N} \); \( \frac{180°(N - 2)}{N} \leq 90° \Rightarrow N \leq 4; \) Minimum value of \( N \) must be 3 \( \Rightarrow N = 3 \) or 4. \( \therefore \) Column A = 2; ∴ Column A = Column B. Choice (3)

24. If \( N = 1, \frac{2^{N^2}}{1^2} = 4 \) in this case \( A = B. \)
If \( N \geq 2, A = \frac{2^2 + 4^2 + 6^2 + \ldots (2N)^2}{1^2 + 3^2 + 5^2 + \ldots (2N - 1)^2} \)
The numerator is less than \( 2^2 + 4^2 + 6^2 + \ldots (2(N - 1))^2 \)
\( (2N - 1)^2 \)
\( \therefore Column A < 4; \therefore Column A < Column B. \)
Choice (4)

25. Let the number be represented as \( 10a + b; \)
If \( \frac{a}{b} \) is prime, clearly \( \frac{a}{b} \) must be \( < 10. \)
\( \frac{a}{b} \)
\( = 2, \) \( 3, \) \( 5 \) or \( 7 \)
If \( \frac{a}{b} = 2, 10a + b = 21 or 42 or 63 or 84; \)
If \( \frac{a}{b} = 3, 10a + b = 31 or 62 or 93 \)
If \( \frac{a}{b} = 5, 10a + b = 51; \) If \( \frac{a}{b} = 7, 10a + b = 71; \)
\( \therefore Column A = 9; \therefore Column A = Column B. \)
Choice (3)
26. x and y are whole numbers. \( 2^x = 1 \) or 2 or 4 or 8 or 16 or …
\( 2^x + 1 = 2 \) or 3 or 5 or 9 or 17 or 32.
\( 2^x + 1 = 9, x = 3 \) and \( y = \pm 2 \).
\( x \) has at least two possibilities.
Column B: \( (x, y) = (5, 0) \) is the only solution.
:. Column B = 1; ∴ Column A > Column B. Choice (1)

27. Column A − Column B =
\( \frac{1}{2} \left( (a-b)^2 + (b-c)^2 + (a-c)^2 \right) \)
\( = \frac{1}{2} ((a-b)^2 + (b-c)^2 + (a-c)^2); \ a, b \) and c are distinct.
\( a, b \) and c are distinct.
\( \therefore a, b \) and c are distinct.
\( \therefore (a-b)^2 + (b-c)^2 + (a-c)^2 > 0. \)
\( \therefore \) Column A > Column B. Choice (1)

28. Let the length and the breadth of rectangle be \( l \) and \( b \) respectively (initially). Initial area = \( l \times b \).
Column A: Final area = \( l \times b + 8 = l \times (b + 2) \Rightarrow l = 4; \) Column B: Final area = \( l \times b + 8 = b \times (b + 2) \Rightarrow b = 4 \)
Choice (1)

29. The possible values of ABB are 100, 144, 400, 900. ∴ Column A > column B. Choice (1)

30. Column A: Let the C.P. be Rs 100 ⇒ MP = Rs 150
Let the discount percentage be \( x \) per cent and the profit/loss percentage be \( y \) per cent.
Selling price = \( 100 \left( 1 - \frac{x}{100} \right) \)
\( = 100 \left( 1 \pm \frac{y}{100} \right) \Rightarrow 100 = 3x + 2y \) or \( 3x - 2y \)
\( - 2y = 100 \Rightarrow (1); Also \ x = \frac{2y}{3} \; ; \)
\( (1) \Rightarrow 100 = 3 \left( \frac{2y}{3} \right) + 2y \) or \( 3 \left( \frac{2y}{3} \right) - 2y \)
\( = 100 \)
\( y = 25 \) or \( y = 100, \) which is not possible.
\( \therefore y = 25; \; \therefore \) Column A = Column B Choice (3)

31. If \( y \) is odd, \( 9^y \) ends with 9 and \( 4^y \) ends with 4.
In this case, column A = 5. If \( y = 0, 9^y = 4^y = 1 \)
In this case, column A = 0. If \( y \) is even and positive, \( 9^y \) ends with 1 and \( 4^y \) ends with 6.
In this case, column A = 5. In any case, Column A < Column B. Choice (2)

32. Let the numbers be a and b. Column A: \( a + b = 8; a^2 + b^2 = (8 - b)^2 + b^2 = 2b^2 - 16b + 64 \)
\( = 2(b-4)^2 + 32 \)
\( (b-4)^2 \geq 0; \; \therefore a^2 + b^2 \geq 32. \)
If it is 32, Column A = Column B. If it is > 32, Column A > Column B. Choice (4)

33. The vowels are a, e, i, o and u; positions of a, e, i, o and u are 1, 5, 9, 15 and 21.
:. Three vowels have a composite position and one vowel has a prime position.
Column A = \( \frac{1}{5} \); Column B = \( \frac{3}{5} \)
:. Column A < Column B. Choice (2)

34. Column A: Let the number be 100 initially. Final value = \( 100 \left( \frac{1}{100} + \frac{20}{100} \right) \left( \frac{1}{100} + \frac{20}{100} \right) \)
\( = 144 \)
Effective percentage increase = 44 per cent;
:. A = 44 per cent. Column B: Let the number be 100 initially, Final value = \( 100 \left( 1 - \frac{30}{100} \right) \left( 1 - \frac{20}{100} \right) \)
\( = 56 \)
Effective percentage decrease = 44 per cent;
:. B = 44 per cent Choice (3)

35. Let the selling prices of the articles considered in each column be Rs 100 each.
Column A: C.P. = Rs(100 + x)
Actual loss percentage = \( \frac{x}{100+x} \times 100 \) per cent
Loss percentage calculated on the selling price = \( \frac{x}{100} \times 100 \) per cent; ∴ Column A = \( \frac{100x}{100+x} \) per cent + x per cent
Column B: Cost price = Rs(100 - x); Actual profit percentage = \( \frac{100x}{100-x} \) per cent
Profit percentage calculated on the selling price = \( \frac{x}{100} \) (100) = x per cent; ∴ Column B = \( \frac{100x}{100-x} \) per cent + x per cent
100 - x < 100 + x.
:. Column A < Column B. Choice (2)

36. Column A: 1123 under base 4 = 91; Column B: 101111 under base 2 = 47.
:. Column A > Column B Choice (1)

37. Column A: 80 per cent of 95 = \( \frac{80}{100} \times 95 \)
= 6; Column B: 25 per cent of 304 = \( \frac{25}{100} \times 304 \)
304 = 76
Column B: 8 + 2\( \sqrt{15} \) = \( (\sqrt{5} + \sqrt{5}) \)
\( (3.9) \); Column B: 9 + 2\( \sqrt{12} \) = \( (\sqrt{3} + \sqrt{3}) \)
\( (4.0)^2 \)
\( (\sqrt{5} + \sqrt{5}) \)
\( (\sqrt{3} + \sqrt{3}) \)
\( (4.0)^2 \)

38. Column A: \( (x - 2)^2 = 9 \Rightarrow x = 5 \) or 1; Column B: \( x + 3 = 11 \Rightarrow x = 4 \)
:. The given two values cannot be compared.
Choice (4)

39. Column A: \( (x - 2)^2 = 9 \Rightarrow x = 5 \) or 1; Column B: \( x + 3 = 11 \Rightarrow x = 4 \)
:. The given two values cannot be compared.
Choice (4)

40. Column A: \( (3^3)^y = (3^2)^4 = (27)^4 \); Column B: \( 7^{10} = 7^{11}, A > B \) Choice (1)

41. Column A: The number of ways in which the letters of the word CRICKET can be arranged is \( \frac{7!}{\frac{2!}{2!}} = 5040 \)

42. Column A: Let the number be 100 initially. Its final value = \( 100 \left( \frac{1}{100} + \frac{20}{100} \right) \left( \frac{1}{100} + \frac{20}{100} \right) \)
\( = 96 \Rightarrow A = 4 \) per cent
Column B: Let the number be 100 initially. Its final value k = \( 100 \left( \frac{1}{100} + \frac{30}{100} \right) \left( \frac{1}{100} + \frac{30}{100} \right) \)
\( = 91 \Rightarrow B = 9 \) per cent

43. Column A: \( 2x + y = 9; \) xy is a two digit number.
:. \( x \leq 4.5 \). : maximum value of \( x = 4; \) Column A = 4
Column B: \( x - y = 5; \) XY is a two digit number
\( y \geq 0 \). : \( x \geq 5; \) Column B ≥ 5
Choice (2)

44. Let the usual speed of Ajay be s kmph. Usual time = \( \frac{d}{s} \) hours
Column A: Present time = \( \frac{d}{s} \left( \frac{1}{100} + \frac{1}{100} \right) \)
\( = \frac{5}{4} \) s. Column A = \( \frac{1}{4} \) d hours.
Column B: Present time = \( \frac{d}{s} \left( \frac{1}{100} + \frac{1}{100} \right) \)
\( = \frac{5}{6} \) s. Column B = \( \frac{1}{6} \) d hours;
Column A > Column B Choice (1)

45. The number of factors of 50 is 6. \( (1, 2, 5, 10, 25 \) and 50); The number of prime factors of 50 is 2. \( (2 \) and 5)
Column B = \( \frac{2}{6}; \) Column A = B. Choice (3)

46. Since the initial lengths of the squares are not known the quantities cannot be compared.
Choice (4)
47. By BODMAS rule, Value in column (A)
\[ = 8 + 64 - \frac{8}{8} = 8 + 64 - 1 = 71 \]
Value in column (B) = \[ \frac{8}{8} \times 8 + 8 - 8 = 16 - 8 = 8; A > B. \]

48. Given that \( x^2 = a^2 \Rightarrow x = \pm a; \) if \( x = a, A = B; \)
\( \text{If } x = -a, \text{then } A \neq B. \) \( \text{Choice (4)} \)

49. If \( x = y, \) \( \frac{2}{3} y + 2 = y \Rightarrow y = 6; \) if \( y < 6, \) say
\( 3, x = 4; \) if \( y > 6, \) say 9, \( x = 8 \) \( \text{Choice (4)} \)

50. There are 50 odd numbers in the first 100 natural numbers.
There are 50 even numbers (including zero) in the first 100 whole numbers.
\( \therefore A = B. \) \( \text{Choice (3)} \)

### PRACTICE TESTS

#### TEST PAPER 1

1. C.P = Rs 540, MP = 540 + 15 per cent of 540 = Rs 621
S.P = Rs 496.80, Discount = 621 - 496.80 = 124.2
Discount per cent = 124.2/621 \times 100 = 20 per cent

2. Let the HCF of \( a \) and \( b \) be \( H \) then HCF of \( c \) and \( d = H \)
given that \( \frac{a}{H} = \frac{b}{H} = \frac{c}{H} = \frac{d}{H} = 77 \)
The possible values of \( \frac{a}{H}, \frac{b}{H}, \frac{c}{H}, \text{ and } \frac{d}{H} \) are given below.
\[
\begin{array}{cccc}
\text{a} & \text{b} & \text{a+b} & \text{c} \\
1 & 77 & 78 & 1221 \\
7 & 11 & 18 & 1337 \\
\end{array}
\]
\( \therefore \) The possible values of \( \frac{a+b}{H} \) and \( \frac{c-d}{H} \) are
\( \frac{c-d}{H} = \frac{1221 - 1337}{220} = \frac{-116}{220} = \frac{-116}{4} \)

3. Ratio of profits if \( A, B \) and \( C \) is \( 10,000 \times 12 : 15,000 \times 12 : 20,000 \times 6 = A : B : C \)
\( \Rightarrow A : B : C = 20 : 30 : 20 = 2 : 3 : 2 \)
\( \therefore A's \ share = A's \ share = Rs \ 5000 \) \( \text{Choice (4)} \)

4. Let \( AB \) be the height of the building.
Let \( CD \) be the height of the pole. \( BC = AE, \)
\( AB = CE \) and \( CD = 36 \) m \( \Rightarrow ED = 36 - EC = 36 - AB \)

5. Let there be 10 parrots and 18 cows. If three cows escape, the ratio of parrots to cows is \( 2 : 3. \) Let there be 11 parrots and 17 cows. If 1 parrot and 2 cows escape, the ratio of parrots to cows is again \( 2 : 3. \) But from this data alone we can't uniquely determine the initial ratio of the birds.

6. Each letter can be posted in 4 ways
\( \therefore \) The five letters can be posted in \( 4 \times 4 \times 4 = 64 \) ways

7. Let the length of the parallel sides of the trapezium be \( 5x \) and \( 9x \) cm respectively.
Given distance between parallel sides = 13 cm,
\( \therefore \) Area = 273 sq. cm
\( \Rightarrow \frac{1}{2} (13)(5x + 9x) = 273 \Rightarrow x = 3. \)
\( \therefore \) The lengths of the parallel sides are 15 cm and 27 cm.

8. Let the distance be "D" km.
\( \therefore \) Speed upstream \( = \frac{D}{7} \) km/hr; Speed down stream \( = \frac{D}{5} \) km/hr

9. The total number of outcomes = 6².
Favourable cases are \( (1, 1), (1, 2), (1, 4), (1, 6) \)
\( (2, 1), (2, 3), (2, 5), (3, 2), (3, 4) \)
\( (4, 1), (4, 3), (5, 2), (5, 6), (6, 1), (6, 5) \)
\( \therefore \) The required probability = \( \frac{15}{36} = \frac{5}{12} \)

10. Let the mark scored by \( A \) be 100.
Then, \( B's \) marks = 110 and \( C's \) marks = 99
\( \therefore C's \) marks is 1 per cent less than \( A's \) marks

11. Volume of water raised = volume of the spheres \( \Rightarrow \pi(4)^2h = 160 \Rightarrow \frac{4}{3} \pi (3.5^3) \Rightarrow h = 17.5 \) cm
\( \therefore \) The water level initially = \( 23 - 17.5 = 5.5 \) cm

12. Given \( P = \sqrt{42 + \sqrt{42 + \sqrt{42 + \ldots \infty}} \Rightarrow P = \sqrt{42 + P} \)
On squaring both sides we get \( P^2 = 42 + P \)
\( \Rightarrow P^2 - P - 42 = 0 \Rightarrow P^2 - 7P + 6P - 42 = 0 \)
\( \Rightarrow (P - 7)(P - 6) = 0 \Rightarrow (P + 6)(P - 7) = 0 \Rightarrow P = 7 \text{ or } -6 \)
But the value of the given expression can never be negative
\( \therefore P = 7 \)

13. Let \( AB \) be the tower and \( C \) be the position of man.
\( \therefore \) In \( \triangle ABC, \tan 45° = \frac{h}{20} \)
\( \Rightarrow h = 17.5 \) cm, Choice (3)

14. By observation, the sum of \( 2^1, 2^1, 2^1 \) is a multiple of 7.
Similarly, the sum of the next 3 powers, and every one of the 17 sets of three successive powers is a multiple of 7.
[In $1 + 2 + 2^2 + 2^3 + \ldots + 2^n$, there are 51 terms, or 17 sets of three successive powers] 

$\therefore$ The number is a multiple of 7 or there is no remainder. 

Choice (1)

15. Required number of ways = $^{3}C_1 \times ^{3}C_2 + ^{3}C_1 = 9$ 

Choice (1)

16. Let the distance between A and B be $x$. 

Then the distance travelled by walk = $x/4$ 

Remaining distance = $3x/4$ 

$\therefore$ Distance travelled by cycle = $x/5$ 

Remaining distance = $2x/5$ 

$\therefore$ $490 = 2x/5 \Rightarrow x = 1225$ m 

Alternatively, if $d$ is the total distance, 

$x = 1225$ m 

$490 = 2x/5 \Rightarrow 25x = 490 \Rightarrow x = 19.6$ m 

Choice (4)

17. Let the length of the cloth required be $l$ m. 

Area of the cloth = $50 \times l$ sq.m 

Area of cloth required for the conical tent. 

Curved surface area of cone = $\pi rl$ and $\ell = \sqrt{r^2 + h^2}$ 

$= \pi (28) \sqrt{28^2 + 96^2} = 2800\pi \Rightarrow 50l = 2800\pi \Rightarrow \ell = 56 \pi$ m 

Choice (3)

18. Total number of games played in the tournament = $^{5}C_2 \times ^{3}C_2 = 10$; $\therefore$ Sum of the points in all the matches = 10. 

{For a win, one player gets one point. For a draw, two players get $1/2$ a point each. 

So for each match the total score of all the players increases by 1} 

Choice (2)

19. Part of the job done on the first day = $\frac{1}{4}$ 

Part of the job done on the second day = $\frac{1}{4} = \frac{1}{4}$ 

Part of the job to be completed = $1 - \left(\frac{1}{4} + \frac{1}{2}\right) = \frac{1}{4}$ 

Time in which this will be completed = $1 + \frac{3}{4} = \frac{1}{3}$ of the third day. $\therefore$ The job will be completed in $2^{1/3}$ days. Choice (1)

20. Let the quantity to be withdrawn be $x$ litres. 

Quantity of milk in it = 0.9x litres. 

Quantity of milk remaining = (0.9)(20) 

$= (18 - 0.9x)$ litres.

$\frac{18 - 0.9x}{20} (100) = 80 \Rightarrow x = \frac{20}{9}$ 

Choice (3)

21. Listed price of car = Rs 50,000 

After successive discounts of 20 per cent and 25 per cent 

Selling price = $50000 \times \left(\frac{100}{100 - 20}\right) \times \left(\frac{100}{100 - 25}\right)$ 

$= Rs 30,000$ 

This is the cost price for Suresh 

Amount spent on repairs = 20 per cent of 30,000 = 6000 

Total cost price = Rs36,000 

Profit = 20 per cent 

Selling price for Suresh = $\frac{120}{100} \times 36,000$ 

= Rs 43,200 

Choice (2)

22. Given, $\frac{48}{12 - b} + \frac{12}{3(12 - b)} = 8$ 

$\Rightarrow \frac{48}{12 - b} + \frac{4}{12 - b} = 8$ 

$\Rightarrow 64 = 8 \Rightarrow b = 4$ kmph 

Choice (4)

23. Part of the tank filled by A and B in a period of 2 hours = $\frac{1}{10} + \frac{1}{30} = \frac{2}{15}$ 

Part of the tank filled by A and B in a period of $(2 \times 7)$, that is, 14 hours = $\frac{14}{15}$ 

remaining work = $1 - \frac{14}{15} = \frac{1}{15}$ 

Now, A can fill $\frac{1}{15}$ of the tank in $\frac{1}{15} \times 10 = \frac{2}{3}$ hours. $\therefore$ The tank will be filled in $\frac{14}{3}$ hours. 

Choice (3)

24. Fresh coconuts have 12 per cent solid. 

Dry coconuts have 78 per cent solid. 

Quality of fresh coconut solid = Quality of solid in dry coconut. 

Quantity of solid in 65 kg fresh coconut = $\frac{12}{100} (65) = 7.8$ kg. 

total quality of dry coconut = $\frac{78}{x}$ kg. 

= 10 kg. 

Choice (4)

25. Let the periods of time taken by P and Q to complete the job be x days and y days respectively. 

Job = $\left(\frac{2 + 3}{x + y}\right)$. So $\frac{4}{x} + \frac{6}{y} = 4.8$ 

$\Rightarrow \frac{1}{x} + \frac{1}{y} = 1$ 

$\Rightarrow \frac{1.2}{y} + \frac{0.8}{x} \Rightarrow \frac{x}{y} \times \frac{2}{3} = 1$ 

$\Rightarrow y = 12$ 

Choice (2)

26. Let the sum be Rs 100 

Amount after 17 years = Rs 300; Amount after 34 years = Rs 900. Amount after 51 years = Rs 2,700; Amount after 68 years = Rs 8,100 . $\therefore$ The amount becomes 81 times itself in 68 years. 

Choice (3)

27. The 6 men can be arranged in 6! ways. 

There are 7 gaps. The seven girls can be arranged in these 7 gaps in 7! ways. 

$\therefore$ Total number of arrangements possible = 6! 7!. 

Choice (2)

28. Required probability = Probability (the card being a spade) + Probability (the card being a king) - Probability (the card being a spade as well as a king) = 

$\frac{1}{4} + \frac{1}{13} - \frac{1}{52} = \frac{4}{13}$ 

Choice (3)

29. Marks obtained $\times$ (Number of hours)$^2$ that is $\frac{M}{M_1} = \frac{H^2}{H_1^2}$ 

$\Rightarrow \frac{450}{625/2} = \frac{9}{H_1^2} \Rightarrow H_1 = \frac{5}{2} \Rightarrow 2^{1/2}$ hours 

Choice (2)

30. $(1 + x)^x + (1 + x)^{1-x} = x^{x^y}$ 

$\Rightarrow 1 + x^x + 1 + x^y = x^{x^y} = 1 - 1 = 0$ 

Choice (1)

31. Given, $P(\overline{A}) = 0.3 : 5$ 

$P(\overline{A}) = \frac{3}{8}$ and $P(A) = \frac{5}{8} \Rightarrow P(B)$: 

$P(\overline{B}) = 5 : 7$ 

$P(B) = \frac{5}{12}, P(\overline{B}) = \frac{7}{12}$ 

Any one of them solve the problem, the problem will be solved. 

$P(A \cup B) = 1 - P(\overline{A} \cap \overline{B})$ 

$= 1 - P(\overline{A}) \cdot P(\overline{B})$ 

$= 1 - \frac{3}{8} \times \frac{7}{12} \Rightarrow 1 = \frac{13}{20}$ 

Choice (1)

32. Part of the job completed in 6 days = 

$6 \left(\frac{1}{20} + \frac{1}{30} + \frac{1}{40}\right) = \frac{13}{20}$ 

$\therefore$ Remaining part = $\frac{7}{20}$ 

This would be divided among Q and R in the ratio of their capacities, that is ratio of
daily work done = \frac{1}{30} \times \frac{1}{40} = 4 : 3

\therefore \text{Q would do} \quad \frac{4}{\frac{7}{20}} = \frac{1}{5} \text{ of the total work.}

\text{R would do} \quad \frac{3}{\frac{7}{20}} \times \frac{3}{20} \text{ of the total work.}

\text{The required ratio } = 6

\left( \frac{1}{20} \right) \times \left( \frac{1}{30} \right) \times \frac{1}{5} \times \left( \frac{1}{5} \right) \times \left( \frac{1}{40} \right) \times \frac{3}{20} = 3 : 4 : 3

\text{Choice (1)}

35. \text{From the given condition, } \frac{a}{b} \cdot \frac{b}{c} \text{ and } \frac{a}{c}

\text{are } \frac{1}{2} \cdot \frac{3}{4} \text{ and } \frac{5}{6} \text{ respectively. Only choice (2) is true.} \quad \text{Choice (2)}

36. \text{Quantity of wine in mixture drawn from}

P = \frac{20}{100} \times 5 = 1 \text{ litre}

\text{Quantity of wine in mixture drawn from}

Q = \frac{30}{100} \text{ litres. Quantity of wine in mixture drawn from} \quad \text{Required concentration}

= \frac{3}{5 + 4 + 2} \times 100 \% = \frac{300}{11} \% \quad \text{Choice (3)}

37. \text{Let the speed of the first boy } = 3x \text{ kmph}

\therefore \text{The speed of other boy } = 4x \text{ kmph}

\text{Given } (3x + 4x), 5 = 210 \Rightarrow (7x), 5 = 210

\Rightarrow x = \frac{210}{35} = 6 \text{ kilometres per hour}

\therefore \text{Speed of faster boy } = 24 \text{ kilometres/hour} \quad \text{Choice (4)}

38. \text{Total consumption for } 10 \text{ days } = 50 \times 10 \times 1.5

\text{Consumption for } 4 \text{ days } = 50 \times 4 \times 1.5

\text{Consumption for } 5 \text{ days } = 60 (x) (5)

\text{50} \times 10 \times 1.5 = 50 \times 4 \times 1.5 + (60 \times x \times 5)

\Rightarrow 50 = 300 + 300x \Rightarrow 300x = 450

x = 1.5 \text{ kg}

\text{Choice (3)}

39. \text{Let the present ages of the person and his wife be } 6x \text{ years and } 5x \text{ years. The ratio of their ages 25 years hence hence}

\begin{align*}
&= 6(x + 25) + 5(x + 25) = 11(x + 25) \\
&= \frac{6}{5}(x + 5)
\end{align*}

\therefore \text{This ratio is always less than } 6 : 5.

\text{Only Choice (4) satisfies this condition.} \quad \text{Choice (4)}

40. \text{From 0 to 100 (first hundred and one whole numbers), we have a total of 12 zeroes.} \quad \text{Choice (3)}

\textbf{TEST PAPER 2}

\textbf{Solutions for questions 1 to 40:}

\begin{enumerate}
\item \text{Expenditure of Raju in the first 6 months } = (4500)(6) = Rs \text{ 27000}

\text{His expenditure in the next 4 months } = (3500)(4) = Rs \text{ 14000.}

\text{His expenditure in the next 4 months } = (4000)(2) = Rs \text{ 8000.}

\text{Total expenditure of Raju } = Rs \text{ 49000.}

\text{Total consumption for 10 days } = 50 \times 10

\text{Consumption for 4 days } = 50 \times 4 \times 1.5

\text{Consumption for 5 days } = 60 (x) (5)

\text{50} \times 10 \times 1.5 = 50 \times 4 \times 1.5 + (60 \times x \times 5)

\Rightarrow 50 = 300 + 300x \Rightarrow 300x = 450

x = 1.5 \text{ kg}

\text{Choice (3)}

\item \text{From the given data, } a + x + y + z \rightarrow (1) \text{ and } a − 11 = 2 (x − 11 + y − 11 + z − 11) − 5

\Rightarrow a = 2 (x + y + z) − 60 \rightarrow (2)

\text{Solving (1) and (2), we get } x + y + z = 60 \rightarrow (3)

\text{It is also known that, } y = z \rightarrow (4) \text{ and } x = z \rightarrow 10 \rightarrow (5)

\text{Solving (3), (4) and (5), we get } x = 25 \text{ and } y = 20 \therefore \text{Present age of } Q = 20 \text{ years} \quad \text{Choice (2)}

\item \text{Time taken to meet for the first time anywhere on the track } = \frac{\text{Length of the track}}{\text{Relative speed}}

\Rightarrow \frac{600}{10+15} = 24 \text{ sec.} \quad \text{Choice (2)}

\item \sqrt{32} = \sqrt{64} = 2 \sqrt{2}

\sqrt{8} = \sqrt{4} \times \sqrt{2}

\sqrt{52} = 2 \sqrt{13}

\sqrt{27} = \sqrt{9} \times \sqrt{3}

\Rightarrow 2 + \sqrt{6} \Rightarrow \sqrt{32 + \sqrt{27}}

\Rightarrow \frac{\sqrt{2} + \sqrt{3}}{\sqrt{2} + \sqrt{3}} \Rightarrow \sqrt{2} \quad \text{Choice (2)}

\item \text{Let the cost of the gold chain be } Rs \text{ x and the service charge be } Rs \text{ y.}

\Rightarrow \text{Cost of gold ring } = \frac{x}{2}

\text{From the given data, } x + y = 3200 \rightarrow (1)

\Rightarrow \frac{x}{2} + \frac{y}{2} = 500 \Rightarrow \frac{3x}{2} + 2y = 5000 \Rightarrow 3x + 4y = 10000 \rightarrow (2)

\text{Solving (1) and (2), we get } y = Rs \text{ 400} \quad \text{Choice (3)}
\end{enumerate}
11. Let the speed of the second train be \( x \) kmph.
\[
\frac{138 + 262}{(135 - x)} \times \frac{5}{18} = 32 \Rightarrow \frac{400 \times 18}{(135 - x)5} = 32
\]
\[
\Rightarrow 32 (135 - x) = 80 \times 18 \Rightarrow 135 - x = 45
\]
\[
\Rightarrow x = 90 \text{ Choice (4)}
\]

12. If the two particular players are not included the number of selections = 14C11.
If one alone is included the number of selections = 14C10 x 2
Total selections = 14C11 + 14C10 x 2
Choice (1)

13. The total number of outcomes = \( 2^n \)
The number of favourable cases = \( nC_1 + nC_2 + \ldots + nC_a \) = \( \frac{2^n}{2} \left( \binom{n}{1} + \binom{n}{2} + \ldots + \binom{n}{a} \right) = 2^{n-1} \).
\[
\Rightarrow \text{The required probability} = \frac{2^{n-1}}{2^n} = \frac{1}{2}
\]
Choice (2)

14. Let the speed of Kumar be \( x \) kmph and the speed of Pavan be \( y \) kmph.
\[
\frac{120}{y} = \frac{120}{x} + 1; \quad \frac{120}{y} = \frac{120}{x^2} - 2
\]
\[
\Rightarrow \frac{120}{x} + 1 = \frac{120}{x^2} - 2 \Rightarrow \frac{120}{x} = 3
\]
\[
\Rightarrow x = 40 \text{ kmph Choice (3)}
\]

15. Part of the work completed by Pavan in one hour = \( \frac{1}{20 \times 6} = \frac{1}{120} \)
Part of work completed by Kalyan in one hour = \( \frac{1}{18 \times 5} = \frac{1}{90} \)
Work done by Pavan and Kalyan in one hour = \( \frac{1}{120} + \frac{1}{90} = \frac{7}{360} \)
Part of the work completed by Pavan and Kalyan in \( \frac{7}{360} \) that is \( \frac{36}{7} \) hours = \( \frac{7}{360} \times \frac{36}{7} = \frac{1}{10} \)
So, they can do the work in 10 days. Choice (4)

16. Let B's salary = Rs 100; A's salary = 20 per cent less than B = Rs 80
C's salary = 30 per cent more than B = Rs 130
\[
\Rightarrow \text{A's salary is less than C's salary by} = \frac{50 \times 130}{100} = 38.5 \text{ per cent}
\]
\[
\text{(As \( \frac{52}{130} \times 100 = 40 \text{ per cent, the answer is}\) slightly less than 40 per cent.) Choice (2)}
\]

17. In a non-leap year, everyday repeated 52 times with one odd day. To have 53 Fridays in a year, that odd day should be Friday.
\[
\Rightarrow \text{The required probability} = \frac{1}{7}
\]
Choice (3)

18. Let the speed of the train be \( s \) m/sec.
Let its length be \( L \).
\[
L = 10 s; L + 300 = 30(s - (36) \left( \frac{s}{44} \right))
\]
\[
10s + 300 = 30s - 30 \Rightarrow 20s = 600 \Rightarrow s = 30 \text{ Choice (3)}
\]

19. Let AB represent the tower and the points C and D be the initial and final positions of Rohit.

20. The number of rectangles in a \( 8 \times 8 \) chess board is \( 8 \times 8 = 64 \).
The number of squares in a \( 8 \times 8 \) chess board is \( \binom{8}{2} = 28 \).
In this case, \( k = 6 \), \( y = 8 \) and \( x = 8 \). Choice (2)

21. Let the parts of the job completed by a man, a woman and a machine in a day be \( m \), \( w \) and \( c \) respectively.
Job = (2m + 3w + 8c) 12 = (6w + 28c)6
\[
\Rightarrow \text{The required probability} = \frac{204}{1296} = \frac{17}{108}.
\]
Choice (1)

22. Let the number of Rs 10, Rs 20 and Rs 100 notes with Mayur be \( x \), \( y \) and \( z \) respectively.
\[
\Rightarrow \text{The required probability} = \frac{1}{5}
\]
Choice (2)
29. Let ABCD be the rectangular tank and the goat is tied to the corner A. The area the goat can graze is the sector MPN.

\[ \text{Area} = \frac{270}{360} \times \pi r^2 = \frac{3}{4} \times \frac{22}{7} \times 49 = 115.5 \text{ sq. m.} \]

Choice (4)

30. Let the sides of the square and the triangle be A and E respectively. Let the radius of the circle be R.

\[ A^2 = \frac{\sqrt{2}}{4} E^2 = \pi R^2; S = 4A, T = 3E \text{ and } C = 4\pi R^2 \]

\[ S^2 = 16 \left( \frac{\sqrt{2}}{4} E^2 \right), T^2 = 9E^2 \text{ and } C^2 = 4\pi^2 \]

\[ \left( \frac{A}{\pi} \right) \text{ that is, } S^2 = 4\sqrt{3} E^2, T^2 = 9E^2 \text{ and } C^2 = 4\pi^2 \]

\[ \left( \frac{\sqrt{2}}{4} E^2 \right) = \pi \sqrt{3} \Rightarrow C^2 < S^2 < T^2 \]

\[ \Rightarrow C < S < T \]

Choice (1)

31. Value of the first instalment when the last instalment was paid = 1000 \((1.1)^2\) = Rs 1210

Value of the second instalment when the last instalment was paid = 1000 \((1.1)\) = Rs 1100

Required value = 1210 + 1100 + 1000 = Rs 3310 Choice (1)

32. Let the price be Rs x initially.

Price after the first increase = \((1.2)x\) = Rs 1.2x

Price after the second increase = \((1.1)(1.2)x\) = Rs 1.32x

33. Marks secured by Mohit = 60 per cent; Pass mark = 45 per cent

Difference between the marks secured and pass mark = \((60 - 45)\) per cent = 15 per cent

Given that Mohit got 45 marks more than the pass marks.

Let the maximum marks be x.

\[ \Rightarrow 15 \text{ per cent of } x = 45 \Rightarrow x = \frac{45 \times 100}{15} = 300 \]

\[ \Rightarrow The \ maximum \ marks \ in \ the \ examination = 300. \]

Choice (2)

34. Perimeter = \((1 + 2 + 3 + \ldots n) cm\)

\[ = \frac{n(n+1)}{2} \text{ cm} \]

Among the given choices, only choice (4) cannot be expressed in the form \(\frac{n(n+1)}{2}\).

Choice (4)

35. Let each side of the square be ‘a’ cm.

\[ S = 4A^2, T = 3E^2 \text{ and } C = 4\pi R^2 \]

\[ \Rightarrow \text{Area of the shaded region} = a^2 - \frac{\pi a^2}{2} \]

\[ \Rightarrow 476 = \frac{8a^2 - \pi a^2}{8} = 476 \]

\[ \Rightarrow a^2 = \frac{8 \times 7}{34} = 178 \Rightarrow a = 13 \text{ cm} \]

Choice (2)

36. The difference between the compound interest for the 3rd year and the 2nd year is equal to the simple interest on the compound interest of the 2nd year.

\[ 3600 \times \frac{R}{100} = 720 \Rightarrow R = 20 \text{ per cent p.a.} \]

\[ P \left(1 + \frac{R}{100} \right)^2 - P \left(1 + \frac{R}{100} - 1 \right) = 3600; \]

\[ P \left(1 + \frac{R}{100} \right)^2 - P \left(1 + \frac{R}{100} \right) = 3600; \]

\[ P \left(12 \div 5 \right) = 3600 \Rightarrow \text{P = Rs 15000} \]

Choice (4)

37. Let the price of sugar and its consumption be initially Rs \(p/kg\) and Rs \(c/kg\) respectively.

Its initial expenditure = \((p)(c) = Rs \ pc\).

Final price = \(\left(\frac{100+10}{100}\right) = Rs 1.1p/kg\)

Final consumption = \(\left(\frac{100-20}{100}\right) = 0.8c\ kg\)

Final expenditure = \((1.1p) (0.8c) = Rs 0.88pc\)

Expenditure has decreased. \(\Rightarrow\) per cent decrease = \(1 - \frac{0.88}{1} (100) = 12\) per cent

Choice (3)

38. \((15000) (12) : (20000) (x) = 1 : 1; x = 9 \]

Choice (2)

39. Cost of white washing = Rs 1568

\[ \Rightarrow \text{Area of four walls} \times \text{cost per square feet = Rs 1568} \]

\[ 2h(l + b) \times \text{cost/feet}^2 = 1568 \]

\[ 2[14(20 + b)] \times 1.75 = 1568 \Rightarrow b = 12 \text{ feet} \]

Choice (4)

40. Area of rectangular field = \(50 \times 30 = 1500 \text{ m}^2\)

Let the depth of the trench be \(d\) m.

\[ \Rightarrow \text{Volume of trench} = 15 \times 10 \times d = 150 \text{ m}^3 \]

Area of the trench = \(15 \times 10 = 150 \text{ m}^2 \)

\[ \Rightarrow \text{Remaining area of the field} = 1500 - 50 = 1450 \text{ m}^2 \]

\[ \Rightarrow \text{Raise in level} = \frac{\text{Volume of trench}}{\text{Area of field}} \]

\[ \Rightarrow 2 \frac{2}{9} \times \frac{150d}{1350} \Rightarrow d = 20 \text{ m} \]

\[ \Rightarrow \text{The trench was dug by 20 m deep.} \]

Choice (4)
Solutions for Data Analysis and Data Sufficiency

DATA ANALYSIS

Practice Exercise 1

Solutions for questions 1 to 5:

1. By observation the number of Swing as well as Comfort branded cars sold in each year is less than the Beatle, Kite and Vayu branded cars.

2. Total number of cars sold in 1998 = 776. 25 per cent of 776 = 1/4 × 776 = 194

3. By observation the number of cars sold in successful years, we find that the number of cars of Comfort brand, in 1999, is twice the number of cars of the same brand in 1998 that is, 152/76 = 2 and it is the greatest.

4. In the year 2000, 133 1/3 per cent of Vayu branded cars sold = 4/3 × 324 = 432

5. If the ratio of the number of cars sold in the year 2002 to the number of cars sold in the year 1998 is the greatest, the percentage increase will be the greatest for that car.

For Swing 206/128 < 2; For Kite 431/151 < 3;
For Vayu 456/226 < 3; and For Comfort 305/76 > 4

Choice (4)

Solutions for questions 6 to 10:

6. Total sales of all the brands together in the year 2004 = 20 + 18 + 20 + 9 = 40 + 27 = 67 thousand cars.

7. Pawan 800 increased from 15 to 20 = 5/15×100 growth = 33⅓ per cent. Jindica there is no change.

Pantro increased from 14 to 20 = 6/14×100 = 42⅔ per cent. For Bord there is a decrease in the sales.

∴ Pantro showed maximum percentage increase.

Choice (1)

8. Revenue made by Pawan 800 in 2003 = 15 × 200 = Rs 3000 × 10⁶

Jindica = 18 × 290 = 5220 × 10⁶

Pantro = 14 × 310 = 4340 × 10⁶

Bord = 12 × 300 = 3600 × 10⁶

∴ Jindica made the maximum revenue

Choice (4)

9. As sales volume and price both increased by maximum for pantro, its revenue changes by maximum per cent.

Choice (4)

10. As there is no information on manufacturing cost, given question cannot be answered from the given data.

Choice (4)

Solutions for questions 11 to 15:

11. Profit per cent of Glasgow limited only in 2004 was 23/45 × 100 > 50 per cent, all other years it is less than or equal to 50 per cent.

Choice (4)

12. Expenditure in 1999 = 35 – 7 = 28

In 2000 = 40 – 15 = 25; In 2001 = 50 – 25 = 25

In 2002 = 45 – 20 = 25; In 2003 = 50 – 21 = 29

and In 2004 = 45 – 23 = 22

Choice (4)

13. If the profit in 1998 is 100 then profit in 1999 is 140. Since the profit in 1999 is Rs 7 lakhs

Profit in 1998 = 100/140 × 7 = Rs 5 lakhs. Similarly income in the year 1998 = 100/125 × 35 = 28 lakhs

Expenditure in 1998 = 28 – 5 = Rs 23 lakhs

Choice (3)

14. Average profit = \(\frac{7+15+25+20+21+23}{6}\)

= 111/6 = Rs 18.50 lakhs and it is closest to 2 profit in 2002

Choice (2)

15. As given in the solution for question number 12, the expenditures in 2000, 2001 and 2002 are equal.

Choice (3)

Solutions for questions 16 to 20:

16. Total seats available = 80. Number of seats admitted by IT graduates = 162 × 80/360 = 36

At least one each by Engineering, science, Arts and commerce = 4; Total seats filled = 40

Maximum possibility for Maths graduates to do HR specialization = 40

Choice (3)

17. Number of IT graduates admitted to operations = 20/360 × 162 = 9 and that to marketing = 80/360 × 162 = 36

The difference = 27

Choice (3)

18. Required percentage = \(\frac{60-45}{45} \times 100\)

= 33⅓ per cent

Choice (1)

19. Number of Arts graduates in the course

= \(\frac{720}{35} \times 360 = 70000/100\)

= 7 per cent

Choice (4)

20. Total number of seats available = 41. Number of IT graduates = 60/360 × 162 = 27

Seats filled by Commerce graduates = 41 – 27 = 14.

\(\frac{93}{100} \times 14\)

Choice (2)

Solutions for questions 21 to 25:

21. Required percentage is the least be in the year 2000 at 15/60 × 100 per cent be 25 per cent

Choice (1)

22. In the year 2004, the number of books by Indian authors = 90 – 33 = 57

Number of books by Indian authors is greater than that by foreign authors by 57 – 33 × 100 per cent = 72.72 per cent

Choice (1)
23. Let the average cost of a book be Rs 4x. Then the average cost of a book authored by an Indian author is x.
Total cost of all the books in 2003 = 80 × 4x = Rs 320x
Total cost of books by Indian authors = 50x = Rs 50x
Total cost of books by foreign authors = 320x – 50x = Rs 270x
Ratio of the total cost of books by foreign authors to that by Indian authors = 270x : 50x = 27 : 5
Choice (2)

24. There is no relationship between the average costs or total costs in the year 2001 and 2002.
Hence the answer cannot be determined.
Choice (4)

25. Let the average cost of a book by an Indian author or a foreign author be Rs 1
Total cost of books by foreign authors in 2002 = 25 × 1 = Rs 25
Total cost of books in 2003 = 80 × 1.1 = Rs 88
Total cost of books by Indian authors in 2003 = 50 × 1.2 = Rs 60
Total cost of books by foreign authors in 2003 = Rs (88 – 60) = Rs 28
Required percentage = \( \frac{28}{25} \times 100 \) per cent = 12 per cent.
Choice (4)

---

**Practice Exercise 2**

**Solutions for questions 1 to 5:**

1. During the last 5 days the average sales, of sales of D was the greatest, as its sales increased by 60 units going to be the maximum.
Choice (2)

2. Observing the given data as the sales of A and C is more than that of B and D on 6th day and as their prices are also more, on 6th day we can say that combined revenue of A and C is more than that of B and D.
Choice (2)

3. In the third part the total sales was 483 units which is the maximum.
Choice (3)

4. The least profit of the trader on 15th day = \( 2400 \times x + 1800 \times 16 + 1800 \times 16 + 1320 \times 13 = Rs 89,160/- \)
Choice (4)

5. For none of the days the sales is double the previous day’s cumulative sales.
Choice (2)

**Solutions for questions 6 to 10:**

6. Ratio of imports to exports is the greatest in 2002. at 700/500 that is 7/5 Choice (2)

7. The percentage increase in imports from 2001 to 2002 = 200/500 × 100 = 40.
Choice (4)

8. Trade value in the year 2000 = 400 + 300 = 700
In 2001 = 900; In 2002 = 1200; In 2003 = 1300 and In 2004 = 1300
Choice (2)

9. The required percentage increase = \( \frac{1300 - 1200}{1200} \times 100 = \frac{1}{12} \times 100 = 8.33 \) per cent
Choice (1)

10. Average imports = \( \frac{2900}{5} = Rs 580 \) crore.
The imports in two years is less than the average imports per year.
Choice (2)

---

**Solutions for questions 11 to 15:**

11. Required percentage = \( \frac{251}{499} \times 100 = \frac{250}{500} \times 100 = 50 \) per cent
Choice (2)

12. Required number = \( 251 + \frac{499}{500} + 174 + 282 + 120 + 98 + 128 = 1700 \)
Choice (3)

13. Maximum of the numbers of residents who prefer only one brand = 499 and that of two different brands = 901
Required percentage = \( \frac{499}{501} \times 100 = 99.79 \) per cent
Choice (2)

14. 156 residents have their first preference as Milk Bikis and second preference as Tiger.
148 residents have their first preference as Tiger.
112 residents have their first preference as Tiger and second preference as Milk Bikis.
Required percentage = \( \frac{112}{170} \times 100 = 5.33 \) per cent
Choice (2)

15. Required answer is \( 282 - (148 + 128) = 6 \)
Choice (1)

**Solutions for questions 16 to 20:**

16. Angle represented by the population in the northern region = \( \frac{28000}{360} = \frac{100}{8} \)°
Choice (3)

17. Percentage of female population in northern region = \( \frac{240}{1000} \times 2 \times (\frac{28000}{100} \times 5) = \frac{240}{28} \times \frac{2}{5} < (1 \times \frac{2}{5}) \)
In the East zone = \( \frac{13}{8} \times (\frac{2}{5}) > 1 \times (\frac{2}{5}) \)
In the West zone = \( \frac{38}{36} \times (\frac{2}{5}) > 1 \times (\frac{2}{5}) \)
Choice (2)

18. Female population in the western region = \( \frac{25}{100} \times \frac{2}{5} \times 576000 \times \frac{100}{24} = 240000 \)
Choice (3)

19. Female population in the East zone = \( \frac{13}{100} \times 2x = 26x/100 \)
Male population in the East zone = \( \frac{12}{100} \times 5x = 30x/100 \)
\( \frac{34x}{100} \)
Required ratio = 17 : 13
Choice (4)

20. Female population in the South zone = \( \frac{38}{100} \times \frac{2}{5}x = \frac{152000}{x} \)
Male population in the South zone = \( \frac{36}{100} \times \frac{2}{5}x = \frac{360000}{x} \)
\( \frac{34x}{100} \)
Required ratio = 17 : 13
Choice (1)

**Solutions for questions 21 to 25:**

The following table can be drawn to show the number of people who read different News papers of different localities.

<table>
<thead>
<tr>
<th>News papers</th>
<th>The Times of India</th>
<th>The Hindu</th>
<th>Hindustan Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>( 5600 \times \frac{20}{100} = 1120 )</td>
<td>( 5600 \times \frac{40}{100} = 2240 )</td>
<td>( 5600 \times \frac{40}{100} = 2240 )</td>
</tr>
<tr>
<td>B</td>
<td>( 7800 \times \frac{30}{100} = 2340 )</td>
<td>( 7800 \times \frac{40}{100} = 3120 )</td>
<td>( 7800 \times \frac{30}{100} = 2340 )</td>
</tr>
<tr>
<td>C</td>
<td>( 7000 \times \frac{40}{100} = 2800 )</td>
<td>( 7000 \times \frac{20}{100} = 1400 )</td>
<td>( 7000 \times \frac{40}{100} = 2800 )</td>
</tr>
<tr>
<td>D</td>
<td>( 6400 \times \frac{20}{100} = 3200 )</td>
<td>( 6400 \times \frac{30}{100} = 1920 )</td>
<td>( 6400 \times \frac{20}{100} = 1280 )</td>
</tr>
<tr>
<td>E</td>
<td>( 5000 \times \frac{20}{100} = 1000 )</td>
<td>( 5000 \times \frac{20}{100} = 1000 )</td>
<td>( 5000 \times \frac{60}{100} = 3000 )</td>
</tr>
</tbody>
</table>

21. In the localities A, B, C and E, more than 1500 people read Hindustan Times.
Choice (4)

22. Required ratio = \( \frac{2800 + 3200}{1400 + 1000} = \frac{6000}{2400} = 5 : 2 \), Choice (2)
23. In the next year in locality D, Number of people who read The Times of India
   \[
   = \frac{3200 \times 120}{100} = 3840
   \]
   Number of people who read The Hindu = \(1920 \times 130 = 2496\)
   and that of Hindustan Times = \(1280 \times 140 = 1792\)
   ∴ Total number of people = 8128.

24. \((2240+3120+1400+1920+1000) = 9680\). Choice (4)

25. Required per cent = \(\left(\frac{11660 - 10460}{10460}\right) \times 100 = 10.29\%\). Choice (1)

### Practice Exercise 3

**Solutions for questions 1 to 5:**

1. Average net profit = \(\frac{140.50}{419172} = \frac{140.50}{42 \times 10^4}\)
   = Rs 0.033 lakhs /car Choice (1)

2. Required increase = \(\frac{3855.60 - 2850.50}{2850.50} \times 100 \approx 35.3\%\)
   Choice (2)

3. Projected total expenditure
   \[
   = \frac{3400.5 \times 2070.5}{2070.5} = 3400.5 \approx 5585 
   \]
   crores. Choice (3)

4. Required percentage = \(\frac{140.50}{1850.36} \times 100 \approx 7.6\%\)
   Choice (3)

5. Observing the given table, as net profit for the quarter ending 30/6/04 is more and the number of cars is not so high, profit/car would be the maximum during this period. Choice (4)

**Solutions for questions 6 to 10:**

6. Overall female literacy for towns B and C, put together = \((80 + 95)/(190 + 180) \times 100 = 47.29\%\) per cent Choice (1)

7. Number of males = total population – number of females. For town A, number of males = 450 – 230 = 220
   In this way the total male population = \((220 + 210 + 170 + 190 + 240)\) that is 10.30 lakhs Choice (3)

8. Number of literates in town D = \((60/100) \times 400000 = 240000\)
   Number of male literates = 240000 – 98000 = 142000
   Number of males = 400000 – 210000 = 190000
   Literacy rate of males = \((142/190) \times 100 = 74.7\%\) per cent Choice (2)

9. We can see that only town B has more males than females. So, the ratio of males to females in town B is greater. Choice (2)

10. Number of male literates in town D = \((65/100) \times 190 \times 10^3 = 123500\)
    Those in town E = \((70/100) \times 240 \times 10^3 = 168000\)
    Overall male literacy in both the towns
    \[
    = \left(\frac{1235 + 1680}{190 + 240}\right) \times 100 = 67.7\%\)
    Choice (3)

**Solutions for questions 11 to 15:**

11. In the year 2001 = \(1000 \times 30 \times 100 = 300 - 80 = 220\)
    In 2002 = 400 – 100 = 300
    In 2003 = 200 – 130 = 70
    In 2004 = 300 – 120 = 180
    Hence, 220 + 300 + 70 + 180 = 770 students received interview calls but could not get selected. Choice (2)

12. Since, we do not know how many students were studying in institutes B and C in 2004, therefore we cannot answer this question. Choice (4)

13. Required ratio = \(\frac{(110 + 120 + 100 + 140)}{1780 + 190 + 240 + 230} = \frac{470}{840} \approx 56.4\%\)
   Choice (4)

14. Required number = 100 + 90 + 110 + 110 = 410.
   Choice (3)

15. Required per cent = \(\frac{310}{370} \times 100 = 83.78\%\)
   Choice (2)

**Solutions for questions 16 to 20:**

16. In 2002 the number of girls appeared = 650 – 330 = 320; Girls failed = 439 – 349 = 90
    Required percentage = \(\frac{260}{320} = 81.25\%\) Choice (3)

17. Number of students passing in 2003 \(\equiv 360 + 350 = 710\)
    Percentage increase
    \[
    = \frac{710 - 590}{590} \times 100 = 20.33\%\)
    Choice (3)

18. If the pass percentage in a particular year is the greatest, then the fail percentage will be the least in that year. By observation only in 2003, the pass percentage is crossing 80 per cent and hence it is the greatest in 2003. Choice (3)

19. Number of boys failed = 439 – 349 = 90
    Number of girls appeared = 923 – 439 = 484
    The required ratio = 90 : 484 = 45 : 242
    Choice (1)

20. Ratio of boys passed to the girls passed in 2001 = \(195/213 < 1\)
    In 2002 = 228/263 < 1; In 2003 = 301/291 > 1
    In 2004 = 349/359 < 1 Choice (3)

**Solutions for questions 21 to 25:**

21. Number of cars of model R sold = \(22/100 \times 10400 = 2288\) Choice (3)

22. Required percentage = \(14/22 \times 100 = 64\)
    per cent Choice (1)

23. The ratio of average value of brands S and P cars = 17/32 : 22/16 = 17 : 44 Choice (2)

24. Assume in 2006, 100 cars were sold and the total revenue was Rs 100
    Cost of each in 2006 = Rs 100
    Choice (1)

25. The required difference (32 – 30) per cent, that is 2 per cent of 10400 = 208. Choice (2)

### Practice Exercise 4

**Solutions for questions 1 to 5:**

1. Average monthly expenditure on food
   \[
   = \frac{1}{5} \left(\frac{24000 \times 20}{100} + \frac{28000 \times 20}{100} + \frac{25000 \times 20}{100} + \frac{30000 \times 15}{100} + \frac{32000 \times 25}{100}\right)
   \]
   = Rs 5150 Choice (4)

2. Total expenditure on rent = \(24000 \times 15 + 28000 \times 18 + 25000 \times 20 + 30000 \times 15 + 32000 \times 15 \times 100\)
   \[
   = 25640. \text{ Choice (3)}
   \]

3. Required percentage = \(16 \times 2800 \times 100 = 140\%\)
   Choice (4)
4. Required percentage $\frac{(1700)}{4500} \times 100 = 37.7\%$ Choice (2)

5. Observing the expenditure, E’s is the least and his percentage, on bills is the least, hence his expenditure on bills is the least. Choice (4)

**Solutions for questions 6 to 10:**

6. Production of steel by company C in 2003 = 12/100 × 860 = 103.2 lakh tonnes

7. Among 190/500, 90/690, 260/600 and 80/860, only 80/860 < 10 per cent

The percentage change in the given five years = 462.60 + 189.2 = 11.25 per cent Choice (3)

8. Total production of steel except in 2003 = 2570

Product of steel by company A from 2000 to 2004 except 2003 = 18/100 × 2570 = 462.60 lakh tonnes

Production of steel by company A in the year 2003 = 22/100 × 860 = 189.2

Total production of steel by company A in the given five years = 462.60 + 189.2 = 651.8 lakh tonnes Choice (4)

9. Average production of steel per year = 3430.5 = 686 lakh tonnes

The production in 2001, 2003 and 2004 is greater than the average production. Choice (3)

10. Required angle = 15/100 × 360° = 54° Choice (3)

**Solutions for questions 11 to 15:**

11. Only U.P. has more than 20 per cent of the total number of employees, as 20 per cent of 360° is 72°. Choice (1)

12. Given, 60 × (Actual share of Punjab) = 60°; Actual share = 100°; Total share is 360°

= (100 – 60) = 400°

Percentage share of the employees from Gujrat

= 45/100 × 100 = 11.25 per cent Choice (3)

13. Given, 15°/360° of total employees = 840

⇒ Total employees = 20,160 Choice (4)

14. Required difference = $\frac{90°}{360°} \times \frac{360°}{30°} = 5040$ Choice (1)

15. Required ratio = $\frac{30°}{60°} = 1 : 2$ Choice (3)

**Solutions for questions 16 to 20:**

16. Every year the number of new males and females settling in colony D is more than the other colonies. So the number of persons settling in colony D is the highest. Choice (4)

17. In 2003, the number of males are less than females in colony D only. So the ratio of males to females is the least for colony D. Choice (2)

18. In colony C, the total number of persons in 2000 = 167 + 155 = 322

The total number of persons in 2004 = 194 + 173 = 357; Percentage increase = 35/322 × 100

10 per cent of 322 = 32.2 and 1 per cent of 322 = 3.22 ; 11 per cent of 322 = 35.42 per cent. 10 per cent < Ans < 11 per cent Choice (1)

19. In the year 2001, the number of new persons settling in A = 310; B = 274; C = 334; D = 352; E = 212

In two colonies, C and D the number of new persons settling is more than 320. Choice (3)

20. The number of new persons in 2004 is more than that in 2003 for A = (178 – 163) + (156 – 142) = 15 + 14 = 29

For B = 17; for C = 13; for D = 15; for E = 6; Only for two colonies A and B, in 2004 it is more than 15 compared to 2003. Choice (1)

**Solutions for questions 21 to 25:**

Number of students in each school in as follow

School A – 30 per cent of 12000 = 3600

School B – 25 per cent of 12000 = 3000

School C – 21 per cent of 12000 = 2520; and

School D – 24 per cent of 12000 = 2880

The following table can be drawn to show the number of students who opted different subjects in the different schools.

<table>
<thead>
<tr>
<th>Schools</th>
<th>Subjects</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>25 per cent × 3600 = 900</td>
<td>25 per cent × 3000 = 750</td>
<td>37.5 per cent × 2520 = 945</td>
<td>37.5 per cent × 2880 = 1080</td>
<td></td>
</tr>
<tr>
<td>Art</td>
<td>25 per cent × 3600 = 900</td>
<td>50 per cent × 3000 = 1500</td>
<td>25 per cent × 2520 = 630</td>
<td>12.5 × 2880 = 360</td>
<td></td>
</tr>
<tr>
<td>Commerce</td>
<td>50 per cent × 3600 = 1800</td>
<td>25 per cent × 3000 = 750</td>
<td>37.5 per cent × 2520 = 945</td>
<td>50 per cent × 2880 = 1440</td>
<td></td>
</tr>
</tbody>
</table>

21. Required answer = 900 + 750 + 945 + 1080 = 3675. Choice (2)

22. Required ratio = 360°/630° = 4 : 7. Choice (1)

23. Required per cent = (150/900) × 100 = 16.67 per cent. Choice (3)

24. Average number of science students in the four schools = 3675/4 = 918

. In schools C and D, the number of science students are more than the average. Choice (2)

25. By observation. Choice (4)

**Practice Exercise 5**

**Solutions for questions 1 to 5:**

Let us calculate the total number of votes cast in different localities in different years.

<table>
<thead>
<tr>
<th>Year</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>60,000 × 45 per cent = 27000</td>
<td>65,000 × 60 per cent = 39000</td>
<td>80,000 × 75 per cent = 60000</td>
<td>70,000 × 40 per cent = 28000</td>
<td>60,000 × 55 per cent = 33000</td>
</tr>
<tr>
<td>1994</td>
<td>70,000 × 50 per cent = 35000</td>
<td>72,000 × 64 per cent = 46080</td>
<td>85,000 × 80 per cent = 68000</td>
<td>80,000 × 60 per cent = 48000</td>
<td>65,000 × 70 per cent = 45500</td>
</tr>
<tr>
<td>1998</td>
<td>75000 × 65 per cent = 48750</td>
<td>80,000 × 85 per cent = 68000</td>
<td>90,000 × 60 per cent = 54000</td>
<td>86,000 × 50 per cent = 43000</td>
<td>75,000 × 80 per cent = 60000</td>
</tr>
<tr>
<td>2002</td>
<td>78000 × 70 per cent = 54600</td>
<td>84000 × 72 per cent = 60480</td>
<td>98000 × 65 per cent = 63700</td>
<td>100000 × 45 per cent = 45000</td>
<td>104000 × 60 per cent = 62400</td>
</tr>
</tbody>
</table>
1. Required answer = 48750 + 68000 + 54000 + 43000 + 60000 that is 2,73,750 Choice (2)

2. In 1994, required average number of votes cast = (35000 + 46080 + 68000 + 48000 + 45500) + 5 = 48516 Choice (1)

3. In 2002, 464000 – 286180 = 177820 people did not cast their vote. Choice (2)

4. In the year 1994, maximum number of voters cast their votes in constituency C. Choice (2)

5. Required ratio = 164000 : 200900 = 1640 : 2009 Choice (3)

Solutions for questions 6 to 10:

6. Amount invested in PPF and pension plan in 2004= (28/100) × 175000 = Rs 49000 Choice (1)

7. (Investment in banks/investment in shares) × 100 = (7/28) × 100 = 25 per cent Choice (2)

8. Ratio of the annual incomes in 2003 and 2004 = 425/500 = 17/20 = 0.85
Ratio of annual spending = 275/325 = 11/13 = 0.84; Ratio of annual savings = 150/175 = 6/7 = 0.857 Choice (3)

9. From 2003 to 2004, the increase in the investment in the real estate = (22 per cent of 175000 – 22 per cent of 15000) = 22 per cent of 25000 = Rs 5500 Choice (4)

10. Investment of the Goels in 2004 in Banks = (7/100) × 175000 = Rs 12250
Interest on Rs 12250 for one year = (6/100) × 12250 = Rs 735 Choice (4)

Solutions for questions 11 to 15:

Let us calculate all the values of revenue and expenditure and represent this information in the form of the table.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20 per cent</td>
<td>25 per cent</td>
<td>40 per cent</td>
<td>25 per cent</td>
<td>20 per cent</td>
<td>10 per cent</td>
<td>10 per cent</td>
</tr>
<tr>
<td></td>
<td>360</td>
<td>432</td>
<td>540</td>
<td>756</td>
<td>945</td>
<td>1134</td>
<td>1247.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60 per cent</td>
<td>25 per cent</td>
<td>20 per cent</td>
<td>50 per cent</td>
<td>10 per cent</td>
<td>10 per cent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>240</td>
<td>384</td>
<td>480</td>
<td>576</td>
<td>864</td>
<td>950.4</td>
<td>1045.44</td>
</tr>
</tbody>
</table>

11. The profit in the year 2002–03 was 756–576 = Rs 180cr Choice (3)

12. The average revenue = 5414.4 ÷ 7 = 773.5. In 3 years, the revenue was more than the average revenue. Choice (1)

13. Profitability for the year 2003 – 04 = 81/945 = 0.085. Choice (2)

14. By observing the table of expenditure, we can conclude that the increase in the value of expenditure is the highest for the year 2003–04. Choice (3)

15. The value of profitability is the highest for the year 1999–00. Choice (1)

Solutions for questions 16 to 20:

16. Let the number of RVS brand motor bikes be 100 in 2003 then the sales of motor bikes in 2004 = 110
Sales of motor bikes RVS sold in 2003 = 100 × 19800 = 18000
Similarly the number of units sold in 2003 for Luxor = 20500
for Swing =24000; for Road King = 20000 Choice (3)

17. The required percentage = 31800 – 24600 × 100 % = 29.3 % Choice (1)

18. The number of motor cycles of Luxor brand to be sold in 2005 = 1.20 × 24600 = 29520
The number of RVS brand motor cycles sold in 2004 = 19800
RVS sales should increase (29520 – 19800) = 9720
Required percentage = 9720/19800 × 100 = 49 per cent Choice (4)

19. Let the price per unit of Road King brand motor cycle in 2003 and 2004 be Rs x and Rs y respectively.
Given that 100x = 105y ⇒ x/y = 21/20.
The price in 2004 is less than that in 2003 by 1/21 × 100 = 4.76 per cent Choice (1)

20. In 2004, the average sales of the given companies = 117600/5 = 23520
⇒ 90 per cent of 23520 = 21168.
This value is nearest to the number of units sold for Road King brand. Choice (4)

Solutions for questions 21 to 25:

21. Runs scored by player B through 1’s = 30 per cent of 7500 = 2250
Runs scored by player A through 1’s = 21 per cent of 6000 = 1260
Required difference = 2250 – 1260 = 990 Choice (2)

22. Required percentage = (2250 – 1200) × 100 = 87.5 per cent Choice (4)

23. Required ratio = 1440 : 1500 = 24 : 25 Choice (2)

24. As there is no information on the number of occasions where C was out and the number of balls where no runs were scored, the question cannot be determined. Choice (4)

25. Total number of fours scored by D and G = 8400 + 4200 = 12600
Total number of fours scored by A and B = (20% of 6000) + (24% of 7500) = 750
∴ Required difference = 2400. Choice (3)
**Practice Exercise 6**

**Solutions for question 1 to 5:**

<table>
<thead>
<tr>
<th>City</th>
<th>Total Number of Employees</th>
<th>Male employees</th>
<th>Part time Employees</th>
<th>Wages of Part time employees</th>
<th>Number of days part time employees worked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyderabad</td>
<td>600</td>
<td>360</td>
<td>200</td>
<td>120</td>
<td>18</td>
</tr>
<tr>
<td>Bangalore</td>
<td>300</td>
<td>200</td>
<td>60</td>
<td>180</td>
<td>18</td>
</tr>
<tr>
<td>Mumbai</td>
<td>120</td>
<td>45</td>
<td>20</td>
<td>150</td>
<td>24</td>
</tr>
<tr>
<td>Delhi</td>
<td>60</td>
<td>30</td>
<td>10</td>
<td>150</td>
<td>24</td>
</tr>
<tr>
<td>Jaipur</td>
<td>90</td>
<td>30</td>
<td>30</td>
<td>225</td>
<td>15</td>
</tr>
<tr>
<td>Mohali</td>
<td>90</td>
<td>18</td>
<td>30</td>
<td>225</td>
<td>20</td>
</tr>
<tr>
<td>Chennai</td>
<td>150</td>
<td>120</td>
<td>75</td>
<td>240</td>
<td>10</td>
</tr>
</tbody>
</table>

1. Required difference = 200 – 75 = 125. Choice (2)
2. Total wages of all the part-time employees at Mohali: 225 \times 30 \times 20 = Rs 1,35,000 Choice (2)
3. Required ratio = 200:60 = 10:3 Choice (3)
4. Total wages paid to all the employees at Chennai = 75 \times 300 \times 30 + 75 \times 240 \times 10 = Rs 8,55,000. Choice (1)
5. As the number of part-time employees at Hyderabad is more than twice that at any other city, the total amount is the highest at Hyderabad. Choice (3)

**Solutions for question 6 to 10:**

6. Average production
   \[ = \frac{50 + 60 + 72 + 84 + 75 + 96}{6} = 72.8 \]
   The production of rice in 2001, 2002 and 2003 is greater than the average production. Choice (3)
7. Total quantity of rice exported in 2003
   \[ = \frac{20}{100} \times 96 \times 10^3 \text{ kg} \]
   Value of exports in 2003 = Rs 24000 crore Choice (1)
8. Percentage increase in the production of rice only in 2003 is more than 25 per cent Choice (4)
9. Exports to Kenya in 1999 = \frac{18}{100} \times 25/100 \times 60 = 2.7 million tonnes. Choice (2)
10. The percentage of increase in the production of rice from 1998 to 1999 and that from 1999 to 2000 are equal. In the year 2003, the value of rice exported to Iran is more than that exported to Iraq by 4 per cent points but not by 4 per cent. In the year 2003, the value of rice exported to Kenya = \frac{12}{100} \times 24000 = Rs 2880 crore. This statement is true. Choice (3)

**Solutions for questions 11 to 15:**

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP (Rs Crores)</th>
<th>Exports (Rs Crores)</th>
<th>Imports (Rs Crores)</th>
<th>National Income (Rs Crores)</th>
<th>Percapita income (Rs)</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-03</td>
<td>20,000</td>
<td>1,000</td>
<td>2,000</td>
<td>21,000</td>
<td>40,000</td>
<td>50,000</td>
</tr>
<tr>
<td>2003-04</td>
<td>24,000</td>
<td>2,400</td>
<td>2,400</td>
<td>24,000</td>
<td>40,000</td>
<td>60,000</td>
</tr>
<tr>
<td>2004-05</td>
<td>30,000</td>
<td>4,500</td>
<td>3,750</td>
<td>29,250</td>
<td>50,000</td>
<td>60,000</td>
</tr>
<tr>
<td>2005-06</td>
<td>30,000</td>
<td>6,000</td>
<td>4,500</td>
<td>28,500</td>
<td>48,000</td>
<td>62,500</td>
</tr>
<tr>
<td>2006-07</td>
<td>36,000</td>
<td>9,000</td>
<td>7,200</td>
<td>34,200</td>
<td>50,000</td>
<td>72,000</td>
</tr>
<tr>
<td>2007-08</td>
<td>45,000</td>
<td>9,000</td>
<td>11,250</td>
<td>47,250</td>
<td>60,000</td>
<td>75,000</td>
</tr>
</tbody>
</table>

11. Except in 2005-06, in every other year national income increased when compared to the previous year. Choice (1)
12. Required percentage
   \[ = \frac{72,00,000 – 50,00,000}{50,00,000} \times 100 = 44 \text{ per cent} \]
   Choice (3)
13. By observation, only in 2003-04, the exports were more than twice that in the previous year. Hence, the greatest percentage change is in 2003-04. Choice (4)
14. As the population did not decrease in any year, the required number of years is zero. Choice (4)
15. The national income is the highest in 2007-08 and the only year that is comparable is 2006-07. But when compared to 2006-07, national income in 2007-08 increased by at least 30 per cent where as population increased by close to 5 per cent. Hence in 2007-08, per capita income based on national income will be the highest. Choice (3)

**Solutions for questions 16 to 20:**

16. Number of brand C motor cycles sold
   \[ = \frac{21}{100} \times 25200 = 5292 \]
   Choice (1)
17. By value, the sales of brand D motor cycles is more than brand A motor cycles by \((27 – 21)21 \times 100 = 29 \text{ per cent} \)
   Choice (2)
18. The required ratio = \(28/25 : 21/18 = 24:25 \)
   Choice (2)
19. Assume in 2003, 100 motorcycles were sold and the total amount was Rs 100 that is average cost = Re.1
   In 2004, it is \(= 120/125 = Rs 24/25. \)
   \[ \therefore \text{ per cent decrease in value} = \frac{1/25 \times 100}{4} = 4 \text{ per cent} \]
   Choice (4)
20. Measure of the motor cycle C, for the market share by value = \(24/100 \times 360^o = 86.4^o \)
   Choice (3)

**Solutions for questions 21 to 25:**

21. The weighted average price for the year 2001
   \[ = \left(\frac{105 \times 20}{100} + \frac{120 \times 30}{100} + \frac{115 \times 20}{100} + \frac{130 \times 30}{100}\right) \]
   \[ = (21 + 36 + 23 + 39) = 119 \]
The weighted average price for the year 2002
\[
= \left( \frac{120 \times 20 + 125 \times 30 + 120 \times 20 + 135 \times 30}{20 + 30 + 20 + 30} \right) = \left( \frac{24 + 37.5 + 24 + 40.5}{100} \right) = 37.8 \text{ per cent}
\]
\[
= \left( \frac{126 - 119}{119} \times 100 \right) = 5.88 \text{ per cent}
\]
2. Weighted average price for year 2003
\[
= \left( \frac{130 \times 20 + 130 \times 30 + 125 \times 20 + 140 \times 30}{100 + 100 + 100 + 100} \right) = (26 + 39 + 25 + 42) = 132 \text{ Choice (4)}
\]
3. The weighted average price for 2000
\[
= 100; \text{ The weighted average price for 2001} = 119
\]
\[
= \text{The weighted average price for 2002} = 126
\]
\[
= \text{The weighted average price for 2003} = 132
\]
As the prices of all the types of articles in 2004 is more than that in 2003, weighted average price will also be more than 124.
\[
= \text{For the year 2002, 2003 and 2004 the weighted average price is more than 124. Choice (3)}
\]
4. Observing the given data only in 2003, the percentage increase crosses 15 per cent. Choice (4)
5. In 2002, the required ratio = 2981/1105 = 2.7 Choice (3)

Solutions for questions 6 to 10:
6. Given profit of P in 2004-05 = Rs 60 lakhs; Profit percentage of P in 2004-05 = 30 per cent
\[
\text{Given, } 30 = 60 \times \frac{30}{100} \text{ expenditure}
\]
\[
\implies \text{Expenditure of P in 2004-05 = Rs 200 lakhs. Hence, its income in 2004-05 = Rs 260 lakhs. Choice (1)}
\]
7. Let the profit of Q and R in 2004-05 be Rs 12x. Then, using the graph, we have
\[
\frac{12x}{\text{expenditure of Q}} = 0.3 \text{ and } \frac{12x}{\text{expenditure of R}} = 0.4
\]
\[
\implies \text{Expenditures of Q and R are in the ratio 4 : 3.}
\]
\[
\text{Incomes ratio = } 52x : 42x = 26 : 21 \text{ Choice (3)}
\]
8. As the profit is 30 per cent of expenditure, income = 130 per cent of expenditure of R in 2006-07 = Rs 390 lakhs.
\[
\implies \text{Expenditure of R in 2006-07 = Rs 300 lakhs. Also, 150 per cent of expenditure of R in 2007-08 = Rs 435 lakhs}
\]
\[
\implies \text{Expenditure of R in 2007-08 = Rs 290 lakhs. per cent increase in profit of R from 2006-07 to 2007-08 = } \frac{55}{90} \times 100 = 61.11 \text{ per cent Choice (3)}
\]
9. Given, 20 per cent of P : 10 per cent of Q : 30 per cent of R = 4 : 2 : 3 that is, P:Q:R = 20:20:10 = 2 : 2 : 1 Choice (2)
10. As the income of P in 2007-08 is not known, the ratio cannot be determined. Choice (4)

Solutions for questions 11 to 15:
11. Male literacy rate for E = 275/400 × 100 = 68.75 per cent Choice (3)
12. Female literacy rate in A = 90/210 = 3/7 = 42.84 per cent
\[
\text{In } B = 125/275 = 5/11 = 45.45 \text{ per cent; In } C = 80/200 = 40 \text{ per cent}
\]
\[
\text{In } D = 150/325 = 6/13 = 46 \text{ per cent}
\]
\[
\text{In } E = 225/375 = 60 \text{ per cent Choice (3)}
\]
13. Number of illiterates in B = (330 + 275) – (150 + 125) = 330
\[
\text{That in } C = (175 + 200) – (100 + 80) = 195
\]
\[
\text{Those in } B \text{ and } C = 330 + 195 = 525 \text{ lakhs}
\]
\[
\text{5.25 crores. Choice (4)}
\]
14. Total population of state A = 225 + 210 = 435; That of state D = 350 + 325 = 675
\[
\text{The required ratio is } 435 : 675 = 29 : 45 \text{ Choice (3)}
\]
15. Existing number of literates = 100 + 80 = 180 lakhs.
\[
\text{Literacy target of state C = 60 per cent of 375 = 225 lakhs that is 45 lakhs more. Choice (2)}
\]

Solutions for questions 16 to 20:
16. Production cost / unit = (1,80,00,000 × 120 + 60) / 60,000 (360) = Rs 150.
\[
\text{Sales price / unit = } \frac{40\% \text{ of } 3,00,00,000}{80\% \text{ of } 60,000} = Rs 250. \text{ Choice (3)}
\]
17. Sales income from North = 30°/360 × 40 per cent of 3,00,00,000 = Rs 10,00,000
\[
\text{Interest } = 15/360 \times 1,80,00,000 = Rs 7,50,000
\]
\[
\text{Required percentage } = \frac{10,00,000}{7,50,000} \times 100 = 133\frac{1}{3} \text{ per cent Choice (1)}
\]
18. Administrative expenses in 2007-08
\[
= 130 \text{ per cent of } \frac{30}{360} \times 1,80,00,000 = Rs 19,50,000
\]
\[
\text{Sales in 2007-08 } = \frac{19,50,000}{21} = Rs 97,50,000.
\]
\[
\text{Sales in 2006-07 } = 40 \text{ per cent of 3,00,00,000 } = Rs 1,20,00,000
\]
\[
\text{Required percentage } = \frac{1,20,00,000 \times 97,50,000}{1,80,00,000} \times 100 = 18.75 \text{ per cent Choice (4)}
\]
19. Income from property and royalty charges = 25 per cent of 3,00,00,000 = Rs 75,00,000.
\[
\text{Now, } 75,00,000 \times 360 = 150^\circ. \text{ But none of the expenses form more than 150^\circ. Choice (1)}
\]
20. Change in expenditure on administrative expenses, maintenance and manufacturing expenses from 2006-07 to 2007-08 = 20 per cent of 105 = 21
\[
\text{Change in raw material and wages from 2006-07 to 2007-08 } = 20 \text{ per cent of 195 = 39}
\]
\[
\text{Change in all other expenses } = 30 \text{ per cent of 60 = 18. Net change = } +21 - 39 + 18 = 0 \text{ per cent Choice (2)}
\]
Solutions for questions 21 to 25:
   that is in 2000 and 2002. Choice (3)

22. In the year 2000, 2001 and 2004 there is trade surplus, in the remaining two years there is trade deficit. The required ratio is 2 : 3 Choice (4)

23. Required percentage: 8 per cent/20 per cent Choice (1)

24. In the year 2000, let the trade surplus per employee as well as the number of employees be x each. Given that x² = 40crores.
   ⇒ x = 20000 Choice (3)

25. In which ever year the trade value is the highest, that will be the required answer. Choice (3)

Practice Exercise 8
Solutions for questions 1 to 5:
1. Let the number of females and males be 1200 and 1300 respectively.
   Overall literacy
   = \frac{30\% \times 1200 + 40\% \times 1300}{1200 + 1300} \times 100
   = 35.2 per cent Choice (3)

2. In the year 2002, let the number of females and males be x and y. Given that, 35 per cent of x = 49 per cent of y ⇒ x/y = 7/5.
   ∴ Required percentage = 2/5 × 100 = 40 per cent.
   Choice (2)

3. per cent increase in male literates from 2000 to 2001
   = \left[ \frac{(44)(1.2)}{40} - 1 \right] \times 100 = 32. Choice (1)

4. Let the number of males and females in 2002 be 700 and 800 respectively.
   Overall literacy rate
   = \frac{35 \times 700 + 49 \times 800}{700 + 800} \times 100 = 42.5 per cent.
   Similarly overall literacy in 2003
   = \frac{38 \times 900 + 50 \times 1100}{900 + 1100} \times 100 = 44.6 per cent.
   The increase is 44.6 – 42.5 = 2.1 per cent points. Choice (2)

5. Let the number of males in 2000 and 2001 be x and y respectively. Given that, 40 per cent of x = 44 per cent of y ⇒ x : y = 11 : 10.
   Choice (2)

Solutions for questions 6 to 10:
6. Internal marks of Alok in maths
   = \frac{(49 + 96)(140)}{300} \times 40 = 38
   In the same way, internal marks of Bawesh, Chandan, Deepak and Gautham are 38 each.
   ∴ Total is 190. Choice (1)

7. As all the five students got equal marks in internal exams of maths, Deepak will get the least marks as he got the least in external exam. Choice (2)

8. Aggregate marks in II language of Chandan is the highest as he got 38 and 48 in the internals externals respectively. Choice (3)

9. As all the students got 38 marks each in mathematics and as their external marks are greater, their aggregate total in maths is the highest. Choice (2)

10. All the five students will get scholarship in maths. In science Alok, Bawesh and Gautham will get the scholarship. ∴ Scholarship amount received is 8 \times 5000 = Rs 40,000 Choice (4)

Solutions for questions 11 to 15:
11. By observation, fees per student in 2003 is less than that in 2004. And the number of students in 2003 is also less than that in 2004. ∴ Total fees in 2003 will be less than that in 2004.
   There is no need to find the total fees in 2003. Total fees in 2001 = 125 \times 500 = 62500
   That in 2002 = 200 \times 350 = 70000
   That in 2004 = 180 \times 475 = 85500 Choice (4)

12. Spending towards the maintenance
   = (20/100) \times 75 \times 400 = 6000 Choice (3)

13. Average number of students per year
   \frac{400 + 500 + 350 + 450 + 475}{5} = 2175/5 = 435
   The number of students in 2001, 2003 and 2004 are greater than 435. Choice (2)

14. Total fees collected in 2004 = 180 × 475
   Let the number of students in 2005 be x. Given that, 1.25 \times 180 \times x = 180 \times 475 ⇒ x = 380. ∴ Number of students who left = 475 – 380 = 95 Choice (4)

15. Using the values of total fees in 2003 and 2004, the required percentage increase
   = \frac{(85500)–(140 \times 450)}{140 \times 450} \times 100
   = \frac{22500}{63000}
   = \frac{35.7}{per\;\;cent}\;Choice\;(4)

Solutions for questions 16 to 20:
Let us calculate the values and represent it in the table.

<table>
<thead>
<tr>
<th>Dainik Bhaskar</th>
<th>Dainik Jagaran</th>
<th>TOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 60% 24000 that is = 14400</td>
<td>20% = 4800</td>
<td>20% = 4800</td>
</tr>
<tr>
<td>B 50% =9000</td>
<td>20% = 3600</td>
<td>30% = 5400</td>
</tr>
<tr>
<td>C 40% = 12800</td>
<td>10% = 3200</td>
<td>50% = 6000</td>
</tr>
<tr>
<td>D 20% = 5000</td>
<td>40% = 10,000</td>
<td>40% = 10,000</td>
</tr>
<tr>
<td>E 40% = 6400</td>
<td>40% = 6400</td>
<td>20% = 3200</td>
</tr>
<tr>
<td>F 30% = 6000</td>
<td>50% = 10,000</td>
<td>20% = 4000</td>
</tr>
</tbody>
</table>

16. In localities D and F more people read Dainik Jagaran than Dainik Bhaskar. Choice (2)

17. Total number of people who read Times of India = 43,400 Choice (1)

18. In localities C and D, more people read Times of India than Dainik Bhaskar. In others it is the reverse. Choice (4)

19. By observation, we can say that in localities A, B and C, the required ratio is less than 1.

   Locality A = \frac{4800}{14400} = 0.333.

   For Locality B = \frac{3600}{9000} = 0.4 and

   For the Locality C = \frac{3200}{12800} = 0.25.

   ∴ The ratio is the least for locality C. Choice (3)
20. Required per cent =
\[
\frac{4800 + 5400 + 10000 + 3200}{14400 + 9000 + 5000 + 6400} \times 100
\]
\[
= \frac{23400}{34800} \times 100 \geq \frac{117 \times 2}{117 \times 3} \times 100 \equiv \frac{66}{3} per cent
\]

Choice (2)

Solutions for questions 21 to 23:

21. The required percentage increase
\[
= \frac{10 - 4}{4} \times 100 = 150%
\]
Choice (2)

22. By observation the car moves at 8 km per minute when the time is 60 seconds.
Choice (3)

23. When the time is 10 seconds, speed is 1 km per minute. If we substitute k = 10, we get speed = 10/10 = 1 km/min.
When time is 20 seconds speed = 20/10 = 2 km/min.
∴ The required function is k/10
Choice (1)

Solutions for questions 24 and 25:

The profit earned is Rs 2559484, Rs 2991386 and Rs 2609540 respectively.
Choice (2)

25. The sales have decreased from 2002 to 2003. Statement (I) is not true.
In the year 2000 and 2003 the company does not make profit. Statement (II) is not true.
The percentage increase in the sales for the given years approximately is
\[
\frac{8864 - 5326}{5326} \times 100 \equiv 66%
\]
Conclusion (C) can be drawn from the given data.
Choice (3)

Practice Exercise 9

Solutions for questions 1 to 5:

1. From godown x, the supply of at least three of the products A, B, C and D meets the demand at R and hence can be transported to R.
Choice (2)

2. Total demand of A: 35 + 40 + 40 + 35 = 150
New demand for all the products = 50 per cent of 150 + 145 + 140 + 140 = 500
Total supply of all the products = 125 + 135 + 125 + 115 = 500
∴ Excess of demand = 0 tonnes.
Choice (2)

3. Minimum amount required = 40 \times 15 \times [35 + 30 + 25 + 40] = 78000 Choice (2)

4. Demand of the products A, B, C and D at Q are 32, 24, 36 and 28 respectively.
∴ Only W is in a position to transport to Q.
Choice (1)

5. As W and X are in a position to supply at least one product to each of P, Q, R and S, we can say that these are optimum suppliers.
Choice (3)

Solutions for questions 6 to 10:

6. Ratio of estimated imports of edible oils to the actual imports of edible oils
in 1996 = 30/23 = 1.3; in 1997 = 40/30 = 1.33; in 1998 = 45/27 = 1.6 and in 2001 = 80/60 = 1.33
Choice (3)

7. The required percentage = (121/295) \times 100 = 41 per cent
Choice (2)

8. The percentage increase in the value of estimated imports in 1997 = (10/30) \times 100 = 33.33 per cent
in 1998 = (5/40) \times 100 = 12.5 per cent
in 2000 = (10/60) \times 100 = 16.66 per cent and in 2001 = 10/70 \times 100 = 14.28 per cent
Choice (1)

9. During 1998, the value of imports from Malaysia = Rs 1400 crore. When converted into US $ = 1400/40 = $35 crore and Cost of 5 litres = $4
Number of litres for $35 crore = 35 \times 10^7 \times \frac{5}{4 \times 10^7} = 437500 kl
Choice (4)

10. By observation the required ratio is 4 : 2
or 2 : 1
Choice (4)

Solutions for questions 11 to 15:

11. B, C, D, H, N and O have the batting average above 45
Choice (3)

Choice (2)

13. Only A and D have their batting and bowling averages more than 25.
Choice (4)

14. Only D, I, J, K, M, N and O have the strike rate more than 20 and the no. of catches taken per match more than 0.8
Choice (4)

15. Net Runs = (Runs Scored – Runs Conceded) \times 1 + Catches \times 2 + Wickets \times 5
A = (13,510 – 3423) \times 1 + 196 \times 2 + 121 \times 5
= (10087 + 392 + 605 + 11084
B = (7,202 – 1237) \times 1 + 142 \times 2 + 66 \times 5
= (5965) \times 1 + 284 + 330 = 6579
P = (11323 – 1726) \times 1 + 247 \times 2 + 70 \times 5
= (9597) + 494 + 350 = 10441
Choice (4)

D = (2700 – 5347) \times 1 + 132 \times 2
+ 185 \times 5
= -2647 + 264 + 925 = -1458
Choice (1)

Solutions for questions 16 to 20:

16. Value per tonne of sugar exported in 2000 = 144/12 = 12; In 2001 = 165/15 = 11
In 2002 = 130/10 = 13 and in 2003 = 156/12 = 12.
In 2004 = 230/20 = 11.5 and in 2005 = 275/22 = 12.5. It is the greatest in 2002.
Choice (1)

17. The percentage increase in the exports of sugar (by value) in 2001 = 21/144 \times 1 = 6.8
\approx 14 per cent
In 2003 = 26/130 \approx 1/5 \approx 20 per cent
In 2004 = 74/156 \approx 1/21 \approx 50 per cent and
In 2005 = 45/230 = 1/5.1 \approx 20 per cent
Choice (1)

18. The average quantity for the given period
\[
\frac{12 + 15 + 10 + 13 + 20 + 22}{6} = \frac{92}{6} = 15.33
\]
In the years 2004 and 2005, the quantity exported is greater than the average.
Choice (2)

19. Value of sugar exported in 2001 = 165/15
= Rs 11, in 2004 = 230/20 = Rs 11.50
The difference is Rs 0.50.
Choice (4)

20. Value per tonne in 2006 = 1.4 \times 275
= 1.25 \times 22
Rs 14.
Choice (4)

Solutions for questions 21 to 25:

21. As A, B, C, E and G have higher share in 2000 than in 1990, their population increased.
Only F there is decrease, since 11 \times 2 > 3 \times 3
Choice (1)

22. In the year 2000 the population of Meher Nagar
= (20 + 5) per cent = 25 per cent
Similarly the population of Sai Nagar in 2000 (25 + 10) per cent = 35 per cent
The difference is 10 per cent of 75 lakh = 75,000
Choice (3)

23. In 1990, the population of the tribal people = 25/100 \times 12/100 \times 50 = 1,50,000
Choice (2)

24. In 2000, the required percentage
\[
\frac{15 - 12}{12} \times 100 = 3/12 \times 100 = 25 per cent
\]
Choice (3)

25. The required ratio is 20/100 \times 50 : 20/100 \times 75 = = 2 : 3
Choice (4)
Practice Exercise 10

Solutions for questions 1 to 5:

1. Ratio of returns on the investment of B during the first and the second year = 28 per cent of 45 : 40 per cent of 30 = 21 : 20 Choice (2)

2. Return on investment of E in the first year 75 per cent of 60 = 45
During the second year = 35 per cent of 20 = 7
Overall = 62 per cent of 100 = 62
Return on investment in the third year = 62 – (45 + 7) = 10
Return on investment as percentage = 10/20 × 100 = 50 per cent Choice (2)

3. During the first year, investment by E is the greatest and return on investment also is the greatest.
Choice (3)

4. Ratio of investments of D and F during the second year = 10 : 30 = 1 : 3 Choice (4)

5. Since the total amounts invested by the persons are equal for the given three years, whoever gets the least percentage of return will also get the least amount of return. By observation, B’s return is the least.
Choice (2)

Solutions for questions 6 to 10:

6. As there is no individual split-up of students from different places, data is not sufficient to answer this question. Choice (4)

7. Total number of students from Hyderabad = 900; Number of BE students from Hyderabad
= 1200 × 25/100 = 300
∴ Required percentage = 300/900 × 100 = 33.33 per cent Choice (3)

8. Number of students from BBA background who took marketing and are from Mumbai
= 60 per cent of 20 per cent of 3000 × 20/100 = 72.
∴ Required difference = 120 – 72 = 48 Choice (2)

9. Total number of students who are from Delhi in 2006 = 20 per cent of 3000 = 600
In 1999, number of students from Delhi
= 20% of 1200 = 240
∴ Total number of students in 2005
= 500/20 per cent = 2500
∴ Increase in intake = 500 Choice (1)

10. ∴ Required ratio = 40/100 : 198/360 = 8 : 11. Choice (2)

Solutions for questions 11 to 15:

11. By observation, the total production by the given companies was the greatest in the year 2004. Choice (4)

12. Required average
= \frac{200+150+250+400+400}{5} = 280.
The production of A in 2000, 2001 and 2002 is less than 280. Choice (3)

13. Since the total production of C is 1650 is the greatest, the average production will also be the greatest for C. Choice (3)

14. Required percentage = (300/100) × 100 = 300 per cent Choice (4)

15. Let the cost of each oven of company A be ‘n’. So, the cost of the oven of company B = n + 500
Required difference = (n + 500) × 400 – n × 350
= 50n + 200000. But ‘n’ is not known.
Choice (4)

Solutions for questions 16 to 20:

In 2003 25 per cent of the two wheelers produced are sold in India = Remaining 100 – 25 = 75 per cent, 2 wheelers are exported. Like wise (100 – 55) = 45 per cent of 4 wheelers are exported
Let us represent the percentage of vehicles exported in a line graph

16. By comparing the graphs they are exhibiting inverse relationship. Choice (1)

17. Required ratio = 42 per cent of 25000 : 45 per cent of 50000
= 7 : 15 Choice (2)

18. Total no of 3 wheelers produced in India
= 35 + 65 + 45 + 60 + 40 = 2,45,000
Total number of 3 wheelers exported
= (63 × 35,000) + (43 × 65,000) + (0.3 × 45,000) + (0.55 × 60,000) + (0.65 × 40,000) = 1,22,500
Required percentage = \frac{1,22,500}{2,45,000} × 100 = 50 per cent Choice (3)

19. Observing the above graph as the exports of 4 wheelers highest at 70 per cent and their products on is also the highest during that year, only in 2005 is the percentage is more than 50 per cent Choice (2)

20. Total units produced in India = 7,42,000
Total Number of units exported
= 1,22,500 + 1,63,400 + 1,01,550 = 38,450
∴ Required answer = \frac{74200}{38450} ≃ 2 Choice (3)

21. Total number of shoes manufactured by the four companies A, B, C and D are 942, 472, 776 and 1035 respectively.
∴ D > A > C > B Choice (2)

22. The number of shoes manufactured by company B in quarter I = 21 + 30 + 37 + 15 = 103.
In quarters II, III, and IV are 108, 119 and 142 respectively. By observation, only from quarters III to IV, there is an increase of approximately 20 per cent, whereas other cases it is clearly less than that. Choice (2)

23. The total number of shoes manufactured by company C in Q III in 2005
= 48 + 62 + 78 + 27 = 215
Number of shoes manufactured in Q III
In 2004
= \frac{215}{1.25} = 172 Choice (1)

24. The total no of shoes for male and female segments
= (219 + 296) + (95 + 134) + (173 + 221) + (220 + 325) = 1683 Choice (4)
25. By careful observation, we can find that no company satisfies the condition.  
Choice (1)

DATA SUFFICIENCY

Solutions for questions 1 to 25:

1. Let the cost of each chocolate and each biscuit be Rs c and Rs b respectively.  
\[ 4c + 8b = 20 \] 
Using statement A, \( c \leq 2 \)  
If \( c = 1, b = 2, c \neq 2 \) as \( b = 1.5 \). A is sufficient.  
Using statement B, \( b \leq 2 \), we have different possibilities for \( c \). B is not sufficient.  
Choice (1)

2. Combining both the statements, we get, \( a + b - c + d = (a + b) - (c - d) = \) even – odd  
Using statement as B, \( b = 1.5 \). A is sufficient.  
Choosing it, \( 2 \) as \( b = 1.5 \). A is sufficient.  
Choice (1)

3. Let the number of days the maid was present be \( x \), \( 50x \) = \( (30 - x) 10 \) \( 500 \Rightarrow x > 15 \)  
From statement A: number of days the maid worked is greater than 15, statement A is sufficient.  
Statement B not sufficient to answer the question as the number of days worked may be 16, 17, 18 etc.,  
Choice (1)

4. From statement A, we cannot say whether \( x^2 > y^2 \) or not as \( x \) may be positive or negative.  
Statement B alone is not sufficient to find whether \( x^2 > y^2 \) as we do not have any information about \( y \).  
Using both the statements, \( x^2 > y^2 \) and \( x \) is positive, we can say that \( x^2 > y^2 \).  
Choice (3)

5. By combing both the statements also, we cannot answer the question as \( y > z \) or \( y < z \). Choice (4)

6. If a number has only 3 factors, then the number is always a perfect square.  
So statement I alone is sufficient.  
Choice (1)

7. Let the number of pens, pencils and erasers he bought be \( x, y \) and \( z \) respectively.  
Total expenditure = Rs \((4x + 3y + 2z)\)  
Either of the statements are not sufficient to answer the question:  
Using both statements, \( x + y + z = 6 \) and \( x, y, z \geq 2 \) that is, \( x + y + z \geq 6 \).  
Choice (3)

8. Either statement alone is not sufficient.  
By combining both the statements, \( a = b = c = d = -1/2 \) and \((a + b)(c + d)\) is an integer and \((a + b)(c + d)\) is not an integer.  
Choice (4)

9. To have the maximum number of items, one must purchase more of cheap items.  
\( \therefore a = 1 \). Hence statement A is sufficient.  
To have minimum number of items one must purchase more of costlier items.  
\( \therefore a = 4 \).  
Either of the statements are sufficient.  
Choice (2)

10. From statement I, we know that \( x^2 > y^2 \).  
From this we cannot say whether \( x^2 > y^2 \) or not since \( x \) may be positive or negative.  
From statement II, we know that \( y \) is a positive integer. Again this alone is not sufficient, since we do not have any information about \( x \).  
Using both the statements also we cannot say whether \( x^2 > y^2 \) or not as we do not know whether \( x \) is positive or negative.  
Choice (4)

11. It is given \( 2x + 3y = 17 \)  
Statement A is not sufficient to answer the question, as possible values of \( x \) and \( y \) are \((4, 3) (7, 1), (1, 5)\).  
Statement B alone is sufficient, as \( x = 7 \) and \( y = 1 \) is the only solution.  
Choice (1)

12. If the HCF of two numbers is 1 then the two numbers are relative primes (co-primes). So statement A alone is sufficient.  
Choice (1)

13. Let the fraction be \( \frac{n}{d} \) Using statement A, \( \frac{n + 1}{d + 1} = \frac{3}{4} \Rightarrow \frac{n}{d} < \frac{3}{4} < 1 \)  
Using statement B, \( \frac{n - 1}{d - 1} \Rightarrow \frac{n}{d} > \frac{5}{7} \)  
Choice (2)

14. Product of \( x \) and \( y \) = \((\text{LCM of } x \text{ and } y) \times (\text{HCF of } x \text{ and } y)\).  
Using both the statements, product of \( x \) and \( y = 2 \times 2 = 4 \)  
Choice (3)

15. Using statement A, Let the age of the man two years ago be \( 13x \) years and wife be \( 10x \) years.  
Ratio of their present ages = \( \frac{13x + 2}{10x + 2} = 1.3 - \frac{0.6}{10x + 2} \) which is less than 1.3.  
We cannot say whether this is more than 5/4 or not. A is not sufficient.  
Using statement B, Let the age of the man two years hence be \( 5x \) years and wife be \( 4x \) years.  
Choice (3)

16. Using both the statements, if the HCF of two numbers is 1 then the numbers are relative primes. Let \( a = 7, b = 2 \Rightarrow a - b = 5 \)  
Let, \( c = 5, d = 3 \Rightarrow c - d = 2 \)  
\((a - b) \) and \((c - d)\) are relative primes  
Let us take another example. But for \( a = 7, b = 2, c = 11, d = 6 \)  
Here, \((a - b) \) and \((c - d)\) are not relative primes.  
Hence, the question cannot be answered.  
Choice (4)

17. Let the present ages of Prakash and Rakesh be \( p \) years and \( r \) years respectively.  
Prakash was \( r \) years old \((p - r) \) years ago.  
Age of Rakesh, then \( r = (p - r) = (2r - p) = 2\Rightarrow 3p/4 \)  
Using statement A, \( p = 80 \).  
\( r = 60 \) A is sufficient.  
Using statement B, \( r > p/2 \). B is not sufficient.  
Choice (1)

18. From statement A, we know that the highest power of 2 contained in \( k! \) is 19.  
If \( k = 22 \) or 23 then the highest power of 2 in \( k! \) is 19.  
To find the number of zeroes at the end of \( k! \) we need to find the highest power of 5 in \( k! \)  
If \( k = 22 \) or 23 the highest power of 5 in \( k! \) is 4.  
So the number of zeroes at the end of \( k! \) is 4.  
Choice (1)

19. Let \( A \) be \( 10x + y \).  
Using statement A, \( 10(x + y) - (10x + y) = 9 \)  
\( y = 1 \) A is sufficient.  
Using statement B, \( 10x + y - (x + y) = 9 \)  
\( x = 1 \) B is not sufficient.  
Choice (1)

20. From statement A: \( 3^3 + 2^0 = 35 \) so the positive pairs of \( P \) and \( Q \) are \((1, 5) \) and \((3, 3) \).  
So \( P \) can be 1 or 5 and hence a unique value of \( P \) is not possible.  
From statement B: \( 3^3 + 2^0 = 35 \) so the positive pair of \( P \) and \( Q \) is \((4, 3) \). So \( P = 4 \).  
Choice (1)

21. Let the numbers of chocolates with Ramesh and Suresh be \( r \) and \( s \) respectively.  
both statements, \( s = r \).  
Choice (3)

22. From statement A, we have \( z = y - 1 \).  
\( xyz = (y + 1) (y) (y - 1) \)  
As the product of 3 consecutive integers is always divisible by 6, \( xyz \) is also divisible by 6.  
\( \therefore \) Statement A alone is sufficient.  
Choice (1)
23. Let the costs of a pen, an eraser and a
sharpen be Rs p, Rs e and Rs s respectively.
Using both statements, 2p = 3e + 1
and 2e = s + 6. Hence 4p = 3s + 20
Both statements even when taken
together are not sufficient to answer
the question as we can say p/s > 3/4.
Choice (4)

24. From statement A, we know that x'y' > 0
This is possible only when y is positive
(as x'² is always positive and x'y should be positive).
∴ Statement A alone is not sufficient to say about x.
From statement B, we know that x'y² < 0
⇒ x is negative as y² is positive
∴ Statement B alone is not sufficient to say about y.
Using both the statements we can say that
x is negative and y is positive ⇒ xy < 0
Choice (3)

25. Given, e + g + h = 120 (1) where e, g
and H are the numbers of marbles with
Eswar, Ganesh and Harish be e, g and h
respectively.
Using statement A, e + g + h = 90. As g is
unknown, h cannot be found.
Using statement B, e + g = 70.
Hence h = 50 from (1) B is sufficient.
Choice (1)

——— PRACTICE EXERCISE 2 ———

Solutions for questions 1 to 25:

1. Both statements even when taken
together are not sufficient to answer
the question as they provide only information
about ratio of incomes and expenditures
not their actual values.
Choice (4)

2. To calculate the simple interest we need
the sum, the rate of interest, and the peri-
od of investment. As the period of investment
is not known, the question cannot be
answered. Choice (4)

3. Given, A α 1/d² that is a point nearer
to the source will have more intensity of
light.
From statement A, we have A/B = 4/3.
∴ A will have less intensity of light.
Statement A is sufficient.
∴ Statement B is not sufficient as
distance of A from the source is given,
but the position of B is not known.
Choice (1)

4. From statement A, \[ \frac{a}{100} \times c = \frac{b}{100} \times d \Rightarrow ac = bd \]
From this, we cannot say whether \( \frac{ab}{cd} \) or not.
From statement B, \[ \frac{b}{100} \times c = \frac{d}{100} \Rightarrow ab = cd. \text{Hence B alone, is sufficient.} \] Choice (1)

5. Let the numbers of apples, bananas and
mangoes purchased by Ram be a, b and m
respectively.
Total expenditure = Rs (10a + 12b +
15 m)
Using statement A, we have 10a =
12b = 15 m
From statement B we have a + b +
m = 30.
Using both statements we have b = 5/6
a and m = 2/3a
Substituting them in a + b + m = 30, we
get a = 12
Total expenditure can be found. Choice (3)

6. Let the total value of the consignment be
Rs x. ∴ Total profit = \[ \frac{x}{3} \times \frac{2}{100} \times \frac{6}{3} \times \frac{100}{100} \]
But we should know the total profit to
find x, which is given as Rs 2000 in statement
B. Using both the statements we can find
the value of x. Choice (3)

7. Let the costs of each idli, dosa and each
puri be Rs i, Rs d and Rs p respectively.
Using statement A, we have
8i + 9d + 10p = 222 \hspace{1cm} (1)
Using statement B, we have
16i + 17d + 20p = 432 \hspace{1cm} (2)
We have only one equation with three un-
knowns i, d and p, ∴ d cannot be found
from any statement.
Combining both the statements and (2) –
2x (1), gives d = 12 Choice (3)

8. From statement A, we know that A's savings
16 per cent of his salary and B's savings
20 per cent of his salary.
But we do not know whether their sav-
ings are equal or not, therefore statement
A alone is not sufficient.
From statement B, we know that savings
of A and B are equal.
∴ Using both the statements we get,
16 per cent of A's salary = 20 per cent of B's
salary ⇒ A's salary : B's salary = 5 : 4. ∴ A's
salary is more than B's salary. Choice (3)

9. Let the present ages of Mohan and Sohan
be m years and s years respectively.
Using statement A, m = 2(s – 10) + 30 that
is, m = 2s + 10. ∴ m > 2s A is sufficient.
Using statement B, m – 10 = 3s – 30 that
is, m = 3s – 20. ∴ m < 3s B is not sufficient. Choice (1)

10. Combining (A) and (B): 1200 = P + 120,
from which 'P' can be found.
From 1200 = \[ P \left( \frac{1 + \frac{R \times 100}{100}}{100} \right) \]
, R can be found.
Hence, amount can be found out at the
end of 4th year. Choice (3)

11. Given a + b + c = 90-------(1), where a, b
and c are the respective weights of A, B and
C.
From A, we have a + b – c = 70-------(2)
(1) – (2) gives c = 10. From (1) and (2),
a + b = 80
We have only one equation with two un-
knowns a and b.
∴ b cannot be found. A is not sufficient.
Using statement B, we have a + c = b – 30
90 – b = b – 30 ⇒ b = 60. B is sufficient.
Choice (1)

12. From statement A, we have the units digit
of x² = 2
This is possible only when the units digit
of x is 8.
∴ Statement A alone is sufficient
From statement B, we have the units digit
of x² is 9. This is possible when the units
digit of x is 3 or 7.
Choice (1)

13. Let x be 10a + b. Using statement A, we
have \( (10a + b) + (10b + a) = 11 \)
⇒ 10a + b + 10b + a = 11 ⇒ a + b = 1
∴ a = 1 and b = 0 is the only possibility.
∴ ab = 10. A is sufficient.
Using statement B, we have
10a + b – (10b + a) = 9 ⇒ a – b = 1
The number has more than 1 possibility.
B is not sufficient. Choice (1)

14. From statement A, 2 or any prime number
more than 2 will satisfy the given condi-
tions.
∴ A alone is not sufficient.
From statement B, (n – 1) is odd and hence
(n – 1) is not an even number. ∴ State-
ment B alone is sufficient. Choice (1)

15. Given x and y are natural numbers that
satisfy 2x + 3y = 13
By trial and error, the possible solutions
are (2, 3) and (5, 1).
From statement (A), both (2, 3) and (5, 1)
are possible.
From statement (B), as x ≠ y (5, 1) is the
only possibility. Choice (1)

16. From statement A, if x is a positive integer
then x < x² and if x is a negative integer
then x > x².
If x = 1 then x = x². Hence we can say
that x is never greater than x². So A alone
is sufficient.
Statement B alone is not sufficient as x
> x² for x = 1/2 and x < x² for x = 2.
Choice (1)
17. Given, \( E = A + nF \), where \( E = \) Total expenditure, \( A = \) Entry fees; \( F = \) Cost of food and \( n = \) number of persons.

\[
\therefore \text{Expenditure per member} = \frac{A}{n} + F
\]

From statement A we have \( 150 = \frac{A}{10} + F \)  
-------(1)

From statement B, we have \( \frac{2500}{30} = \frac{A}{30} + F \)  
-------(2)

Combining both the statements and solving (1) and (2) \( A = Rs 1000 \) and \( F = Rs 50 \)
\( \therefore E = 1000 + 1000 = Rs 2000. \) Choice (3)

18. From statement A y can be either even or odd. The same conclusion can be drawn from statement B also. Hence, the question cannot be answered even after combining both the statements. Choice (4)

19. Let the present ages of Raja, his wife and his son be \( x \), \( y \), and \( z \) years respectively.

\[ x + z = 70 \quad \text{(1)} \]

Using statement A, when Raja’s wife would attain Raja’s age, she would be \( x \) years old.
She would attain Raja’s age \( (x - y) \) years from now.
Raja’s age then \( x + x - y = (2x - y) \) years.
\( 3x - y = 140 \quad \text{(2)} \)

Using statement B, when Raja’s son would attain Raja’s wife’s age, he would be \( y \) years old.
He would attain Raja’s wife’s age \( (y - z) \) years from now.
Raja’s age then \( x + 2y - z = 150 \quad \text{(3)} \)

Using both statements, we have three unknowns and three different equations and solving them we can find \( y \).

Choice (3)

20. Statement A alone is not sufficient since the value of \( a \) or \( b \) and \( c \) or \( d \) is not known.
Statement B, alone is sufficient since it is known that the numbers are in increasing order that is, \( d > c > b > a \).
Hence \( \sqrt{a} + \sqrt{b} < \sqrt{c} + \sqrt{d} \).

Choice (1)

21. From statement A, to have the maximum number of items, \( a \) should be \( y \). Statement A is sufficient.
From statement B, to have minimum number of items, \( a \) should be \( y \). \( B \) is sufficient.

Choice (2)

22. Statement A alone is not sufficient as there is no information about principal or interest.
From statement B alone we know that CI for the first year is 10 per cent less than that for the fourth year.
If the rate of interest is \( r \) per cent then
\[
\left(1 + \frac{r}{100}\right)^4 = 10. \text{ So, } r \text{ can be found out}
\]

\[
\text{CI} = \left(1 + \frac{r}{100}\right)^2 - 1 \times 100\%.
\]

Thus, required percentage difference can be found  
Choice (1)

23. From statement A as he had, as maximum possible coins he must have minimum possible number of coins of Rs 5. \( \because \) The number of Rs 50 ps coins should be 44.
\( \therefore \) Number of Rs 1 coins are not more than 1. Statement A is sufficient.
From statement B, as Ravi had minimum number of coins he must have 2 half rupee coins and 2 one rupee coins and 5 five rupee coins. Statement B is also sufficient to answer the question. Choice (2)

24. From statement A, as the selling price of 15 articles \( > \) cost price of 10 articles, s.p. of 1 article may or may not be greater than that of c.p. of article, hence we cannot answer the question.
From statement B, as the selling price of small number of articles are more than the cost price of greater number of articles hence the trader makes profit.

Choice (1)

25. Let the numbers of chicken and sheep in the farm be \( c \) and \( s \) respectively. \( c + s = 29 \quad \text{(1)} \)

Using statement A, total number of legs = \( 2c + 4s = 88. \)
\( \therefore c + 2s = 44 \quad \text{(2)}; (2) - (1) \Rightarrow s = 15. \text{ A is sufficient.} \)

Using statement B, \( c - s = 1 \text{ or } s - c = 1 \)
If \( c - s = 1 \), from (1), \( s = 14 \) or if \( s - c = 1 \), from (1), \( s = 15. \text{ B is not sufficient.} \)

Choice (1)

---

**Practice Exercise 3**

**Solutions for questions 1 to 25:**

1. Let the initial monthly income and that expenditure of Ram be Rs \( x \) and Rs \( y \) respectively. His saving Rs \( (x - y) \).
Using statement A, increase in monthly income = Rs 0.2x.
Suppose his monthly expenditure does not increase.

Choice (2)

2. Using both the statements also, we cannot find the average as we do not know the six consecutive numbers. Choice (4)

3. Let Raj’s monthly sales in this month be Rs \( x \). His monthly commission in this month = Rs 0.2x.
Using statement A, 0.2x \( \leq \) 2000, \( x \leq 10000 \) A is sufficient.
Using statement B, 0.2x \( \geq \) 2000, \( x \geq 10000 \) B is not sufficient. Choice (1)

4. Let the first term of A.P. be ‘a’ and common difference be ‘d’. Given \( a = \text{even} \)
From statement A, we have 8th term of the progression is even that is \( a + 7d = \text{even} \).
Already as \( a \) is even, hence 7d should be even that is \( d \) is even, hence we can find that all the terms are even.
From statement B, as 13th term is even that is, \( a + 12d = \text{even} \).
Anyway as 12d is even, we can not find whether \( d \) is even or not. Hence we cannot find whether 16th term is even or not. Choice (1)

5. Let the numbers of boys and girls in the class be \( b \) and \( g \) respectively. Required per cent = \( \frac{b}{b + g} \) (100) per cent

Using statement A, \( b + g = 70. \text{ As } b \text{ is unknown. } \therefore \text{ required percentage cannot be found.} \text{ A is not sufficient.} \)
Using statement B, \( b/g = 3/4 \). Substituting these values, required percentage can be calculated.

B is sufficient. Choice (1)
6. Using both the statements the question cannot be answered as the milk is sold at cost price or not is not mentioned. Choice (4)

7. Let the number of employees in the office be x. Number of married employees = 0.4x.
Using both statements, number of married male employees = 0.75x0.4x = .3x. Number of these who have at least one child = 0.8 (0.75x) = 0.6x. Number of married female employees who have a child (4x × 0.25)×0.6 = .06x

Required percent = \( \frac{0.24x + 0.66x}{4x} \times 100\% = 15 \) per cent.
Both statements taken together are required to answer the question. Choice (3)

8. Statement A alone is not sufficient as we do not know the cost of cheaper variety.
From statement B alone, since the cost of the cheaper variety itself is Rs 18, so the cost of the mixture is always more than Rs 18 per kg. Choice (1)

9. Let Ram’s cost price be Rs x. His profit percentage = x per cent
Using statement A, x + x per cent of x that is \( x = 39 \). \( x^2 + 100x = 3900 \Rightarrow x = 30 \) or -130. Since x > 0, . . . x = 30. A is sufficient.
Using statement B, x per cent of x = 9 \( \Rightarrow x = 900 \)
\( \Rightarrow x \pm 30 \). Since x > 0, . . . x = 30 B is sufficient.
Choice (1)

10. The ratio of the 7th terms is \( \frac{t_7}{t_7} = \frac{a_7 + (7-1)d}{a_7 + (7-1)d} = \frac{a_7 + 6d}{a_7 + 6d} \)
Using statement A, alone:
\( s_{13} = \frac{13}{2}[2a_1 + 12d] \) \( \Rightarrow \frac{a_1 + 6d}{2} = \frac{3}{2} \)

Statement B alone is not sufficient as there is no information about the values that a and d take. Choice (1)

11. Using statement A, as we have discount per cent is less than profit per cent. But as discount per cent is calculated on M.P. which is normally more than CP, we may have discount less than or more than or equal to profit.
Using statement B, we have SP = (MP + CP)/2 that is SP – CP = MP – SP \( \Rightarrow \) discount = profit.
B is sufficient. Choice (1)

12. From statement A, by knowing the product of the roots alone we cannot say whether the sum of the roots is greater than the product of the roots or not. Statement A alone is not sufficient.
From statement B, we have the quadratic equation as 5x² – 3x + 1 = 0, hence we can find whether sum of the roots is greater than product of the roots or not. Choice (1)

13. Let the share of Praveen be Rs p. Share of Rakesh = Rs (60000 – p).
Using statement A, we have
\( p = 60000 - p - 12000 \Rightarrow p = 48000 \)
Using statement B, as ratio of profits = ratio of investments for these two persons, we can find p as 2/5 (60,000). B is sufficient.
Choice (2)

14. Combining both the statements, it can be concluded that B is more efficient than C, as the work done by B in one day is more than that of C by 1/36.
Choice (3)

15. Using statement A, extra interest = -(1000)
\( \frac{R}{100} \) (2) = 200 that is R = 10. A is sufficient.
Using statement B, extra interest = (P) \( \frac{10}{100} \) (2) = 200 that is P = 2000. B is sufficient.
Choice (1)

16. Using both the statements, as we know the time taken by the train to cover 130 m, we can find the time taken by it to cover 250 m.
Choice (3)

17. Let the monthly salaries of Raja, Suresh and Pavan be Rs r, Rs s, Rs p respectively.
\( r + s + p = 1,00,000 \) \( \Rightarrow \) (1)
Using statement A, we can find r but not p. A is not sufficient.
Using statement B, p = r + s = 1,00,000 – p
\( \Rightarrow p = 50,000 \) B is sufficient.
Choice (1)

18. From statement A, we know that the triangle ABC is a right-angled triangle. To find its area we should know at least two of its sides. . . Statement A alone is not sufficient.
From statement B, we know that the triangle ABC is the largest triangle. But to find its area we should know its radius.
. . . Using both the statements we can find the area of the triangle as its base will be diameter and height will be equal to radius of the circle. Choice (3)

19. A is not sufficient as we do not know what percent of poor students travel to school by car, so, we cannot answer the question.
Using statement B, number of students who travel to school by car = \( \frac{27}{27+73} \times 100 \) that is 27 per cent. Hence B is sufficient. Choice (1)

20. The question can be answered from statement A alone, as in an equilateral triangle the perpendicular bisectors pass through the opposite vertices.
Statement B alone is not sufficient as we do not know what type of triangle is ABC.
Choice (1)

21. Using statement A, given k+1 = 4 \( \Rightarrow k = 3 \) per cent increase \( \frac{4-3}{3} \times 100 = 33\frac{1}{3} \) per cent. A is sufficient
Using statement B, k is known. . . percentage increase can be found. B is sufficient. Choice (2)

22. Using both the statements we can find their time taken as shown below
Time taken by X to complete one round=2/10 \( \times 60 = 12 \) min and that of y = 2/8 \( \times 60 = 15 \) min
Therefore, they meet at the starting point once every 60min. L.C.M of 12 and 15. Hence we can answer the questions. Choice (3)

23. Using statement A, let the target people be P, Total expected money = 3000 \times P collected money = 5000 \times P \times 69/100 = 3450P which is more than 60 per cent of total expected money. A is sufficient
From statement B, the trust collected only 31 \times 20P = 620P which is not 60 per cent of the total expected money. As we do not have any information about the other 69 per cent of people, so, we cannot determine. Statement B not sufficient.
Choice (1)

24. From statement A, ABCD may be a square or a rhombus, but since every square is a rhombus, therefore statement A alone is sufficient to answer the question.
Choice (1)

25. Let the cost price of A be Rs y.
Using statement A, decrease in profit = \( \frac{10}{100} \times y = 12 \) \( \Rightarrow y = 120 \). A is sufficient.
Using statement B, increase in profit = \( \frac{20}{100} \times y = 24 \) \( \Rightarrow y = 120 \). B is sufficient.
Choice (2)
Solutions for questions 1 to 15:

1. If a number is divisible by 25 and 3 then it is divisible by 75.

From statement (A), we have x is not divisible by 15. As 15 is a factor of 75 definitely it is not divisible by 75. Statement (A) alone is sufficient.

Statement (B) alone is not sufficient as we do not know whether x is divisible by 3 or not.

Statement (C) alone is not sufficient as we do not know whether x is divisible by 25 or not.

Using statements (B) and (C), x is divisible by 25 and 12 so x is divisible by 25, 3 and 4. So x is divisible by 75. Using statements (B) and (C) we can answer the question.

Choice (4)

2. Let Raju’s, Sonu’s and Bheemu’s ages be R, S and B respectively.

None of the given statements is independently sufficient as they give only partial information. Combining all the three statements, we have:

\[ S + 10 = 2(B + 10) \] \[ R = 5B \] \[ R = 50 \]

Solving (1), (2) & (3) we get R = 50 yrs, S = 30 yrs and B = 10 yrs.

Hence, all the three statements (A), (B) and (C) are required to solve the problem.

Choice (4)

3. Any one of the statements alone is not sufficient as we do not have the information about all the three persons in one statement. Using statements (A) and (C), working together (A) and (B) can do the work in 12 days but (C) alone can do the work in 10 days. So (C) is more efficient.

Using statements (A) and (C) we can answer. Using statements (A) and (B) OR (B) and (C), we can not answer the question as we do not have the information about (C) or (A) respectively.

Choice (2)

4. Using statement (A), Pass mark

\[ P = 40T/100 + 10 \]

Using statement (B), Pass mark

\[ P = 50T/100 - 50 \]

From (1) & (2), T = 600 and P = 250.

Using statement (C), First rank marks = P + 100 per cent of P, 240 + 240 = 480.

Hence, all the three statements are required to solve the problem.

Choice (2)

5. From statement (B), product of roots is 17. So the roots must be 17 and 1 as the roots are positive integers. We know the roots so we can frame the quadratic equation.

Statement (B) alone is sufficient.

By knowing only sum or difference of the roots, we cannot find the quadratic equation. Hence we require both statement (A) and (C), which give sum as well as difference of the roots. Choice (3)

6. Considering statements (A) and (B), as A’s speed is 20 kmph, B’s speed is 20 + 10 = 30 kmph (that is, B’s speed is 50 per cent more than A).

Considering statements (A) and (C) or (B) and (C) speeds of A and B are 20 kmph and 30 kmph. Hence, any two of the three statements are required to answer the question. Choice (3)

7. Let shares of P, Q and R be x Rs, y Rs and z Rs. Then \( x + y + z = 1200 \)

From statement (B), we have \( y = 1/3 (x + z) \) \( y = 300 \) Statement (B) alone is sufficient.

From the above it is clear that, we can find that we can find the share of the person whose share is mentioned in terms of the other two. Hence using both (A) and (C), we can find the shares of P and R respectively using which we can Q’s share. Using statements (A) and (C) also we can answer.

Choice (2)

8. Cost of levelling the path = Area of path × cost per m²

Using statements (A) and (B): Area of path = \( \pi(82^2 - 6^2) = 88^{22} \) m².

Hence, cost of levelling = \( 88 \times 5 = Rs 440 \).

Similarly, using statements (B) and (C) or (A) and (C) only, the problem can be done. Choice (4)

9. Length of the diagonal of a cuboid = \( \sqrt{\ell^2 + b^2 + h^2} \)

None of the statements is independently sufficient as they do not give values of \( \ell, b \) and \( h \).

Combining (A) and (B) we have \( \ell + b + h = 26 \) and \( 2(\ell b + bh + h^2) = 281. \)

As \( (\ell + b + h)^2 = \ell^2 + b^2 + h^2 + 2(\ell b + bh + h^2) \), we can find \( \ell^2 + b^2 + h^2 \).

But combining (A) and (C) or (B) and (C), as we can not find \( b \) and \( h \) values, \( \ell^2 + b^2 + h^2 \) cannot be determined. Choice (2)

10. \( M_1 = 80; D_1 = 40; H_1 = 6; W_1 = 1. M_2 = ?, if \ W_1 = 31 \)

Considering statement (A), \( H_1 = 9 \)

In order to have \( D_2 \) consider both the statements (B) and (C). \( D_2 < 51 and D_2 > 49 \Rightarrow D_2 = 50 \)

\( 0.80 \times 40 \times 6 \times 11 = M_2 \times 50 \times 31 \)

\( \Rightarrow M_2 = 128 \) Men.

All the three statements are required to answer the question. Choice (4)

11. From statement (A), x can be 2, 3, 5 or any other prime number. Statement (A) alone is not sufficient.

From statement (B), x can be 3, 6, 9, 12 …

Statement (B) alone is not sufficient.

From statement (C), x is not divisible by 2, so x is an odd number. Statement (C) alone is sufficient.

Using statements (A) and (B), x is a prime number and divisible by 3 so x = 3. Using statements (A) and (B) we can answer.

Choice (3)

12. Statement (A) alone is not sufficient as we do not know the principal.

From statement (B), let sum = Rs x, then amount = 2x

Using \( I = \frac{PTR}{100} \), we have \( (2x - x) \)

\( = \frac{x \cdot 4 \cdot R}{100} \)

\( \Rightarrow R = 25 \) per cent p.a. So B alone is sufficient.

From statement (C), by knowing only principal we can not find the rate of interest.

Using statements (A) and (C), as we know sum, interest and time period we can answer the question. Choice (2)

13. Let speed of boat in still water and speed of stream be x kmph and y kmph respectively.

From statement (A), we have \( x - y = 8 \)

From statement (B), we have \( 5 (x + y) = 4 (x + y) \)

\( \Rightarrow x = 9y \)

From statement (C), we have \( \frac{d}{x - y} = \frac{d}{x + y} \)

\( \Rightarrow x + y : x - y = 5 : 4 \Rightarrow x = 9y \)

Combining statements (A) and (B) or (A) and (C), we can answer the question. Choice (3)

14. Let first term and common difference of the progression be a and b respectively. Then 8th term = \( a + 7d \)

From statement (A), we have \( a + 5d = 17 \)

From statement (B), we have \( (a + 2d) + (a + 4d) = 22 \Rightarrow 2a + 6d = 22 \Rightarrow a + 3d = 11 \)

From statement (C), we have \( (a + d) + (a + 13d) = 46 \Rightarrow 2a + 14d + 46 \Rightarrow a + 7d = 23 \)

So from statement (C) alone we can find 8th term.

Combining statements (A) and (B), we have \( a + 5d = 11 \) \( (1) \) and \( a + 3d = 11 \) \( (2) \)

Solving the two equations we can find 8th term.

Choice (4)

15. Let speed of train be x m/s and length of the train be y m. Then
Solutions for questions 16 to 25:

16. From statement (A), $x = \frac{54k + 40}{k}$; Where k is quotient when x is divided by 54. When 54k + 40 is divided by 18 the remainder is equal to the remainder when 40 is divided by 18. (as 54k is divisible by 18) So statement (A) alone is sufficient.

From statement (B), as 12 is not a multiple of 18, we cannot answer the question from this.

From statement (C), $2x = 18P + 8$ where P is the quotient when 2x is divided by 18.

So we can not get the remainder when x is divided by 18. Statement (C) alone is not sufficient.

Using statements (B) and (C), when x is divided by 12 the remainder is 4 so x is even number.

Using both the statements we can answer the question.

So either statement (A) or both (B) and (C) are redundant. Choice (2)

17. Statement (A) alone is not sufficient efficiency of Ram is not mentioned

Statement (B) is not sufficient as work share of Ram and Shyam is not mentioned.

Statement (C): Efficiency of Ram is not mentioned

Combining (A) and (B); let Shyam takes x days to complete the whole work.

$120 \times 10 + 1 \times 14 = 1$

$\Rightarrow x = 28$ days

:. work done by Ram in 10 days can be calculated

Combining, (B) and (C) or (A) and (C) the part of work completed By Ram can be calculated.

18. From statement (A), we know the relation between A and B, B and D so we can find the relation between A and D. So we can find by what percent A’s salary more/less than D’s salary. A alone is sufficient

Either statement (B) or (C) is not sufficient as we do not have the information about A. (B) and (C) are redundant. Choice (3)

19. Statement (A): let the number of students passed and failed be respectively 3x and 2x.

As we do not know the value of x the given question can not be answered.

Statement (B) alone is not sufficient as there is no information about failed.

When (A) and (B) are considered, we have

$3x + 12 = 2\frac{11}{2}$. From this we can calculate x.

(C) alone is not sufficient. As there is no information about passed or failed; Even if we combine (A) and (C) or (B) and (C), we cannot find the number of students passed.

Choice (4)

20. From question statement, we know the time taken by A even A and C. Hence we can find the time taken by C.

From statement (A), as we know time passed and failed be respectively 3x and 2x.

So statement (A) or (C) is redundant. Choice (3)

21. When the roots are $\alpha, \beta$ then the quadratic equation is given by $x^2 - x (\alpha + \beta) + \alpha \beta = 0$

From (A), we have $\alpha + \beta = 11$;

From (B), we have $\alpha - \beta = 11$;From (C), we have $\alpha \beta = 18$

Using statements (A) and (B), we have $\alpha + \beta = 11 \text{---(1) and } \alpha - \beta = 7\text{---(2)}$.

Solving the two equations we get $\alpha$ and $\beta$.

So we can frame the quadratic equation

Using statements (A) and (C), we have $\alpha + \beta = 11$ and $\alpha \beta = 18$ So we can frame the quadratic equation.

Using statements (B) and (C), we have $\alpha - \beta = 7$ and $\alpha \beta = 18$.

:. $(\alpha + \beta)^2 = 7^2 + 4 \times 18 = 121 \Rightarrow (\alpha + \beta) = +11 \text{or } -11$

So unique value of $(\alpha + \beta)$ is not possible, so we can not get unique quadratic equation.

So statements (B) or (C) is redundant. Choice (3)

PRACTICE TESTS

TEST PAPER 1

Solutions for questions 1 to 5:

1. The number of distinctions increased by three times from 2002 to 03, and in all other years, it is not even twice. In the year 2003 there is maximum percentage increase. Choice (4)

2. In 2004 the number of students got a percentage between 51 per cent to 70 per cent = 155 – 20 = 135

:. Required percent = $\frac{135}{265} \times 100 \approx 51$ per cent Choice (2)

3. Number of students appeared for the examination in the year 2001 = 180

Number of students appeared for the examination in the year 2005 = 270.

:. Average annual percentage increase = $\frac{50}{4} \text{per cent that is } 12.5 \text{per cent}$ Choice (4)
4. Total number of students who got less than 51 per cent marks in five years 
   
   \[= \frac{80 + 70 + 100 + 170 + 120}{5} = 80\] 
   
   \[= 400/120 \times 100\] 
   
   \[= 400/5 = 80\] 
   
   \[= \text{Required average} = 80\] 
   
   Choice (1) 

5. Required percentage less \[= \frac{10 \times 80}{100} = 12.5\] 
   
   per cent. Choice (3) 

Solutions for questions 6 to 10: 

6. Only for Company B the ratio of annual profit to annual expenditure is crossing 1.5, for all others it is less than that. \[= \text{it is maximum for company} \ B \text{ Choice (2)}\] 

7. Required percentage \[= \left(\frac{156 - 125}{125}\right) \times 100\] 
   
   \[= 24.8 \text{ per cent} \times 25 \text{ per cent} \] 
   
   Choice (3) 

8. Let us calculate Bonus as a percentage of profit. \[\text{Company A} = \frac{34}{152} \times 100 = 22.36 \%\] 
   
   \[\text{Company B} = \frac{56}{225} \times 100 = 25 \%\] 
   
   \[\text{Company C} = \frac{35}{168} \times 100 = 21 \%\] 
   
   \[\text{Company D} = \frac{31}{148} \times 100 = 20.83 \%\] 
   
   \[\text{Company E} = \frac{22}{148} \times 100 = 14.86 \%\] 
   
   \[\text{Company F} = \frac{20}{148} \times 100 = 13.75 \%\] 

9. Required percentage \[= \frac{22/148 \times 100}{25} = 14.86 \%\] 
   
   Choice (4) 

10. Required percentage for Company \[B = \frac{125}{350} \times 100 = 35.71 \%\] 
   
   Which is less than 40 per cent for all others it is atleast 40 per cent. \[\because \text{it is lowest for company B. Choice (2)}\] 

Solutions for questions 11 to 15: 

Let us represent the given data in the form of the table. 

<table>
<thead>
<tr>
<th>Class</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>20</td>
<td>50</td>
<td>20</td>
<td>20</td>
<td>30</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Second</td>
<td>50</td>
<td>20</td>
<td>30</td>
<td>20</td>
<td>40</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Third</td>
<td>30</td>
<td>40</td>
<td>60</td>
<td>30</td>
<td>40</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

11. Let us assume that 100 students passed from each city. \[= \text{Required average} = \frac{3500}{7} = 500\] 
   
   Choice (3) 

12. The ratio of number of students who passed the exam in first and third class is 220:250 
   
   \[= \text{Required number of students who passed the exam in third class} = \frac{250}{220} \times 1100 = 1250\] 
   
   Choice (1) 

13. Let us assume that the total number of students passed from each city is 100. \[= \text{Required percentage} = \frac{140 - 110}{110} \times 100\] 
   
   \[= 27.27 \%\] 
   
   Choice (1) 

14. Required percentage for company B \[= \frac{220}{230} \times 100 = 95.65 \%\] 
   
   Choice (3) 

15. Required ratio \[= 20:30 = 2:3\] 
   
   Choice (4) 

Solutions for questions 16 to 20: 

16. Let us assume that the total number of people recruited in 2003 is 1000. \[= \text{in} \ 2004 \text{ it is} \ 1500\] 
   
   \[= \text{Required percentage} = \frac{150 + 150}{2500} \times 100 = 12 \%\] 
   
   Choice (2) 

17. Required percentage \[= \frac{150}{100} = 150 \%\] 
   
   Choice (4) 

18. Let us assume that the total number of students recruited by Infosys in 2003 is 100. \[= \text{in} \ 2004, \text{it recruits} = 120\] 
   
   \[= \text{Required ratio} = \frac{2040 - 1000}{1000} \] 
   
   \[= 140 \%\] 
   
   Choice (3) 

19. Let us assume that the number of persons recruited in 2003 is 100 in 2004, it is 2000. \[= \text{Required percentage} = \frac{30 - 10}{10} \times 100 = 200 \%\] 
   
   Choice (1) 

20. According to the given data, the number of persons recruited in 2003 = 10000 
   
   Required ratio \[= \text{2000/1800} = 10 : 9\] 
   
   Choice (4) 

Solutions for questions 21 to 24: 

21. Number of students failed in schools A and D \[= \frac{2200 \times \left(\frac{66}{100}, \frac{44}{100}\right)}{110} = 2200 \times \frac{66}{110} = 2420\] 

   Choice (2) 

22. Required ratio \[= 8 \times 52 : 13 \times 42 = 16 : 21\] 

   Choice (1) 

23. Let us assume that the no. of students appeared in exams in 2006-07 in school C = 120 : 
   
   Choice (3) 
   
   In previous year = 100 
   
   Number of students failed in 2006-07 in school C \[= \frac{70 \times 120}{100} = 84\] 
   
   Choice (4) 

24. Suppose, the total number of students appeared in the given six schools is 10000. 
   
   Number of students in school B \[= 10000 \times 20/100 = 2000\] 
   
   Number of students in school B \[= 10000 \times 52/100 = 1040\] 
   
   Similarly, number of students failed in F \[= 2500 \times 55/100 = 1375\] 
   
   Required ratio \[= \frac{1040}{1375} = 0.75\] 
   
   Choice (1) 

Solutions for questions 25 to 28: 

Let us represent the given information in tabular form. 

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
<th>Column 5</th>
<th>Column 6</th>
<th>Column 7</th>
<th>Column 8</th>
<th>Column 9</th>
<th>Column 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total income</td>
<td>20000</td>
<td>24000</td>
<td>22000</td>
<td>18000</td>
<td>16000</td>
<td>26000</td>
<td>22000</td>
<td>16000</td>
<td></td>
</tr>
<tr>
<td>House hold expenses</td>
<td>14000</td>
<td>12000</td>
<td>12000</td>
<td>10000</td>
<td>6000</td>
<td>16000</td>
<td>10000</td>
<td>8000</td>
<td></td>
</tr>
<tr>
<td>Education expenses</td>
<td>4000</td>
<td>8000</td>
<td>6000</td>
<td>2000</td>
<td>8000</td>
<td>6000</td>
<td>8000</td>
<td>4000</td>
<td></td>
</tr>
<tr>
<td>Savings</td>
<td>2000</td>
<td>4000</td>
<td>4000</td>
<td>6000</td>
<td>2000</td>
<td>4000</td>
<td>4000</td>
<td>4000</td>
<td></td>
</tr>
</tbody>
</table>

25. By observation of the above table, we can say that the ratio of savings to education expenses is one or more than one for families D and H. It is 0.5 for families A, B and G. 

\[\text{Required ratio for C} = \frac{4000}{6000} = 0.67\] 

\[\text{E} = \frac{2000}{8000} = 0.25 ; \text{F} = \frac{4000}{6000} = 0.67\]
26. Savings per cent of
   \[ B = \frac{4000}{24000} \times 100 = 16.67\% \]
   Savings per cent of
   \[ H = \frac{4000}{16000} \times 100 = 25\% \]
   Required difference = 25 - 16.67 = 8.33 per cent.
   \[ \text{Choice (1)} \]

27. Required per cent = \[ \left( \frac{6000 - 2000}{2000} \right) \times 100 \]
   \[ = \frac{4000}{2000} \times 100 = 200\% \]
   \[ \text{Choice (1)} \]

28. By observation, we can say that the percentage of household expenses for families B, E, G and H is 50 per cent or less than 50 per cent of their respective incomes.

Household expenses as a percentage of income for A = \[ \frac{14000}{20000} \times 100 = 70\% \]
C = \[ \frac{12000}{22000} \times 100 = 54.54\% \]
D = \[ \frac{10000}{18000} \times 100 = 55.56\% \]
F = \[ \frac{16000}{26000} \times 100 = 61.53\% \]

:: For families A, D and F, it is more than 55 per cent.
   \[ \text{Choice (2)} \]

_Solutions for questions 29 to 31:

29. For Congress, No. of votes cast in 1999-2000 = 4,88,000 × 30/100
   \[ = \frac{146400}{120} \times 100 = 122000 \]
   :: Required difference = 146400 - 122000 = 24400
   \[ \text{Choice (2)} \]

30. No. of valid votes cast for BJP = \[ 24 \times 4,88,000 \times 100 = 117120 \]
   \[ \text{Choice (4)} \]

31. Number of votes cast for BSP in 1999-2000 = \[ \frac{4,88,000}{100} \times 100 = 48,800 \]
   :: No. of votes cast for BSP in 1998-99 = \[ \frac{4,88,000}{100} \times 100 = 61000 \]
   :: Total votes cast in 1998-99 = 6,10,000
   \[ \text{Choice (3)} \]

_Solutions for questions 32 to 36:

32. When the product of two numbers is positive, both must have the same sign.

Using statement A, \( x^2 \) and \( y \) have the same sign. \( x^2 > 0 \) which means \( x \) could be positive or negative.

:: \( y > 0 \). A is not sufficient.

Using statement A, \( x^2 \) and \( y^2 \) have the same sign. \( y^2 > 0 \) which means \( y \) could be positive or negative.

:: \( x^2 > 0 \) which means \( x > 0 \). B is not sufficient.

Using both statements, \( x, y > 0 \). Both statements taken together are required to answer the question.
   \[ \text{Choice (3)} \]

33. Using statement A, \( B (B - 1) = 0 \). :: \( B = 0 \) or 1
   In any case, \( B^3 = B \). A is sufficient. Using statement B, if \( B > 0 \) \( \Rightarrow B^3 > B \) and if \( B < 0 \)
   \( \Rightarrow B^3 > B \) or \( B^3 < B \).

:: \( B^3 > B \) only when \( B > 0 \) and \( B^3 < B \) when \( B < 0 \).

:: \( B \) alone is not sufficient. \[ \text{Choice (1)} \]

34. There are more white balls than black balls in a total of 12 balls. :: There are more than 6 white balls and less than 6 black balls. Let us say there are \( w \) white balls and \( b \) black balls.

Using statement A, \( \frac{w}{12} \times 2 = \frac{w}{12} \leq 8 \)

:: \( w = 7 \) or 8

Using statement B, \( \frac{b}{12} \geq \frac{1}{3} \)

:: \( b \geq 4 \)

Using both the statements we get \( b = 4 \) or 5. When both the statements combined together also we can not answer the question.
   \[ \text{Choice (4)} \]

35. Since angle of elevation is not given in statement A.
   Since heights of the towers are not given Statement B alone is also not sufficient.

   that is \( B \) are combined, we get \( AB = 80m; \)
   \( CD = 62.5m. \) and \( \angle EDB = 45^\circ. \)

   \[ \text{In } \Delta DBE, \tan 45^\circ = \frac{BE}{DE} \Rightarrow DE = BE \]

   \[ = AB - AE = 80 - 62.5 = 17.5 \]

:: The distance between two towers is 17.5.

When combined both the statements we can answer the question.
   \[ \text{Choice (3)} \]

36. From statement A; \( 2x > 3y + 6; \)

:: \( x > \frac{3}{2}y + 3 \)

\[ \Rightarrow x > \frac{3}{2}y \Rightarrow x > y \] \[ \text{Choice (1)} \]

Since we do not know the relation between \( x \) and \( z \). A is not sufficient to answer question.

From Statement B, \( 5y > 3z + 1y; \)

:: \( y > \frac{3}{5}z + \frac{1}{5} \)

\[ \Rightarrow y > z - \frac{2}{5} \]

Since we do not know the relation between \( x \) and \( y \). :: statement B alone is not sufficient.

By combining both the statements also we cannot answer the question. \[ \text{Choice (4)} \]

_Solutions for questions 37 to 40:

37. I. \( 2x + 3y = 8 \) \( \Rightarrow (1); \) II. \( 5x + 4y = 13 \)

\[ \Rightarrow (2) \]

\[ 2x + 3y = 8 \Rightarrow (1) \times 5; \]
\[ 5x + 4y = 13 \Rightarrow (2) \times 2 \]

The above equation will become \( 10x + 15y = 40 \Rightarrow (3); \)
\[ 10x + 8y = 26 \Rightarrow (4) \]

On solving (3) & (4), we get \( y = 2; \)
\[ x = 1; \]
\[ y > x \]
   \[ \text{Choice (2)} \]

38. I. Factorising \( x^2 + 14x + 40 = 0 \)

\( x^2 + 10x + 4x + 40 = 0 \)
\( x(x + 10) + 4(x + 10) = 0 \)
\[ (x + 10)(x + 4) = 0; \]
\[ x = -10 \text{ or } x = -4 \]

II. Factorising \( y^2 + 15y + 50 = 0 \)

\( y^2 + 10y + 5y + 50 = 0 \)
\( yt(y + 10) + 5(y + 10) = 0 \)
\[ (y + 10)(y + 5) = 0; \]
\[ y = -10 \text{ or } y = -5 \]
\[ x = y \]
\[ y > x; y > x \]
   \[ \text{Choice (4)} \]

39. I. \( x = \left( \frac{7}{3} \right)^2; \)

\[ x = \left( \frac{7}{3} \right)^2; \]
\[ x = 7; \]
\[ x = 49 \]

II. \( y = \frac{1}{2}; \)
\[ y = \frac{1}{2}; \]
\[ y = 0.03125; \]
\[ x > y \]
   \[ \text{Choice (1)} \]

40. I. \( x = \frac{1}{4} + \sqrt{2}; \)

\[ x = \frac{1}{4} + \sqrt{2}; \]
\[ x > y \]
   \[ \text{Choice (1)} \]

II. \( y = \frac{3}{4}; \)
\[ y = \frac{3}{4}; \]
\[ y > x \]
   \[ \text{Choice (2)} \]
**TEST PAPER 2**

**Solutions for questions 1 to 4:**

1. S had the lowest percentages of profit growth each year over the given period. \(\therefore\) The percentage growth over the given period must be the lowest for S. Choice (3)

2. S’s profit in 2004 = \(13.915/(1.15)(1.1)(1.1)\) = \$10 million. Choice (2)

3. Let the profit of S in 2005 be Rs \(x\) million.

   Its profit in 2006 = \(x(1 + \frac{10}{100})\) = Rs 1.1x million

   Its profit in 2007 = \(1.1x(1 + \frac{15}{100})\) = Rs 1.265x million. \(\therefore\) Its profit increased by \(1.265x - x\) = 26.5% over these two years. \(\therefore\) average percentage growth = \(\frac{26.5\%}{2}\) = 13.25 per cent Choice (1)

4. Let the profit of S in 2005 be Rs \(x\) million.

   Total supply of all the products = 125 + 335 + 125 + 115 = 500

   \(\therefore\) Excess of demand = 0 tonnes. Choice (2)

   8. Minimum amount required = \(40 \times 15 \times \left[35 + 30 + 25 + 40\right] = 40 \times 15 \times 130 = 78000\)

   Choice (2)

**Solutions for questions 9 to 12:**

9. Let the total population of the states in 1998 – 99 be T. Total population of the states in 1999 – 00 = T.

   Percentages of literates did not change in each state from 1998 – 99 to 1999 – 00. \(\therefore\) if the population of any state increases from 1998 – 99 to 1999 – 00, the number of literates in it would increase from 1998 – 99 to 1999 – 00.

   \(\frac{3}{15} = \frac{4}{20}; \frac{2}{15} = \frac{3}{20}; \frac{1}{15} = \frac{2}{20}; \frac{4}{15} = \frac{5}{20}\)

   \(\therefore\) The populations increased for 2 states. Choice (2)

10. Let the total population of the 5 states be \(x\). Required ratio = \(\frac{70}{100}; \frac{20}{100}; \frac{50}{100}; \frac{30}{100}\)

   = 14 : 15 Choice (1)

11. Let the population of S in 1998 – 99 be \(x\).

   Population of T in 1998 – 99 = \(1 + \frac{20}{100}\) x

   = 1.2x; Population of T in 1999 – 00 = \(1 + \frac{20}{100}\) x = 0.8x.

   Number of illiterates in S in 1999 – 00 = \(25/100 \times (1.2x) = 0.3x\) and that in T = \(35/100 \times 0.8x = 0.28x\)

   Required ratio = \(0.3x : 0.28x = 15 : 14\) Choice (1)

12. Let the population of each state in 1998 – 99 be \(x\).

   Total number of literates in the 5 states in 1998 – 99 = \(\frac{70}{100} + \frac{60}{100} + \frac{50}{100} + \frac{75}{100} + \frac{65}{100}\)

   \(= \frac{3.2x}{2}\)

**Solutions for questions 13 to 16:**

13. Using statement A, let Dilpreet and Manpreet received 10,000 + 0.5x and \(x\) votes. \(\Rightarrow 10,000 + 0.5x + x = 100000 \Rightarrow x = 60000\)

   \(\therefore\) Manpreet received 60,000 votes and Dilpreet received 40,000 votes.

   Statement B is not sufficient as there are no details about the votes received by Manpreet.

   Choice (1)

14. Let the cost price of A be Rs \(y\).

   Using statement A, decrease in profit = \((10/100)y = 12, y = 120\).

   Using statement B, increase in profit = \((20/100)y = 24, y = 120\).

   Either of the statements is sufficient.

   Choice (3)

15. Part of the job completed by P = \(6/20\)

   Remaining part = \(7/10\)

   This will be completed by Q and R. Parts of the job completed by Q and R will be in the ratio \(\frac{1}{x} = \frac{1}{y}\)

   Using statement A, \(\frac{x}{y} = 4/3 \Rightarrow\) Parts of the remaining part done by Q and R can be found. A is sufficient.

   Using statement B, \(y\) is unknown. \(\therefore\) Parts of the remaining job done by Q and R cannot be found. B is not sufficient.

   Choice (1)

16. Let the speeds of Manish’s boat in still water and the river be \(x\) kmph and \(y\) kmph respectively.

   Average speed = \(\frac{(12)(2)}{12 + 12} = \frac{(x+y)(x-y)}{x+y} = \frac{x}{x-y}\)

   Using statement A, \(\frac{x}{y} = 2 i.e x = 2y\)

   \(\therefore\) average speed = \(\frac{(2y+y)(2y-y)}{2y}\)

   \(= \frac{3}{2}\) y kmph

   \(y\) is unknown

   \(\therefore\) average speed cannot be found A is not sufficient.

   Using statement B, \(x = 8, y\) is unknown.

   \(\therefore\) average speed cannot be found. B is not sufficient

   Using both statements, \(y = x/2 = 8/2 = 4\). The average speed can now be found.

   Choice (4)
Solutions for questions 17 and 18:

17.  R is not a square. ∴ Its length is more than its breadth. Let the side of S be a. Let the length and the breadth of R be ℓ and b respectively.

Using A, a² = ℓ b < ℓ². ∴ a < ℓ.

Using statement II, \[ \frac{1}{a} + \frac{1}{b} = \frac{1}{\ell} \] \[ \Rightarrow a + b = \ell \] \[ \therefore a < \ell. \]

∴ Either statement is sufficient. Choice (4)

18.  A quadrilateral is cyclic only if, any pair of its opposite angles are supplementary. \( \therefore \) ABCD is cyclic if \( \angle A + \angle C = \angle B + \angle D \)

Using statement A, suppose \( \angle A = \angle C = 60^\circ \) and \( \angle B = \angle D = 120^\circ \). Then \( \angle A + \angle D = \angle B + \angle C \)

but \( \angle A + \angle C \neq \angle B + \angle D \). In this case ABCD is not cyclic. If \( \angle A = \angle C = 90^\circ \); \( \angle B = \angle D = 90^\circ \) then ABCD is cyclic.

A is not sufficient. B is sufficient. Choice (1)

Solutions for questions 19 to 23:

19.  Seating capacity of all the airlines = 100

\[ 50 \times 180 + 45 \times 80 + 50 \times 180 + 60 \times 180 + 75 \times 180 + 30 \times 80 + 40 \times 80 + 30 \times 80 + 20 \times 180 = 57,50,000 \] Choice (3)

20.  Let Rs \( x \) be the amount charged by each of the airlines on business class in 2006-07.

As the Indian airlines and Kingfisher carried 10 per cent and 20 per cent of the total traffic, the ratio of revenues cannot be determined as the ratio of charges for economy and business class is not known. Choice (4)

21.  The total aircraft in 2006-07 = 400/0.8 = 500

∴ Average number of people carried per aircraft = \[ \frac{110\% \text{ of } 110\% \text{ of } 6 \text{ Crores}}{500 \times 200} \]

\[ = \frac{11 \times 11 \times 6 \times 10^5}{500 \times 200} = 726 \] Choice (3)

22.  Let the total air traffic in 2003-04 be \( x \).

∴ Total air traffic in 2006-07 = (1.15) \( (1.1) \times x \)

∴ Required percentage = \[ \frac{x}{(1.15) \times (1.1) \times x} \times 100 = 72 \text{ per cent} \]

Choice (2)

23.  As the number of trips is same, revenue depends on number of aircraft, seating capacity, occupancy ratio and fares.

∴ Required ratio \( 45 \times 80 \times 75 \) per cent \( : 180 \times 75 \times 80 \) per cent \( x 8k = 5.32 \)

Choice (4)

Solutions for questions 24 to 27:

24.  In none of the years is the domestic consumption more than the total of Import and Export.

Choice (4)

25.  The per cent change in exports is the highest in 2003 as the change is half of that of 2002 that is, 50 per cent increase.

Choice (2)

26.  Domestic consumption for 2002: 50 + 25 = 75 million tones. For 2003: 45 + 50 = 95 million. The percentage change in domestic consumption from 2002 to 2003 is \( 545/100 = 11.7\% \) per cent

Choice (1)

27.  Domestic consumption is more than Production in each of the years in which Imports are more than Exports. This happened in 2001 and 2003.

Choice (2)

Solutions for questions 28 to 32:

28.  As there are no drop outs, total number of students in that batch from 2003 to 2007 = 37 + 25 + 17 + 15 + 4 = 98

∴ The maximum number of students who can take admission in class V in that batch = 200 – 98 = 102

Choice (4)

29.  Observing the table, the number of students admitted in class VI has increased by maximum of 10 in 2007 from 2006 and it is 1036/100 = 103 per cent, and all others are less than this.

Choice (3)

30.  Total number of students who took admission in, 2003 = 150 + 37 + 23 + 20 + 10 + 15 = 255

2004 = 156 + 40 + 25 + 15 + 9 + 7 = 252

2005 = 163 + 41 + 22 + 17 + 2 + 26 = 251

2006 = 169 + 36 + 29 + 23 + 15 + 9 = 281

2007 = 190 + 46 + 22 + 14 + 4 + 4 = 279

∴ In the year 2005 the number of students who took admission is minimum.

Choice (2)

31.  Percentage decrease in total number of students in year 2003 to 2004 = \( 3/255 \times 100 \) per cent = 1.17 per cent

Percentage decrease in total number of students in years 2004 to 2005 = \( 1/255 \times 100 \) per cent = 0.397 per cent

Again percentage decrease in the total number of students in 2006 to 2007 = \( 2/281 \times 100 \) per cent = 0.712 per cent

Choice (3)

32.  The number of students, who took admission in the batch who took admission in class V in the year 2003 = 150 + 40 + 2 + 23 + 3 = 238

which is more than 200. ∴ There must be at least 38 dropouts. Choice (1)

Solutions for questions 33 to 36:

33.  The amount spent on education in 1998 = 105 per cent of 90 = 94.5 per cent. The percentage decrease in entertainment = \( 45/20 \times 200 \) = 22.5 per cent.

Choice (4)

34.  Savings of Amol in the year 2006 = \( 9/360 \times x = 1,35,000 \) ⇒ \( x = Rs 5,40,000 \)

The required difference = \( 10x/360 = 10 \times \frac{5,40,000}{360} = 15,000 \)

Choice (4)

35.  Amol’s savings in 2006 = 90° Entertain amount in 2006 = 50°.

∴ New savings = 150 per cent of 50° = 75°

Present savings should be reduced by \( 5/90 \times 100 = 16.66 \) per cent Choice (3)

36.  There are only two items shown increase from 2006 to 2007, they are food and education.

But as food’s rate of increase is more, food will have more percentage increase. Choice (3)

Solutions for questions 37 to 40:

37.  I. Factorising \( 26x^2 - 43x + 15 = 0 \)

⇒ \( x = 15/13 \) or \( x = -1 \)

II. Factorising \( 2y^2 + y - 12 = 0 \)

⇒ \( y = 3 \) or \( y = -4 \)

Choice (4)

38.  I. Factorising \( 2x^2 + 13x + 18 = 0 \)

⇒ \( x = -2 \) or \( x = -9/2 \)

II. Factorising \( y^2 + y - 12 = 0 \)

⇒ \( y = 3 \) or \( y = -4 \)

Choice (4)

39.  I. \( x = \frac{5}{4} \Rightarrow \frac{5}{4} = \frac{5^2}{4^2} \Rightarrow \frac{x}{4} = \frac{5}{4} \times \frac{5}{4} \)

\[ \Rightarrow \frac{125 \times 25}{64 \times 16} = \frac{3125}{1024} = 3.0517 \]

II. \( y = \frac{\sqrt{50} + \sqrt{2}}{\sqrt{50} - 4} \Rightarrow \sqrt{50} > 4 \)

∴ \( y > 4 \) Choice (2)

40.  I. \( x = \frac{1}{7 + \sqrt{2}} - \frac{1}{7 - \sqrt{2}} \)

\[ \Rightarrow \frac{7 - \sqrt{2} - 7 + \sqrt{2}}{(7 + \sqrt{2})(7 - \sqrt{2})} \]

\[ \Rightarrow \frac{7 - \sqrt{2} - 7 + \sqrt{2}}{49 - 2} = -\frac{2\sqrt{2}}{47} \; x < 0 \]

II. \( y = \frac{64}{27} \times \frac{1}{8k} \)

\[ y > 0 \; y > x \]

Choice (2)
Solutions for Intelligence and Critical Reasoning

SERIES

Practice Exercise

Solutions for questions 1 to 72:

1. The given series can be written as the squares of consecutive primes.
   Choice (4)

2. The differences are consecutive Odd numbers
   Choice (2)

3. The given numbers are the alternate prime numbers.
   Choice (2)

4. 11, 13, 15, 17 is the odd number series.
   12, 10, 8, 6 is the even number series in reverse order series.
   Choice (1)

5. 1, 2, 3, 4, 5, 6, 7, 8 = 512
   Choice (3)

6. 124, 140, 165, 201, 250, 314, 391, 395
   where 16, 25, 36, 49 and 64 are the perfect squares of the consecutive numbers.
   Choice (2)

7. 17, 34, 51, 102, 408, 2040 = 12240
   Choice (2)

8. 43, 44, 48, 57, 73, 98
   Choice (4)

9. The differences are perfect cubes in decreasing order.
   Choice (1)

10. The consecutive natural numbers are given in the numerators and their squares are given in the denominators.
    Choice (2)

11. 13, 14, 22, 49, 84, 113, 233, 454
    1 = 1, 8 = 2, 27 = 3 and so on
    Choice (4)

12. 5, 5, 10, 10, 10, 120, 600, 2600
    Choice (3)

13. 7, 21, 22, 66, 67, 201, 202
    Choice (2)

14. 24, 63, 12, 41, 18, 2, 36, 23, 90, 270
    Choice (4)

15. The series consists of successive prime numbers. The prime number after 61 is 67.
    Choice (4)

16. 5×1, 6×2, 14×3, 45×4, 184×5, 925
    Choice (1)

17. 21, 23, 46, 48, 96, 98, 196
    Choice (3)

18. 2×2, 7×2, 17×2, 37×2, 77×2, 157
    Choice (2)

19. 13×1, 51×1, 203×1, 811×1, 3243×1, 12971
    Choice (4)

20. 5×1, 6×2, 12×3, 15×4, 60×5, 390
    Choice (4)

21. (4)1, (6)1, (8)1, (10)1, (12)1, (14)1 = 2744
    Choice (4)

22. The given series can be written as n2+1, where n is a prime number.
    22+1, 32+1, 52+1, 72+1, 112+1, 132+1, 172+1 = 290
    Choice (4)

23. 930 = 30×30, 812 = 28×28, 702 = 26×26
    + 26, 600 = 242 + 24, 506 = 222 + 22
    Choice (1)

24. (1)1, (2)1, (3)1, (4)1, (5)1, (6)1 = 1296.
    Choice (4)

25. 6 = 2+2, 12 = 3+3, 30 = 5+5, 56 = 7+7, 132 = 11+11, 182 = 13+13
    Prime numbers of the form of N2 + N.
    Choice (1)

26. (2)1, (3)1, (4)1, (5)1, (6)1 = 7776.
    Choice (3)

27. 2 = 1+1, 30 = 3+3, 130 = 5+5, 350 = 7+7, 738 = 9+9
    The given numbers are in the form of N3+N. Where N is an odd number.
    Choice (2)

28. The series consists of successive prime numbers. The prime numbers after 83 are 89 and 97.
    Choice (3)

29. The digits in each number are reversed and the number so formed is added to the original number.
    Choice (1)

30. The product of the digits in each number is added to the number to get the next number in the series.
    Choice (3)

31. 253, 222, 219, 205, 193, 183, 175
    Choice (1)

32. 121, 123, 125, 127, 129, 131, 133
    Choice (2)

33. 121×2+1, (125)×2+1, 133×2+1
    (140)×2+1, 145×2+1, 155×2+1, 166
    Choice (4)

34. 5, 10, 15, 20, 25, 60
    Choice (1)

35. 12, 60, 7, 8, 10, 15, 120, 75, 375, 375
    (187, 5)
    Choice (1)

36. Every number starting with the third number is the sum of its previous two numbers.
    Choice (1)

37. 3, 15, 21, 27, 39, 60, 90, 140, 210, 315, 420
    Choice (1)

38. 23, 221, 170, 24, 16, 14, 12, 10, 8, 6
    Choice (3)

39. 103, 126, 149, 172, 195, 218, 241
    Choice (3)

40. 8, 24, 37, 111, 124, 37, 385
    Choice (3)

41. M, P, S, V, Y, B, E
    Choice (1)

42. C, H, M, R, W, B, Q
    Choice (1)

43. The first letters are related as follows:
    B, C, E, H, L, Q, O.
    The second letters are C, D, F, I, M, R.
    Choice (2)

44. The series consists of pairs of corresponding letters from the two halves of the alphabet. So the next pair is [E, R]
    Choice (1)

    Choice (1)

Series 2: S, T, V, Y, C, H

Series 3: O, R, W, D, M, X
    Choice (3)
46. The given series has two alternate series. The first letters are S₁, V₁, Y₁, B. The second letters are A₁, D₁, G₁, J. The other series is EH, OX, ST, EH. Choice (2)

47. A₁, B₁, D₁, H₁, P J₁, L₁, N₁, P₁, R X₁, U₁, B₁, O₁, L₁ Choice (4)

48. The first series is B₁, F₁, R₁, B₁, F. The second series is D₁, G₁, H₁, L₁, Q. The third series is E₁, O₁, U₁, A₁, E, I is a series of consecutive vowels. Choice (2)

49. A₁, B₁, D₁, G₁, K C₁, E₁, H₁, L₁, O D₁, G₁, K₁, P₁, V B₁, F₁, K₁, Q₁, X Choice (2)

50. The first series is I, O, U, A, E, I is a series of consecutive vowels. The second series is J, K, L, M, N, P is a series of consecutive consonants. The third series is also a series of consecutive consonants. Choice (1)

51. It is a series of vowels written in ascending first and then in descending order, hence 'e' comes next. Choice (1)

52. B₁, E₁, H₁, K₁, N J₁, M₁, P₁, S₁, V The number at the middle represents the place values of the two letters. Choice (2)

53. B₁, C₁, D₁, E₁, F D₁, B₁, Z₁, X₁, V F₁, I₁, L₁, O₁, R H₁, D₁, Z₁, V₁, R Choice (3)

54. The pattern for the first letter: H₁, D₁, A₁, W₁, S The pattern for the second letter: O₁, K₁, G₁, C₁, Y The pattern for the third letter: V₁, R₁, N₁, J₁, E₁ Choice (4)

55. B₁, D₁, H₁, N₁, V₁, W₁ F A₁, B₁, E₁, J₁, O₁, Z₁ D₁, E₁, C₁, F₁, B₁, G Choice (2)

56. T + 2 = V; T + 2 = R; O + 2 = Q; O – 2 = M; P + 2 = R; P – 2 = N Hence, TOP : VRQMRN and SET : UQGCVR. Choice (4)

57. The first letters are E₁, G₁, K₁, O₁, Y₁ The second letters are F₁, I₁, O₁, X₁, J₁ The third letters are: G₁, K₁, S₁, E₁, U₁ Choice (1)

58. P₁, N₁, L₁, J₁, H L₁, N₁, P₁, R₁, T J₁, H₁, F₁, E₁, D₁, B Choice (3)

59. The 1st letters are in the following pattern: T₁, W₁, Z₁, C₁, F The pattern for the second letter: A₁, D₁, G₁, I₁, M The pattern for the third letter: N₁, Q₁, T₁, W₁, Z Choice (3)

60. The first letters are consecutive vowels: A₁, E₁, I, O, U, P The pattern for the second letter: C₁, F₁, I₁, L₁, O, P The pattern for the third letter: D₁, H₁, L₁, P₁, T Choice (2)

61. The first series is: C₁, F₁, I₁, O, S₁, Z₁, J The second series is: D₁, H₁, K₁, C₁, J₁, F and the third series is: F₁, L₁, O₁, W₁, D₁, R Thus the next term is ZFR. Choice (2)

62. This is the series of consonants in the reverse order. So, the letter in the blank is 'J'. Choice (1)

63. P₂B = B + 8; J₂E = J + 2; T₅D ⇒ T + D = 5; O₅C = O + C = 5 Choice (2)

64. Series 1: B₁, D₁, F₁, H₂, J Series 2: (1₁), (2₁), (3₁), (4₁), (5₁) Series 3: A₁, E₁, I₁, M₂, Q Choice (2)

65. In the given series, the place value of the letter is written on either side of the letter. 1K₁ ⇒ K = 11, 1L₂ ⇒ L = 12 Choice (2)

66. (i) B₁, C₁, A₁, B₁, Z₁, A₂, Y (ii) D₁, G₁, C₁, F₁, B₁, E₁, A (iii) The numbers in each term is square of the sum of the position values of the letters. Choice (2)

67. Series 1: B₁, D₁, H₁, N₂, V Series 2: (3₁), (5₁), (4₁), (3₁), (4₁) Series 3: Z₁, W₁, T₁, O₂, N Choice (4)

68. ab bc c ed d d d Choice (1)

69. a b c a b a b a b c The three letters a, b and c are taken in cyclic order. Choice (3)

70. a b c a b a b c a c a b b c c All the given pairs of numbers can be written as (n)² : (n + 1) Choice (1)

71. 10 x 6 = 90 and 17 x 6 = 102 Choice (1)

72. The digits in the given numbers are reversed. Choice (3)

73. If the alphabet is taken as it is, then from any letter in the rightward direction place value increases and on in leftward direction, the place value decreases.

74. The place value of H is 8. The required letter is 8 + 5 = 13 = O. Choice (4)

75. The place value of O is 15. The required letter is 15 – 7 + 3 = 11 = K. Choice (3)

76. YœthirstletterotherhitogotY Required letter = 22 – 7 = 6 = F. Choice (1)

77. The place value of P is 16. The required letter is 16 – 4 + 2 = 14 = N. Choice (3)

78. The place value of K is 11. The required letter is 11 + 1 + 5 + 1 = 18 = P. Choice (1)

79. The place value of X is 24. The required letter is 24 + 5 + 1 + 20 = T. Choice (1)

80. The place value of Y is 25. The required letter is 25 + 12 = 37 = F. Choice (1)

Solutions for questions 73 to 76:

Practice Exercise

Solutions for questions 1 to 30:

1. 756³ = 990 : : 1238³ = 1472 Choice (3)

2. Next prime number to 83 is 89. Similarly, the next prime number to 67 is 71. Choice (2)

3. 928³ = 583 : : 1523³ = 1178 Choice (2)

4. \sqrt{32} = 35 and \sqrt{1225} = 50 Choice (2)

5. Similarly, \sqrt{1089} = 33 and \sqrt{1089} = 33 Choice (1)

6. (6)² : (6)³ : (11)² : (11)³ = 12 Choice (1)

7. 405³ = 135 : : 729³ = 243 Choice (3)

8. The digits in the next numbers are reversed. Choice (3)

9. 35² = 245 : : 65² = 455 Choice (1)

10. 15 x 6 = 90 and 17 x 6 = 102 Choice (1)

11. The given pair of numbers can be written as n : n² Choice (3)

12. 8² = 8² : : 10² = 10 Choice (4)
13. Chennai is the capital city of Tamil Nadu, similarly Jaipur is the capital city of Rajasthan. Choice (2)
14. Food is related to hunger, in the same way water is related to thirst. Choice (3)
15. Doctor works in Hospital, similarly Chef works in kitchen. Choice (1)
16. \(23 \times 7 = 161 : 19 \times 7 = 133\) Choice (4)
17. \(6^4 : 6^4 = 10^5 - 10^5 : 8^4 - 8^4 = 504\) Choice (2)
18. Sum of the digits in the given numbers are subtracted from the numbers.
   \(7 + 8 + 6 = 21 \neq 786 - 21 = 765\) Choice (2)
19. The given pair numbers can be written as \(n^2 + n\) Choice (3)
20. \((20)^2 + 20 = 420\) Similarly, \((31)^2 + 31 = 992\) Choice (2)
21. Successive prime numbers are given. Next prime number to 5 is 7 and for 7 is 11.
   Similarly, for 1113 the missing numbers are 1317. Choice (1)
22. \((5)^2 + (8)^2 = 25 + 64 = 89\) Similarly, \((6)^2 + (3)^2 = 36 + 9 = 45\) Choice (2)
23. \(4 \rightarrow 1/4 = 0.25\)  
   \(5 \rightarrow 1/5 = 0.2\) Choice (3)
24. \(3 \rightarrow 1/3 = 0.333\) Similarly, \(7 \rightarrow 1/7 = 0.143\) Choice (1)
25. We get bread from bakery, similarly we get milk from Dairy. Choice (2)
26. Calorie is the unit of heat, similarly Bar is the unit of pressure. Choice (3)
27. Ammeter is an instrument to measure the strength of an electric current, similarly Barometer is an instrument to measure atmospheric pressure. Choice (4)
28. Canada is in the continent North America, similarly Sudan is in Africa. Choice (2)
29. We get wool from trees, similarly we get wool from sheep’s. Choice (3)
30. Cardiology deals with heart, similarly botany deals with plants. Choice (1)

**Solutions for questions 31 to 40:**

If the 1st half and the 2nd half of the English alphabet are reversed, then a new series is formed as follows.

\[
\text{MLJKIHGFEDCBAZYXWVUTSRQPN}
\]

Here, each consecutive pair of the letters in the first term is reversed to get the next term. Choice (4)

32. The place value of each letter is multiplied by two Choice (3)
33. For each vowel in the first term its previous vowel is given in the second term. Choice (2)
34. \(bcd + 2 = +4\) Similarly, \(def - 3 = -4\) Choice (1)
35. In each term the position value of the letter is equal to the product of the digits on either sides. Choice (3)
36. \(3G3 + 1 = +1\) 4 R 433rd letter is G and the 44th letter is R. Similarly, \(6N6 + 1 = +1\) 7 766th letter is N and the 77th letter is Y. Choice (2)
37. Pen is used to write, similarly needle is used to sew. Choice (4)
38. J is the 4th letter from the left and Q is the 4th letter from the right of the alphabet. So, J and Q are corresponding letters. Similarly, M and N are the corresponding letters. Hence, JM : QN : : CT : XG. Choice (4)
39. Each letter is shifted backwards by two positions. Choice (1)
40. Each letter is shifted backwards by four positions. Choice (1)

**ODD-MAN OUT**

--- **Practice Exercise** ---

**Solutions for questions 1 to 30:**

1. All except ‘21’ are prime numbers. Choice (1)
2. Except ‘1001’ in every number the number of zeros between two digits is equal to the value of the digit. Choice (1)
3. Except ‘243’, all others are even numbers. Choice (2)
4. Except ‘903’ all are the multiples of 11. Choice (1)
5. Except ‘Dog’ all are aquatic animals. Choice (3)
6. All the numbers except ‘158’ are in the form of ‘n^2 − n’. Choice (4)
7. Except in second option in every group the third number is the product of first two numbers. Choice (2)
8. Pairs of prime numbers in descending order are taken and written one next to the other. Choice (3)
9. Except ‘Dam’ in all the other water sources, water flows. Choice (2)
10. All except ‘Football’ require a stick or a bat other than a ball. Choice (2)
11. Except ‘Tripura’ all are the capital cities of the various states. Choice (3)
12. Except ‘9’ all the numbers can be written in \(n^{n+1}\) form. Choice (1)
13. All except ‘46’ are multiples of ‘7’. Choice (1)
14. Except 312 all are the odd numbers. Choice (4)
15. Except “Flapping” all are the sounds made by various animals. Choice (4)
16. Except ‘Sorrow’ all are the synonyms. Choice (4)
17. 1728 = (12)^3 but 1726 is given; 512 = (8)^3 Choice (4)
18. Except ‘66’ all are perfect cubes. Choice (1)
19. The digits in each set represent the position of the given letter in the English alphabet. 2W3 \(\Rightarrow 23 = W\); 1Q7 \(\Rightarrow 17 = Q\); 1M3 \(\Rightarrow 13 = M\); 1R9 \(\Rightarrow 19 = S\) but not R. Hence 1R9 is the odd one. Choice (4)
20. Except in Choice (1) in all the groups the place value of the letter is equal to the product of two numbers on either of its sides. Choice (1)
21. In all the pairs, the sum of the digit and the place value of the letter is equal to 5 except in (1). Choice (1)
22. In each group the number between the two letters is equal to the sum of the position values of letters on either side of it. But this pattern is not followed in choice (3). Choice (3)
23. In every pair the second term is the younger one of the animal except in choice (4). Choice (4)
24. Except ‘Dynamics’ all are the various parts of the mathematics. Choice (1)
25. In each group of letters the second letter is the corresponding letter from the other end of the alphabet and the third letter is the corresponding letter with respect to two halves of the alphabet. This process is followed in all the groups except in ‘SHG’. Choice (2)
26. Except ‘O’ all are the consonants. Choice (2)
27. Except ‘April’ all are the months which consists of 31 days. Choice (3)
28. Except Lotus’s alotherareterrestrialplants. Choice (2)

29. Except in the fourth option in all the pairs the place value of one of the letters from left to right is same as that of the other from right to left. Choice (4)

30. Except in the pair GE in every pair a consonant is followed by its immediate next vowel in the alphabet. Choice (1)

CODING-DECODING

— Practice Exercise —

Solutions for questions 1 to 6:

1. Letters are arranged in the increasing order of their place values. Choice (4)

2. The word is divided into two halves and each half is reversed. Choice (1)

3. In the word, the vowels are written in the increasing order followed by the consonants in the increasing order. Choice (2)

4. In this, alternate letters starting from the first are written followed by the remaining letters. So, SIGNIFICANT is written as SGIIAT-Choice (2)

5. By comparing (1) and (2) we have Sip is b, ::. The code for tip is either g or h. Choice (4)

6. Each letter is shifted backwards by 2 positions Choice (4)

Solutions for questions 7 to 9:

The letters and their corresponding codes are as follows:

Letters: P M N I L E A R T S
Codes: 5 4 9 3 6 0 7 2 1 8

7. 57278310 is the code of the word PARA-site. Choice (4)

8. 395713091 is the code of the word INPATIENT. Choice (1)

9. 52340 is the code of the word PRIME. Choice (2)

Solutions for questions 10 to 12:

The letters and their corresponding codes are as follows.

Letter: A B C D E F G H I J K
Code: 1 2 3 4 5 1 2 3 4 5 1

Letter: L M N O P Q R S T U V
Code: 2 3 4 5 1 2 3 4 5 1 2

Letter: W X Y Z
Code: 3 4 5 1

10. 15353145 is the code for the word POR-trait. Choice (4)

11. 113411435 is the code for the word PUR-SUANCE. Choice (1)

12. 3544554 is the code for the word MON-soon. Choice (1)

Solutions for questions 13 to 16:

13. Word: G R A D U A T E
   Logic: +1 -1 +2 -2 +3 -3 +4 -4
   Code: H Q C B X X X A
   Similarly, ‘LABORATORY’ is coded as MZDMUXXKWT. Choice (3)

14. A Pen is used for writing and in the code duster means pen. Hence, duster is used for writing. Choice (1)

15. In the given word P, R, D, T are even positioned letters and all the remaining are with odd positioned letters. Thus 11212212 is the code of the word PREDICATE. Choice (3)

16. The first 3 letters are shifted forward by 3 position, the last 3 letters are shifted backwards by 3 letters Choice (1)

Solutions for questions 17 to 19:

It is given that the code for A and Z is 1, B and Y is 2, C and X is 3, D and W is 4 and so on. The letters and their corresponding codes are as follows:

Letter: A B C D E F G H I J K
Code: 1 2 3 4 5 6 7 8 9 10 11

Letter: L M N O P Q R S T U V
Code: 12 13 14 15 16 17 18 19 20 21 22

Letter: W X Y Z
Code: 23 24 25 26

17. 9137591398891213 is the code of the word INTERMISSION. Choice (4)

18. 958791913 is the code of the word REASON. Choice (3)

19. 78613459 is the code to the word THUNDER. Choice (4)

Solutions for questions 20 to 22:

Word: EQUATION
Logic 1: The letters in the word are reversed N O I T A U Q E
   Logic: +1 +1 +1 +1 +1 +1 +1
   Code: O P J U B V R F

20. Choice (3)

21. Choice (1)

22. Choice (4)

Solutions for questions 23 to 27:

23. In this the place values of the letters are given as their codes. Choice (1)

24. Word: CONCEPT
   Logic: +1 +2 +3 +4 +5 +6 +7
   Code: D Q Q G J V A
   Similarly, EXECUTION is coded as FZHGGZWPW. Choice (4)

25. The word and their codes are as follow
   In these words ‘E’ and R coded as 1 and 5 but which stands for what is not known. A is coded as 6.
   Hence the code for EAR is 156 or 165 or any combination of 1, 5, 6. Choice (3)

26. Turmeric is yellow in colour and in the code yellow is called orange. Choice (4)

27. Let us number the letters in the word SIGNAL as 1 2 3 4 5 6
   These letters are arranged in the coding as GAS I N L 5 1 2 4 6
   Similarly, HURDLE is coded as RLUDE. Choice (3)

Solutions for questions 28 to 30:

In the word PAGEANT, the letter A is written twice and so the code z. Hence the code for A is z.

Similarly, from the 2nd word the code for E is v. From the 5th word the code for N is m. Comparing the 2nd and 3rd words, the letter M and the code n are common. So, the code for M is n.

Similarly by comparing the words, the code for I is r, the code n are common. So, the code for M is n.

28. ormvzi is the code to the word LINEAR. Choice (1)

29. orgtrzgv is the code of the word LITIGATE. Choice (2)

30. krtnvmg is the code to the word PIGMENT. Choice (3)

VENN DIAGRAMS

— Practice Exercise —

Solutions for questions 1 to 3:

As per the given data, we get the following diagram:

\[ H = 45 \]

\[ b = 55 \]

\[ G = 65 \]

Total = 150

1. 55 take only Geography. Choice (3)

2. 35 students take only History. Choice (2)

3. At most one subject = \( a + r = 150 - 10 = 140 \). Choice (4)

Solutions for questions 4 to 6:

Since, 60 students failed in Maths. \( a + b = 165 \) and 60 = 105 students passed in Maths similarly, 65 students failed in English.
5. 5 students failed in both the subjects. Choice (4)
6. As 55 students passed only in English which implies that 55 students failed only in  
Maths. Choice (1)

**Solutions for questions 7 to 10:**
From the given data, we get the following diagram, where P S and M stands for Panasonic, Siemens and Nokia

\[
\begin{align*}
P & = 140 \\
S & = 143 \\
M & = 120 \\
\text{Total} & = 403
\end{align*}
\]

i. 22 families use only Panasonic Phones.
ii. 10 families use only Nokia phones.
iii. 35 families use only Siemens phones.
iv. 25 families use both Panasonic and Nokia but not Siemens.
v. 15 families use both Nokia and Siemens but not Panasonic.
vi. 23 families use both Panasonic and Siemens but not Nokia.
vii. All the 200 families use mobile-phones of at least one company.

7. 35 families use mobile-phones of only Siemens. Choice (2)
8. 25 families use mobile-phones of both Panasonic and Nokia but not Siemens (Region common to Panasonic and Nokia but not Siemens). Choice (1)
9. Exactly one company = Only Panasonic + Only Nokia + Only Siemens = 22 + 10 + 35 = 67 families. Choice (2)

10. Neither Panasonic nor Siemens implies only Nokia.
   So, 10 families use mobile-phones of neither Panasonic nor Siemens. Choice (3)

**Solutions for questions 11 to 14:**
According to the given information, the Venn-diagram will be as follows:
\[
\begin{align*}
\therefore a & = 42 \text{ per cent} - (8 + 4 + 10) \text{ per cent} = 20 \text{ per cent} \\
\text{Similarly, } b & = 43 \text{ per cent} - (8 + 4 + 9) \text{ per cent} = 22 \text{ per cent} \\
\text{c} & = 44 \text{ per cent} - (10 + 4 + 9) = 21 \text{ per cent} \\
n & = 100 \text{ per cent} - (20 + 21 + 22 + 10 + 9 + 8 + 4) \text{ per cent} = 6 \text{ per cent} \\
\therefore & b = 100 - 6 = 94 \text{ people} \\
\text{Hence, 600 people are the members the club.}
\end{align*}
\]

11. 600 people are there in the club. Choice (3)
12. At most one = none + exactly one = 36 + (20 + 21 + 22) \text{ per cent of } 600 = 36 + 63 \text{ per cent of } 600 = 36 + 378 = 414 \\
   Choice (2)
13. Atleast one category = m \text{ – n} = 600 \text{ or } 600 – 36 = 564 \text{ students} Choice (3)
14. (10 + 9 + 8) \text{ per cent of } 600 = 162 \text{ people belong to exactly any two of the categories.} Choice (1)

**Solutions for questions 15 to 17:**
Given 100 students were surveyed who read novels of Christie or Doyle or both.

From the given table we get the information that 40 females read Doyle and 70 students read Christie.
   Further,
1. 37 per cent of the total students read both that is 37 students.
2. The ratio of males and females is 1 : 1. that is number of males = number of females = 50.
3. 50 per cent of the females that is 50 per cent of 50 = 25 females read both.

**Solutions for questions 18 to 20:**
From the above venn diagram we get x + y = 51.

18. It is given that, x = 2y \therefore 3y = 51 or y = 17 \\
   \therefore x = 34 \\
   \therefore \text{The people who watch sonny TV = } 36 + 17 = 53. Choice (4)
19. People who watch at most two channels = 150 \text{ – (people who watch all the three) } \Rightarrow 150 – 8 = 142. \\
   \therefore 142 people watch at most two channels. Choice (1)
20. It is given that, x = 15 \therefore y = 51 – 15 \therefore y = 36. Choice (2)

**Solutions for questions 21 to 24:**
The given diagram is as follows.

\[
\begin{align*}
\text{Males} & \\
\text{Doyle} & = 15 \\
\text{Christie} & = 23 \\
\end{align*}
\]
21. The letter ‘X’ represents those athletes who participate in all the four races that is, the region common to all the four circles. Choice (2)  

22. Athletes who participate in at least three races are represented by the letters U, V, W, T and X that is, the region common to the three circles and the region common to all four circles. Choice (3)  

23. Athletes who participate in exactly two races are represented by the letters P, Q, R and S that is, the region common to exactly two circles. Choice (1)  

24. The letter ‘W’ represents those athletes who participate in all the four races that is, the region common to all four circles. Choice (3)  

27. Some females are Doctors and some females are Intelligent. Some Doctors are Intelligent. Choice (2)  

Solutions for questions 25 to 27:  

25. Algebra and Geometry are different from each other but they constitute two different areas in Mathematics. Choice (4)  

26. Ganga, Godavari and Indus are three rivers and they are different from each other. Choice (3)  

Solutions for questions 28 to 30:  

28. City is the part of state, which is the part of a country. Choice (1)  

29. A soldier can be a painter or a singer or both. Choice (4)  

30. Red and yellow are two distinct colours but both are two parts of the rainbow colours. Choice (3)  

Solutions for questions 31 to 33:  

The given diagram is as follows.  

Number of elements in only C = 40 – (7 + 12 + 9)  
⇒ 40 – 28 = 12  

37. It is given that the number of elements in B is twice that of number of elements in C, that is, B = 80.  
Then y = [(80 – (8 + 9 + 12))] = y = (80 – 29)  
that is y = 51 Choice (3)  

38. Number of elements in C = 40  
It is given that the number of elements in A = 40  
Number of elements in only A  
x = 40 – (8 + 12 + 7) ⇒ x = 40 – 27 ⇒ x = 13 Choice (4)  

39. It is given that the number of elements in all the sets are equal. Hence, A = B = C = 40  
Now, x = 40 – (12 + 8 + 7) ⇒ 40 – 27 ⇒ 13  
Now, y = 40 – (12 + 8 + 9) ⇒ 40 – 29 ⇒ 11  
Now, (A ∪ B ∪ C) = 13 + 11 + 12 + 7 + 8 + 9 + 12 = 72 Choice (2)  

40. Number of elements in A’ that is, the elements which are not in A = 12 + 9 + y + r = 21 + y + r Choice (1)  

CLOCKS  

Solutions for questions 1 to 25:  

1. In 1 hour the hour-hand moves 360/12 = 30°. Hence, in 10 minutes it cover 30°/6 = 5° Choice (4)  

2. As we know that hour hand moves half a degree per minute.  
∴ It will move 24° in 48 minutes. Since, minute hand moves by 6° in one minute.  
∴ It will move 48 × 6 = 288° in 48 minutes. Choice (4)  

3. In 50 seconds the second hand covers 300°.  
In 60 seconds the minute hand covers 300/60 = 6°. Hence, in 50 seconds it covers 5°. Choice (2)  

4. As we know that 0 = 11/2 m – 30h here, we have h = 5 and m = 35 Choice (1)  

5. The angle between the hands at 3 hours 25 minutes is  
θ = 11/2 m – 30 h  
Here, h = 3 and m = 25 Choice (4)  

6. Here, we have h = 7 and m = 10  
θ = 30 × 7 – 11/2 × 10 = 210 – 55 = 155° Choice (3)  

7. θ = 11/2 m – 30h Here it is given that θ = 0 and h = 6 Choice (1)  

8. Here, we have h = 4, θ = 0°  
0 = 11/2 m – 4 × 30 ⇒ m = 210/11 Choice (1)  

9. West 9  
North  
It is given that the minute hand is pointing towards South, then the hour hand must be towards Southeast. Choice (1)  

10. It is given that θ = 180°, h = 3  
0 = 11/2 m – 30h, 11/2 m = θ + 30h Choice (2)
11. 12:00 – 8:53 = 3:07 Choice (1)
12. (12:00 – 7:15) = 4:45. Choice (4)
13. The exception time for the condition \( \theta = 180^\circ \) is 6 O'clock. From 4:00 p.m. on Tuesday to 4:00 p.m. on Wednesday, it occurs 22 times. From 4:00 p.m. Wednesday to 4:00 a.m. on Thursday it occurs 11 times. From 4:00 a.m. to 11:00 a.m., it occurs 6 times. Hence both the hands will be opposite for \((22 + 11 + 6) = 39\) times.

14. Let the given information be represented as follows:

\[
\begin{array}{c|c|c}
& 50 \text{ minutes ago} & \text{Present time} \\
\hline
2 \text{ O'clock} & 50 \text{ minutes} & 5 \text{ O'clock}
\end{array}
\]

Let the number of minutes from 2 O’clock to fifty minutes ago be \(x\).
\[
\therefore \text{The number of minutes from present time to 5 O’clock is 4x.}
\]
\[
\therefore x + 4x + 50 = 180
\]
Let the number of minutes from 2 O’clock to fifty minutes ago be \(x\).
\[
\therefore \text{The number of minutes from the present time to 5 O’clock is 4x.}
\]
\[
\therefore x + 4x + 50 = 180 \Rightarrow x = 26
\]
\[
\therefore \text{The present time is 3:16. Choice (1)}
\]
15. The duration from 4:00 a.m. on Sunday to 12:00 p.m. on Wednesday = 80 hours. In 80 hours, the clock gained \(7 + 9 = 16\) minutes. But to show the correct time, the clock has to gain 7 minutes. Hence, after \(7/16 \times 80 = 35\) hours, it shows the correct time. 35 hours from 4 am on Sunday is 3:00 p.m. on Monday. Choice (2)

16. Time from 6:00 a.m. Monday to 7:00 p.m. on Thursday = 85 hours. The watch gains \((4 + 6) = 10\) minutes in 85 hours.
\[
\therefore \text{The watch gains 4 minutes in [4/10 x 85] = 34 hours. (shows correct time)}
\]
34 hours = 1 day 10 hours. 1 day 10 hours from 6:00 a.m. Monday = 4:00 p.m. Tuesday. Choice (2)

17. The number of hours from 8:00 p.m. on Thursday to 8:00 a.m. on Monday = 84 hours. In 84 hours, the clock gained 12 minutes. But to show the correct time, the clock has to gain 5 minutes.
\[
\therefore 5/12 \times 84 = 35 \text{ hours.}
\]
35 hours from 8:00 p.m. on Thursday is 7:00 a.m. on Saturday. Choice (1)

18. Time from 4:00 a.m. on 6th of this month to 6:00 p.m. on 10th of this month = 110 hours.

The watch loses \((12 + 20) = 32\) minutes. The watch loses 32 minutes in 110 hours.
\[
\therefore \text{The watch loses 12 minutes in 32 x 110/32 = 41 hours 15 minutes}
\]
Hence 41 hours 15 minutes from 4:00 a.m. on 6th is 9:15 p.m. on 7th. Choice (1)

19. From 2:00 p.m. on 2nd of a month to 2:00 p.m. on the 4th of the same month, it occurs \(44\) times.

20. In a correct clock, the hands of a clock coincide every \(65/11\) minutes. But in this case they are together again after 66 minutes, hence clock loses time.
\[
\text{Loss in 66 min} = (66 - 65/11) = 6/11 \text{ minutes.}
\]
\[
\text{Loss in 24 hours} = 6/11 x 60 x 24 = 1440/11 = 1109/121 \text{ minutes.}
\]
The clock loses \(1109/121\) minutes in 24 hours. Choice (3)

21. The number of hours from 10:00 p.m. on a day to 8:00 a.m. on the next day = 10 hours.

In 10 hours, the clock lost \(50 - 10 = 40\) minutes.

The clock will show the correct time, at the moment it gains 11 hours 50 minutes = 710 minutes.

\[
710/40 \times 10 = 177.5 \text{ hours} = 7 \text{ days 9/2 hours.}
\]
7 days \(9/2\) hours from 8a.m. on 3rd of the month is 30 minutes past 5 p.m. on 10th. Choice (3)

22. Let the time be 5 hours \(x\) minutes. Minute hand reaches 6 at 5 hours 30 minutes and hour hand 6 O’clock.
\[
\therefore \text{From the answer choices the present time which satisfied the given condition is 5 hours 15 minutes. Choice (1)}
\]

23. Difference in minutes between the two clocks in one hour = 3 minutes.

Number of hours from 8:00 a.m. to 12:00 noon on that day = 4 hours.

The two clocks differ by \(3x = 12\) minutes. Choice (3)

24. Let the present time be \(x\) O’clock.
\[
\therefore 3(10 - (x + 4)) = 10 - x
\]
\[
3(6 - x) = 10 - x
\]
\[
18 - 3x = 10 - x
\]
\[
8 = 2x, x = 4
\]
\[
\therefore \text{The present time is 4 O’clock. Choice (2)}
\]

25. Time from 3:00 p.m. Sunday to 9:00 p.m. Tuesday = 54 hours. The watch loses \((5 + 10) = 15\) minutes in 54 hours.
\[
\therefore \text{The watch loses 5 min in 5/15 x 54 = 18 hours}
\]
18 hours from 3:00 p.m. Sunday is 9:00 a.m. on Monday, which is when the clock shows the correct time. Choice (4)

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**CALENDARS**

**Solutions for questions 1 to 25:**

1. 100 days = 7(14) + 2. Hence, there are 2 odd days in 100 days. Choice (2)

2. Number of odd days in 382 days. \(\Rightarrow 382/7 = 54\) complete weeks + 4 odd days. Choice (4)

3. October have 31 days and 31 = 7(4) + 3 Choice (3)

4. Number of odd days in 426 days = 426/7 = 60 complete weeks + 6 odd days. 6th day after Sunday is a Saturday. Choice (1)

5. There are 6 odd days in 125 days. Hence, the six days to Friday is Saturday. Choice (3)

6. Odd days from 2005-2008: 1 + 1 + 1 + 2. Hence, 1st January 2009 is 5 days after Saturday, that is, Thursday. Choice (1)

7. Total number of odd days from 1st January to 23rd February is \(\Rightarrow Jan(2) + Feb(2) = 4\). Hence, the 4th day from Monday is Friday. Choice (1)

8. A century year is a leap year only if it is divisible by 400. In the given years, only 2800 is divisible by 400. Hence, 2800 is a leap year. Choice (3)

9. If a year starts with Friday, then that year will have 53 Fridays and 53 Saturdays. All the remaining days occur for only 52 times. Choice (1)

10. The leap year occurs for every four years. So, 2096 + 4 = 2100 but 2100 is a century year which is not divisible by 400. Hence, 2100 is not a leap year. 2100 + 4 = 2104 is the next leap year after 2096. Choice (3)

11. As we do not know whether the year is a leap year or not, the day of the week on 14th July in that year cannot be determined. Choice (4)

12. Number of odd days from 1st January, 2012 to 1st January, 2016 are 5. 5th day after Sunday is Friday. Choice (1)

13. The number of days from 10th April, 1963 to 23rd August, 1963 Month: April + May + June + July + August
17. August 1963 is 2 days to Wednesday.

20th January, 2000 is a Thursday.
20th January, 1997 is 3 days before Thursday, that is, Monday.

Hence, 23rd August 1959 is five days back to Friday is Sunday. Choice (1)

15. The number of odd days from 20th January, 1997 to 26th February, 1997 is 2. (As calculated in question 13)
2nd day after Monday is Wednesday. Choice (3)

16. The number of odd days from 2nd December 2008 to 2nd December 2009 = 1 odd day.
Hence, 2nd December of 2008 is one day odd day.

23rd August + September + October + November + December = 114 days
Hence, 23rd August 1959 is five days back to Friday is Sunday. Choice (1)

18. The number of odd days from 12th January 2007 to 22nd February 2007 = 6 odd days.
Hence, 22nd February 2007 is 6 days from Friday that is Thursday.
From 22nd February 2007 to 22nd February 2008, number of odd days is 1.
Hence, 22nd February 2008 is one day from Thursday that is Friday. Choice (1)

19. 18th July 1978:
1600 + 300 + 77 + number of days from 1st January 1978 to 18th July 1978.
1600 years has ‘0’ odd days.
300 years has ‘1’ odd day.
In 77 years, there are 19 leap years and 58 non-leap years.
One leap year has ‘2’ odd days and a non-leap year has ‘1’ odd day.
Number of odd days in 77 years = 19 x 2 + 58 x 1 = 96

Number of odd days from 1st January, 1978 to 18th July, 1978:
Month: Jan + Feb + Mar + Apr + May + June + July
Odd days: 3 + 0 + 3 + 2 + 3 + 2 + 4 = 17
Total number of odd days = 1 + 96 + 17 = 114 days
Number of odd days in 114 days = 114/7
= 16 weeks + 2 odd days. 2nd odd day is Tuesday.
Hence, 18th July, 1978 is a Tuesday. Choice (3)

20. The method of calculation is as shown in question 19.
There are 5 odd days from 1st January 1 AD to 24th May 2019. The 5th day from Sundays is Friday.
Hence, 24th May 2019 is Friday. Choice (2)

21. The number of odd days is 35 days
35 days have ‘0’ odd days.
Hence, 26th March, 2023 is a Sunday. Choice (1)

22. A non-leap year starts and ends with the same day.
Hence, the year is a non-leap year. Choice (1)

23. The year 2008 is a leap year and a leap year repeats itself after 28 years (7 x 4 = 28).
2008 + 28 = 2036
Hence, 2036 will have the same calendar as that of 2008. Choice (4)

24. Year 2022 = 23 + 24 + 25 + 26 + 27 + 28 + 29 + 30 + 31 + 32 + 33 = 6 odd days
As the number of odd days from 2022 to 2033 is 14 ⇒ 14/7 = 0 odd days.
Hence, 2033 will have the same calendar as that of 2022. Choice (4)

25. Number of days from 3rd April, 1995 to 1st October, 1995
Month: April + May + June + July + August + September + October
Odd days = 6 + 3 + 2 + 3 + 2 + 1 = 20 days
= 6 odd days
6th day after Monday is a Sunday.
Hence, 1st October, 1995 is a Sunday.
I can meet my friend on the 1st, 8th, 15th, 22nd, 29th of October. Choice (2)

BLOOD RELATION

--- Practice Exercise ---

Solutions for questions 1 to 9:

1. My father’s brother’s only sibling is my father, whose father-in-law is the father of my mother.

2. My brother’s grandfather is my grandfather either paternal or maternal. My grandfather’s only son has one child only. Therefore he has to be my maternal uncle only. My uncle’s son is my cousin. Choice (3)

3. Ravi’s mother’s brother is Ravi’s mother’s father that is Ravi’s maternal grand-father. His only daughter is Ravi’s mother, whose daughter is Ravi’s sister. Choice (2)

4. From the given data, we get the following diagrams.

Clearly, B is the grandmother of E. Choice (2)

5. My mother’s brother’s wife’s son is my maternal uncle’s son. My father’s father-in-law is father of my maternal uncle, whose son is grandson of my father’s father-in-law.

6. The man’s sister’s husband is the man’s brother-in-law. Brother-in-law’s wife is his sister. Daughter of his sister is his niece. Choice (2)

7. Ravi’s father’s wife is Ravi’s mother. Her mother-in-law is Ravi’s father’s mother that is Ravi’s Paternal grand mother. Ravi’s paternal grand mother is also Shyam’s maternal grand mother that is, Ravi’s father and Shyam’s mother are siblings. Hence, Ram is Shyam’s cousin. Choice (3)

8. My mother’s sister’s husband’s only son is my aunt’s son that is cousin. My cousin’s sister is also my cousin. Choice (2)
9. Given Shilpa is the only child of her parents. Her sister-in-law is the sister of her husband. Hence if her sister-in-law is the daughter of Rahul then her husband is the son of Rahul. Choice (1)

Solutions for questions 10 to 13:

10. P | Q | R = S, P is the mother of Q.
R is the aunt of Q. Thus R is the sister in
law of P and S is the nephew of R. Thus
P is aunt or mother of S. Choice (4)

11. S ≠ T < U > V
S is the sister of T, U is the son of T, U is
the father of V.

Choice (3)

12. X ≠ Y (Z) X is sister of Y who is the
father of Z. Thus X is the aunt of Z.
Choice (1)

13. A (B) C ≠ D. A is father of B, who
is mother of C who in turn is the sister of
D.
Thus A is the grandfather of D.
Choice (4)

Solutions for questions 14 to 17:

Given,
S ≠ T means S is sister of T, S ≠ T means S is the
brother of T, S ≠ T means S is the son of T,
S ≠ T means S is the daughter of T, S ≠ T means
S is the father of T, S × T means S is the
mother of T.

B
that is A is the uncle of B. Choice (2)

15. X = Y ⇒ X (father of) Y
So, X is the grandfather of Y and
X = Z ⇒ X (father of) Z (mother of)
Y
So, X is the grandfather of Y.
Choice (3)

16. Q × P = R ⇒ P (daughter of) Q
that is P is the mother of Q and R
Choice (2)

17. P × R + Q ⇒ P (sister of) R (brother of)
Q
So, P is the sister of Q. Choice (4)

Solutions for questions 18 to 21:

These questions are based on the following
information.

From (1),

A
Brothers
C
Daughters
B

From (2) and (3)

E (f)
Husband

From (3)

J
Son
Husband

25. Anna is the daughter-in-law of Emanuel.
Choice (1)

DIRECTION SENSE

Solutions for questions 1 to 19:

1. Let A and B be the initial and the final
points respectively in the journey.
Distance he is away from the original place:
Vertically → 10 km
Horizontally → 5 + 3 = 8 km
Choice (1)

2. The path travelled by Rajan is as follows:
Let the initial point be I and the final point be F.

3. Let A and B be the initial and the final
points in the journey. The vertical distance between
A and B is (15 – 13) = 2 m
Choice (4)

4. The path travelled by Reema is as follows:
Let I and F be the Initial and final point respectively.

The direction in which Reema started
her journey is 90° in anticlockwise from
south that is east.
She started her journey towards east. Choice (4)

Let A and B be the initial and the final points respectively in the journey. He is 20 – (8 + 10) = 2 km away from the starting point. Choice (4)

The path traversed by the person is as follows:

We know that $(AB)^{2} = (BE)^{2} + (AE)^{2}$ and from figure, $BE = BC + CD + DE = 1 + 2 + 2 = 5 \text{ km}$

$AE = FB + 4 = 4 \text{ km}$

$	herefore AB = \sqrt{(5)^{2} + (4)^{2}} = \sqrt{41} \text{ km}$. Choice (2)

Let A and B be the initial and the final points respectively in the journey.

$AB = \sqrt{9^{2} + 4^{2}} = 10 \text{ km (approx)}$. Choice (2)

The path traversed by Ramesh is shown in above figure by solid line. Let O and H be office and house respectively.

We know that, $(OH)^{2} = (BH)^{2} + (OB)^{2}$ and
$BH = 60 – 30 = 30$, $OB = 80 + (70 – 50) = 100$

$\therefore \text{OH} = \sqrt{30^{2} + 100^{2}} = \sqrt{10900} = 100$

$	herefore$ The house is towards South-west from the office. Choice (4)

From the given description it is clear that the person starts from the same place and reaches the starting point. Hence, the distance between the Railway Station and his house is 0 km. Choice (2)

Jatin is walking towards the East. Choice (4)

The path traversed by Sameer is as follows:
where H is the house and O is the Office.

$	herefore$ Office is towards South-west with respect to house. Choice (4)

N, E, S, W, NE, SE, NW and SW are the pointers of the compass which point North, East, South, West, North-east, South-east, North-west and South-west respectively. But now the pointer NE of the compass is showing west thus all the remaining pointers also point as shown above. Thus the pointer E(east) points North-west. Hence, Atul travelled towards North-west. Choice (4)

Given that a compass was damaged and its needle turned in such a way that it showed North for East and so on. So, the original directions

A person walked towards West, which is actually North. Choice (4)

In the evening as the sun is in the West the shadow falls towards East. As shadow of Shyam is falling to his left and his left is east. .. He is facing south and Shaan is facing North.

Choice (2)

Given that – Piyush and Ravi were facing each other. Piyush’s shadow fell to his left (that is towards West as it was morning). So, Piyush was facing North and Ravi was facing South.

Choice (2)

At 5:15 the minute hand is at the hour division 3 thus we can say clock is as shown below.

$	herefore$ At 9 O’clock the hour hand will at 9 and points towards North-east.

Choice (2)
Solutions for Intelligence and Critical Reasoning

22. A is standing in the South-East direction. Choice (3)

23. Bis standing towards North with respective to F. Choice (2)

24. Since, we do not know the distance between D and I, we cannot say the position of I with respect to D. 
∴ It cannot be determined. Choice (4)

25. C is towards North-west with respect to H. Choice (1)

ROUTEs AND NETWORKs

Practice Exercise

Solutions for question 1 and 2:

1. Let us represent the given information in the form of a diagram.

The possible routes from Delhi to Indore are as follows:
(i) Delhi – Ahmedabad – Indore
(ii) Delhi – Ahmedabad – Calicut – Indore
(iii) Delhi – Calicut – Indore.
(iv) Delhi – Ahmedabad – Bangalore – Calicut – Indore.
∴ Four different routes are possible. Choice (4)

2. AQPB and APQB can be eliminated because P and Q cannot send the data to B. The paths AQB and APB do not violate any conditions and hence can be possible routes to send data from A to B.

Choice (2)

Solutions for questions 23 to 25:

According to the given information, we get the following diagram.

So, A is facing North originally which is North-West as per the given figure. Choice (1)

Air
Rail
Road

Kolkata ↔ Kolkata ↔ Kolkata ↔
Delhi Delhi Delhi
Chennai ↔ Chennai ↔ Chennai ↔
Delhi Delhi Delhi
Nagpur ↔ Nagpur ↔ Raipur →
Mumbai Mumbai Nagpur
Nagpur ↔ Raipur ↔ Hyderabad ↔
Raipur Kolkata Chennai
Kolkata ↔ Chennai → Delhi →
Hyderabad Hyderabad Nagpur
Hyderabad ↔ Nagpur → Mumbai →
Mumbai Delhi Hyderabad
Chennai ↔ Hyderabad →
Raipur Mumbai

↔ ↔ indicates two way connection.
→ → indicates one way connection.

3. There is only one such possibility.
Mumbai – Hyderabad – Chennai – Raipur
∴ She needs to travel through two cities to reach Raipur. Choice (2)

Solutions for questions 4 to 7:

4. The root one has to follow to reach P from R is as follows.
R 1 hr S 1 hr Q 1 hr P
(4:00 (6:00) (7:00) (8:00)
a.m.) (a.m.) (a.m.) a.m.)
∴ One takes 4 hours to reach P from R if he starts at 4 am.
But if starts at 7 O’clock.
He can reach P as follows
R 1 hr S 1 hr Q 1 hr P
(7:00 (9:00) (10:00 a.m.)
a.m.) (a.m.) (a.m.)
∴ One takes 3 hours to travel to P from R. Choice (2)

5. The shortest route that a person can follow from R to Q is R – S – Q
R S Q
(10:00 (11:12) 1:00
a.m.) a.m.) (p.m.)
1 hr wait
As he reached Q at 1 pm he should start from S at 12 noon but no train reaches from R at 12 noon thus he must reach S at 11 a.m. only.
∴ He would have started at 10:00 a.m. from R. Choice (1)

6. R 1 hr S 1 hr Q 1 hr P 1 hr T
(4:00 (5:00-6:00) (7:00 (9:00)
a.m.) a.m.) a.m.) a.m.) a.m.)
7. The route is as follows:

P (10 a.m.) → T (11:00 p.m.) → Q (12:00 a.m.) → R (5:00 p.m.) → S

Next train at 11:30 a.m. at 11:00 p.m. at 4:00 p.m. at 5:00 p.m.

∴ He will reach ‘S’ at 5 O’clock.

Choice (3)

Solutions for questions 11 to 13:

Let us represent the given information through diagram, which is given as follows:

C → A → H → G → F → E → D

Choice (1)

11. As it is clear that to travel from H to any city, one has to travel via B. Choice (2)

12. The longest route from C to D is as follows:

C → H → B → A → E → G → F → D

One can visit all the cities by travelling from C to D. Thus it is 6 cities.

Choice (4)

13. From the diagram it is cleared that one can go to D only after crossing F thus one cannot reach D before F. Choice (1)

Solutions for questions 14 and 15:

14. From the observation, it is very clear that one cannot go to I from any city. Hence I cannot be visited. Among the other cities one can go to C only through B. Hence, the cities, one cannot visit are I and C while going from F to B. Choice (3)

15. The longest possible route from G to B is as follows:

(ii) G → H → F → D → E → A → B

(iii) G → F → D → E → H → A → B

∴ The longest route from G to B contains five cities in between. Choice (2)

Solutions for questions 16 and 17:

16. Q gets filled in first 2 1/2 hours.

P needs 800/200 hours that is, 4 hours to get filled completely.

If no water flows from Q to R, R fills in 1200/300 that is, 4 hours.

But after 2 1/2 hours, water flows from Q to R.

∴ R gets filled completely before P gets filled.

∴ P never gets filled as water flow stops in the pipes when R gets filled completely.

Choice (3)

17. As Q gets completely filled in first 2 1/2 hours, in that time 2 1/2 (300) = 750 litres of water flows from S to P.

∴ P will have 750 litres in it by the time Q is completely filled.

Choice (4)

Solutions for questions 18 and 19:

The following diagram is obtained from the given information:

![Diagram](image)

18. If the person travel along the route HACFGE, then he can travel through maximum, number of cities with in the given limit of 1700 km. Thus, he can travel through a maximum of five cities.

Choice (3)

19. The minimum distance from D to H is 2300 km which is along the route DECH.

Choice (2)

Solutions for questions 20 to 23:

20. P and T are connected through Q. T and S are connected through R. Q and R are connected through P. Q and S are connected through T or P or T. So none of the pairs in the choices are directly connected.

Choice (4)

21. From Q to P, he can reach by boat.

From P to R he can also travel by boat.

So, a person should travel by boat to reach R from Q without changing the mode of transport.

Choice (1)

22. If a person wants to visit all the places and again return to P, then he can go in the order of P → Q → T → R → S and then S → R → P (OR) P → R → S and then S → R → T → Q → P

He must visit R twice. Choice (2)

23. One has to travel between any of the two cities with a restriction that if there is more than one possible route, he has to go by the least number of cities enroute. It is better to take the pair of cities given in each of the choices.

Choice (1) Q and S: A person can go from Q to T or R to S or P to R to S or vice-versa. In both the routes, there are two cities enroute. We can calculate the number of options in the entire route by multiplying the options available in each segment of the route.

For the route Q-T-R-S, the number of options = 1 × 2 × 2 = 4

For the route Q-P-R-S, the number of options = 2 × 1 × 2 = 4

Choice (2) P and T: The route between P and R has only one mode of travel, that is boat.

Choice (3) P and R: The route between P and R has only one mode of travel, that is boat.

Choice (4) Q and R: If a person travels by QTR, then the options are air-rail or air-air that is two ways. If it is by PQT, then the options are boat-air or rail-air that is two ways. If it is by PRT, then the options are boat-rail or boat-boat in either way. Hence, they are only two options.

Choice (4) Q and R: If a person travels between Q and R, then he can go by QTR or by QPR. If he goes by QTR, then the options are air-rail or air-bus, that gives two options or if he goes by QPR, then the options are rail-boat or boat-boat, that will again give us two options.

So, it is very clear that Q and S have maximum number of travel options available between them.

Choice (1)
24. From the diagram, it is clear that to travel from A to H, one has to visit city E. Choice (2)

25. The longest route from G to F is: G – A – B – E – H – C – F Choice (2)

SYMBOLS AND NOTATIONS

--- Practice Exercise ---

Solutions for questions 1 to 3:

1. X is the only element which is immediately followed by a digit and immediately preceded by a symbol. Choice (1)

2. After reversing the first ten elements the 8th element from the left end is 2 and the 5th element to its left would be 9. Choice (2)

3. Here in the sequence the first elements are the consecutive letters, the second elements are the consecutive digits and the third elements are the consecutive symbols. Hence the next term must be C 3 φ Choice (3)

Solutions for questions 4 and 5:

4. T = 2, ζ = 1, ι = 1, Q = 2, L = 1, C = 2, S = 7, T = 2, Β = 2, ξ = 9 Choice (2)

5. Eleventh element from the right is #. The seventh letter to the right of # is L. Choice (3)

Solutions for questions 6 to 8:

6. After conversion the expression will be. 15 + 3 = 13 + 2 + 3 × (7 + 6) + (4 + 3) − 5 + 13 = 1 Choice (1)

7. After conversion the expression will be. 8 − 4 + 7 + 15 + 3 × 2 + 4 − 2 − 8 + 4 + 7 × 15/3 × 2 + 4 − 2 = 82 − 6 = 76. Choice (3)

8. After conversion the expression will be. 1 + 2 − 3 + 4 + 2 × 5 + 1 = 2 − 2 + 3 × 4/2 × 5 = 1 + 2 − 3 + 10 = 10. Choice (4)

Solutions for questions 9 to 11:

Given that  =  ∴  : =  ; ∴  →  ; ∴  =  ; ∴  =  Let us convert the symbols as per the given directions.

9. (1) 5 Λ 10 $ 2 8 Ω 5 = 5 + 10 × 2 8 = 5 + 25 = 30 Choice (false)

(2) $ 5 10 0 0 A 8 $ 6 5 = 5 + 10 + 2.8 × 51.5 < 40 Choice (2)

10. (1) 7 4 Λ 5 6 $ 1 7 < 3 + 5 > 6 + 11 7 > 8 > 6 (true) Choice (1)

(11) 3 4 5 Λ 10 Λ 7 0 $ 3 3 > 5 > 18 + 7 − 5; 3 > 5 = 12 (false)

(2) 3 Ω 5 A 10 £ 7 Δ 5 = 3 + 10 × 7 + 5; = 2 < 10/7 + 5 true) Choice (2)

Solutions for questions 12 to 14:

12. After conversion the expression will be, 7 + 4 + 12 = 10 + 15 + 3 = 28 + 12 + 10 + 5 = 35 Choice (4)

13. After conversion the expression will be, 27 + 3 × 27 + 80 − 23 = 27 + 23 = 23 + 20 = 30 Choice (3)

14. After conversion the expression will be, 343 + 35 × 10 + 16 × 7 − 25 = 343 + 35 × 10 + 112 − 25 = 185 Choice (1)

Solutions for questions 15 to 17:

Given that the symbol → means, ≤ means ≥; ‘‘’ means ≥; ‘‘’ means ≥; ‘’ means ≥; ‘’ means =

15. Statement P + Q means P ≥ Q; Q + R = Q > R; R − S = S < R; P ≥ Q > R and S > R Conclusion I: R − S means S > R is definitely false. Choice (II)

16. Statement: L × M means L = M; L + N means L ≥ N; N − T means N < T implies L = M ≥ N and T > N Conclusion I: M < T means M < T is not definite from both the given statements. Choice (II)

17. Statements: A + B means A ≥ B; A × C means A = C A = D means A ≠ D implies A < D or A > D implies C = A ≥ B and A < D or A > D Conclusion II: C > B is not definitely true because C > D or C < D Choice (4)

Solutions for questions 18 to 20:

18. The given statements are as follows. Q → S = Q ≥ S = S ≤ Q; T → Q = T; R + T = R + T = T ≤ R Combing (i), (ii) and (iii) we get. ∴ S ≤ Q = T < R Conclusion II is S > R that is S > R is true Choice (II)

19. Conclusion II is S > R that is, S ≤ R does not follow Choice (1)

20. Given statements are as follows,

T ~ Z = T = Z; T × Y ⇒ T < Y = Y > T; W − Y = W ≥ Y

Conclusion I, Z ≥ W ⇒ Z > W is true. Conclusion II, W + T ⇒ W > T is also true. Choice (3)

Solutions for questions 21 to 23:

21. 12 D 7 ∴ 9 = (7 × 9) + 12 = 75 = 75 8 + 7 Choice (2)

22. 40 △ 5 # 9 = 40 × (9 − 5) = 160 = P Choice (2)

23. 39 IV 45 15 = 39 + 15 45 = 13 = x Choice (4)

Solutions for questions 24 and 25:

The coding pattern is based on the binary system in which only two digits 1 and 0 are used.

Given that 0 is written as M; 1 is written as N; 2 is written as NM because

2 2 = 1 − 0 ⇒ 10 = NM Similarly, 3 is written as NN because

2 3 = 1 − 1 ⇒ 11 NN Choice (2)

24. 8 ⇒ 1000 that is N M M Choice (2)

25. The given equation is (M N M N M = N M M N N) that is

11 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 = 30 − 27 = 3 = 11 = NN Choice (2)

LINEAR AND CIRCULAR ARRANGEMENTS

--- Practice Exercise ---

Solutions for questions 1 to 3:

It is given John sits exactly in between Anil and David, John sits exactly in between Charan and Kamal.

As John sits exactly between the two pairs of boys, he has to sit exactly in the middle of the row. The possible arrangements are

Kamal/Charan Anil/David John Anil/Charan David/Kamal/Charan

John/Kamal/Charan Anil/David

Kamal/Anil/David
1. John sits exactly in the middle of the row. Choice (1)
2. If Kamal and Charan occupy the ends then in four different ways the boys can be seated and if Anil and David occupy the extremes then they can be seated four more ways, thus totally the five boys can be seated in eight different ways. Choice (3)
3. If Anil sits to the immediate left of John and there is a boy who sits to the immediate right of Kamal then their seating order is as follows
   Kamal Anil John David Charan
   Anil is to the immediate right of Kamal. Choice (2)

Solutions for questions 4 and 5:
It is given that three subjects are scheduled between Mathematics and Physics and Botany is scheduled exactly between English and Hindi.

<table>
<thead>
<tr>
<th>Periods</th>
<th>Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Maths/Physics</td>
</tr>
<tr>
<td>II</td>
<td>Eng/Hindi</td>
</tr>
<tr>
<td>III</td>
<td>Botany</td>
</tr>
<tr>
<td>IV</td>
<td>Eng/Hindi</td>
</tr>
<tr>
<td>V</td>
<td>Maths/Physics</td>
</tr>
<tr>
<td>VI</td>
<td>Chemistry</td>
</tr>
</tbody>
</table>

4. As explained above Botany is scheduled either in the IIIrd period or in the IVth period. Choice (4)
5. If Hindi is scheduled immediately after mathematics then the arrangement is as follows.

Solutions for questions 6 to 8:
It is given that seven persons – I, J, K, L, M, N and O sit in a row.
From (i), we have, M __ __ __ O From (ii), we have, I __ __ __ __ K From (iii), we have, J __ __ __ L From (iv), we have, L __ __ O Combining (i), (ii), (iii) and (iv) we have Case (1): (i) N M L K O (or) Case (2): (i) M L N O K
6. O sits at one end that is case (1) M sits exactly at the middle of the row. Choice (2)
7. J and K can sits on either ends of the row. Choice (3)
8. In case (2) L sits in between M and N. Choice (1)

Solutions for question 9:
9. As per the given instruction, we get the following seating arrangement:
   A  E  C
   D  B  F
   Hence, only statement (2) is true. Choice (2)

Solutions for questions 10 to 12:
It is given that six persons A, B, C, D, E and F stay in a six floors building where each one of them stays in a different floor.
From (I), we have Charan Raman Kiran From (II), we have Rajan Pavan Shrvan Combining (I) and (II), we get either Kiran or Shrvan stays at the 1st floor. From (III), we have Raman Kiran Pavan And Rajan is below Raman and above Kiran Combining (I), (II) and (III), we get Kiran, Pavan, Rajan and Raman are below Raman who is below Charan. The order is as follows: 6 - Charan; 5 - Raman; 4 - Rajan / Kiran; 3 -Rajan / Kiran; 2 - Pavan; 1 - Shravan
10. Pavan stays in the 2nd floor. Choice (1)
11. Either Rajan or Kiran stays in the 4th floor. Choice (4)
12. If one person stays in between Pawan and Kiran, then the order is as follows.
    6 - Charan; 5 - Raman; 4 - Kiran; 3 - Rajan; 2 - Pavan; 1 - Shrvan Rajan stays in the 3rd floor. Choice (3)

Solutions for question 13:
13. From the given statements, we get the following seating arrangement:
   Where A - Anand, B - Bhuvan, C - Chander, D - Dinesh, E - Martin, F - Newman, G - Owen

Solutions for questions 14 to 16:
It is given that, eight persons – P, Q, R, S, T, U, V and W sit in eight chairs alligned as shown below.

From (ii) V can not be at left extreme and, from (ii) and (iii) V and W are in same row but not adjacent each other and from (iv), W is not at any extreme end so, the possibilities are

Solutions for questions 17 and 18:
It is given that six trains leave from a station at six different timings.
From (i), two trains leave in between T1 and T3, but from (iii) T3 leaves before T1, we have T3 - T2 - T1 / T6 From (ii), we have T1 > T6 From (iii), we have T1 > T4, T6
Note: T1 > T4 means T1 leaves before T4.
17. If T3 is the last train to leave the station, then the order of the trains to leave the station is as follows.
    1 - T1 / T4 2 - T7 / T6 3 - T3 4 - T4 5 - T5 6 - T2 .: T3 is the fourth train to leave the station. Choice (1)
18. If T1 leaves immediately after T6 then the order is as follows.
    1 - T6 1 - T5 2 - T6 2 - T1 3 - T3 3 - T1 4 - T4 4 - T4 5 - T5 5 - T2 6 - T2 6 - T3 .: It is possible only in two ways. Choice (2)
Solutions for questions 19 and 20:
19. 

![Diagram]

It is given that A is two places away to the left of E, who is adjacent to B and D. D is to the right of E and A is setting between B and F. These conditions give us the following arrangement.

∴ A is sitting opposite D.  Choice (1)

20. 

![Diagram]

As per the given conditions, if H is sitting between B and D, then H must be sitting to the left of D, as already E is sitting to the right of D. hence, we get the following seating arrangement. Hence, only the statement “F” is sitting between B and C, must be true.

Choice (3)

Solutions for question 21:

21. More than one arrangements are possible here.

∴ It cannot be determined.

![Diagram]

Solutions for questions 22 to 24:
For circular seating arrangement, the data is as given below

(i) Six friends – A, B, C, D, E and F.
(ii) F is to the left of A
(iii) B is sitting between C and E and is opposite to A.
(iv) E is sitting to the right of D.

Using statements (ii), (iii) and (iv), we get Here, B is between C and E and is to the right of D, this statement means that E is at seat 2 and D is sitting at seat 3.

22. E is sitting to the left of B.  Choice (2)

23. If every person interchanges seat with the person sitting opposite to him, then also the arrangement remains the same, but rotates by 180°. Hence, F is sitting to the right of C.  Choice (4)

24. It is given that the following persons interchange places:

A and D, F and E, B and C.

Now we get the following arrangement.

(1) is false, as A is to the left of A.
(2) Only E is sitting between B and D, hence false.
(3) As C and D sit opposite to each other hence this statement is true.
(4) E and F sit opposite to each other, hence this is false.  Choice (3)

25. Either Pinky or Shanu is opposite Dimple.  Choice (4)

26. Suman is sitting opposite Veda.  Choice (1)

27. In case (i) Dimple is sitting opposite Shanu.  Choice (2)

28. Atul can be opposite the first ranker in case III only. In that case, according to (ii) Neha will be between Atul and Vickey. Hence, Vickey is the fourth ranker.  Choice (1)

29. From (i), Neha is adjacent to the second ranker. From (iii), Neha is adjacent to the fourth ranker and Atul.  ⇒ Atul is the second ranker. Vickey can be adjacent to the second ranker in case II and also case III. Hence, either Geeta or Archie can be the first ranker.  Choice (1)

30. The second ranker Atul can be opposite the third ranker Rahul in case II only.

In this situation Lata is the fourth ranker.  Choice (2)

Solutions for questions 25 to 27:
It is given that Rohan is sitting adjacent to Pankaj who is sitting opposite Arun.

![Diagram]

Now, from the above arrangements and the remaining information, we get the following two arrangements.

Solutions for questions 28 to 30:
From (i), (ii) and (iv) we get the following arrangements.

1. Parag likes Melody.  Choice (3)
2. Curie lies Dairy milk.  Choice (2)
3. Govinda likes Alphenlibee.  Choice (2)
Solutions for questions 4 to 6:
From (ii) and (iii)
Binita is in class III
From (i) and above discussion
Namrata is in class IV
From (iv) and above discussion
Savit is in class V
Namita is in class II
Sunita is in class I
4. Namita is in class II.  Choice (1)
5. Sunita is in class I.  Choice (1)
6. Namrata is in class IV.  Choice (4)

Solutions for questions 7 and 8:
From (i), (ii) (iii) and (iv) B is not wearing yellow, green, black and pink coloured dress.
∴ He is wearing red coloured dress.
D is wearing yellow coloured dress.
A is wearing green coloured dress.
B is the fifth ranks.
C and D are the 4th and the 3rd ranker in any order.
7. B is wearing red coloured dress.  Choice (1)
8. C’s rank can be the 3rd or the 4th.  Choice (4)

Solutions for questions 9 to 11:
The given information is as follows.

<table>
<thead>
<tr>
<th>Name</th>
<th>Profession</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Architect</td>
<td>Hyderabad</td>
</tr>
<tr>
<td>B</td>
<td>Not Doctor</td>
<td>Not Bangalore</td>
</tr>
<tr>
<td>C</td>
<td>Engineer</td>
<td>Chennai</td>
</tr>
<tr>
<td>D</td>
<td>Not Professor</td>
<td>Not Bangalore</td>
</tr>
<tr>
<td>E</td>
<td>Not Architect</td>
<td>Kolkata</td>
</tr>
</tbody>
</table>

The doctor from Bangalore cannot be any one among A, B, C, D and E. Hence, it is F.
Since D is not a professor, he is not from Delhi.
⇒ B is the professor from Delhi.
Since, the person from Kolkata is not an Architect, A is from Hyderabad and D is from Kolkata.
⇒ D is the Painter and E is the Lawyer.
The final distribution is as follows.

<table>
<thead>
<tr>
<th>Name</th>
<th>Profession</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Architect</td>
<td>Hyderabad</td>
</tr>
<tr>
<td>B</td>
<td>Professor</td>
<td>Delhi</td>
</tr>
<tr>
<td>C</td>
<td>Engineer</td>
<td>Chennai</td>
</tr>
<tr>
<td>D</td>
<td>Painter</td>
<td>Kolkata</td>
</tr>
<tr>
<td>E</td>
<td>Lawyer</td>
<td>Mumbai</td>
</tr>
<tr>
<td>F</td>
<td>Doctor</td>
<td>Bangalore</td>
</tr>
</tbody>
</table>

9. F is the doctor.  Choice (4)
10. The painter is from Kolkata.  Choice (3)
11. E is the lawyer.  Choice (2)

Solutions for question 12 to 15:
The given information is as follows.

<table>
<thead>
<tr>
<th>Student</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Phy. Sc / Eng</td>
</tr>
<tr>
<td>C</td>
<td>Bio / Maths</td>
</tr>
<tr>
<td>D</td>
<td>Eng / Bio</td>
</tr>
<tr>
<td>E/F</td>
<td>Hist</td>
</tr>
<tr>
<td>F/B</td>
<td>Geog</td>
</tr>
<tr>
<td>E</td>
<td>Maths / Ph. Sc</td>
</tr>
</tbody>
</table>

From the above table it is clear that E cannot get the highest marks in History.
∴ E got the highest marks in History.
12. F got the highest marks in History.  Choice (3)
13. B got the highest marks in Geography.  Choice (3)
14. C could be the person who got the highest marks in Biology.  Choice (1)
15. If C got the highest marks in Maths, then E got the highest marks in Physical Science.  Choice (2)

Solution for questions 16 to 18:
The given information is as follows.

<table>
<thead>
<tr>
<th>House</th>
<th>Car</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ekta</td>
<td>White</td>
</tr>
<tr>
<td>Chetan</td>
<td>Not Yellow Pink</td>
</tr>
<tr>
<td>Fahrook</td>
<td>Not pink Red</td>
</tr>
<tr>
<td>Dhiren</td>
<td>Yellow</td>
</tr>
</tbody>
</table>

From the above table it is clear that Amol and Bhaskar has red and pink coloured house in any order.
White coloured car must belong to the person who has a pink coloured house.
So, Ekta has a blue coloured car.
Fahrook has yellow coloured house.
Dhiren and Chetan has blue and green coloured houses in any order.
The final distribution table is as follows.

<table>
<thead>
<tr>
<th>Name</th>
<th>House</th>
<th>Car</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amol / Bhaskar</td>
<td>Red Green</td>
<td></td>
</tr>
<tr>
<td>Ekta</td>
<td>White Blue Pink</td>
<td></td>
</tr>
<tr>
<td>Chetan</td>
<td>Blue / Green Pink</td>
<td></td>
</tr>
<tr>
<td>Amol / Bhaskar</td>
<td>Pink White</td>
<td></td>
</tr>
<tr>
<td>Farookh</td>
<td>Yellow Red</td>
<td></td>
</tr>
<tr>
<td>Dhiren</td>
<td>Blue / Green yellow</td>
<td></td>
</tr>
</tbody>
</table>

16. Ekta has blue car.  Choice (3)
17. Farookh has yellow house.  Choice (2)
18. Bhaskar’s house is either pink or red in colour.  Choice (4)

Solutions for questions 19 to 21:
The given information is as follows.

<table>
<thead>
<tr>
<th>Asian Countries</th>
<th>Chi</th>
<th>Jap</th>
<th>Mal</th>
<th>Eng</th>
<th>Aus</th>
<th>Ger</th>
<th>Pol</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>B</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>C</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>D</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>E</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

From the above table,
F is from Germany and G is from England.
⇒ C is from Australia and E is from Poland.
∴ B and D are from Japan and Malaysia in any order.
Hence, the final arrangement is as follows.

<table>
<thead>
<tr>
<th>Chi</th>
<th>Jap</th>
<th>Mal</th>
<th>Eng</th>
<th>Aus</th>
<th>Ger</th>
<th>Pol</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>x</td>
<td>x</td>
<td>X</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>B</td>
<td>X</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>C</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>D</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>E</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>F</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>G</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

19. F is from Germany.  Choice (3)
20. Either B or D is from Malaysia.  Choice (4)
21. G is from England.  Choice (1)

Solutions for questions 22 to 24:
From (i) and (ii) A is husband of P or Q
The colour of the dress of R and S are violet and blue.
From (iii) A is the husband of P
B and Q are wearing green dress.
From (iv) C is the husband of S, who were wearing violet dress.
E is husband of F who were wearing blue dress.
The couples and their dresses are as follow

<table>
<thead>
<tr>
<th>Couples</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>P Red</td>
</tr>
<tr>
<td>B</td>
<td>Q Green</td>
</tr>
<tr>
<td>C</td>
<td>S Violet</td>
</tr>
<tr>
<td>D</td>
<td>T Orange</td>
</tr>
<tr>
<td>E</td>
<td>R Blue</td>
</tr>
</tbody>
</table>

22. B and Q wears green dress.  Choice (3)
23. A is the husband of P.  Choice (3)
24. S is the wife of C.  Choice (3)

Solutions for questions 25 to 27:
From (i) and (ii), T and U are from the same country and P and R from different country.
∴ Q and S are from the same country.
Similarly, for the colours, 
The persons wearing blue and black coloured 
costumes are from the same country. 
The persons wearing green and yellow coloured 
costumes are from different countries. 
So the persons wearing red and orange coloured 
costumes are from the same country.

From (iii) and (iv), 
Q is wearing green coloured dress. As U is wearing 
blue coloured dress, thus T and R are from 
India and wearing yellow and black dresses in 
any order. P is wearing orange coloured dress. S 
is wearing red coloured dress.
The final distribution will be as follows:

<table>
<thead>
<tr>
<th>Person</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Yellow / black</td>
</tr>
<tr>
<td>U</td>
<td>Blue</td>
</tr>
<tr>
<td>R</td>
<td>Yellow / black</td>
</tr>
<tr>
<td>Q</td>
<td>Green</td>
</tr>
<tr>
<td>Pak</td>
<td>S</td>
</tr>
<tr>
<td>P</td>
<td>Orange</td>
</tr>
</tbody>
</table>

25. S is wearing red costume. Choice (2)
26. P, Q and S are the players from Pakistan. Choice (3)
27. Either R or S is wearing yellow costume. Choice (4)

Solutions for questions 28 to 30:
From (i), either $D_1$ or $D_2$ are the director for 
movies $M_1$ and $M_2$, and either $D_3$ or $D_4$ are the 
directors of the movies $M_3$ and $M_4$.
From (iv), $M_4$ is directed by $D_4$, which impress 
that $M_1$ is directed by $D_1$.
From (ii) and (iii) 
Kavita and sonu worked together in $M_2$, and for 
$D_3$ Kailash is the male singer, which means that 
$M_3$ is directed by $D_3$.
Now the singers for $M_3$ is Kavita and Kailash 
and for $M_4$ are Shreya and Sonu.

<table>
<thead>
<tr>
<th>Movie</th>
<th>Director</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M_1$</td>
<td>$D_1$</td>
<td>Sonu</td>
<td>Shreya</td>
</tr>
<tr>
<td>$M_2$</td>
<td>$D_2$</td>
<td>Sonu</td>
<td>Kavita</td>
</tr>
<tr>
<td>$M_3$</td>
<td>$D_2$</td>
<td>Kailash</td>
<td>Kavita</td>
</tr>
<tr>
<td>$M_4$</td>
<td>$D_4$</td>
<td>Kailash</td>
<td>Shreya</td>
</tr>
</tbody>
</table>

28. $D_1$ is the director of $M_1$. Choice (3)
29. $M_2$ is directed by $D_2$. Choice (2)
30. Kailash and Kavitha work together in $M_3$. Choice (2)

COMPARISON

Practice Exercise

Solutions for questions 1 to 3:
From (i), $B > C$
From (ii), $A > G > F$
From (iii), $C$ is the second tallest.
From (iv), $E$ is not the third tallest.
From (v), $F > D$
From (ii) and (v)

Solutions for questions 4 to 6:
Let the number of chocolates with each of them 
be denoted by the first letter of his name.
From (ii), $C < S < R$.
From (iii), $S > N$
From (iv), $R – C = K – R$ 
As $R – C$ is atleast two, and no number has a 
difference of three with more than one of the given 
numbers,
$R – C = 2$
$K – R = 2$
From (ii) and (iii) 
$N < C < S < R$
As $K – R = 2$, A must be greater than $R$.
∴ The final arrangement will be 
$N < C < S < R < A < K$

4. Ranjit has 6 chocolates. Choice (2)
5. Sumit has 5 chocolates. Choice (1)
6. The difference is $8 – 3 = 5$. Choice (4)

Solutions for questions 7 to 9:
The sum of the ranks can be atleast three and at 
most seven.
From (ii), In Physics either Bunny or Sunny got 
the fourth rank.
As it is given that Bunny got the fourth rank in 
chemistry [from (i)], ∴ Sunny got the fourth rank in physics.
Also, as the sum of the ranks of Bunny is not the highest (that is, 7).
Bunny’s rank in physics can be either 1 or 2. But from (ii), Akil got a better rank than Bunny in physics.
∴ In Physics Akil got the first rank and Bunny 
got the second rank.
∴ In Chemistry, Nikil must get the first rank and Akil 
must get the second rank.
The ranks are represented in the following ta-
ble:

<table>
<thead>
<tr>
<th>Rank</th>
<th>Physics</th>
<th>Chemistry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akil</td>
<td>Nikil</td>
</tr>
<tr>
<td>2</td>
<td>Bunny</td>
<td>Akil</td>
</tr>
<tr>
<td>3</td>
<td>Nikil</td>
<td>Sunny</td>
</tr>
<tr>
<td>4</td>
<td>Sunny</td>
<td>Bunny</td>
</tr>
</tbody>
</table>

7. Nikil got the first rank in Chemistry. Choice (2)
8. Akil got the second rank in Chemistry. Choice (1)
9. Sunny got the third rank in Chemistry. Choice (3)

Solutions for questions 10 to 12:
From (i), $P < R < S$.
From (ii), $S$ is the third eldest.
From (iii), $Q$ is elder than fourth youngest [that 
is, fourth eldest]
∴ $Q$ is the second eldest.
From (iv), $T$ is the second youngest and $U$ is the 
youngest.
∴ $V$ must be the eldest.
Also, $R$ is the fourth eldest and $P$ is the fifth el-
dest.
∴ We have, $U < T < P < R < S < Q < V$.
10. $V$ is the oldest. Choice (4)
11. $P$ is the third youngest. Choice (2)
12. $R$ is the fourth oldest. Choice (1)

Solutions for questions 13 to 15:
From (i) and (iv), Anand got a better rank than 
atleast three persons that is, Anand’s rank can be 1 or 2 or 3.
From (iii) Charan’s rank can be 6 or 5 or 4.
If Anand’s rank is 3 then Charan’s rank must be 
4, in this case, condition (v) is violated.
∴ Anand’s rank is either 1 or 2.
Here we have three possibilities:

(a)  $1 2 3 4 5$
   | Gopal | Anand | Deepti | Hriday/ | Charan |

(b)  $1 2 3 4 5$
   | Brijesh/ | Harish |

(c)  $1 2 3 4 5$
   | Anand | Gopal | Hriday |

Solutions for questions 16 to 18:
Let the marks scored by each person be denoted 
by the first letter of his name.
From (ii), $E > C > D$. From (iv), $G > H$ From 
(v) $D > G$
Combining the above, we get.
\[ E > C > D > G > H \]
from (iii), \[ 2 3 4 5 6 7 8 \]
As H did not get the lowest score, either A or B got the lowest score.
From (i) and above results, A got the first rank and B got the eight rank.
\[ A > E > C > D > F > G > H > B \]
16. Dayanand got the fourth highest score. Choice (4)
17. Goutam got the third lowest score. Choice (3)
18. Anurag got the highest score. Choice (2)

**Solutions for questions 19 to 21:**
Each row or column must be filled with different numbers among 75, 80, 85 and 90. From (iv), Either C or D got 90 marks in Chemistry. From (ii), and above, D got 90 marks in Chemistry.
Now from (iii), C got 75 marks in Physics. Hence B can not get 75 marks in Physics and hence from (iii), B got 75 marks Biology. Also D can get 75 marks only in Maths.
Now, As C got 85 marks in Biology, D can not get 85 marks in Biology. Hence, D got 80 marks in Biology and 85 marks in Physics. Now, A can get 90 marks in Biology. Now A can not get 90 marks in Physics. So, B gets 90 marks in Physics, which implies A got 80 marks in Physics. Also as B, C and D got 75 marks each, A can get 75 marks in Chemistry only. So A gets 85 marks in Maths. In the same way, B gets 85 marks in Chemistry and 80 marks in Maths and C gets 90 marks in Maths and 80 marks in Chemistry.
The final table will be as follows:

<table>
<thead>
<tr>
<th></th>
<th>Maths</th>
<th>Physics</th>
<th>Chemistry</th>
<th>Biology</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>85</td>
<td>80</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>B</td>
<td>80</td>
<td>90</td>
<td>85</td>
<td>75</td>
</tr>
<tr>
<td>C</td>
<td>90</td>
<td>75</td>
<td>80</td>
<td>85</td>
</tr>
<tr>
<td>D</td>
<td>75</td>
<td>85</td>
<td>90</td>
<td>80</td>
</tr>
</tbody>
</table>

20. C got 80 marks in Chemistry. Choice (2)
21. Only one person (that is C) got more marks than A in Maths. Choice (3)

**Solutions for questions 22 to 25:**

From (ii) and (v) we get,
Now from (i), (iv) and (vi), The door decorated by diamond which has yellow coloured curtain can be the costliest or, the door decorated by Pearl can be the door of the least cost.
If the Pearl decorated door is of least cost then the door decorated by gold must be the third costliest. But it violates condition (vi).
\[ \therefore \] The diamond decorated door is the costliest. As platinum is the second costliest. It can be only the door to the right of the door decorated by silver.
\[ \therefore \] Door decorated by gold must be the third costliest.
Now combining with (iii) we get the final arrangement as follows.

<table>
<thead>
<tr>
<th>Colour of curtain</th>
<th>Decorated by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Pearl</td>
</tr>
<tr>
<td>Indigo</td>
<td>Topaz</td>
</tr>
<tr>
<td>Silver</td>
<td>Platinum</td>
</tr>
<tr>
<td>Green</td>
<td>Blue / Violet</td>
</tr>
</tbody>
</table>

22. Fourth costliest door is decorated by Pearl. Choice (3)
23. The colour of the curtain of the door decorated by Topaz can be blue or violet. Choice (4)
24. The colour of the curtain on the costliest door is yellow. Choice (3)
25. Diamond decorated door and green curtain door are adjacent to each other. Choice (1)

**Solutions for questions 26 to 30:**
The given conditions are that P, Q, R and S are four men. In terms of weight, we know that P is heavier than S and R is heavier than Q but is lighter than S, which means that R is lighter than S.
So, the order of weight is as follows.
Order of weight
\[ 1 \ 2 \ 3 \ 4 \ P \ S \ R \ Q \]
In terms of poverty, it is given that Q is richer than S and Q is the richest of all, whereas R is richer than P.
So, the order of poverty is as follows.
Order of Poverty
\[ 1 \ 2 \ 3 \ 4 \]

**SELECTIONS**

**PRACTICE EXERCISE**

**Solutions for questions 1 to 3:**
Let each person be donated by the first letter of his name.

1. If D is selected, then some of the possibilities are: DEF CDE ABD
   \[ \therefore \] Any one can be selected. Choice (4)
2. If A is selected, then C must not be selected. [from (i)]
::: Now using condition (ii) the possibilities are:
ABE
ABF
ADE
ADF
AEF
::: There are 5 possibilities. Choice (1)
3. As B is selected, then C must not be selected.
If D is selected, then E or F must be selected.
::: If A is selected, then D must not be selected.
::: To select a team of 3. E or F must be selected.
::: From (ii), only one of A and B is with them.
::: The possibilities are: M, N, K/L, A/B and L/K, C, B/A.
::: There are four possibilities. Choice (1)

**Solutions for questions 7 to 11:**

7. If P and Q are selected, then S or T may also be selected from the boys. So the boys may be PQS or PQT. If PQS form the team, then the team should be PQSUW. If PQT are the boys, the teams may be PQTUV and PQTUW. Choice (2)
8. If P and Q are selected, then S or T may also be selected from the boys. So the boys may be PQS or PQT. If PQS form the team, then the team should be PQSUW. If PQT are the boys, the teams may be PQTUV and PQTUW. Choice (2)
9. If P and S are the boys selected, then R cannot be selected. So the boys can be P and S along with Q or T. That is PSQ or PST or PSQT (three ways of selection). Then the girls U or W can be selected as V cannot go with S. So the teams may be PSQUW, PSTUW, PSQT with U or W. Hence, altogether there are four ways of selection. Choice (4)
10. If four boys can be selected as PQRS, PQST, PQRST, QRST but P and R cannot be together, then PQST or QRST is possible. In either case V cannot be selected as S and V do not go together. Choice (2)
11. Among the choices PQRVW cannot go as a team, as P and R cannot be together, whereas the other given teams can be selected. Choice (4)

**Solutions for questions 12 to 14:**

12. K and C are in the same team.
::: L must be in the other team. [from (ii)]
::: Only one of A and B is in the same team as L.
::: Using other conditions the possibilities are:
(a) K, C, A, M and L, B, N
(b) K, C, B, M and L, A, N
(c) K, C, A and L, M, N, B
(d) K, C, B and L, M, N, A
(e) K, C, B, N and L, M, A Choice (4)
13. M and B are not in the same team.
From (ii), either K or L is with B.
Now, if A is with B, then C and N must be with M, which violates (iv).
::: A is with M.
Now, at least one of C and N is with B.
::: The teams are: B, K/L, C, N and M, L/K, A
B, K/L, C and M, L/K, A, N
B, K/L, N and M, L/K, A, C
::: There are six possibilities. Choice (4)
14. From (iii), M and N are in the same team.
One of K and L is with them.
::: C cannot be with them as it violates (iv).

::: From (ii), only one of A and B is with them.
::: The possibilities are: M, N, K/L, A/B and L/K, C, B/A.
::: There are four possibilities. Choice (1)

**Solutions for questions 15 to 19:**

Let us write the data in short.
2 boys = A and B
2 girls = C and D
2 men = P and Q
2 women = R and S
2 cars = Black and White

Conditions are as follows:
(i) 2 children and 2 adults must be there in one car.
(ii) A # Q, that is A and Q cannot be in one car.
(iii) P # D, that is P and D cannot be in one car.
(iv) R # S, that is R and S cannot be in one car.
(v) 2 males + 2 females = Each car, that is 2 males and 2 females must be there in each car.

It is clear that 1 boy, 1 girl, 1 man and 1 woman must be there in each car. As A and Q cannot be in one car, it can be concluded that A and P must be in one car. As P and D cannot be together, P and C must be in one car. So B, Q and D must be in the other car, whereas R and S can be in any of the cars. So, the distribution is as follows.

<table>
<thead>
<tr>
<th>Cars</th>
<th>Black Or White</th>
<th>White Or Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>A P C R or A P C S</td>
<td>B Q D S or B Q D R</td>
<td></td>
</tr>
</tbody>
</table>

Now let us solve the questions.

15. If P and A go in one car, P is a man and A is a boy.
So, they should have two females in their team – one woman and one girl. They can be R or S and C or D. So any of RD, RC, SC, SD can be with them. Choice (2)
16. If Q and R go together, the car must have a boy and a girl in it. D cannot go with P. So, she must go with Q and R. The boy may be A or B, but A and Q do not go together. So Q, R, D and B must go in one car. Choice (3)
17. The car which is carrying D cannot carry P, hence P must be in the other car. Four members must be in each car of which two children and two adults (two males and two females) must be there. So, the selection may be as follows.

<table>
<thead>
<tr>
<th>Car 1</th>
<th>Car 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2Children + 2Adult</td>
<td>2Children + 2Adult</td>
</tr>
<tr>
<td>C A D B</td>
<td>P Q</td>
</tr>
</tbody>
</table>
R and S can be in any car. But D cannot go with P. So A, C, P cannot go with D.

Choice (1)

18. P, S, A and C is a correct combination. Choice (1) is not true, as it states that PSAC is not the correct combination but Q, R, B, D is correct. Hence choice (2) is also not true for the same reason as that of choice (1).

P, Q, A, C cannot go in one car. But P, S, A, C can go in one car. Choice (4)

19. P, S, A and C, Q, R, B, D are correct, as P is a man.

A is a boy.

S is a woman.

C is a girl.

Q, R, B, D is also correct, but all others are incorrect combinations. Choice (2)

Solutions for questions 20 to 22:
Let each person be denoted by the first letter of his name.
From (iii) at least one of A, E, F and D must not be selected.
From (iv), at least one of C and H must not be selected.
∴ At least one of B and G must be selected.
From (v) and above results, exactly one of B and G must be selected.
∴ Exactly one of A, E, F and D, and exactly one of C and H must not be selected.
∴ From (iii) and above results A or E is not selected.
∴ F and D are selected.
If B is selected then we have the following possibilities: A/E, F, D, B, H
If G is selected, then we have the following possibilities: A/E, F, D, G, C/H

20. Fattu and David must always be selected. Choice (3)

21. If Chandu is selected, then Girish, Fattu and David must be selected. Choice (4)

22. If Bharath is selected, then Harish, David and Fattu must be selected. Choice (1)

Solutions for questions 23 to 27:
Three persons Ajay, Bony and Chetan buy two each out of 6 items P, Q, R, S, T and U. If Ajay buys R, Bony does not buy P or S or both. If Bony buys Q, Chetan does not buy U or T or both.

23. If Ajay buys R and T, then Bony cannot buy P or S or both. So Bony buys Q and U.

Choice (2)

24. If Bony buys Q and S, then Chetan cannot buy T and U. So, Ajay must buy T and U, as each one has to buy two each. Choice (2)

25. If Chetan bought P and S, Ajay and Bony have to choose any two each of Q, R, T, U. Ajay may have any pair of QR, QT, QU, RT, RU, or TU. So, we cannot say anything about their purchases as all the choices 1, 2, 3 be true always. Choice (4)

26. If Ajay buys P and Bony buys Q, then Chetan buys neither T nor U. So, Chetan can buy the pair of R and S only. Choice (1)

27. Let us validate each choice.
Choice 1: If Ajay buys R, Bony cannot buy P and S but he can buy Q or T or U. So it is not necessary to buy Q.
Choice 2: If Chetan buys T or U, that means Bony cannot buy Q. So this is also false.
Choice 3: Ajay bought R, then it is not necessary for Bony to buy T as explained in Choice 1.
Choice (4). If Ajay buys R and Bony buys Q, then Chetan has to buy only P and S, as he cannot buy T and U. Chetan has to buy P and S.

Choice (4)

Solutions for questions 28 to 30:
28. If Kareem is selected, Puja cannot be selected, then Tinku and Shalu also cannot be selected. That leaves only Ronak and Umesh. Hence Ronak and Umesh must be selected.

Choice (3)

29. It is given that P may go to A or B and must be seen, whereas S goes to only A, and T goes to only B. It is clear from the data that O has gone back and neither (M and R), nor (U and Q) go together. If Q, R, S go to one director and meet him, the other director sees any two of M, N, U and T along with P, who must be seen. M does not go with R and U, so PNT or PUT are seen. Only B can see them as S goes to A. So B – PNT or PUT is correct.

Choice (1)

30. Choice (1): If B is selected, then A and E cannot be selected. The other 3 must be from CDFG but D and F have to be together so the team will be B, D, F and any one of C or G. So D must be selected in the team, hence this choice is definitely TRUE.
Choice (2): If A is selected B cannot be chosen. The other 3 members can be any 3 from C, D, E, F and G. This choice is not definitely TRUE.
Choice (3): If B is selected, then A and E are ruled out. The other 3 can be chosen from C, D, F and G. Of this D and F must be chosen with the last member being either C or G. This choice is not definitely TRUE.
Choice (4): C need not be chosen on every team. If we select DFG, this is a valid team without C.

Choice (4)

DEDUCTIONS

Practice Exercise

Solutions for questions 1 to 5:
1. As the middle term is not distributed even once in the given premises, no conclusion can be drawn. Choice (4)

2. As one of the premises is universal and affirmative, the other one is particular and affirmative the conclusion must be particular.
Hence, ‘some insects are dogs’ and ‘some dogs are insects’ are the only two conclusions that can be drawn from the given premises. Moreover a negative conclusion cannot be drawn from affirmative premises. Choice (4)

3. As both the premises are universal affirmative, the conclusions that can be drawn are universal affirmative and particular affirmative.
Hence, ‘some stones are papers’ and ‘all stones are papers’ are the only two conclusions that can be drawn from the given premises. Choice (4)

4. As both the premises are particular, conclusion cannot be drawn. Choice (4)

5. As one of the premises is negative, the conclusion must be negative.
Hence, ‘no bike is bus’, ‘no bus is bike’, ‘some bikes are not buses’ and ‘some buses one not bikes’ are the conclusions those can be drawn from the given premises. Choice (3)

Solutions for questions 6 to 15:
6. Here both the statements are negative. So no conclusion can be drawn. Choice (4)

7. The middle term B is not distributed, hence no conclusion can be drawn. Choice (4)

8. Here there are three terms. The middle term ‘flowers’ is distributed. As one of the premises is particular and negative, the conclusion must be particular and negative.
∴ The conclusion is ‘some beautiful are not ugly’. Choice (4)

9. There are three terms but the middle term “colourful” is not distributed, hence no conclusion can be drawn. Choice (4)

10. There are four terms, hence no conclusion can be drawn. Choice (4)

11. Both the statements are particular, hence no conclusion can be drawn. Choice (4)
12. Here there are three terms and the middle term A as well as particular is distributed. As both the premises are affirmative the possible conclusions are
(i) Some Bs are Cs. (ii) Some Cs are Bs. Choice (2)
13. Both the statements are negative, hence no conclusion can be drawn. Choice (4)
14. Any light is bright ⇒ All lights are bright. Here there are three terms. The middle term ‘light’ is distributed. One of the premises is particular, hence the conclusion must be particular.
∴ The possible conclusions are
(i) Many brights are bulbs.
(ii) Many bulbs are bright. Choice (4)
15. There are three terms. The middle term “intelligent” is distributed. One of the premises is particular and other one is negative, hence the conclusion must be particular and negative.
∴ The conclusion is ‘some managers are not devils’. Choice (1)

Solutions for questions 16 to 20:
16. From the first and the second statements, it can be concluded that ‘some camels are not cat’s’. Using this conclusion with the third statement it can be concluded that ‘some dogs are not cats’. Choice (2)
17. From the second and the third statements, the conclusion is ‘some teachers are not doctors’. Using this conclusion with the first statement, it can be concluded that ‘some teachers are not lawyers’. Choice (3)
18. As two of the given premises are negative, no conclusion can be drawn. Choice (4)
19. From the first and the third statements, it can be concluded that, ‘some pens are not pencils’. Using this conclusion with the second statement, it can be concluded that ‘some pens are not scales’. Choice (4)
20. Since two of the given premises are particular, conclusion cannot be derived. Choice (4)

Solutions for questions 21 to 25:
21. (A) It does not violate any condition. Choice (1)
22. (A) It does not violate any rule. Choice (1)
23. (A) The term ‘intelligent’ which is not distributed in the premises is distributed in the conclusion. Hence not a valid set. Choice (3)

24. (A) Here both the premises are particular, hence is not a valid set. Choice (4)
(B) Both the premises are negative, hence is not a valid set. Choice (4)
25. (A) It does not violate any condition. Choice (1)
(B) The middle term ‘fly’ is not distributed. Choice (2)

Solutions for questions 26 to 30:
26. As one of the premises is particular and the other one is negative, the conclusion must be particular negative.

As the term ‘buses’ is not distributed in the premise, it should not be distributed in the conclusion. Hence, ‘some buses are not scooters’ is the only conclusion that can be drawn from the given premises.
27. As one of the premises is particular, the conclusion must be a particular. As both the premises are affirmative the conclusion cannot be negative. Hence, ‘some televisions are computers’ ‘some computers are televisions’ are the two conclusions that can be drawn from the given premises.
28. As both the premises are negative, conclusion cannot be drawn.
29. In order to draw a conclusion we need to have exactly three different terms but there are four terms in these two premises. Hence, conclusion cannot be drawn.
30. As one of the premises is particular conclusion must be particular. As both the premises are affirmative the conclusion cannot be negative. Hence, ‘some pencils are erasers’ and ‘some erasers are pencils’ are the two conclusions that can be drawn from the given premises.

STATEMENTS AND ASSUMPTIONS

Practice Exercise

Solutions for questions 1 to 5:
1. Unless the University assumes that some people want to do Hotel Management course, the advertisement would not have been given. The advertisement is given with an intention of attracting the people to the University also. Hence, both I and II follow. Choice (4)
2. The statement assumes existence of the subject and the other hypothetical things referred to. Hence, both I and II follow. Choice (4)
3. When a notice is given, it is assumed that there is a necessity to give such notice. Hence, II follows. If it is assumed that the customers do not abide by the notice, then the notice would not have been issued. Hence, I follow. Choice (4)
4. The word ‘pity’ indicates that the statement expects the government to take charge of the situation. Hence, I follows. The statement has no reference to the feelings of the government towards the affected areas. Hence, II does not follow. Choice (1)
5. The word ‘Despite’ indicates that the statement assumes that an icon in Bollywood will be affected by the trapping of tinsel town. Hence, I follows. From the statement II, it appears that becoming an icon occurs before getting affected. Hence, II does not follow. Choice (1)

Solutions for questions 6 to 10:
6. The author of the statement is giving information about the grades of the listeners. This implies that the listeners are interested to know such information. Hence, (I) is an assumption. (II) is a generalisation which cannot be assumed. Choice (1)
7. The nuclear-haves [countries possessing nuclear weapons] realised certain facts after the Indian explosions. These explosions also gave Indians a sense of pride. This does not imply that the nuclear-haves would never have realised the facts otherwise. The meaning of the phrase “sense of pride” used in the statement is different from the meaning of “proud people” used in assumption (I). Neither (I) nor (II) is an assumption. Choice (3)
8. In this statement, the author concludes that the glittering thing is gold. His reason for this conclusion is that “It glitters” This points to the fact that the author of this statement opines that only gold glitters and no other thing glitters. This opinion of the author can also be said to be his assumption. Hence Only (I) is an assumption. (II) is not an assumption as it contradicts the author’s view. Choice (1)
9. From the statement, we cannot say whether Bushkashi is a sport or not. Hence, (II) is not an assumption. “Everybody loves watching Bushkashi.” From this we cannot say that Bushkashi is the only thing that is liked by everybody, hence I does not follow. Choice (3)
10. The fact that this suggestion is given means that the book could be useful for the exam. Hence, assumption I follows. The person may be preparing for the exam or he may be the publisher of the book who makes this statement to garner publicity. Hence, (II) does not follow. Choice (1)
Solutions for questions 11 to 15:

11. Choice (1): It is stated that Veerappan is able to strike at will. It is also stated that the STF personnel were led to believe that Veerappan had magical powers. It is because that STF people are unable to assess as to when he would attack. Hence, (1) is a conclusion.
Choice (2): As the STF personnel believed that Veerappan has magical powers, it is the assumption of the STF personnel, that one can become invisible with magical powers.
Hence, (2) is an assumption.
Choice (3): It is stated that officers are afraid of posting in STF and that STF personnel were lead to believe that Veerappan is invisible. From all these, (3) can be inferred.
Choice (4): The statement has no reference to war tactics.
Hence, (4) is out of context.  Choice (2)

12. Choice (1): Though it is stated that the villagers are locking themselves indoors by 3 p.m. it is not explicitly stated at what time the dacoits are raiding the village. But from the given context it can be inferred that the dacoits raid the village after 3 p.m.
Hence, (1) is a conclusion.
Choice (2): As it is stated that they return from fields, it cannot definitely say that they are farmers, they can go to the field for different purposes.
Hence, (2) is not a conclusion.
Choice (3): It is said that the dacoits have raided the village frequently. From this it can be inferred that there is no proper police protection.
Hence, (3) is an inference.
Choice (4): As the villagers do not return before 3 p.m., so it is the assumption of the villagers that the dacoits do not raid before 3 p.m.  Choice (4)

13. Choice (1): As the Governor has requested the centre to dismiss the government, the statement is not true.
Choice (2): As the Governor requested for dismissal of the government as the law and order broke down, it is the assumption of the Governor.
Choice (3): As the governor requested the centre for dismissal, under the powers conferred upon it, (3) can be concluded.
Choice (4): From the given statement it is not explicitly mentioned that the centre has asked the Governor to confirm the breakdown of law and order situation in the state. Hence, (4) can be inferred.  Choice (2)

14. Choice (1): From the phrase “caught between the devil and the deep sea”, it can be concluded that country X does not want to antagonise either party.
Hence, (1) is a conclusion.
Choice (2): The statement does not give any clue, regarding the whereabouts of the don.
Hence, (2) is out of context.
Choice (3): As FBI has sought the help of country X, it is the assumption of FBI that country X can find out the whereabouts of the don.
Hence, (3) is an assumption.
Choice (4): As it is stated that the don is notorious, it can be inferred that he is involved in illegal activities. Hence, (4) is an inference.  Choice (3)

15. Choice (1): The passage has no reference to the British.
Hence, (1) is out of context.
Choice (2): As the Indians are using the McMahon line, it can be concluded that it accepts the border drawn by the colonial powers. Hence, (2) is a conclusion.
Choice (3): As the Chinese were not accepting the McMahon line, it can be inferred that it is not to the advantage of the Chinese.
Hence, (3) is an inference.  Choice (4)

Solutions for questions 16 to 20:

16. From the words ‘in the event of mid-air emergency’ I follows. The statement has no reference to the President. Hence, II does not follow. Since a helicopter was kept on high alert, III follows. Choice (3)

17. The statement refers to the Indian IT sector being taken by storm with the announcement by IBM. It could be that such a big investment is after a long time and not necessarily for the first time. Hence, I and II do not follow. There is no reference to the status of the company. Hence, III does not follow.  Choice (4)

18. The statement does not relate pioneers with the ability to give international standard flight training. Hence, I does not follow. From the statement, it cannot be found out what the people do not prefer. Hence, II does not follow. The first statement indicates ‘being pioneers’ as the reason for the ability to understand flying better. Hence, III follows.  Choice (4)

19. ‘Giving away the rights’ is called foolish. Hence, II follows. The reason for which the rights were given away is not mentioned in the statement. Hence, either I or III follow.  Choice (2)

20. There is no information in the statement to indicate that radio is not available to any one other than the common man. Hence, I does not follow. Statement II indicates that there was no programme broadcast on radio, which airs songs of listeners’ choice until 1980, Hence, II does not follow. The statement has no reference to various programmes that are broadcast on radio. Hence, III does not follow.  Choice (4)

Solutions for questions 21 to 25:

21. It is asserted that the quality of education is a reflection of the quality of teachers, but not vice versa.
As the passage advises an improvement in the training of teachers, it is assumed that there is scope for improvement. Hence (2) is an assumption.
The passage states that the quality of education in the determining factor. Hence, (3) can be concluded.
From the tone of the statement, it can be understood that there is a need to improve the economic and social sectors. Hence (4) is an inference.  Choice (2)

22. As the statement refers to higher incomes and the boom in the service sector, (1) can be inferred from the given statement.
As the statement equates higher earnings and young age of the consumers, to ability to purchase higher quality accessories, (2) is the implicit assumption.
The statement does not indicate when the boom began. Hence, (3) is out of the context.
As it is explicitly stated that earnings and the desire for superior quality goods has increased, it can be concluded that the purchasing power has increased.  Choice (2)

23. The word ‘decipherer’ in the statement indicate that the data in the hard disk is in a coded form. Hence, Choice (1) can be concluded from the given statement.
There is no information as to whether the experts belongs to the police department or not. Hence, choice (2) is out of context.
The police are trying to find out the contents of the hard disk. Hence, Choice (3) is the assumption.
From the passage nothing can be inferred about the activities of Broccoli. Hence, Choice (4) is out of context.  Choice (3)

24. The statement has no reference to the political aspect of the cabinet’s decision. Hence, Choice (1) is out of context.
As the cabinet has taken a decision to under the power conferred on it, it can be concluded.  Choice (2)
From the decision, the intention of the government can be inferred that it wants increase its tax revenue without burdening the lower income group. Hence choice (3) is an inference.

From the decision, it is clear that the cabinet is assuming that people in the income group of more than 5 lacks per annum can bear the tax burden. Hence, choice (4) is an assumption.

25. From the statement, it cannot be inferred, as to whether the rest of the book is going to hold the interest of the fans or not. Hence, choice (1) is out of context.

The fans may be very eager or it is possible that they are interested only in what happens to Harry Potter. As every fan wants to skip to the last page, it is more probable that they are eager. Hence, choice (2) is not a conclusion but it is an inference.

The reason why the book is the best one is not known from the statement. Hence, choice (3) is out of context.

As the readers plan to skip to the last page, to know what happens to Harry Potter, it is their assumption that the information will be available in the last page. Hence, choice (4) is an assumption. Choice (4)

STATMENTS AND CONCLUSIONS

Practice Exercise

Solutions for questions 1 to 15:

1. The statement tells us that a 14 year old convict in a bank robbery case had told the court, when he was being prosecuted, that he was inspired by movies on ‘Star Movies’ – a channel banned by the cable TV network. It also tells us that this is the latest incident of its kind, which means that more such offences have been committed by juveniles under the influence of movies. However, the statement does not tell us that all young criminals were inspired by Star Movies nor can we take this example and pass a judgement on all juveniles and any conclusion which does so would not be a valid one. However, we can say that a few juveniles are motivated or influenced by these movies which is exactly what conclusion I says and hence it follows. Conclusion II generalises all young minds as being adventurous which is not correct, as isolated happenings within in a group cannot be used to categorise a particular group, hence it does not follow. Only conclusion I follows. Choice (1)

2. The statement tells us that magazines publish special supplements whenever there are special events/celebrations and that readers should reserve their copies in advance. This tells us that these supplements have a huge demand in the market which could be ascribed to their covering the event very exhaustively. This is exactly what conclusions I and II state, hence both follow. Choice (4)

3. The statement tells us that India has a number of collaborations with Germany and this has resulted in our projects receiving financial as well as technical know-how. The statement does not tell us the fields in which we do have collaborations and neither does it tell us that collaborations exist in every field. What we can however deduce is that a collaboration leads to an exchange of technical know-how and extension of financial aid. But we have to be careful as to not generalise this trend as the statement talks only of the case of Indian and German collaborations but not of collaborations everywhere in the world. Thus, we can say that some collaborations lead to the exchange of technical know-how and extension of financial aid. Based on this, we can eliminate conclusion I on account of the words ‘every field’. However, conclusion II states exactly what we have discussed above, hence it follows. Choice (2)

4. The statement tells us that a top Hollywood actor of Indian origin has given up his profession and has come back to act in Indian films. This statement, however, does not give us any clue as to the reason for which this actor has left Hollywood and as such any conjecture on this aspect would not be valid. Conclusion I very emphatically states that ‘love for the country and his desire to work in Indian movies’ made him come back to India. However, the given statement gives no proof for this hypothesis, hence this is not a definite conclusion. Conclusion II tells us that he was ‘facing a problem’ in Hollywood, which also cannot be concluded from the given statement. Hence, both I and II do not follow. Choice (3)

5. The statement gives us certain facts and figures about a particular area. It states that 40 per cent of the women are in government service and 70 per cent of the overall population is in government service. From this we cannot infer anything about the remaining 60 per cent of the women of that area. Conclusion I states that 60 per cent of the women are employed in the private sector which is not supported by the given statement, as it could be possible that these women are not employed at all. Hence I does not follow. We can discount conclusion II by taking the following example. Let us assume that this area has 100 male and 100 female members. Of this 40 women are employed in the government service and 100 males are all employed (as 70 per cent of the overall population is employed). From this we cannot know whether there are any couples in this area or not and hence concluding that 40 per cent of the couples are married is not possible. Thus, II does not follow. Choice (3)

6. The statement has no reference to weight lifting. Hence, I does not follow. The words ‘there ought to be’ indicate that at present there is no such law. Hence, II follows. Choice (2)

7. It is a general statement made by Brian Lara and so it does not necessarily imply that he plays on Saturdays and Sundays. Hence, I does not follow. From his statement, it can be concluded that, he is aware of the difficulties of playing on Saturdays and Sundays. Hence II follows. Choice (2)

8. The statement does not indicate whether there is any other reason that can cause erosion of ethnic culture. Hence, neither I nor II follows. Choice (3)

9. From the statement it is clear that the number of districts in the country is more than 602. The statement is not clear whether there are more states in the country than that indicated in the statement. Hence, I does not follow. Hence, neither I nor II follows. Choice (3)

10. The words ‘fate decided otherwise’ indicate that Sabita did not pursue the profession that her parents wanted her to. Hence, I follows. The statement does not reflect Sabita’s opinion. Hence, II does not follow. Choice (1)

11. The statement tells us that USA is helping Pakistan build up a massive military. This means that USA is an ally of Pakistan and we also could infer that USA, in terms of military, is much stronger than Pakistan. Students should be very cautious here as to not bring in their general awareness and relate this aspect to India, as the passage does not mention India in any way, nor does it explicitly state the reason as to why Pakistan intends to build up its military. Hence, any reason given for the same would be pure conjecture and not supported by evidence from the passage. Conclusion I is rejected.
12. The statement tells us that in the past, pigeons were used to send mail and connects it with present day Orissa, where it is still being used by the police department in some areas. This could be because those areas are not easily accessible to the postal department, or because of the remoteness of the area, sending mails through pigeons is more convenient. It could also be that the police department finds pigeon mail more safe and secure when compared to other ways of sending mail. All in all we can conclude that pigeon mail is still being used because it is superior in some aspect to other ways of sending mail. This is exactly what II states, hence it follows. Just because pigeons are being used in some areas, we cannot conclude that the postal department has not made progress in the last century. Hence I does not follow.
Choice (2)

13. The statement tells us that all patients having high blood pressure were found to be having some worry or the other. At first glance it appears that having high Blood Pressure is connected to worry. However, on closer inspection we can see that there is no definitive evidence, medical or otherwise, to show that worry causes high Blood Pressure or vice-versa in the given statement. It is possible that this link is purely coincidental, hence any conclusion which shows a definitive link between the two is to be avoided. Conclusion I follows on account of the word 'may' which links the two terms 'worry' and 'blood pressure'. Conclusion II, which is the converse of I, also follows on account of the word 'may not'. Hence, both conclusions I and II follow.
Choice (4)

14. The given statement tells us that 80 per cent of the employees of X Ltd earn more than Rs 5000/- or conversely less than 100 per cent of the supervisors earn more than Rs 5000/-. Hence, I is contradictory and II is not certain. Hence, neither I and II follows. Choice (3)

15. The statement is a rather philosophical one which states that the world is neither good nor bad and that each person interprets the world in his/her own way. This basically means that every person perceives this world in his/her terms. This implies that some people could perceive the good side of the world and some others would see the bad side. But we cannot generalise and say that all people find the world good or that all find it bad. The objection in the above case is to the use of the word 'all' which would mean a sweeping generalisation which is something that is not supported by the given statement. However, in this case conclusions I and II both follow on account of the word 'some'. Choice (4)

**Solutions for questions 16 to 20:**

16. The UGC while making such plans it made an assumption that, surely there will be takers for these courses. If UGC assumes that there will not be any takers, it would not have made such plans. Hence, Choice (1) is implicit.

As the UGC is extending scholarships to those who are enrolling to these courses, it can be concluded that the financial burden is going to be lesser. Hence, Choice (2) is the conclusion.

The passage has no reference either to the design of the course to its utility. Hence, Choice (3) is out of context.

From the act of the UGC it can be inferred that UGC want more girls take up professional courses. Hence, choice (4) can be inferred.
Choice (2)

17. The word ‘decipher’ in the statement indicate that the data in the hard disk is in a coded form. Hence, Choice (1) can be concluded from the given statement.

There is no information as to whether the experts belongs to the police department or not. Hence, choice (2) is out of context.

The police are trying to find out the contents of the hard disk. Hence, Choice (3) is the assumption. From the passage nothing can be inferred about the activities of Broccoli. Hence, Choice (4) is out of context.
Choice (1)

18. From the statement, it cannot be inferred, as to whether the rest of the book is going to hold the interest of the fans or not. Hence, choice (1) is out of context. The fans may be very eager or it is possible that they are interested only in what happens to Harry Potter. As every fan wants to skip to the last page, it is more probable that they are eager. Hence, choice (2) is not a conclusion but is an inference.

As the readers plan to skip to the last page, to know what happens to Harry Potter, it is their assumption that the information will be available in the last page. Hence, Choice (3) is an assumption.
Choice (3)

19. The statement has no reference to the efficiency of the British Police. Hence, Choice (1) is out of context.

From the statement it can be understood that the British Police have the authority. Hence, Choice (2) is an inference.

The police have released them with out changes. When there are no changes, it is assumed that they are not guilty. Hence, Choice (3) is an assumption.

As it is stated that there are no changes against the suspect, it can be concluded that the police could not find any evidence. Hence, Choice (4) is a conclusion.
Choice (4)

20. The statement has no reference to the political aspect of the cabinet’s decision. Hence, Choice (1) is out of context.

As the cabinet has taken a decision to under the power conferred on it, it can be concluded. Choice (2), is a conclusion.

From the decision, the intention of the government can be inferred that it wants increase its tax revenue without burdening the lower income group. Hence Choice (3) is an inference.

From the decision, it is clear that the cabinet is assuming that people in the income group of more than 5 lacks per annum can bear the tax burden. Hence, Choice (4) is an assumption.
Choice (2)

**Solutions for questions 21 to 25:**

21. Choice (1): It is stated that taking ‘Battle tanks’ on to Himalayas is almost impossible even today. From this we cannot say that there are definitely no tanks on the Himalayas. There can be some tanks also. So it cannot be properly concluded.
Choice (2): As the General has done what is unthinkable, in more hostile conditions, it is probable that he might have faced some opposition, or he has chalked out a plan where there is no opposition.
Hence, (2) is out of context.
Choice (3): The passage is not revealing who the enemy is.
Hence, (3) is out of context.
Choice (4)
22. Choice (1): As it is asked, to dance with caution, it can be concluded that the situation is such that dancing with the powerful is necessary. Hence, (1) is a conclusion.

Choice (2): The last sentence 'dance with caution' indicates that it is not necessary to throw ethics to the wind, if one wants to dance with the devil.

Choice (3): As the two events 'dancing with the powerful' and 'stepping on the devil's tail' is being talked about together, it can be understood that the author assumes that the powerful are devils. Hence, (3) is an assumption.

Choice (4): There is no reference to the powerless. Hence, (4) is out of context.

Choice (1)

23. Choice (1): Though it is stated that the villagers are locking themselves indoors by 3 p.m. it is not explicitly stated at what time the dacoits are raiding the village. But from the given context it can be inferred that the dacoits raided the village after 3 p.m.

Hence, (1) is a conclusion.

Choice (2): As it is stated that they return from fields, it cannot definitely say that they are farmers, they can go to the field for different purposes.

Hence, (2) is not a conclusion.

Choice (3): It is said that the dacoits have raided the village frequently. From this it can be inferred that there is no proper police protection.

Hence, (3) is an inference.

Choice (4): As the villagers do not return before 3 p.m., so it is the assumption of the villagers that the dacoits do not raid before 3 p.m.

Choice (1)


Hence, (1) is out of context.

Choice (2): As the Indians are using the McMahon line, it can be concluded that it accepts the border drawn by the colonial powers. Hence, (2) is a conclusion.

Choice (3): As the Chinese were not accepting the McMahon line, it can be inferred that it is not to the advantage of the Chinese.

Hence, (3) is an inference.

Choice (4): This statement contradicts the Indian stance in case of McMahon line.

Choice (2)

25. Choice (1): As the Governor has requested the centre to dismiss the government, the statement is not true.

Choice (2): As the Governor requested for dismissal of the government as the law and order broke down, it is the assumption of the Governor.

Choice (3): As the governor requested the centre for dismissal, under the powers conferred upon it, (3) can be concluded.

Choice (4): From the given statement it is not explicitly mentioned that the centre has asked the Governor to confirm the breakdown of law and order situation in the state. Hence, (4) can be inferred.

Choice (3)

### INFERENCES

### Practice Exercise

**Solutions for questions 1 to 10:**

1. It is asserted that the quality of education is a reflection of the quality of teachers, but not vice versa. As the passage advises an improvement in the training of teachers, it is assumed that there is scope for improvement. Hence, (2) is an assumption.

The passage states that the quality of education is not explicitly mentioned that the centre has asked the Governor to confirm the breakdown of law and order situation in the state. Hence, (3) can be concluded.

From the tone of the statement, it can be understood that there is a need to improve the economic and social sectors. Hence, (4) is an inference.

2. Choice (1): It is stated that Veerappan is able to strike at will. It is also stated that the STF personnel were led to believe that Veerappan had magical powers. It is because that STF people are unable to assess as to when he would attack. Hence, (1) is a conclusion.

Choice (2): As the STF personnel believed that Veerappan has magical powers, it is the assumption of the STF personnel, that one can become invisible with magical powers.

Hence, (2) is an assumption.

Choice (3): It is stated that the dacoits have raided the village frequently. From this it can be inferred that there is no proper police protection.

Hence, (3) is an inference.

Choice (4): As the villagers do not return before 3 p.m., so it is the assumption of the villagers that the dacoits do not raid before 3 p.m.

Choice (1)

3. Choice (1): The passage has no reference to the British.

Hence, (1) is out of context.

Choice (2): From the expressions 'she is able to forgive' and 'the humanity glows', it can be understood that the author assumes that forgiveness is humane.

Hence, (2) is an assumption.

Choice (3): The forgiveness may arise in two situations. One is that the other person repented or for the reason that the victim does not want to nurse a grudge against the offender. Hence, (3) is neither an inference nor a conclusion.

Choice (4)

4. Choice (1): As it is asked, to dance with caution, it can be concluded that the situation is such that dancing with the powerful is necessary.

Hence, (1) is a conclusion.

Choice (2): The last sentence 'dance with caution' indicates that it is not necessary to throw ethics to the wind, if one wants to dance with the devil.

Choice (3): As the two events 'dancing with the powerful' and 'stepping on the devil's tail' is being talked about together, it can be understood that the author assumes that the powerful are devils.

Hence, (3) is an assumption.

Choice (4): This statement contradicts the Indian stance in case of McMahon line.

Choice (3)

5. Choice (1): Though it is stated that the villagers are locking themselves indoors by 3 p.m. it is not explicitly stated at what time the dacoits are raiding the village. But from the given context it can be inferred that the dacoits raid the village after 3 p.m.

Hence, (1) is a conclusion.

Choice (2): As it is stated that they return from fields, it cannot definitely say that they are farmers, they can go to the field for different purposes.

Hence, (2) is not a conclusion.

Choice (3): It is said that the dacoits have raided the village frequently. From this it can be inferred that there is no proper police protection.

Hence, (3) is an assumption.

Choice (4): As the villagers do not return before 3 p.m., so it is the assumption of the villagers that the dacoits do not raid before 3 p.m.

Choice (1)


Hence, (1) is out of context.

Choice (2): From the expressions 'she is able to forgive' and 'the humanity glows', it can be understood that the author assumes that forgiveness is humane.

Hence, (2) is an assumption.

Choice (3): The forgiveness may arise in two situations. One is that the other person repented or for the reason that the victim does not want to nurse a grudge against the offender. Hence, (3) is neither an inference nor a conclusion.

Choice (4)

7. Choice (1): As the Governor has requested the centre to dismiss the government, the statement is not true.

Choice (2): As the Governor requested for dismissal of the government as the
8. Choice (1): Though it is not stated explicitly, the intention to modernize the railway station to international standards, means that they are intended for international travellers.

Hence, (1) is an inference.
Choice (2): The statement intends to mention that the time period for modernizing the 18 railway stations is up to 2020.

Hence, nothing can be inferred about the time period for modernizing the Patna railway station alone.
Choice (3): The statement does not mention anything about possibilities. Hence, (3) is out of context.
Choice (4): From the words "the first 18 railway stations", it cannot be concluded that there 'will' not be other such railway station.

Hence, (4) is out of context. Choice (4)

9. Choice (1): It is stated that taking 'Battle tanks' on to Himalayas is almost impossible even today. From this we cannot say that there are definitely no tanks on the Himalayas. There can be some tanks also. So it cannot be properly concluded.

Choice (2): As the General has done what is unthinkable, in more hostile conditions, it is probable that he might have faced some opposition, or he has chalked out a plan where there is no opposition.

Hence, (2) is out of context.
Choice (3): The passage is not revealing who the enemy is.

Hence, (3) is out of context.
Choice (4): As the author compares the conditions, it is the author’s assumption that it is easier to take tanks up the motorable roads than on mule track.

Hence, (4) is an assumption. Choice (4)

10. Choice (1): From the phrase "caught between the devil and the deep sea", it can be concluded that country X does not want to antagonise either party.

Hence, (1) is a conclusion.
Choice (2): The statement does not give any clue, regarding the whereabouts of the don.

Hence, (2) is out of context.
Choice (3): As FBI has sought the help of country X, it is the assumption of FBI that country X can find out the whereabouts of the don.

Hence, (3) is an assumption.
Choice (4): As it is stated that the don is notorious, it can be inferred that he is involved in illegal activities. Hence, (4) is an inference.

Choice (4)

Solutions for questions 11 to 25:

11. In the paragraph, it is given that while all the major football powers have made it easily to the pre-quarter finals, it is France that under performed. The fans are not all that happy which implies that the fans are happy at least to some extent and by this, we can conclude that despite their poor performance they were into pre-quarter finals. So, the inference is probably true.

Choice (2)

12. In the question, it is given that there are 8 pools with each pool consisting of equal number of teams and in the 1st round, each team played all the other teams in that pool exactly once. In the paragraph, it is given that 48 matches were played in the first round. So, 6 matches are played in each pool and this happens only when there are 4 teams in each pool. As there are 8 pools, $8 \times 4 = 32$ teams which participated in the world cup. So, the inference is definitely true.

Choice (1)

13. In this, there is no specific information whether there is a pre-tournament forecast for every world cup. So the data is inadequate.

Choice (3)

14. In the paragraph, it is given that "The men in blue and white stripes - - - - - - heirs have peaked too early". The tone of the statement reveals that it is not too good to play exceptionally well in the first round as that may probably effect the future prospects because the opposition teams will have a clue to defend. So, the inference is probably true.

Choice (2)

15. In the last paragraph, it is given that "most teams have displayed a spirit of adventure unusual for the opening round". In this "most countries" do not imply all the countries. So, the inference is definitely false.

Choice (4)

Solutions for questions 16 to 20:

16. In the passage, it is clearly given that "They can enlighten - - - - - - bringing down carbon emission levels". So, the inference is probably true.

Choice (2)

17. The last statement, "Unless private investment - - - - - hard to build", implies that private investment that is forthcoming in a good measure investment is very little. So, the inference is definitely true.

Choice (1)

18. In the paragraph, it is given that "A report on the - - - - has been tardy progress". But whether a committee has been appointed cannot be concluded with the available information.

Choice (3)

19. In the paragraph, it is given that a mere 11 million out of 66 million is enough to effect a saving of 20,000 crore on the import bill, but nothing is mentioned about the total bill. Hence, data is inadequate.

Choice (3)

20. Any crop which has low gestation period and high yielding potential will definitely be a profitable one to the cultivators but whether it may be very profitable or not is definitely not known. So, the inference is probably true.

Choice (2)

Solutions for questions 21 to 25:

21. The passage states that Assam has the largest plantation belt of tea in the world and is the largest producer in the country, however it does not give us any clue as to the yield per hectare. Hence no inference can be made on this aspect as the data is inadequate.

Choice (3)

22. The passage states that the number of tea estates registered with the National Tea board has increased with the small growers joining it. However the passage does not specify that this statistic is for Assam. However since Assam has the largest plantation belt and production, it is likely that a majority of the tea estates there would be held by small time growers. Hence it is probably true as it has not been conclusively proved in the given passage.

Choice (2)

23. From the passage we know that Cropped area of tea = 2,69,000 hectares

Yield per hectare = 1,850 kg

∴ Total yield in Assam = 5,13,00,000 kg

(approximately)

This is approximately = 51.3 million kg

∴ The country’s yield = Approximately 100 Mn kg.

(Since Assam accounts for 53 per cent of the country’s total production)

∴ The given statement is definitely false.

Choice (4)

24. As per the passage the industry hopes to reverse its losses by cutting down on the perks enjoyed by the managerial cadre. This means that the managerial cadre perks adds significantly to the overhead costs hence the given statement is definitely true.

Choice (1)
25. The passage directly states that the local tea industry in Assam employs 5.9 lakhs workers, hence the given statement is definitely false. Choice (4)

COURSES OF ACTION

--- Practice Exercise ---

Solutions for questions 1 to 10:

1. As the problem is the students who are under stress the solution to the above problem is to find out, how to keep the students away from stress rather than banning the violent scenes on screen. Hence, I does not follow.
   II increases the stress on children. It is inappropriate. Hence, II does not follow.
   ∴ Neither I nor II follows. Choice (3)

2. As the cause for extinction of polar bears is green house gases, we should reduce that. So, I is a proper course of action.
   Shifting of all the polar bears is not feasible and also the environment may not be suitable for them. So II is not a proper course of action. Choice (1)

3. A firm or an organisation runs any business at minimum expenses whether it is making profit or a loss. As the present level of expenses is not known, I does not follow.
   Creating on alternate domestic market is a solution to beat the exchange rate risk. Hence, II follows.
   ∴ Only II follows. Choice (2)

4. The government should set up an inquiry committee to find out the reason so that such cases do not get repeated. So I is a proper course of action.
   Statement II is something which has to be done immediately after the collapse, but the fact that the number of death, etc are known, the time for that action is long over.
   Choice (1)

5. Increased productivity would reduce the problem of low buffer stocks and tight food situation. Hence, I follows.
   Course of action II takes a long time to yield result. Hence, II does not follow.
   ∴ Only I follows. Choice (1)

6. Course of action I assumes that the present education system does not teach the basic values of life. So, I is not a proper course of action.
   Course of action II is not giving any solution. Choice (3)

7. By allocating more funds it would be easier to carry out the reforms.
   When funds are allocated only to these sectors it would hamper the growth in other areas. Therefore, this is a negative course of action.
   ∴ Only I follows. Choice (1)

8. Here as the pillion riders are receiving more head injuries, helmet can save them from head injuries. I is a proper course of action.
   II causes a new problem, that is, injuries to the driver. So II is not a proper course of action.
   Choice (1)

9. In the given statement it is mentioned that the chefs are inadequate but it is not mentioned whether they are not available globally or they are not available in that area. If they are not available globally, the question of recruiting chefs from other places does not arise. Hence, I does not follow.
   Because the problem is with the inadequacy of chefs shifting to other business lead to death of one type of industry. Hence, it is a negative course of action.
   ∴ Neither I nor II follows. Choice (3)

10. As the Indian cricket team lost continuous six finals, a proper investigation is necessary. So, I follows.
    The statement does not give scope to ascertain the reason.
    So II does not follow. Choice (1)

Solutions for questions 11 to 20:

11. As the problem is with the poor umpiring decisions, hence “high standing and repute” umpires should be allowed to officiate hence I is proper course of action.
    II is a negative course of action.
    III is not possible. Choice (1)

12. Course of action I and III are negative courses of actions.
    Here the problem is regarding pests. As, the course of action II says about the research which will help to produce hybrid varieties which are strong enough to fight against pests, hence it follows.
    Choice (1)

13. I and III are the proper courses of actions as the terrorist can attack at any place.
    I is not a proper course of action, as this cannot be done immediately. Choice (3)

14. Disclosing all arms to the enemy country is not a proper course of action to avoid threat. Hence, I does not follow.
    Course of action II will create a new problem, as that will led to arms race. Hence II is not a proper course of action.
    III is a proper course of action as being alert by all means is always the solution of a threat. Choice (2)

15. Here the lack of emergency medical facilities.
    I follows, as it profits the emergency medical facility.
    II is based on an assumption that hospitals does not have such facilities.
    III is not a proper course of action as that may cause a new problem to the vehicles travelling on roads. Choice (2)

16. Here the problem is extinction of various species of animals, so providing them their native habitat is the proper solution for the problem.
    II is a proper course of action, as stopping deforestation can solve the problem to some extent.
    III is not a proper course of action as urban forest cannot be the habitat for the wild animals. Choice (3)

17. As, hawkers are not the only problem, hence I does not follow.
    As, II is talking about all encroachments, hence it follows.
    III is not a proper course of action as that is not practically possible. Choice (3)

18. Here the problem is with the municipal staff who did not take any initiative though the water got contaminated.
    I is a negative course of action, hence does not follow.
    Initiative must be taken by municipal staff, not by word officers, hence II does not follow.
    III is not proper course of action because it is not practically feasible for every family to go with their own bore wells. Hence, none follows. Choice (4)

19. I is a negative course of action.
    II and III are feasible and also help the banks to reduce their non-performing assets. Choice (3)

20. As people can be educated regarding vitamins.
    ∴ This a valid course of action.
    II is a negative course of action.
    III is based on the assumption that such types of programmes were not there before.
    So, we are not certain about the result. Choice (4)

Solutions for questions 21 to 25:

21. Here the problem is the drainage system and the choked openings of the drains.
    (1) directly addresses the problems.
    (2) would cause new problems. Garbage would get collected at the openings. Hence, (3) would not help in solving the problem. (4) is not related to the given problem. Choice (1)
Solutions for questions 1 to 5:

1. Death of 90 in one month is the immediate and principal cause for forming an emergency medical team. Choice (1)

2. The two multinationals are already operating in India as the individual players, but they got the permission to work together. Getting permission to operate jointly is the immediate and principal cause but having individual approvals is not the principal cause. Hence, A is the effect and B is not its immediate and principal cause. Choice (3)

3. As the traffic cops have been equipped with a sophisticated instrument, motorists in the city will be more cautious. So, A is the immediate and principle cause and B is its effect. Choice (2)

4. The terrorists deliberately want to create havoc among the people, hence they perpetrate activities like bomb blasts and kidnappings. Hence (2) is the immediate and principal cause and (1) is its effect. Choice (1)

5. The events are related. Chronologically A occurs before B. A can be the immediate and principle cause for the effect B. Choice (2)

Solutions for questions 6 to 15:

6. As the Indian Cricket League formed in opposition to BCCI and was the first to launch the premier league, its competitor BCCI also announced their premier league. So, B is the cause and A is its effect. Choice (2)

7. Increase in air pollution and sound pollution can be the effects of a common cause, that is, increase in vehicular traffic. Choice (4)

8. The statements are referring to different aspects of norms and guidelines. (1) refers to uses, while (2) refers to the negative side of it. Hence, they are effects of a common cause. Choice (4)

9. The necessity to secure a seat on security council is the cause for lobbying. Choice (1)

10. The reasons for the exit being ignominious and his resignation are one and the same. Hence, (1) and (2) are effects of a common cause. Choice (4)

11. The attacks on villages by wild animals is an effect of decrease in forest cover. Hence (B) is effect and A is its cause. Choice (1)

12. As the opposition parties are against to the naval exercise they staged a protest against the government. Hence, B is the cause and A is its effect. Choice (2)

13. The TV programmes affect the tender minds of children. Hence, (B) is the cause and (A) is its effect. Choice (2)

14. The disease has no relation with people of Madras. Hence, (1) and (2) are effects of independent causes. Choice (3)

15. The decrease in cost of petrol in international market and decrease in cost of petrol driven vehicles are effects of independent causes. Choice (3)

Solutions for questions 16 to 25:

16. The industry cannot recruit people. Hence, (1) is not a possible consequence. Those who are planning to join another industry, do not go on strike. Hence, (2) is not a possible consequence. When the Trade Union serves a notice of strike, the management may call them to resolve the issue. Hence (3), is a possible consequence. Choice (3)

17. As banks are flush with cash, loans may be more easily available and applications may be processed faster. So both (B) and (C) are possible consequences. Choice (3)

18. The place is located in a seismically sensitive area. In such places, a multi storeyed building is fraught with risk. Hence (1) is not a possible consequence. The government takes immediate relief measures as a first step. One among such relief measures is a private make shift arrangement. Hence (2), is a possible consequence. Relocating the people to other district is not a practical solution. As it leads to other problems like loss of income source etc. Hence (3), is not a possible consequence. Choice (3)

19. In the statement it is given that this programme is in the planning stage and the given consequences take place after implementation of this programme. Hence none of A, B and C are the possible consequences. Choice (4)

20. As a precaution, the government may evacuate the people from low-lying areas. Hence, (1) is a possible consequence. It is not the duty of the Meteorological Department to take up rescue operations. Hence, (2) is not a possible consequence. The Government maintains a separate fund to deal with natural calamities. Moreover, no damage had taken place so far. Hence (3) is not a possible consequence. Choice (4)

21. A is a possible consequence as NABARD has already started micro finance. Nowhere in the statement the interest rates have been referred. So, B cannot be a possible consequence. The increase or decrease in the income depends on how successfully the borrower invests the borrowed money. Hence, C is not a possible consequence. Choice (1)

22. As Mr. Chatrapati is a very popular figure and the militants have threatened to kill him at any cost, it is possible that he would be provided with the best security. Hence, (1) is a possible consequence. As Mr. Chatrapati is under threat, it is possible that his movements are restricted. Hence (2) is a possible consequence. If it is found that militants are really making efforts, then the question of retaliation arises. Hence, (3) is not a possible consequence. Choice (3)

23. A and B are possible consequences as the demand increases when there is a shortage. But, we cannot say whether the number of unemployed graduates will increase or decrease. Choice (1)

24. When big players enter the market with huge investments, it is quite possible that small business find the going tough. Hence, (1) is a possible consequence. Purchasing smaller companies is one way of penetrating into the market. Hence (2) is a possible consequence. When MNCs...
enter the market with huge investments the possibility of large scale changes in the services is high. Hence, (3), is a possible consequence. Choice (1)

25. The basic purpose of their visit is to estimate the loss incurred due to floods and to submit a report to the government to take further decisions. So A is a possible consequence. B is a consequence that takes place after studying the report. But it is not a direct consequence of the given statement. We cannot say whether the aid will be properly utilized or not. Choice (1)

Solutions for questions 11 to 20:

11. “Free food grain supply” implies that the neighbouring country is in trouble. Argument I explains the troubles and is a strong argument. The fact that the other country is an enemy does not stop us from helping them as we have already understood that it is in trouble. Therefore argument II is a weak argument. Choice (1)

12. Argument I explains a valid reason to go against such marriages because it is wrong to encourage anything that jeopardises the health of a person. Hence, (I) is a strong argument. Argument II is not a valid argument because a custom being followed since a long time does not necessarily make it good. Only I is strong. Choice (1)

13. Argument I is pessimistic in nature because it says that corruption can never be eliminated, but we cannot check the validity of the argument and we have to take this argument to be true, in which case it is to be admitted that argument I is a strong argument. Argument II is a very strong argument because a person’s integrity is a major consideration for giving him or her a job. Both the arguments are strong. Choice (4)

14. Sanctuary for endangered animals becomes necessary when it improves and betters the living conditions of the world. But at the same time, if an economy is not able to provide basic necessities to its people, then it cannot think of constructing sanctuaries. Therefore, the decision is based on both the factors viz. requirement and fund supply. Hence, both I and II are strong arguments. Choice (3)

15. Argument I says that total cost is increasing. But this does not mention whether production is also correspondingly increasing or not. If production is also increasing, then there would not be any problem. Hence, this argument is weak. Argument II: We do not know whether the employees would be removed or not. It is likely that the employment is not disturbed. Hence this also is a weak argument. Choice (4)

16. Argument I says that the prime minister must be “young enough” for some explained reasons. This implies that the prime minister must not be older than a certain age limit. This argument is strong. Argument II: This says that there should not be an upper limit because older persons can perform better because of the experience gained. This also is strong. Choice (3)

Solutions for questions 21 to 25:

21. Knowing a person from Kerala is not a reason for considering a person from Manipur as a foreigner. Hence (1) is not the proper explanation. Since, the colleague, who is from Kerala, never interacted with a person from Manipur, it is possible that he has taken him as a foreigner. Hence, (2) is the proper explanation. Not being from Manipur does not explain why the Keralite is not considered as a foreigner. Choices(4)contradicts the given statement. Choice (2)

22. Choices (1) and (2), strengthens the forecast made. From choice (3), it is clear that an elderly person is back in the race and except for him, no one else was in a position to give a serious threat to the champion. Hence, choice (3) weakens the forecast.
Major tournaments are not being conducted at junior level does not mean that there is no talent among the young generation. Hence, choice (4) neither strengthens nor weakens the forecast.

Choice (3)

23. Exemplary performance will not be possible always. Hence, choice (1), strengthens the need for specialist batsman.

The statement talks about the weakness in the batting, but not the pressure on the bowlers. Hence, choice (2) is irrelevant. According to choice (3), the score put together by batsmen need to be defended by the bowlers. Hence, replacing a bowler is not a good suggestion. The batting should be strengthened without weakening the bowling. Hence, choice (3), weakens the recommendation of the coach.

Choice (4), would strengthen the need for a specialist batsmen.

Choice (3)

24. The author assumes that no other part in India is as beautiful as Shillong.

Choice (1) supports the assumption.

Choice (2) does not compare the beauty of the cities in which the author lived with the beauty of Shillong. Hence, (2) does not weaken the assumption.

The statement does not mention, if the author has seen any other city from a hilltop or not. Hence, choice (3) does not weaken the assumption.

As there are cities which are more beautiful than Shillong, this statement, if true, would seriously weaken the author's assumption.

Choice (4)

25. Choice (1) has no relevance to the statement.

Choice (2) does not mention any achievement that the American mission to Mars has resulted in.

Choice (3) is only an assumption of the Russians. Hence, it does not weaken the proposed Indian mission to the Mars. When no good scientific objective can be achieved, the proposal for the Mars mission would be weakened. Hence, choice (4) if true, would weaken the proposal.

Choice (4)

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**Practice Exercise**

(Assertions and Reasons)

**Solutions for questions 11 to 20:**

11. “Standing next to America” cannot be taken as a valid reason for Indian defence endeavours. Any action of a government evolves out of necessity or urge for development. Hence, RI is not a valid reason.

RI is a valid reason, as India has “hostile” neighbours. “Hostile” implies the presence of inimical and dangerous neighbours, which would necessitate high level of defence preparedness. Hence, RI is a strong and valid reason.

Choice (2)

12. RI : "People's communication skills". This phrase implies "people's communicating ability", but not the media’s. This is not a valid reason.

RII: Even if it is true that science has created this medium, it is people who accept it and make it popular. No reason is given in RII to explain why this medium is growing. Neither RI nor RII is a valid reason.

Choice (4)

13. “Indifferent” means having no opinion. That is, these people are neither against nor advocating reservations. Neither RI nor RII is explaining the reasons as to why these people are indifferent.

Choice (4)

14. RI : This explains the cause for the opposition of the environmentalists towards polythene bags and is valid.

RII: If polythene is made using natural products which do not harm the environment, then it would not be a problem for the environmentalists. However, it could be a problem only when the natural products used in the bags are themselves dangerous to earth in one way or the other but this is not explained by RII. Hence, it is not a valid reason.

Choice (1)

15. RI can be a valid reason because it explains the process by which a child becomes a genius. RII is invalid because we cannot say that "Only a genius mind is curious."

Choice (1)

16. RI is not explaining the reasons behind the increasing number of deaths. RII is a valid reason and under the circumstances given by RII (the law is weak), the law-breakers may behave adamantly.

Choice (2)

17. RI: If only computer education is useful, then more people may tend to join these courses. If more people join and the existing coaching centres are not able to accommodate the new joining, then new centres would be started. The reason explained in RI is based on a hypothetical situation ("no other education is useful"). Moreover, it very vaguely and indirectly explains the causes for the assertion made. Hence, this cannot be taken as a valid reason.

RII: This explains the cause behind the assertion and is valid.

Choice (2)

18. “Capital punishment” means sentencing to death. Both RI and RII give strong reasons to abolish such a law, hence both follow.

Choice (3)

19. RI : The opinion of the political leaders is to create a good impression in the minds of peo-
Solutions for questions 21 to 25:
21. Here the given assertion is about the preference of today’s youth. RI is talking about the strong base of western music. Having strong base does not imply that it is good to listen. RII tells that youth like rock music but there is no evidence that western music is rocking.
→ Neither RI nor RII is a reason. Choice (3)
22. In the given assertion it is given that Mr. P. got Nobel Prize for Peace last year which can be for his work among the poor. Hence RI can be a reason while RII is not a valid reason Choice (1)
23. Here in the assertion, we are only talking about the weakness of the employees. RI is giving the reason for skipping breakfast, so it is not the reason. RII is also not a valid reason, as lack of mental exercise may not lead to deterioration. Choice (3)
24. The interesting topic and the art of writing is a proper reason for the popularity of an author. Hence RI is a reason. RII is not the reason, because if the subject is not good, language does not help. Choice (1)
25. Here the assertion is about the collapse of the newly constructed bridge, which is possible because of faulty construction or because of improper design. Hence, I can be reason.
RII talks about type of soil, which is out of context.
Choice (1)

INPUT AND OUTPUT

Solutions for questions 21 to 25:
20. The only reason behind getting an award can be outstanding performance. Hence, RI and RII are not valid reasons behind Hindi films getting many awards.
Choice (4)

Solutions for questions 6 to 10:
As we observe the output, we know that the words in the given input are arranged in the increasing order of the number of letters. When the words of equal number of letters occur, then words are arranged in the order as they appear in the dictionary. In each step, one word is being rearranged. Among words with equal number of letters, the word that appears first in the dictionary is arranged first and so on. The input is “adopted action to a stamp drafted general operation”. In the given input, the word with minimum number of letters is ‘a’, hence it occupies the first position in the first step and the remaining words follow the same sequence as in the input. In the second position is occupied by the word ‘to’, as it contains the next highest number of letters. Similarly the other words are also arranged.
6. The required arrangement of words can be obtained as shown below:
Input : we do at is exact fund your life
Step I : at we do is exact fund your life
Step II : at do we is exact fund your life
Step III : at do we is exact fund your life
Step IV : at do is we fund exact your life
Step V : at do is we fund life exact your
Hence, Step IV has the required arrangement. Choice (4)
7. The final output is reached as shown under:
Input : post followed after government fallen nomination the of
Step I : of post followed after government fallen nomination the
Step II : of the post followed after government fallen nomination
Step III : of the post after followed government fallen nomination
Step IV : of the post after fallen followed government nomination
Hence, Step IV is the final output for the given input. Choice (3)
8. Choice (4)
9. Choice (3)
10. By back tracking, we cannot determine the arrangement of words in the previous step and neither can we find which words have been actually rearranged and which were initially in their correct positions. Choice (4)

Solutions for questions 11 to 15:
The numbers given in the output are shifted one position to their right cyclically in the output. In Step I, the first number in the input has interchanged its position with the second number. In Step II, the third number has interchanged its position with the first number. In Step III, the fourth number has interchanged its position with the first number. This is followed in the steps further, till all the numbers are arranged by shifting by one place to the right cyclically.
11. The given input is
Input : 256 159 386 125 81 64 121
Step I : 159 256 386 125 81 64 121
Step II : 386 256 159 125 81 64 121
Step III : 125 256 159 386 81 64 121
Step IV : 81 256 149 386 125 64 121
Step V : 64 256 159 386 125 81 121
Step VI : 121 256 159 386 125 81 64
Hence, the last but one step is Step V. Choice (4)
12. In each step, only one element is rearranged. Hence, the total number of steps we require to get the final output is (n – 1), where ‘n’ is the total number of elements in the input.
In this input, the total number of elements = 7.
Hence, we require (7 – 1) = 6 steps to get the final output. Choice (1)
13. In the output the numbers given in the input are rearranged by shifting each number by one position to the right cyclically. Hence, to get the input from the output the converse logic has to be applied, that is, the numbers should be shifted to their left by one place. Hence, the input is 94 32 51 87 13 7 23 58. Choice (1)
14. Choice (4)
15. It is given that the first eight prime numbers are taken in ascending order as the input. Hence, the input and the output will be as follows:
Input : 2 3 5 7 11 13 17 19 Choice (3)

Solutions for questions 16 to 20:
The words given in the input are arranged in the alphabetical order in the output. Let us now analyse the input and the steps through which the output is determined. The given input is “taking decision three clear expects happen next public”. In the given input, the word “clear” comes first in the dictionary, hence it occupies the first position and the remaining words follow the same order as they are in the input. In the second step, the second position is occupied by the word “decision”. Similarly, the other words are also rearranged.
16. The last step for the given input is as shown below:
   Input: products retail growth share little option board base
   Step I: base products retail growth share little option board
   Step II: base board products retail growth share little option
   Step III: base board growth products retail share little option
   Step IV: base board growth little products retail share option
   Step V: base board growth little option products retail share
   Step V is the final output. Choice (2)

17. Choice (1)

18. Choice (4)

19. In these type of questions, we cannot find the input from the output. It is not possible to know the initial position of the words in the input. Choice (4)

20. Choice (3)

**Solutions for questions 21 to 25:**

As we observe the output through every step, we know that the words are arranged in the same order as they are in the dictionary and the numbers are arranged in the decreasing order of their value. Every word is followed by a number. In Step I, among the given words in the input, “global” comes first in the dictionary. Hence, it occupies the first position. The largest number in the input is 356. Hence, 356 occupies the second position in Step I and 356 interchanges its position with the word in the second position. In Step II, the next word which comes in the dictionary is “higher”. Hence, it occupies the third place and interchanges with the word/number in that position. In the next step, the second highest number occupies the fourth place. Similarly, the other words and the numbers are arranged.

21. The given input is
   Input: sat 726 rat 534 mat 684 gate 436 bite
   Step I: bite 726 rat 534 mat 684 gate 436 bite
   Step II: bite 726 gate 534 mat 684 rat 436 sat
   Step III: bite 726 gate 684 mat 534 rat 436 sat
   Hence, Step III is the last step. Choice (4)

22. Choice (3)

23. In these types of questions we cannot determine the input from the output, that is working out in reverse is not possible, because the initial position of numbers and the words cannot be determined. Choice (4)

24. Choice (1)

25. Choice (4)

**Solutions for questions 26 to 30:**

As we observe the output through every step, we find that the words in each step are arranged in the order of 3, 1, 7, 6, 4, 2, 8, 5 to get the order of words in the next step. Let us number the words of the input as 1, 2, 3, 4, 5, 6, 7 and 8. In the input the words in the positions of 3, 1, 7, 6, 4, 2, 8, 5 are arranged to get the words in Step I. In Step I, the words of order 3, 1, 7, 6, 4, 2, 8, 5 are arranged to get the words in Step II. Similarly the same order is followed to get the order of the words in the successive steps. Let us represent the positions of the words and their arrangement in further steps.

Input : 1 2 3 4 5 6 7 8
Step I : 3 1 7 6 4 2 8 5

26. Choice (1)

27. As shown in the given table, for the input of words 1, 2, 3, 4, 5, 6, 7 and 8 the words in Step V are in the order of 4, 5, 6, 7, 3, 2, 8 and 1. Choice (4)

28. It is given that Step IV of an input is “fall into hands grip doing from the view”. In the above given table for the input of words 1, 2, 3, 4, 5, 6, 7 and 8, the order of the words in Step IV is 5, 8, 4, 3, 1, 7, 6 and 2. Choice (3)

29. In the above given table for the input of words 1, 2, 3, 4, 5, 6, 7 and 8, the order of the words in Step VI is 6, 4, 2, 8, 7, 5, 1, 3.

30. Step IV of an input is “public citizens health where against action further decided” and the order of the words in this step is 3, 8, 4, 3, 1, 7, 6 and 2. The order of the words in the Step II is 7, 3, 8, 2, 6, 1, 5 and 4. Choice (1)

**DECISION MAKING**

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**Practice Exercise**

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**Solutions for questions 1 to 5:**

<table>
<thead>
<tr>
<th>Q.No.</th>
<th>City</th>
<th>(i) Population &gt; 20 (a) less than 10 per cent of population has annual income &lt; 1.5lpa</th>
<th>(ii) Income of atleast 50 per cent population is &gt; 2lpa (b) sales of refrigerators in previous year &gt; 5000.</th>
<th>(iii) Well connected with major cities of the world</th>
<th>(iv) Average temperature during summer &gt; 20°C</th>
<th>Coarse of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nagpur</td>
<td>✔</td>
<td>× [✓]</td>
<td>✔</td>
<td>✔</td>
<td>Launch of 446ZMQ</td>
</tr>
<tr>
<td>2</td>
<td>Lucknow</td>
<td>×</td>
<td>✔ [✓]</td>
<td>✔</td>
<td>✔</td>
<td>Launch model no.518JTX 486ZMQ 446ZMQ</td>
</tr>
<tr>
<td>3</td>
<td>Kolkata</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Data inadequate</td>
</tr>
<tr>
<td>4</td>
<td>Delhi</td>
<td>✔</td>
<td>?</td>
<td>✔</td>
<td>✔</td>
<td>Data inadequate</td>
</tr>
<tr>
<td>5</td>
<td>Bhopal</td>
<td>×</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Data inadequate</td>
</tr>
</tbody>
</table>
Solutions for Intelligence and Critical Reasoning

1. Does not satisfy the basic condition (ii) but satisfies the alternate condition. 
   ∴ Launches only 446ZMQ. Choice (2)
2. Does not satisfy condition (i) but satisfies the alternate condition.
3. Satisfies all the basic conditions. 
   ∴ All the 3 models will be launched. Choice (1)
4. No clear information about condition (ii). Choice (4)
5. No clear information about the alternate condition of (i). So data is inadequate. Choice (4)

Launches models numbered 486ZMQ and 446ZMQ. Choice (2)

Solutions for questions 6 to 10:

<table>
<thead>
<tr>
<th>Q.No.</th>
<th>Number</th>
<th>(A) Seven digits</th>
<th>(B) At least 2 prime digits</th>
<th>(C) First &amp; last digits are perfect squares.</th>
<th>(D) First &amp; last digits are even</th>
<th>(E) Middle digit even</th>
<th>(F) All digits are odd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>1778459</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>7.</td>
<td>1366789</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>8.</td>
<td>1367574</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>964374</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>9632578</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

6. Satisfies all the basic conditions. 
   ∴ Superior number. Choice (1)
7. Satisfies all the basic conditions. 
   ∴ Superior number. Choice (1)
8. Does not satisfy condition (D) and also its alternate condition. 
   ∴ Garbage number. Choice (4)
9. Does not satisfy the basic criteria (A) and (D). 
   ∴ Garbage number. Choice (4)
10. Does not satisfy condition (C) and also its alternate condition. 
    ∴ Garbage number. Choice (4)

Solutions for questions 11 to 15:

<table>
<thead>
<tr>
<th>Question Number</th>
<th>(a) Land Cost &lt; 20L</th>
<th>(b) Est. Cost of Const. &lt; 30L</th>
<th>(c) Posh locality</th>
<th>(d) Loan ≥ 20L @ maxm. 18 per cent p.a.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>(b) violated</td>
</tr>
<tr>
<td>12</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>?</td>
<td>(c), (d) unknown</td>
</tr>
<tr>
<td>13</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>?</td>
<td>(d) unknown</td>
</tr>
<tr>
<td>14</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>(c) violated</td>
</tr>
<tr>
<td>15</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>(a) and (d) violated</td>
</tr>
</tbody>
</table>

11. In this case, condition (b) is violated, as the estimated cost of construction is more than Rs 30 lakhs. As there are flats available in that locality on the ground floor, the respective alternate condition (f) is fulfilled. Choice (1)
12. As no information is available to check conditions (c) and (d), the data is inadequate to take any decision. Choice (2)
13. In this case, the loan amount is not specified, which is required to check condition (d). Hence, data is inadequate to take a decision. Choice (2)
14. In this case, condition (c) is violated as the land is not located in a posh locality. However, as all the basic amenities are available nearby, the alternate condition (g) is satisfied. Hence, the matter should be discussed with the family members. Choice (3)
15. In this case, the land cost is Rs 20 lakhs, whereas according to condition (a) the cost of land should be less than Rs 20 lakhs. Hence, condition (a) is violated. As there is no alternate condition for the same, the house cannot be constructed. Choice (4)

Solutions for questions 16 to 20:

The four basic conditions from (a) to (d), given in the selection criteria, are as shown in the table below. In case a basic condition is violated, the case is verified for the respective alternate condition given. The alternate conditions are as given below:

g. If condition (d) is violated, but at least one relative of the candidate is presently staying in A.P. for the last 5 years, then the candidate can be admitted.
(f) If condition (b) or (c) is violated, but not both, and the candidate has a good sports record, then the candidate should be advised to approach the Principal.
(g) If both the conditions (a) and (b) are violated, but the candidate is ready to donate Rs 1,00,000 to the college, then the candidate should be advised to approach the Secretary.

Now let us scrutinise the applicants for the basic conditions, as given in the table below (a tick mark “✓” means that the condition is fulfilled, cross mark “X” means that the condition is violated).
16. In this case, condition (a) is violated. As there is no alternate condition given for violating condition (a) alone, admission cannot be granted to Prakash. Choice (2)

17. In this case both the conditions (a) and (b) are violated in lieu of which the alternate condition (g) is satisfied (that is Rahim can pay a donation of Rs 1,00,000). But, no information is available to check conditions (c) and (d), hence we cannot take a decision as the data is inadequate. Choice (4)

18. In this case, condition (d) is violated, that is Jahangir is not a resident of A.P. Hence, his case is verified for the alternate condition (e). Since, a close relative of Jahangir has been staying in A.P. for the last 10 years (that is more than the required 5 years), Jahangir is selected. Choice (1)

19. In this case, condition (c) is violated, that is Rita is a female. Then the alternate condition (f) is applied. As Rita has a good sports record (represented state in basketball), she should approach the Principal. Choice (3)

20. In this case, both the conditions (a) and (b) are violated. Then, Ranga’s case is verified for the alternate condition (g). As Ranga is ready to pay a donation of Rs 1,00,000, he should be advised to approach the Secretary of the school. Choice (3)

**Solutions for questions 21 to 25:**

The four basic conditions, from (a) to (d), given in this selection criteria, are as shown in the table below.

In case a basic condition is violated, the respective alternate condition is applied in order to take a decision.

The alternate conditions are as given below:

(a) If condition (a) is violated, but the hero does not have a success rate of greater than 50 percent in films, but has a good success rate with the heroine he is going to work with in the film, then take the suggestion of the heroine. OR

(b) If condition (a) is violated, but the hero demands a remuneration of less than Rs 50 lakhs, then he can be selected.

(c) If condition (d) is violated, but the hero can work for at least 15 days in a month, may not be continuous, then the hero can be selected.

Now let us scrutinise all the applicants for the basic conditions (from (a) to (d)) as given in the table below (a tick mark “✓” means that the condition is fulfilled and a cross mark “X” means that the condition is violated):

<table>
<thead>
<tr>
<th>Question Number</th>
<th>Name of the Hero</th>
<th>(a) Success rate as a hero ≥ 70 per cent</th>
<th>(b) Time spent in the Industry ≥ 5 yrs</th>
<th>(c) Remuneration &lt; Rs 10 lakhs</th>
<th>(d) Dates continuous ≥ one week</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>Romeo</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>All conditions are satisfied</td>
</tr>
<tr>
<td>22.</td>
<td>Ritesh</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>(a) violated</td>
</tr>
<tr>
<td>23.</td>
<td>Roopesh</td>
<td>?</td>
<td>✓</td>
<td>✓</td>
<td>?</td>
<td>(a) &amp; (d) unknown</td>
</tr>
<tr>
<td>24.</td>
<td>Chris</td>
<td>x</td>
<td>?</td>
<td>x</td>
<td>?</td>
<td>(b) &amp; (d) unknown and (a) &amp; (c) are not satisfied.</td>
</tr>
<tr>
<td>25.</td>
<td>Hasmukh</td>
<td>x</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>(a) violated</td>
</tr>
</tbody>
</table>

21. In this case, Romeo satisfies all the conditions, hence he is selected as a hero. Choice (1)

22. In this case, condition (a) is violated, then the alternate condition (e) is tested. As Ritesh has 90 per cent hits in the type of films the producer is making, Producer’s advice should be taken. Choice (3)

23. In this case, both the conditions (a) and (d) cannot be checked, as Roopesh’s track record for all the 8 years is unknown, and also his ability to give dates is not mentioned, hence data is insufficient to take a decision. Choice (4)

24. In this case, condition (a) is not satisfied, as the information given regarding the success rate is not that of his success as a hero. Similarly, (c) is not satisfied, as he charged more than Rs 10 lakhs per film. Conditions (b) and (d) cannot be checked, as Chris’s experience in Industry and whether he can give dates continuously for at least one week, is not known. Hence, the data is inadequate for taking a decision. Choice (4)

25. In this case, condition (a) is violated. But as Hasmukh is very successful with the heroine of the film, he fulfils the alternate condition (e). Hence, the suggestion of the heroine should be taken. Choice (3)
Solutions for questions 26 to 30:

<table>
<thead>
<tr>
<th>Question Number</th>
<th>(a) Every student attended all lectures</th>
<th>(b) No body watched the movie earlier</th>
<th>(c) Theatre ≤ 3 kms</th>
<th>(d) Every student agrees</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>(b) violated</td>
</tr>
<tr>
<td>28</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>(c) violated</td>
</tr>
<tr>
<td>29</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>(b) violated</td>
</tr>
<tr>
<td>30</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>(b) violated</td>
</tr>
</tbody>
</table>

26. In this case, condition (b) is violated as some students have seen the movie earlier. As the number of these students is less than half of the total number of students in the group, the alternate condition (f) is fulfilled. Hence, all of them go to watch the movie. Choice (1)

27. In this case, the theatre is more than 3 km away, hence condition (c) is violated. But as at least two seniors are accompanying them to watch the movie, the alternate condition (f) is fulfilled. Hence, all of them can go to watch the movie. Choice (1)

28. Here, condition (b) is violated, that is 2 out of 10 students have already watched the movie earlier. But as the movie is a hit, and more than half the total number of students (that is, 8 out of 10) would be watching the movie for the first time, the alternate condition (f) is satisfied. Hence, all of them go to watch the movie. Choice (1)

29. In this case, as all the conditions are satisfied. Hence, the group will watch the movie. Choice (1)

30. In this case, condition (b) is violated as some students have seen the movie earlier. As the number of these students is less than half of the total number of students in the group, the alternate condition (f) is fulfilled. Hence, all of them go to watch the movie. Choice (1)

CUBES AND DICE

Practice Exercise

Solutions for questions 1 to 8:

1. The 3 cuts can be at the middle of the cube in 3 perpendicular planes. First cut will make the cube into 2 parts. The second cut along a perpendicular plane at the centre will double the number of parts to 4. The third cut along the third perpendicular plane will double 4 parts to 8 parts. Choice (2)

2. The cuts can be two along one plane (giving 3 parts) third cut along a perpendicular plane (giving 3 x 2 = 6 parts) and the fourth cut along the other perpendicular plane (giving 6 x 2 = 12 parts). Choice (2)

3. Five cuts are distributed 2 along each of the two perpendicular planes and one along the third perpendicular plane. Hence, we get 3 x 3 x 2 = 18 pieces. Choice (3)

4. Four cuts can be along one plane (giving 5 parts), another four cuts along a perpendicular plane (giving 5 parts) and the remaining five cuts along the other perpendicular plane (giving 6 parts). Hence the maximum number of identical pieces will be 5 x 5 x 6 = 150 Choice (4)

5. 12 cuts should be divided equally parallel to the three perpendicular planes - 4 parallel to each of the three planes. When there are 4 cuts parallel to the plane, there will be 5 identical pieces. Hence, 4 cuts parallel to each of the three planes means there will be 5 x 5 x 5 identical pieces that is, 125 identical pieces. Choice (4)

6. Three cuts parallel to one face, two cuts in a perpendicular plane and one cut in the third perpendicular plane. Hence, six cuts. Choice (3)

7. We need to find three factors the product of which is 120 - 6 x 5 x 4. So, to get 6 pieces parallel to one plane, we need to have 5 cuts; hence, the number of cuts to get 6 x 5 x 4 pieces, we need 5, 4 and 3 cuts a total of 12 cuts along the three parallel planes to get 120 identical pieces. Choice (4)

8. If X has least possible dimensions and the small cubes (27 or 64) have integers on edges, the dimensions of X will be 12 x 12 x 12 (because then when we cut it into 27, that is, 3 x 3 x 3 cubes, the edges will be 4 cm and when we cut it into 64, that is, 4 x 4 x 4 cubes, the edges will be 3 cms). If X, is now cut into the largest number of cubes, that is, smallest dimensions, that is, 1 cm, we get 12 x 12 x 12 that is, 1728 cubes. Choice (3)

Solutions for questions 9 to 11:

9. Cutting the large cube into 27 smaller cubes will give us a 3 x 3 x 3 configuration. Out of these, if we remove all the outer cubes to get the number of cubes not having any face painted at all, we have to remove one layer of cubes on each of the faces so that we are left with a 1 x 1 x 1 cube which is not painted at all. Hence, the answer is one cube. Choice (2)

10. The cubes which are not along any edge are the ones that have only one face painted. On each face of the original cube, if we do not count the faces along the edges, then we have only one face at the middle which is painted only on one face. Hence, for six faces of the original cube, we get six cubes that have only one face painted. Choice (2)

11. The cubes along the edges but not at the corners will have two faces painted. Along each edge, if we remove the corner cubes, there is one cube that has two faces painted. Hence for 12 edges of the cube, there will be 12 cubes which have only two faces painted. Choice (3)

Solutions for questions 12 to 16:

12. No red paint at all ⇒ remove the 2 opposite faces each having 6 x 6 cubes, 216 - 72 = 144. Choice (2)

13. Cubes having at least two different colours are all those along the edges which is 4 x 6 + 8 x 4 = 56 (where 4 vertical edges each have 6 cubes and the other 8 edges have 4 cubes each). Choice (3)

14. If one layer of the outer cubes is removed on all sides, the remaining 4 x 4 x 4 (that is, 64) cubes will have no face painted at all. Choice (1)

15. The common edges are four and on each edge there are 4 cubes with only red and green. (The eight corner cubes have blue also and hence not counted here). So, 4 x 4 = 16. Choice (4)
16. On the face where the particular colour is used, if we remove the outer cubes, the 4 x 4 square inside will have only one colour. So, 16 cubes in each face. We have 2 faces for green and 2 faces for blue and hence 4 x 16 = 64. Choice (1)

Solutions for questions 17 to 20:

17. No red paint means the two adjacent faces having red have to be removed, that is, 36 + 30 = 66 cubes. Hence, 216 - 66 = 150. Choice (2)

18. At least two different colours will mean out of the 56 cubes along all the edges together, we remove 4 cubes (excluding the corner cubes) for each colour, which have same colour on two faces that is, 12 cubes. Hence, 56 - 12 = 44. Choice (4)

19. One face red ⇒ out of 36 + 30 = 66 cubes (on both the red faces together), we need to remove 6 common cubes which have two faces painted red. Hence, 66 - 6 = 60. Choice (3)

20. There are 3 common edges giving 6 + 6 + 4 cubes which have green and red that is, 16. Choice (3)

Solutions for question 21:

21. 125 smaller cubes will form a 5 x 5 x 5 cube. To cover it we require a 7 x 7 x 7 cube because one additional layer of cubes is required on all faces. Hence additional cubes required = 7^3 - 5^3 = 218 Choice (3)

Solutions for questions 22 and 23:

22. A cannot be opposite D, B, F or E as they are adjacent to A. Hence, A must be opposite C. Choice (2)

23. As explained above, it is better to look at the adjacent faces. Now Yellow is adjacent to White, Red, Green and Pink, so Yellow cannot be adjacent to these colours. Hence, Yellow should be adjacent to Blue colour. Choice (3)

Solutions for questions 24 to 27:

24. From the figures, it can be observed that the four faces adjacent to the face marked with “1” are marked with “2”, “3”, “4” and “5” respectively. ⇒ “6” cannot be on the adjacent face of “1”. Choice (3) is wrong. Choice (3)

25. From the figures, it can be observed that the four faces adjacent to the face marked with “t” are marked with “s”, “p”, “q” and “u” respectively. “r” cannot be on the adjacent face of “t”. Choice (4) is wrong. Choice (4)

26. From the figures it can be observed that the four faces adjacent to the face marked with “d” are marked with “b”, “f”, “c” and “a” respectively. ⇒ “c” cannot be on the adjacent face of “d”. Choice (4) is wrong. Choice (4)

27. By observing the given figures it can be found out that the pairs - (α, φ), (β, θ) and (τ, r) are on the opposite faces. In choice (3) α and φ are on adjacent faces. Hence, this view is wrong. Choice (3)

Solutions for questions 28 to 30:

28. The cube can be drawn as

```
      5
     1
    3   2
6
4  \   \ 4
  \   \   \ 1
  \   \   \ 2
  \   \   \ 3
  \   \   \ 5
   \   \   \ 6
   \   \   \ 4
```

Only choice (2) is not possible with this cube. Choice (2)

29. The numbers on faces of the cube is as given below

```
      3
     6
    2   4
6
5  \   \ 4
  \   \   \ 1
  \   \   \ 2
  \   \   \ 3
  \   \   \ 5
   \   \   \ 6
   \   \   \ 4
```

Choice (4) is violating the views of the cube. Choice (4)

30. Option (2) does not belong to the given cube. Since M and X are opposite each other. Choice (2)

3. As the author is making a general statement, we are not sure whether I or II is his assumption or not. I is not implicit, as the speaker says, “If suppression is there then social justice will not be realized”. That does not mean that he assumes that suppression is there. II is also not implicit, here also we are not sure whether he thinks that social justice is realized or not. Choice (3)

4. I is implicit. The assumption that 15 to 20 days of preparation is sufficient for college studies certainly bridges the gap between the two sentences made by the author. II is not implicit, as the assumption is not complete. We can only observe how the speaker is comparing the CAT exam with college exams but not with any other. Choice (1)

Solutions for questions 5 to 8:

5. This is not related to the problem as it talks about prosecution of intruders where the problem is about the laws. Hence, I does not follow This is a feasible course of action which would prevent intrusion. Hence, II follows. ∴ Only II follows. Choice (2)

6. A firm or an organisation runs any business at minimum expenses whether it is making profit or a loss. As the present level of expenses is not known, I does not follow. Creating on alternate domestic market is a solution to beat the exchange rate risk. Hence, II follows. ∴ Only II follows. Choice (2)

7. As the problem is the students who are under stress the solution to the above problem is to find out, how to keep the students away from stress rather than banning the violent scenes on screen. Hence, I does not follow. II increases the stress on children. It is inappropriate. Hence, II does not follows. ∴ Neither I nor II follows. Choice (3)

8. In the given statement it is mentioned that the chefs are inadequate but it is not mentioned whether they are not available globally or they are not available in that area. If they are not available globally, the question of recruiting chefs from other places does not arise. Hence, I does not follow. Because the problem is with the inadequacy of chefs shifting to other business lead to death of one type of industry. Hence, it is a negative course of action. ∴ Neither I nor II follows. Choice (3)
Solutions for questions 9 to 12:

9. Argument I neither brings out necessity for reduction of airfare nor it talks on economic lines. Hence, I is not strong.
   Argument II brings out the negative result of the suggested action. Hence, II is strong.  Choice (2)

10. Argument I supports the suggestion made in the statement. Statement proposes strengthening rural economy with a purpose of checking influx of people from rural area to urban area. Argument I brings out the bad effects of influx of people from rural area to urban area. Hence, I is strong.
    Argument II assumes that strengthening of economy as industrialisation, which is not true. Hence, II is not strong. Choice (1)

11. Argument I is not strong because it is a mere assertion that night clubs are sign of development. Being sign of development does not support continuation of night clubs. There are many things which cause sleeplessness. This cannot be a reason to ban night clubs. Hence, II is not strong. Choice (3)

12. The director will have many means of controlling various departments under him. But argument I states that the suggestion made in the question leads to better control, which is a strong argument.
    Argument II is against such visits, because the director’s time is valuable, which is also a strong argument. Hence, both I and II are strong. Choice (4)

Solutions for questions 13 to 15:

Let each girl be denoted by the first letter of her name.
From (i) and (ii), A and B are sitting in the middle column.
From (iii), C is at the extreme left of a row.
Form (iv) and above results, D is the first row and E is in the second row and both of them are the extreme right of the corresponding rows.
From (v) and above results, F must be in the first row and at the extreme left.

→ Chameli is at the extreme left of the second row.
→ The final arrangement will be as follows:
   E  A  D
   C  B  F

13. Farheen is at the extreme left of the first row.  Choice (1)

14. Bindu is at the middle of the second row.  Choice (2)

15. Devi is to the immediate right of A.  Choice (2)

Solutions for questions 16 to 19:

16. From the given statements:

From the above diagram,
   Conclusion I, negative, follows.
   Conclusion II, affirmative, does not follow.
   Conclusion III, negative, follows.
   Conclusion IV, affirmative, follows.
   As the negative conclusions follow, let us negate them using the alternate diagram.

17. From the given statements:

From the above diagram:
   Conclusion I, affirmative, follows.
   Conclusion II, negative, does not follow.
   Conclusion III, affirmative, does not follow.
   Conclusion IV, affirmative, does not follow.
   Hence, only I follows.  Choice (1)

18. From the given statements:

From the above diagram:
   Conclusion I, affirmative, does not follow.
   Conclusion II, affirmative, does not follow.
   Conclusion III, negative, follows.

19. From the given statements:

From the above diagram:
   Conclusion I, negative, follows.
   Conclusion II, negative, follows.
   Conclusion III, affirmative, does not follow.
   Conclusion IV, negative, follows.
   As the negative conclusions follow, let us try to negate them using the alternate diagram.

Solutions for questions 20 to 23:

20. From statement I alone, the person who wears the Blue shirt can be A, B or C.
    From statement II alone, as D wears the Black shirt and A or C does not wear the Blue shirt.
    → II alone is sufficient.  Choice (2)

    The person who is the tallest can be B or one among the other three persons.
    From statement II alone, E – 2nd tallest
29. My only sibling’s daughter is my niece and her uncle may be myself or my sibling’s brother-in-law. Therefore, my only sibling’s daughter’s uncle’s wife is either my son’s mother or not related to my son. Choice (4)

Solutions for questions 1 to 5:

C > 2 persons
The person who is the tallest is among the other four persons.
By combining both the statements, as neither of D, C, E, F and A can be the tallest, B must be the tallest. Choice (4)

22. From statement I alone, the code of ‘guns’ can be “tuts”, ‘hoy’ or ‘sop’. From statement II alone, the code of ‘guns’ cannot be “maru” “sop” “tue” and “hoy”. ∴ By combing both, the code of ‘guns’ is ‘tuts’. Choice (4)

23. From statement I alone, after turning to his (right + left + left) the person is facing towards West.

24. ‘s’ is the code for 6. Choice (2)
25. ‘v’ is the code for 1. Choice (2)
26. ‘y’ is the code for 3. Choice (4)
27. wyvzy is the code for 73153. Choice (1)

Solutions for questions 24 to 27:
The uncommon digits in 6857 and 4786 are 5 and 4 respectively. Similarly the uncommon letters in their codes are z and r.

Digit 1 2 3 4 5 6 7 8 9
Codes v t y r z S W u x

24. ‘s’ is the code for 6. Choice (2)
25. ‘v’ is the code for 1. Choice (2)
26. ‘y’ is the code for 3. Choice (4)
27. wyvzy is the code for 73153. Choice (1)

Solutions for questions 28 to 31:

28. The path travelled by Ashish is as follows

29. My only sibling’s daughter is my niece and her uncle may be myself or my sibling’s brother-in-law. Therefore, my only sibling’s daughter’s uncle’s wife is either my son’s mother or not related to my son. Choice (4)

Solutions for questions 32 to 35:

32. Dadar from Palam is 13 km away
33. The direct distance from Palam to Dadar is 13 km and then Dadar to Bandra is 20 km. So total distance is 33 km. Choice (3)
34. The direct shortest route from Bandra to Palam is 19.20 km that is, $\sqrt{12^2 + 5^2} = 13$ km. Choice (1)
35. The shortest distance from his house to Bandra is 26.62 that is, $\sqrt{22^2 + 15^2} = 26.62$ km and Bandra to Dadar is 20 km. So the total distance is 46.6 km. Choice (4)

Solutions for questions 36 to 40:

36. AMAZON is coded as BODYMK.

Here, the pattern is
A M A Z O N
+1 +2 +3 −1 −2 −3
B O D Y M K

Similarly, for COURSE
C O U R S E
+1 +2 +3 −1 −2 −3
D Q X Q Q B

COURSE is coded as DQXQQB. Choice (1)

37. Letter / digit which is 20th from the left is E, 8th letter / digit to the left of E is 1. Choice (4)

38. My mother’s husband’s sister’s mother is my maternal grand mother and my mother’s mother-in-law, whose only daughter-in-law is my mother itself and her brother is my maternal uncle. Choice (3)

39. In the evening the shadow fall towards east. Here, as Mona’s shadow falls to her left, Mona’s left is towards east that is she is facing south. Hence, Mona is facing north. Choice (2)

40. The given expression = 2 − 15 + 5 + 3 − 15 × 5
The actual expression = 2 + 15 + 5 × 3 + 15 − 5
= 2 + 3 × 3 + 15 − 5 = 2 + 9 + 15 − 5 = 21
Choice (2)

TEST PAPER 2

Solutions for questions 1 to 5:

1. The given statements can be represented in the following basic diagram.

From the above diagram, Conclusion I, affirmative, does not follow.
Conclusion II, affirmative, does not follow.
Conclusion III, affirmative follows.
∴ Only III follows. Choice (4)

2. The given statements can be represented in the following basic diagram.
3. The given statements can be represented in the following basic diagram.

From the above diagram, Conclusion I, affirmative, does not follow.
Conclusion II, negative, follows.
Conclusion III, affirmative, does not follow.

Negative conclusion II, follows. To prove it false we have to prove “some Goods are costly”, through an alternate diagram.

From the above diagram, II does not follow, but I follows. Conclusions I and II are contradictory to each other.

∴ Either I or II follows. Choice (1)

4. The given statements can be represented in the following basic diagram.

From the above diagram, Conclusion I, affirmative, does not follow.
Conclusion II, affirmative, follows.
Conclusion III, negative, follows.

∴ Only II follows. Choice (2)

5. The given questions can be represented in the following basic diagram.

From the above diagram, Conclusion I, affirmative, does not follow.
Conclusion II, negative, follows.
Conclusion III, affirmative, does not follow.

In the above diagram II does not follow but I follows. I and II are contradictory to each other.

∴ Either I or II follows and III follows. Choice (4)

6. Ravi has no sister but has brother.

No sister ← Ravi → Brother
Wife ← Ravi → Brother → Wife → Brother ← Sister

Choice (4)

7. \[ \text{Tea} = 200 \], \[ \text{Lassi} = 100 \]

Butter Milk = 150

N = ?

The people who do not drink anything cannot be decided because the people drinking exactly one and exactly two is not given. Choice (4)

8. \[ G \quad R \quad A \quad P \quad E \quad S \quad O \quad Y \quad P \quad E \quad Q \]

Choice (3)

I P C N G Q M A N G O

9. \[ 47 \]

\[ 23 \] + \[ 24 \]

\[ 8 \] + \[ 11 \] + \[ 13 \]

So, 23 is the missing number. Choice (2)

Solutions for questions 10 to 13:

P's sister → K Female – Advocate or Clerk
K's husband → L Male – Doctor
N's husband → M Male – Doctor
M's wife → N Female – Clerk or Advocate
M's father → O Male – Retired

Unmarried → P Male – Doctor

The order wise arrangement can be as follows.
M > P > L > K and O > K. So ‘O’ can be anywhere.

Condition 1, no man can be both an advocate or a clerk that means M and O cannot be advocate.
From the condition 2, O is a widower and he is the father of M, who is his son.
From condition 3 → N is a female and her husband is a doctor but he earns more points than P who earns more than L, means N’s husband cannot be L or P.
From condition 4 → K’s husband is L and K is the sister of P.

10. K or N is an advocate. We cannot determine who exactly out of these two is the advocate. Choice (4)

11. M is the husband of N. Choice (3)

12. K gets the lowest points. Choice (1)

13. ‘KN’ is the pair of ladies. Choice (2)
Solutions for questions 14 to 17:
Given that each of the following numbers are coded as letters, let us apply the following rules.

Number : 1 2 3 4 5 6 7 8 9
Letter code : A B C D E F G H I J

(1) The number starting with an odd digit should be coded as 'X', except 9.
(2) The number starting with an even digit should be coded as 'Y', except 4.
(3) If the digit 4 and 9 are both not at the extremes of the number then they should be coded as 'Z'. This means if 4 and 9 are at the extremes, then they should be coded as per the letter code. Excluding these three cases, the remaining digits should be coded as per the letter codes mentioned earlier.

14. The given number is 56728. It starts with an odd number, so 5 is coded as X and the remaining as per the given letter-code. Hence, 56728 is coded as ‘XFGBH’.

15. The given number is 987654. The digits at extremes are 4 and 9. So, they are coded as per the letter code. Hence, 987654 is coded as ‘HGFED’.

16. The given number is 398756. It starts with 3, an odd number, hence 3 is coded as ‘X’. 9 is not at the extreme, so 9 is coded as ‘Z’. So, 398756 is coded as ‘XZHGEF’.

17. The given number is 245376. It starts with 2, an even number. So, 2 is coded as Y. 4 is not at the extremes so coded as ‘Z’. Hence, YZECGF.

Solutions for questions 18 to 21:
Given that none among Raj, Viru and Sri won the race. Also Niru is the fourth to finish.

∴ Mani won the race.

As Niru cannot have red, blue, green (∴ 4th place) and white.
Niru used yellow coloured bike.

Given that the persons with red and yellow coloured bikes finished the race one after the other, the fifth placed peson red coloured bike (∴ 3rd is green).
As Sri used white coloured bike, he finished second and Mani used blue coloured bike.

As Viru did not finish 3rd, Raj finished third and Viru finished fifth.

(1) Mani Blue (2) Sri White (3) Raj Green (4) Niru Yellow (5) Viru Red

18. Mani won the race.

19. Raj used green coloured bike. Choice (4)

20. Viru who is the last to finish – used Red coloured bike.

21. Niru used yellow coloured bike. Choice (4)

Solutions for questions 22 to 24:

22. He is still 15 km to the North because he is simply turning but not walking. Choice (3)

23. He is facing the west. Choice (3)

24. The meeting should be on any Sunday of October. 21st August is Thursday so total days in August + September is 40.

40 ÷ 7 = 5 remainder

So last day of September is Tuesday and 1st of October is Wednesday so, 5th will be Sunday.

Choice (2)

Solutions for questions 25 to 29:

25. The passage tells us that now adays the trend is more towards technology-based courses and thus engineering and technology courses are finding more seekers than anything else. This goes on to show that these sectors are comparatively generating more employment opportunities than other sectors. The given statement contradicts this inference and hence it is definitely false. Choice (4)

26. This statement is evident from the first line of the passage itself and finds support subsequently. Hence this statement is definitely true in the light of this passage.

Choice (2)

27. The passage talks of the winds of change blowing across the education sector in India and also tells that massive changes are taking place in terms of infrastructure but nowhere we can find that learning rather than employability was the transformation that has taken place in the education sector. Hence, this is probably true.

Choice (2)

28. The passage specifies the changes encompassing the education sector in India and also the moves being undertaken to accommodate these changes. The government is also contributing its mite by opening up the education sector to private investors. The given statement contradicts these facts hence it is definitely false. Choice (4)

Solutions for questions 30 to 36:

30. Let the number of small cubes of cubes be n

Then n × 9 × 9 × 9 = 36 × 36 × 36

∴ n = 64    Choice (2)

31. For each letter the consecutive next letter from the Alphabet are written in the following order.

Choice (3)

32. The pairs, which satisfy the given criteria, are AG, GI and NO.    Choice (2)

33. Except Grape, others are rhyming words.    Choice (4)

34. Taking the place values of the letters in the word CONFIDENCE we get:

CON/9/61

(After adding the double digit values)

Sum of these values is 78.

Similarly by taking the place values of the letters in the word the word SUCCESS we get,

SUCC/6/ES

By adding the values we get 89.    Choice (1)

35. This is a question based on artificial values

It is given that 4 x 5 = 12    &    14 x 6 = 65
We get this value on account of the following manipulation:

\[
\begin{align*}
4 \times 5 &= 20 \\
(4 - 1) \times (5 - 1) &= 12 \\
14 \times 6 &= 84 \\
(14 - 1) \times (6 - 1) &= 12 \\
25 \times 3 &= 75 \\
(25 - 1) \times (3 - 1) &= 48
\end{align*}
\]

Choice (2)

Solutions for questions 37 to 40:

37. According to I, some deserving students may not be able to perform due to sickness etc., hence their true ability does not come to the fore. Hence, I is a strong argument. II is also a strong argument, as the examiner’s integrity can be questioned; the examiner might favour certain students or could be biased. Hence, both are strong arguments. Choice (3)

38. I is not strong as the officer can be dismissed only if it is known that he is aware of existence of child labour and he is not taking any action. II is strong for the reason maintained above. Choice (2)

39. I is a strong argument, as the discovery of new oil reserves should result in decrease in quantity of oil imported, thus same foreign exchange. II is not a strong argument as these is no substantiation and explanation as to why the existing contracts are not repeatable. Choice (1)

40. Question in discussion is not R & D but Rupees 1.5 crore. Hence neither of the arguments is strong. Choice (4)
Solutions for Mock Tests

MOCK TEST 1

Solutions for questions 1 to 3:
1. The required cost per tonne
   \[
   \frac{(35 + 40) \times 135}{(35 + 47) \times 60} \approx 2 \times 1
   \]
   Choice (1)

2. The costliest mode of transport must have the highest cost of transportation per tonne.
   Out of \( \frac{10}{8}, \frac{40}{35}, \frac{35}{15}, \frac{15}{10}, \frac{10}{8} \) is the greatest. Hence, the costliest mode of transport is Air freight.
   Choice (4)

3. As \( \frac{35}{47} < \frac{40}{35} < \frac{10}{8}, \frac{25}{35} < \frac{40}{47} < \frac{10}{10} \)
   Choice (4)

Solutions for questions 4 to 7:
4. Total expenditure of A = Rs 6000; Amount paid by A as rent = Rs \( \frac{62.5}{100} \times 6000 = Rs 3750 \)
   Total expenditure of C = Rs 7000; Amount paid by C as rent = \( \frac{25}{100} \times 7000 = Rs 1750 \)
   The difference = Rs \( \frac{3750 - 1750}{2} = Rs 2000 \)
   Choice (2)

5. Total expenditure of D = Rs 9000; Amount spent by D on food = \( \frac{25}{100} \times 9000 = Rs 2250 \)
   Choice (3)

6. Let B’s total expenditure be B and C’s total expenditure be C. Given, C’s expenditure on food is 40 per cent more than B’s expenditure on food that is 50 per cent of C = 1.4 \times 25 per cent of B \( \Rightarrow C = 70 \) per cent of B; C is 30 per cent less than B. Choice (4)

7. B is paying 50 per cent of his total expenditure towards rent whereas 25 per cent of his total expenditure on his food. Other two statements cannot be concluded because the total expenditures are not known. Choice (2)

Solutions for questions 8 to 11:
8. Of \( \frac{25-20}{20-25}, \frac{40-25}{40-40}, \frac{45-40}{45-40} \)
   and \( \frac{50-45}{50-45} \) is the least.
   Choice (4)

9. The required ratio = \( \frac{25+25+40}{30+45+45} = \frac{90}{120} = 3:4 \)
   Choice (1)

10. Of \( \frac{30-25}{25-30}, \frac{45-30}{45-45}, \frac{50-45}{50-50} \)
    and \( \frac{55-50}{50-30} \) is the highest.
    Choice (2)

11. The required percentage increase
    \[
    \left( \frac{50 + 55}{45 + 50} - 1 \right) \times 100 = 10.5 \text{ per cent}
    \]
    Choice (2)

Solutions for questions 12 to 15:
12. Let the regular consumption of petrol of Mr. Manjeet be 100 liters. Expenditure at the initial price of petrol = Rs 4500. When price per liter of petrol is increased to Rs 50 the new consumption be \( x \) liters ; \( x \times 50 = 4500 \)
    \( x = 90 \), \( \therefore \) Percentage decrease in petrol consumption = 10 per cent
    Choice (2)

13. Average price of petrol per liter initially
    \[
    \frac{45 + 47 + 48 + 49}{4} = Rs 47.25
    \]
    Average price of petrol per litre finally
    \[
    \frac{50 + 51 + 51 + 52}{4} = Rs 51
    \]
    Difference = 51 – 47.25 = Rs 3.75
    Choice (4)

14. Initial price of petrol in Delhi = 45; Final price of diesel in Jaipur = 33. Required percentage \( \frac{45}{33} \times 100 = 136\frac{2}{11} \) per cent
    Choice (4)

15. In Delhi, the percentage change in the price per liter of petrol = \( \frac{5}{45} \times 100 = 11.11 \) per cent
    Choice (1)

Solutions for questions 16 to 20:
Total contribution of manufacturing to the GDP in the given years = \( 125 + 165 + 137.5 + 208 + 245 + 225 = 1105 \times 5 \) billion rupees
Total GDP in the given years = \( 500 + 600 + 500 + 650 + 700 + 750 = 3700 \) billion rupees.

    Choice (2)

17. The required percentage is \( \frac{1105.5 - 3700}{3700} \times 100 = \frac{2987}{3700} \times 100 \equiv 30 \)
    Choice (1)

18. Total contribution of
    \[
    \frac{20}{100} \times 3700 = 740 \text{ billion rupees.}
    \]
    Choice (3)

19. The least GDP = \( \frac{350}{40} \times 100 = 875 \) billion rupees.
    Choice (4)

20. It was the lowest in 2001
    Choice (1)
Solutions for questions 21 to 24:

21. In sentence A only cry can fit. In B it can only be ‘cry’. In C it can only be ‘weep for joy’. In D it can be sob, wail or cry, wail. Cry fits into 3 blanks and that is the maximum. Choice (3)

22. In sentence A it is ‘below’ – below is used for position or measurement on a scale. In B it can be under underneath or beside. In C it can only be under–under is used for movement from one side below something to another. In D it can be under or beside. Since under fits into three blanks, the answer is three. Choice (3)

23. In sentence A it can only be ‘economical’. Only ‘economy’ fits into B. In C it can only be ‘economic’ and in D ‘economies’. As each word is used only one time, the answer is one. Choice (1)

24. In sentence A only ‘frowned’ goes with ‘upon’. In B it is grimaced. In C it can be frowned, ‘scowled’ or glared. In D it is ‘scowled’. ‘Scowled’ fits into 2 sentences, as also frowned’, the answer is two. Choice (2)

Solutions for questions 25 to 28:

25. A chance happening is ‘serendipity’. ‘Revelation’ means creating awareness ‘serum’ is a thin liquid while ‘prescience’ is the art of forecasting events.
Choice (2)

26. ‘Flamboyant’ is used with people rather than for a work of art. ‘Picturesque’ is something that is attractive and interesting while ‘resplendent’ means something that is dazzling which cannot be used to substitute the phrase. Only ‘chromatic’ is an apt substitute.
Choice (2)

27. A long and angry speech is a ‘tirade’. ‘Invective’ is abuse while ‘riposte’ is an angry retort.
Choice (2)

28. ‘Allayed’ is to soothe or assuage while ‘revoke’ is to take back an order ‘Alienate’ is to become unfriendly or unsympathetic to someone. To ‘nullify’ is to negate or render something ‘ineffective’.
Choice (1)

Solutions for questions 29 to 32:

29. Statements A and D are erroneous, making option I (B and C) the correct answer. ‘In the heart of the capital Mumbai’ in statement A should be corrected to ‘in the heart of its capital, Mumbai’. In statement D, omission of article ‘a’ before daily wage earner is the error. Choice (1)

30. Statements A and C are grammatically correct. Omission of the definite article ‘the’ before 1960s and 1980s in statement B is an error. In statement D, ‘she also has apparently’ should read ‘she has also apparently’. Choice (2)

31. Only statement D is grammatically incorrect. ‘Commandos are put through a grind of all classes’ in the sentence should be corrected by inserting ‘the’ (definite article) before ‘classes’. Choice (3)

32. Statements A and B are error-free. So option 4 is the answer. Incorrect use of phrasal verbs make both sentences C and D erroneous. The error ‘New Delhi was shut away from’ can be corrected in two ways. New Delhi was shut out of Afghan affairs or New Delhi was shut off from Afghan affairs. Both imply kept away from. In statement D, ‘the situation has turned over’ is wrong. Turned around is correct, which implies a situation which changed for the better.
Choice (4)

Solutions for questions 33 to 36:

33. In choice (A), ‘in getting’ is inappropriate. The challenge the warning system faces is getting the word out or ‘to get the word out’. Choices (B) and (C) are ruled out due to an error in the parallel structure.
Choice (2)

Apart from the above mentioned errors, choice (D) has a tense error. ‘Will respond’ is not appropriate in the context.
Choice (2)

34. ‘Regarded’ should be followed by ‘as’ and not ‘to be’ which makes option A erroneous. Option B is correct. Option C is erroneous because of the phrase ‘of transmitting; which follows ‘the right of television’. It should read the right of television ‘to transmit’ because we have the right to do something not ‘for something’ option D is erroneous because of the use of ‘mass’ in place of ‘massive’. Massive means large whereas ‘mass’ means ‘commonplace’ which is not the meaning intended in this context.
Choice (2)

35. Statements B and C are erroneous because these statements do not maintain consistency in tense. These sentences are in the past tense and hence present perfect should not be used. Statement D is incorrect as ‘was to rid of the nation’ represents incorrect use of the phrasal verb ‘rid something of something’. The correction is ‘rid the nation of the idea……’.
Choice (1)

36. The sentence says what China will have achieved by 2050. The achievements must have parallel structure. Since the first in the list is ‘eradicated’ the others must be ‘established’ and ‘lifted’.
Choice (4)

Solutions for question 37 to 40:

37. Between sentences A and C, C is a better openingsentence. ‘That universe’ in Blinks A and D are a pair because they explain why the mobile phone is unique. Hence CBAD.
Choice (3)

38. B is ideally the opening sentence because it is a generalized statement which states the topic on which the rest of the paragraph is used. C follows B by stating how the researches were instrumental in identifying the climatic shifts. A follows C as it caries the idea forward by stating when the climatic changes took place. D follows A because ‘these’ in statement D refer to the ‘periods of climatic’ change mentioned in A. Hence BCAD is the correct order.
Choice (1)

39. Sentence B is appropriate as the opening statement because it is very generalized. Statement D follows B as it goes on to describe how Christmas fuels consumerism. Statement A follows D by saying consumerism fuels global warming which in tum fuels fear, guilt, doom etc. C ideally sums up the para by saying that ‘all these acts and feelings’, that is the acts and feelings, referred to in the preceding sentences, are a far cry from Christmas. Hence BCAD is the correct order.
Choice (1)

40. From among the given choices, we understand that either B or C may open the paragraph. The words “It is unlikely……” indicate that B is a continuation of an idea. Hence ‘C’ is the appropriate statement to open the paragraph. Option (3) is ruled out. The words ‘use of foreign aid’ in ‘C’ find continuation in A. Hence CA go together. Further D follows A. The word ‘they’ in D refers to the words ‘state governments’ in A.
Choice (2)

Solutions for Questions 41 to 60:

41. Let b be the number of lillies and a be the number of roses purchased. Then a + b = 50
Let x be the cost of one rose and y be the cost of one lily.

Then ax + by = 125 × (1) and bx + ay = 175 × (2)
(ax + by) + (ay + bx) = 300 × (a + b)(x + y) = 300; x + y = 300/50 = 6
Choice (2)
42. Let C.P of 50 articles = S.P of x articles = 1; C.P of 1 article = 1/50. S.P of 1 article = 1/x

\[ \frac{1}{x} - \frac{1}{50} = \frac{25}{100} \Rightarrow x = 40 \quad \text{Choice (3)} \]

43. Work done by P + Q in one day = 1/15
Work done by Q + R in one day = 1/20
Work done by R + P in one day = 1/25 (2P + 2Q + 2R) one day work = \( \frac{1}{15} + \frac{1}{20} + \frac{1}{25} \)

\[ \Rightarrow \text{P + Q + R one day work} = \frac{47}{600} \]

P + Q + R one day work = \( \frac{47}{600} \); Work completed in 3 days by three of them = \( 3 \times \frac{47}{600} = \frac{47}{200} \); (Q + R) can complete whole work in 20 days.

\[ \text{Remaining work} = 1 - \frac{153}{200} = \frac{47}{200} \]; (Q + R) can complete whole work in 20 days.

44. Speed of the train = 126 km/h = 35 m/s
Total distance covered = length of train + length of platform = 100 + 50 = 150 m
Time taken = \( \frac{150}{35} = 4.28 \) sec

Choice (1)

45. Radius of circle = 5; ∴ Area of circle = 25π; Side of hexagon = 5

Area left = 25π - \( \frac{75\sqrt{3}}{2} \) = 13.5

Choice (2)

46. As two boys are sitting together, they have to be considered as one unit. So 7 units can be arranged around a circular table in 6! ways and the two boys can be internally arranged in 2! ways. ∴ They can be arranged in 6! \times 2! ways.

Choice (2)

47. The required probability = \( \frac{^5C_2 \times ^5C_2}{^nC_2} = \frac{10 + 15}{55} = \frac{5}{11} \). Choice (2)

48. As the angle of elevation of top of the pole from A is 30°, the distance between bottom of pole and A is \( \sqrt{3} \) times the height of the pole. So height of the pole cannot be equal to distance between points AB.

Choice (4)

49. The cost of 4 pairs of glows is Rs 600. Hence, the cost per pair is Rs 150, which is 75 per cent of Rs 200.

∴ It is cheaper by 25 per cent. Choice (2)

50. The cost would be 5,00,000 \( \times \frac{70}{100} \times \frac{70}{100} \times \frac{70}{100} = \text{Rs 1,71,500} \)

Choice (1)

51. Let us assume each man can do the work in x days
Total work done by 5 men in 5 days = \( \frac{5 \times 5}{x} \)

25/x; Second part \( \frac{7 \times 5}{x} = \frac{35}{x} \); Total work = \( \frac{60}{x} \)

5 men in one day can do \( \frac{5}{x} \) of the work; 5 men need 12 days to complete \( \frac{60}{x} \) work.

∴ 5 men need 2 more days to complete the work

Choice (1)

52. B’s speed = 20/2 = 10 m/s; Time taken by B to complete the race = 500/10 = 50 sec
∴ A took 50 – 2 = 48 seconds to complete the race.
D’s speed = 100/20 = 5 m/s; Time taken by D to complete the race = 500/5 = 100 sec
∴ Time taken by C to complete the race = 100 – 20 = 80 sec.
∴ Ratio of times taken by A and C to complete the race = 48 : 80 = 3 : 5

Choice (4)

53. Let the speed of the boat in still water be \( x \) kmph; Speed of stream = \( y \) kmph
Relative speed while going downstream = \( x + y \) kmph; Relative speed while going upstream = \( x - y \) kmph

In 1st case, \( \frac{45}{x + y} + \frac{45}{x - y} = 14 \) ---- (1)
And in 2nd case \( \frac{36}{x + y} = 4 \Rightarrow x + y = 9 \)
From (1), \( \frac{45}{x + y} + \frac{45}{x - y} = 14 \Rightarrow \frac{45}{x - y} = 9 \)
\( \Rightarrow x - y = 5 \); ∴ \( x = 7 \) and \( y = 2 \)

Choice (2)

54. Since we do not know the age of the employee who returns, the answer cannot be determined.

Choice (4)

55. Let B take a days to complete the work. Then A takes 2a days and C also takes 2a days to complete the work. A works on the first and fourth days and does 1/a. B works on the 2nd day and does 1/a. Hence A and B contribute equal amounts

Choice (4)

56. Let the critical population be 100; Net increase in 1 year = \( \frac{1.07}{100} \times 100 \)
∴ population after 1 year = \( 1.07 \times 100 \) in 3 years net increase in population = \( (10.01)^3 \times 100 \)
∴ net per cent increase = 22.5 Choice (1)

57. Let the C.P of each article be Rs 100; S.P of the article which is sold at 28 per cent profit = Rs 128
S.P of another article which was sold at 14 per cent loss = Rs 86
Total C.P = Rs 200; Total S.P = Rs 214; Profit per cent = \( \frac{1400}{100} \times 100 = 70 \) per cent
Choice (4)

58. Let the length of the train be \( L \) m. Let its speed be \( S \) m/sec. Time taken by it to cross the 100 m platform = \( L \) seconds;

\[ \frac{L}{S} = 40 \Rightarrow L = 40S \]

Required time = \( S \); \[ \frac{L + 100}{S + 5} = \frac{40S + 100}{S + 5} \]
\[ = \frac{40(S + 5) - 100}{S + 5} = 40 - \frac{100}{S + 5} \]
This is always less than 40. Only choice (3) violates this condition.

Choice (3)

59. The actual cost per kg of the mixture = \( \frac{30 \times 6 + 40 \times 5}{11} = \frac{380}{11} = \frac{34.6}{11} \)

∴ The profit percentage = \( \frac{35 - \frac{34.6}{11}}{\frac{34.6}{11}} \times 100 \)
\[ = \frac{5}{380} \times 100 \equiv 1.3 \text{ per cent. Choice (1)} \]

60. The required number of ways is \( ^{10}C_4 \)
\[ = \frac{7!}{4! \times 3!} = 35 \quad \text{Choice (1)} \]

Solutions for questions 61 to 64:

61. Here, Australian do not play in the spirit of the game, therefore they need counseling.
∴ Assumption I is implicit.
It is talked about only Australians, in the statement, thus assumption II is not implicit. Choice (1)

62. Since, better career ‘starts’ with good English, thus it is the essential requirement for a good career; ∴ Assumption I is implicit. Statement II is talking about a better career, it doesn’t mean that there will be no future without the knowledge of English. ∴ Assumption II is not implicit. Choice (1)

63. According to the author, to have a healthy life one should know about good health. The statement is regarding the sequence of steps towards a healthy life. Hence, neither I nor II is the assumption based on which the statement is made. Choice (3)

64. Lack of Marketing is hazardous for the success of a movie, thus it forms an essential part in the success of a movie. ∴ Assumption I is implicit. ‘Only the Marketing’ does not guarantee the success of a movie, thus assumption II is not implicit. Choice (1)

65. I is not strong because it is irrelevant. II is strong because it states that less money is required for registered marriages and hence money can be saved. Choice (2)

66. I is incomplete. Hence, I is not strong. II is not strong as the relation between team's strength and conducting the event is not established. Choice (3)

67. It is the worth of the work, but not satisfaction, that is criteria for awarding Nobel Prize. Hence I is not strong. More prizes does not lead to lose of significance. Hence II is not strong. Choice (3)

68. I is not strong because it is irrelevant. II is strong because it states that the effect of the lack of trees cannot be offset with green paint. Choice (2)

Solutions for questions 65 to 68:

69. Statement I shows the only way to increase the forex reserves. It does not necessarily mean that an increase in exports would always lead to an increase in forex reserves. Hence, neither A nor B follows. Choice (3)

70. Statement I indicates every sincere person is hard working. Hence, those who are not hard working persons are not sincere. Hence, only A follows. Choice (1)

71. Statement I indicates that sacrifice is necessary for one to become a leader but it does not specify whether sacrifice is sufficient or if there are any other requirements. Hence, A does not follow, but B follows. Choice (2)

72. According to statement I, availability of resources will make a country rich. It does not necessarily mean that nothing else would make a country rich. But when a country is not rich, it can be certainly said that resources are not available. Hence, B alone follows. Choice (2)

Solutions for questions 73 to 75:

73. My father’s sister is my paternal aunt and her mother is my paternal grandmother and my grand mother’s only daughter-in-law is my mother. Her only son can be myself or my brother. Choice (4)

74. The path traversed by Richmond is as follows.
As we know that $(XY)^2 = (XO)^2 + (YO)^2$

$XO = 48 – 24 = 24$ km

$YO = 14 – 7 = 7$ km

$\therefore (XY) = \sqrt{(24)^2 - 7^2} = \sqrt{625} = 25$ km.

Choice (2)

75. In the evening, as the sun is in the West, the shadow falls towards East. As the shadow of the Pam is falling to his left, hence he is facing South. ∴ Sam is facing North. Choice (1)

76. D and E is a married couple. Choice (2)

77. CEO is the father of the logistics manager. Choice (3)

78. Finance manager is the son of the marketing manager. Choice (1)

Solutions for questions 76 to 78:

F is paternal grand mother of C. ∴ F belongs to the 1st generation and C belongs to the 3rd generation. Similarly, from (ii), B and finance manager belong to the 3rd generation and CEO belongs to the 1st generation.

The females are, B, D and F and the males are C, E and A. The final diagram will be as follows.

Solutions for questions 73 to 75:

79. It is given that
EAGLE – 517125
CAMEL – 3113512

If we observe here, the place value of the letters is taken as their code.
Value of E is 5
Value of A is 1
Value of G is 7
Value of L is 12

Similarly, the code for TIGER is 2097518. Choice (2)

80. Milk is white in colour and white is called Blue. Hence, milk is Blue in colour. Choice (4)

Solutions for questions 101 to 104:

101. Total expenditure in Jan = Rs 1571; Mar = Rs 2048 ; Aug = Rs 2072 and Nov = Rs 2288 . ∴ Expenditure in January was the least. Choice (1)

102. Highest price per kg was of D in the month of January = Rs 60

Lowest price per kg was of A in the month of August = Rs 18; The required ratio = 60 : 18 = 10 : 3 Choice (2)

103. Total expenditure in the month of August = $$(26\times18) + (4\times44) + (14\times42) + (4\times51) + (12\times53)$$

= 468 + 768 + 588 + 204 + 636 = Rs 2072 Choice (3)

104. Total amount spent on B in the month of July = $45 \times 3 = Rs 135$

In none of the cases, the amount spent is Rs 135 Choice (4)

Solutions for questions 105 to 109:

105. Total sales in 2002-03 = 105 + 96 + 208 + 165 + 73 = 647 -------- (i)

Total sales in 2000-01 = 94 + 68 + 165 + 112 + 57 = 496

Let 647 ≅ 650 and 496 ≅ 500

Sales target in 2002-02 = 1.2 x 500 = 600 m tones. Hence there is surplus in the sales target

\[ \therefore \text{required percentage} = \left( \frac{650 - 600}{500} \right) \times 100 = 10 \text{ per cent} \] Choice (2)

106. Sales of Tin in 2000-2001= 0.4132 x 57 = 23.55 million tonnes

In 2002-2003, Sales of Tin = 23.55 x 1.1 x 1.1 ≈ 28.5 million tonnes

Total sales = 105 + 96 + 208 + 165 + 73 = 647 million tones. Required percentage
107. Sales of copper in 2002-2003 was 96. The sales increased by 25 per cent in the next year, but still remained 80 per cent of the quantity available. \( \therefore \) Quantity of copper available in 2003-04
\[ \frac{96}{0.8} \times 1.25 = 150 \]
Choice (2)

108. Sales of all metals in 2000-2001 was 496. Sales of all metals in 2002-2003 was 647.
Annual percentage increase
\[ \frac{647 - 496}{496} \times \frac{1}{x - 1} \times 100 \% \]
\[ x = 3 \]
\[ = 15.2 \] per cent
Choice (4)

Solutions for questions 115 to 120:

115. Column A: 1123 under base 4 = 91
Column B: 101111 under base 2 = 47.
\( \therefore \) Value in Column A > Value in Column B
Choice (1)

116. Column A: 80 per cent of 95 = \( \frac{80}{100} \times 95 \)
Column B: 25 per cent of 304 = \( \frac{25}{100} \times 304 \)
\( \therefore \) Value in Column A = Value in Column B
Choice (3)

117. Column A: \( 8 + 2\sqrt{15} \) = \( (\sqrt{5} + \sqrt{3})^2 \)
Column B: \( 9 + 2\sqrt{11} \) = \( (\sqrt{7} + \sqrt{2})^2 \)
\( (\sqrt{5} + \sqrt{3})^2 < (\sqrt{7} + \sqrt{2})^2 \)
\( \therefore \) Value in column B > Value in column A.
Choice (1)

118. Column A: \( (x - 2)^2 - 9 \)
x - 2 = ± 3
\( x = 5 \) or -1
Column B: \( 2x + 3 = 11 \)
\( 2x = 8 \)
x = 4
\( \therefore \) The given two values cannot be compared.
Choice (4)

119. Column A: \( (3^3)^{\sqrt{3}} \) = \( (3^3)^{\sqrt{3}} \)
Column B: \( 7^{\sqrt{7}} = 7 \)
\( \therefore \) Value in column A > Value in column B
Choice (1)

120. Column A: The number of ways in which the letters of the word CRICKET can be arranged is \( \frac{7!}{2!} \)
\[ \frac{5040}{2} = 2520 \]
Column B: The number of ways in which the letters of the word HOCKEY can be arranged is 6! = 720.
\( \therefore \) Value in column A > Value in column B.
Choice (1)

Solutions for questions 121 to 124:

121. When the author says that we also hear that India can leapfrog to new technologies without having to deal with legacy issues, he refers to the groundwork that needs to be done to bring in new technologies, as is clear from the rest of para 3.
Choice (3)

122. ‘Leaders proclaim India’s strength lies in its ability to bypass industrial economy and leapfrog from an agricultural economy to a service based economy’. As agricultural economy is the first sector according to the author, industrial economy must be the second and services the third.
Choice (4)

123. ‘These sectors …(workforce)(para 5, line 3 – 4) shows that (3) is the correct answer.
Choice (3)

124. Refer to para 4. A careful reading points to choice 1.
Choice (1)

Solutions for questions 125 to 128:

125. Refer last paragraph.
Choice (1)

126. Refer paragraph 3.
Choice (2)

127. Refer paragraph 4.
Choice (3)

128. Refer paragraph 2 and 4.
Choice (2)

Solutions for questions 129 to 132:

129. Refer to the last para, lines 3-4 (loved the world. . . . . expressed themselves.)
Choice (2)

130. In the passage, the author uses the words to mean a dislike of empty spaces.
Choice (4)

131. Only choice (2) is right – in all other options the attributes are reversed.
Choice (2)

132. Statements A and B are true – last para, lines 1 – 3.
Choice (1)

Solutions for questions 133 to 136:

133. Refer to the first sentence of Para 6.
Choice (2)

134. The 2nd line of the 1st para “one of the chief --- differences --- incapable of complete satisfaction” makes option 1 the correct choice.
Choice (1)

135. Refer to lines 3 to 6 of para 4 “These are the men --- human power” which shows that option 3 is the right choice.
Choice (3)

136. The words in quote occur at the end of para 2 (third line from the end). The words ‘the same characteristics’ refer
to the characteristics mentioned in the preceding lines – men like Xerxes and Newton who continued to be active even after their needs were met to achieve their dream.

Choice (4)

Solutions for questions 137 to 140:

137. Since the term manic – depressive will refers to a wider range of mentally ill patients in Great Britain it naturally follows that the number of patients will be greater in Great Britain than in US. So Choice 1 is the best Answer. Choice 2 suggests that the admission rate is high in the limited states. So it is not useful in explaining the situation presented in the passage. Choice 3 is irrelevant. Choice 4 dwells on training institutions in Psychology which has no bearing on the number of admissions.

Choice (1)

138. Choice (1) is stated and hence is not an assumption. Dr. Sylvan has not made a link between salinity and the assumption on the impact of salinity on the Viparia. However, he has assumed that the salinity of the Mediterranean has not decreased from the 3 ppm levels and hence concludes that the slug will not survive there.

Choice (2)

139. The assumption behind the group’s contention is that animals that are shy and active only during the night time are feared and persecuted for that reason. Option 3 establishes that owls too are shy and active at night, but they are neither feared nor persecuted. Therefore 3 is the answer. Though options 1 and 4 provide a context to people’s attitude towards the devil, they do not affect the group’s contention. Option 2 is irrelevant to the argument.

Choice (3)

140. Option (1) discusses hearts transplant in general and does not say anything about natural or mechanical hearts.

Option (2) seriously weakens the given recommendation because we do not know the effect of any type of medicine on a mechanical heart.

Option (3) may sound good as a flaw but then it may be possible to inject this important hormone.

Option (4) is not discussing a flaw about mechanical heart. It ends up discussing the current lack of knowledge of some cardiologists. These cardiologists could always increase their knowledge of how mechanical pumps could be made to work efficiently.

Choice (2)

Solutions for questions 141 to 143:

Let be chairs are numbered as follows

1 2 3 4 5 6 7

(i) ⇒ R is in 4
(ii) ⇒ P is in 5
(iii) ⇒ S can be either at 2 or 3 but if S is at 2, v will be at 6 then either Q or T should be at 1 or 7 which contradicts statements (ii)

⇒ S is at 3 and V is at S, U is at 1 and T are at 2 and 6.

Arrangements is U, Q/T, S, R, P, T/Q, V

141. U and V are at either end of the row.

Choice (2)

142. Either T or Q can sit in between P and V.

Choice (4)

143. T is to the immediate right of P.

Choice (1)

Solutions for questions 144 to 150:

144. As the given day is Wednesday, Tuesday precedes the given day. 15th day before yesterday is Monday and the 15th day after Monday is Friday.

Choice (3)

145. Let E, W, S and N are the pointers showing the compass with him thus the path travelled by him is as follows.

Banu followed the directions shown by the compass with him thus the path travelled by him is as follows.

40 m

30 m

25 m

Now he is facing West.

Choice (4)

146. As the females and couple are not opposite. Father and daughter should be opposite each other. As father cannot face North, daughter cannot face South.

Choice (3)

147. The difference between the actual time and the mirror time = 3 hours.

Actual time – Mirror time = 3 - - (i)

Further,

Mirror time + Actual time = 12 - - (ii)

From (i) and (ii),

Actual time = 7:30

Choice (2)

148. Average wage of lala in the month is

Wage on the first day + Wage on the last day

\[ \frac{2}{2} \]

Wage on the first day = 30

Wage on the last day = 30 + 30(10) = 330

Average wage = \[ \frac{30 + 330}{2} \] = 180

Choice (3)

149. From the given information,

Cost : - B > D ; A > C

Fast : - D > C

The cheapest car is the slowest car. It cannot be B or A or D.

∴ It must be C.

Choice (3)

150. In the group stages, in every group a total of \( ^{5}C_{2} \) ie., 10 matches are played. Hence in both groups a total of 20 matches are played. In the semis, two matches are played and in the final, one match is played. Hence a total of 23 matches.

Choice (2)

Solutions for questions 151 to 155:

There are eight friends and the number of persons, who bought same colour dress is either 2 or 3. There is only one possibility = 3 + 3 + 2

The given information is as follows.

<table>
<thead>
<tr>
<th>Blue</th>
<th>White</th>
<th>Pink</th>
<th>Name</th>
<th>Shop</th>
</tr>
</thead>
<tbody>
<tr>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>Pradeep</td>
<td>Shoppers’ Stop</td>
</tr>
<tr>
<td>✗</td>
<td></td>
<td></td>
<td>Akash</td>
<td>Arrowhead</td>
</tr>
<tr>
<td>✗</td>
<td>✗</td>
<td>✓</td>
<td>Supriya</td>
<td>Pantaloone</td>
</tr>
<tr>
<td></td>
<td>✓</td>
<td>✓</td>
<td>Sindhu</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>✓</td>
<td>Powel</td>
<td>Not Peter</td>
</tr>
<tr>
<td>✗</td>
<td>✗</td>
<td>✓</td>
<td>Vandan</td>
<td>Kalaniketan</td>
</tr>
<tr>
<td>✓</td>
<td>✗</td>
<td>✗</td>
<td>Kavita</td>
<td>Reebok</td>
</tr>
<tr>
<td>✗</td>
<td></td>
<td></td>
<td>Chandan</td>
<td></td>
</tr>
</tbody>
</table>

From the above table as Pradeep did not buy white or Pink he bought blue coloured dress.

The remaining three persons (Akash, Powel & Chandan) bought white coloured dress.

As, those who bought white coloured dress did not go to shoppers stop or CMR. Sindhu went to CMR.

∴ Chandan went to Peter England and hence, Powel went to Nike.

∴ The final distribution table will be as follows

<table>
<thead>
<tr>
<th>Name</th>
<th>Shop</th>
<th>Blue</th>
<th>White</th>
<th>Pink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pradeep</td>
<td>Shoppers’ Stop</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
<tr>
<td>Akash</td>
<td>Arrowhead</td>
<td>✗</td>
<td>✓</td>
<td>✗</td>
</tr>
<tr>
<td>Supriya</td>
<td>Pantaloone</td>
<td>✓</td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>
Solutions for questions 156 to 159:
The given routes between the cities are represented in the following diagram:

![Diagram of cities and routes]

(i) G - H - A - I
(ii) G - H - A - F - C - I
(iii) G - H - D - A - F - C - I
(iv) G - H - D - A - F - C - I
(v) G - H - D - E - C - I
(vi) G - H - D - E - F - C - I
(vii) G - H - D - F - C - I

There are seven possible ways. Choice (3)

157. The person cannot reach city E. Choice (3)

158. The largest possible route is E - B - G - H - D - A - F - C - I; He can go through seven cities. Choice (4)

159. Counting the total number of odd days from 15th March to 12th October:
Month: March = 4
April = 6
May = 5
June = 4
July = 2
August = 5
September = 2
October = 1
Total odd days = 4 + 6 + 5 + 4 + 2 + 5 + 2 + 1 = 31
1 day after Wednesday is Thursday; Hence 12th October is Thursday. Choice (3)

Solutions for question 160:

160. At 8:45 the two hands of the given clock will align as follows.

\[
\begin{align*}
\text{At 8:45 the minute hand points West} & \quad \text{and the hour hand points towards South-West} \\
\text{Choice (4)} & \\
\end{align*}
\]

Solutions for questions 161 to 180:

161. Let speed of the boat in still water be \( x \) kmph and speed of stream be \( y \) kmph.
\[
\frac{30}{x-y} + \frac{20}{x+y} = 14 \quad \text{(1)}
\]
\[
\frac{33}{x-y} + \frac{15}{x+y} = 14 \quad \text{(2)}
\]
Solving (1) and (2) we get \( x = 4 \) kmph, \( y = 1 \) kmph. Choice (1)

162. Number of ways of selecting 5 from 7 students is \( \binom{7}{5} = 21 \)
Number of ways of selecting 2 from 6 students is \( \binom{6}{2} = 15 \); Total number of ways is \( 21 \times 15 = 315 \). Choice (2)

163. Let the speed of the first train be \( x \) kmph. Distance travelled by the 1st train in 1 hr = \( x \) km
At 9.00 a.m. the distance between the trains = \( (160 - x) \); Speed of the second train = \( (x + 10) \) kmph
Now \( \frac{160-x}{x+x+10} = 1 \Rightarrow x = 50 \); Speed of the faster train = 60 kmph Choice (4)

164. Total number of balls = 7; Number of ways of selecting two balls is \( \binom{7}{2} = 21 \)
Number of black balls = 3; Number of ways of selecting 2 black balls is \( \binom{3}{2} = 3 \)
\[ \text{Probability of selecting two black balls} = \frac{\binom{3}{2}}{\binom{7}{2}} \]
Choice (2)

165. Let the number of chocolates that each of Pinky, Chinky and Tinky can eat in one hour be \( p, c \) and \( t \) respectively. \( p - t = t - c \)
\[ \Rightarrow 2t = p + c; p + t + c = \frac{240}{8} = 30 \]
\[ t + 2t = 30 \Rightarrow t = 10; 3c = 2p \Rightarrow p + c = 20 \]
\[ \Rightarrow p + \frac{2}{3}p = 20 \Rightarrow p = 12 \Rightarrow 5p = 60 \]
Choice (3)

166. The required part = \( 1 - \frac{1}{3} - \frac{2}{3} \times \frac{2}{3} = \frac{9}{9} \). Choice (1)

167. Let the time taken by tap B to fill the tank be \( x \) hrs. Time taken by tap A = \( (x - 4) \) hr.
\[ \Rightarrow \frac{1}{x-4} + \frac{1}{x+5} \times x = 10; \text{Total work done when all the three taps work together} \]
\[ = \frac{1}{6} + \frac{1}{10} + \frac{1}{15} = \frac{10}{30} = \frac{1}{3}; \text{Total time taken} \]
\[ = 3 \text{ hrs. \quad Choice (2)} \]

168. Let the ages of Amit and Bharath be 4\( k \) years and 5\( k \) years respectively.
\[ 4k + 18 + \frac{7}{8} = 32k + 144 = 35k + 126 \]
\[ \Rightarrow 3k = 18; \quad \Rightarrow k = 6. \quad \text{Choice (3)} \]

169. Number of hemispherical blocks
\[ = \left( \frac{42}{14} \right) \left( \frac{42}{14} \right) \left( \frac{70}{7} \right) = 90; \text{Volume of the cuboid} \]
\[ = \left( \frac{42}{14} \right) \left( \frac{42}{14} \right) \left( \frac{70}{7} \right) \right) = 123480 \text{ c.c.} \]
Volume occupied by the hemispherical blocks = \( 90 \left( \frac{2}{3} \right) \left( \frac{22}{3} \right) \left( \frac{7}{7} \right) \text{ c.c.} = 64680 \text{ c.c.} \)
\[ \Rightarrow \text{Empty space} = (123480 - 64680) \text{ c.c.} = 58800 \text{ c.c} \quad \text{Choice (3)} \]

170. Since the sphere is completely submerged in water, the increase in the level of water is because of the volume occupied by the sphere. Let the increase in water level be \( h \).
\[ \Rightarrow \text{The increase in total volume} = \pi \left( \frac{16}{2} \right)^2 \left( \frac{16}{2} \right) \]
\[ \Rightarrow \pi \times 8 \times 8 \times h = \frac{4}{3} \pi \times 8 \times 8 \times 8 \]
\[ \Rightarrow h = \frac{3}{4} \times 1 \text{ cm} \quad \text{Choice (1)} \]

171. Area of four walls – area of two doors – area of window = \( 2 \times 5 \times (12 + 8) - 2 \times 2 \times 1 - 1 \times 1 = 200 - 4 - 1 = 195 \text{ m} \)
172. Let the principal be Rs \( x \). Let \( x(1.1)^2 - x = \frac{x \times 2 \times 10}{100} \Rightarrow 525 \Rightarrow x(0.01) = 525 \); \( x = 52500 \) Choice (3)

173. Let there be 10 sparrows and 18 pigeons. If 3 birds (all pigeons) escape, the ratio of sparrows to pigeons is 2 : 3. Let there be 11 sparrows and 17 pigeons. If 3 birds (1 sparrow and 2 pigeons) escape, the ratio of sparrows to pigeons is again 2 : 3. But from this data alone (number of birds escaping and ratio of the birds) we can not uniquely determine the initial ratio of the birds.
Choice (4)

174. Since the paper is folded along the length \( 2\pi r = 44 \); \( r = 7 \).
\( \therefore \) Volume of cylinder = \( \pi r^2 h = 22/7 \times (7)^2 \times 10 = 1540 \) cm\(^3\) Choice (4)

175. Speeds of Ramesh, Sameer and Tarun are \( 180 \) m \( \text{sec} \), \( 240 \) m \( \text{sec} \) and \( 300 \) m \( \text{sec} \) that is, 3 m/sec, 4 m/sec and 5 m/sec respectively. Required time = L.C.M. (times taken by any two pairs to meet) = L.C.M. (Time taken by Ramesh and Sameer to meet, time taken by Sameer and Tarun to meet) = L.C.M. \( \left( \frac{600}{60}, \frac{600}{60}, \frac{300}{60} \right) = 600 \) seconds. Choice (1)

176. The number of nuts produced varies directly with the time for which the machines work and the number of machines which are working. The required number of nuts = \( 544 \times \frac{14}{8} \times \frac{25}{10} = 2380 \) Choice (1)

177. Number of man-hours required to complete 9/20 of the work = \( 120 \times 6 \times 30 = 21600 \).
Number of man hours required to complete the remaining work = \( \frac{21600 \times 9}{11} = 26400 \).
Number of men required to complete in 20 days each working hour a day = \( \frac{26400}{20 \times 8} = 165 \).
Additional number of men required = 165

178. The required number of boxes = \( \frac{22 \times (8)(14)}{7(4)(4)} = 44 \) Choice (2)

179. The required height = \( \frac{2 \times 2 \times 7}{22 \times 7 \times 7 \times 2 \times 2 \times 7} = 14/75 \) metres
Choice (1)

180. Let the distance of each equal stretch be ‘x’ km
Average speed = \( \frac{x + x + x}{\text{Total distance}} = \frac{x}{\text{Time}} \)
\( \therefore \) \( x = 20 \) kmph Choice (2)

MOCK TEST 2

Solutions for questions 1 to 20:

1. Let the ages of X, Y and Z be x, y and z years. Given \( x + y + z = 180 \).
10 years ago, sum of their ages = 180 – 3 \( \times 10 = 150 \). 10 years ago, the age of X = \( 1/6 \times 150 = 25 \).
\( \therefore \) Present age of X = 25 + 10 = 35 years.
Choice (2)

2. Number of literates = \( 300 \times \frac{35}{100} = 700 \) .
Number of female literates = \( 700 \times \frac{135}{100} = 245 \) Choice (1)

3. Let the C.P of the article be Rs 100. Then list price = C.P + 20 per cent of C.P = Rs 120
But the list price shown by the father = 20 per cent more on list price = Rs 144
As there is a profit of 0.8 per cent, S.P = Rs 100.8. Discount per cent = 43.2/144 \( \times 100 = 30 \) per cent
Choice (1)

4. from \( y + z \); \( y = 6 - 6x \) or \( z = 5y - 6x \)
from \( z + x \); \( z - y = 5 \)
\( z + x = 5z - 5y \Rightarrow x = 4z - 5y \Rightarrow x = \frac{4(5y - 6x) - 5y}{3} \)
Also, \( z = 5y - 6x = \frac{2}{5} \); Hence, \( x : y : z = 3 : 5 : 7 \) Choice (3)

5. Let the cost incurred by the manufacturer be Rs x.
\( \therefore x (1.2) (1.25) (1.3) = 390 \Rightarrow x (1.95) = 390 \Rightarrow x = 200 \) Choice (1)

6. The required number of months
\( \frac{2880}{800 \times 4 \times 100} = 9 \) Choice (1)

7. 1938 is not divisible by 54 and 37.
\( \therefore \) Ignore choices 1 & 2
Choice : 3 1938 \( \frac{34}{13} = 57 \).
\( \therefore \) The two numbers are 34 and 57
(4 \( \times 7 = 28 \) and 3 \( \times 5 = 15 \) clearly 34 is the smaller.
Choice (3)

8. Suppose Johar joined the business after x months of the start of the business.
\( \therefore \) \( 6 \times 12 : 8 \times (12 - x) = 3 : 2 \Rightarrow 6 = 12 - x \Rightarrow x = 6 \) Choice (2)

9. The ratio of capacities = \( 1/24 : 1/8 : 1/12 = 3 : 4 : 6 \) that is, A does (say) 3x work (out of total of 3x + 4x + 6x = 13x work) in 60 days. \( \Rightarrow \) A does the full work that is 13x in 60 \( \times \frac{13}{3} = 260 \) days Choice (3)

10. The required difference = \( \frac{380 \times (60 - 40)}{100} = 76 \) Choice (3)

11. Let the number of hours taken by the man be x.
\( \therefore \) The number of hours taken by the woman is \( \frac{20}{x} + \frac{10}{x + 10} = \frac{7}{10} \Rightarrow 200x + 2000 + 100x \Rightarrow 7x^2 + 70x \Rightarrow 7x^2 - 230x - 2000 = 0 \Rightarrow 7x^2 - 280x + 50x - 2000 = 0 \Rightarrow (7x + 50)(x - 40) = 0 \); \( x = 40 \) or \( x = \frac{-50}{7} \).
But \( x \) cannot be negative. \( \therefore x = 40 \)
The required time to complete the work = \( \frac{3}{10} \times (40 + 10) = 15 \) Choice (1)

12. Let the Initial sales be px. Price is reduced to \( \frac{p - \frac{3p}{4}}{4} \) and number of cars sold = \( \left[ \frac{3}{10} + \frac{3p}{4} \right] = 13x \frac{13x}{10} \frac{39px}{40} \).
\( \therefore \) Total Sales = \( \frac{3p}{4} \times \frac{13x}{10} \frac{39px}{40} \).
13. Min. marks for pass = x. A’s marks = 0.90x, B’s marks = 8/9 of A = 8/9 of 0.90x
C = 58.11 per cent of (A + B) = 58 \times \frac{11}{17} = \frac{20 \times 0.90x}{19} = 11x

\therefore \text{P} + \text{Q} \text{ fills in}(1 + 1)\text{hour} = \left(\frac{1}{3} + \frac{1}{4}\right)\text{ of the tank fills part of tank filled in 2 hours}

\therefore \text{P fills the 3rd hour, so remaining part after 3 hours} = \frac{5}{12} \text{ Q fills this work in} 4 \times \frac{1}{3} = \frac{1}{3} \times 60 = 20 \text{ minutes}

\text{Total time} = 2 + 20 \text{min} = 3 \text{hr 20 min}

\therefore \text{Tina is opposite to Rina.}

Prem Tina Uma Sona

As Mona is the last of the person who is opposite to Sona.

Prem Tina Uma Sona

Ooha Rina Mona Nina

21. The other persons in the same row as Uma are Prem, Tina and Sona. Choice (2)

22. Prem and Nina are diagonally opposite to each other. Choice (3)

23. The person between Uma and Prem is Tina. Choice (4)

24. If the positions of Rina and Nina are interchanged, the person opposite to Rina is Sona. Choice (3)

\textbf{Solutions for questions 25 to 29:}

25. The given series is a combination series. C+1, D+1, E+1, F+1, G is one series, S+2, O+2, M+2, K is one series and P+3, N+3, L, J+3, H is one series. Hence, GHK is the next term. Choice (2)

26. The given series is a combination series. L+3, N+3, P+3, K is one series, H+3, J+3, L+3, N+3 is one series and C+4, E+4, G+3, I is one series. Hence, RNI is the next term. Choice (4)

27. The given series is a combination series. C+5, H+4, M+3, R+2, Z is one series and B+4, G+3, L, Q+2, V is one series. Hence, ruq is the missing term in the series. Choice (3)

28. After each term, one letter is missing and the terms are consecutive letters in the decreasing order. The number of letters is also decreasing. ZYXWVU, SRQPO, MLKJ, HGF, DC

Hence, MLKJ is the missing term. Choice (1)

29. The given series is a combination series. N+2, P+2, R+2, T+2, V is one series and Q+3, N+3, K+4, H+5, E is one series. The numbers are squares. 1², 2², 3², 4², 5²

Hence, the next term is V25E. Choice (3)

\textbf{Solutions for questions 30 to 32:}

30. Z, M, J, R and E are the letters; which are not immediately followed by a symbol but immediately preceded by a digit. Choice (2)

31. 10th element from the right end is = D

9th element to the right of D is = \lambda

9th element to the right of \lambda = U.

Choice (3)

32. When the second half of the sequence is reversed, the new sequence is as follow C 8 Z 5 M A N P \# E H F G I L W V U T D \@ 6 J I \alpha \phi 4

Now, 13th element from the right end is = L

8th element to its right is = 6

6th element to the left of 6 is = V.

Choice (2)

\textbf{Solutions for questions 33 to 35:}

33. I is definitely strong, because it shows the percentage of children who are being abused. Hence, there is a need to bring bill on this.

So, I is strong.

II is not strong, because this is not the only way to impart discipline among children.

So, II is not strong. Choice (1)

34. As the English language is the key and Mumbai is much better than its rivals, there is every chance of Mumbai being the financial hub.

So, I is strong.

Population is a hurdle for a financial hub. So, II is not strong. Choice (1)

35. I is not strong. Though the individual is responsible, some malpractices may take place. So, the RBI and the government should intervene.

So I is not strong.

II is not strong, because fall in senses does not necessarily imply that the stock market was a gambling den. Choice (4)
Solutions for questions 36 to 40:

36. The events are related events. Chronologically (B) occurs after (A) and (A) is the immediate and principal cause for (B).
   Choice (2)

37. (A) and (B) are related events. Chronologically (B) occurs before (A). (A) is the further action taken by the residents which is immediate.
   Choice (1)

38. (A) and (B) are related events. Chronologically event (A) occurs before (B) but event (B) is not immediate because only decision cannot lead to a strike, those need to be implemented first.
   Choice (4)

39. (A) and (B) are related events. Chronologically (A) occurs before (B). Death of more than 100 children is the immediate and principal cause for forming the investigation team.
   Choice (2)

40. Accident is the immediate and principal cause for the fractured limb and hospitalisation.
   Choice (2)

Solutions for questions 41 to 44:

41. ‘Evinced’ is the right word in the blank because it means ‘to show’. ‘Evoked’ is to avoid and ‘evoked’ is ‘to inspire’. Choice (3)

42. ‘To bask in reflected glory’ is the correct expression which means ‘to lie back and derive pleasure from.’
   Choice (1)

43. ‘Hammered’ is to be ‘badgered with’. Only ‘hampered’ which means ‘to prevent free movement’ fits the blank. Choice (2)

44. ‘Wrest’ is to ‘draw’ or ‘take by force’, while ‘wrestle’ is to fight. The word ‘difficult’ in the sentence indicates that ‘wrest’ is the only word that suits the blank. One can ‘wriggle’ out of a difficult situation but a confession cannot be ‘wriggled’ out of someone.
   Choice (3)

Solutions for questions 45 to 48:

45. ‘Unable to see eye to eye’ means to disagree on many things or to be ‘incompatible’. The words ‘incongruous’ (inappropriate), ‘insouciant’ (nonchalant) and ‘incorrigible’ (irredeemable) are inappropriate.
   Choice (1)

46. When something decreases suddenly and in large amounts, we say it ‘plummets’. ‘Plunged’ is to jump or dive quickly and energetically. We use ‘plonk’ when we put or drop something heavily and carelessly. ‘Fall’ is used with shares but does not denote large amounts.
   Choice (3)

47. When we refer to opinion that is divided into two distinct groups we say it is ‘polarised’. ‘Bisected’ is to divide into two halves, ‘segmented’ is divided into several pieces.
   Choice (3)

48. ‘Impersonation’ is when we pretend to be some one else. ‘Slapstick’ is rough and foolish comedy. “Lampoon” is strong criticism in a humorous way. ‘Burlesque’ is the appropriate replacement because it means a funny and exaggerated imitation.
   Choice (3)

Solutions for questions 49 to 52:

49. Part 4 is erroneous as ‘in a day or two days’ is an incorrect expression. The correction is ‘in a day or two’.
   Choice (4)

50. Part 4 has an error. The correction is ‘……too important to be left to chance’. Because ‘too …to’ is the correct conjunction.
   Choice (4)

51. Part 4 is erroneous because the verb ‘has’ does not agree with the subject ‘incidents’. The correction is ‘….which have occurred several decades ago’.
   Choice (4)

Solutions for questions 53 to 56:

53. In statements ‘B’ and ‘D’ we find the correlative conjunction “not only ….. but also” being used. The usage is correct in statement ‘B’ but because of the words “making their people to” it is incorrect. that is “make” does not take “to” (verbs like make, have, let … do not take “to”). Hence choice (2) is ruled out. In statement ‘D’, “offer not only ….” is the error. When a correlative conjunction is used in a sentence, each word of the correlative conjunction pair must be followed by the words belonging to the same parts of speech or by words belonging to the same grammatical form. Again in ‘D’ also we find the words “making their people to” which is erroneous. Hence choice (4) is ruled out. In ‘C’ and ‘D’ “attainment of those visions” is erroneous because in the first part of the sentence, we find a reference to ‘a strong vision’ (singular). Hence choice (3) is ruled out. Further in ‘C’ “harness their energies for” is erroneous. “Harness” takes the prepositions to/ towards.
   Choice (1)

54. Statements A and D are incorrect because, ‘the power to see things really’ is unclear and awkward. It can be better written as ‘the power to see things as they really are’. Statement B is incorrect because, it uses the expression ‘no more than’. The sentence talks about the collapse of intelligence, which is by no means an insignificant event. Hence the correct expression is ‘no less than’. This expression is used to emphasize the importance of something.
   Choice (3)

55. Option 1 is erroneous in the use of ‘food stock’ instead of ‘food stocks’. We say something arises from something and not through which makes option 2 erroneous. Option 3 is erroneous because of the use of ‘if’ after the word ‘question’. ‘If’ is used to introduce a condition while ‘whether’ questions the existence or otherwise of a particular situation and should be used in this context. Option 4 is correct.
   Choice (4)

56. Choice (2) should read “consumers’” or ‘the consumer’s’, to make it a general statement. Choices (3) and (4) have tense errors. The correct usage here would be ‘brands have gone’.
   Choice (1)

Solutions for questions 57 to 59:

57. C is ideally the introductory statement as it introduces us to the topic of the para that is ‘homesickness’ and states that a home is not the same as a house. Statement A, which goes on to describe what a home is, ideally follows C. Statement D follows A, which says that home is an experience of the heart that includes an attachment to a house, family memory etc, by carrying the idea forward. B sums up the para by saying that the heart always needs to be at home. Hence CADB.
   Choice (2)

58. All the options begin with B. But only statement D can follow B because it complements statement B, which says that Terrorism has a centre in the training camps and battlefields of Pakistan and Afghanistan, by stating that the Taliban and al Qaeda were formed ‘there’ that is Pakistan and Afghanistan. A follows D as it carries the idea forward by talking about the circumstances which favoured terrorism in these two countries. C concludes the para by stating how terrorism spread to different parts of the globe. Hence BDAC is the correct sequence.
   Choice (2)

59. ‘B’ sets the tone of the passage. ‘D’ is followed by ‘A’, and then ‘C’ makes this paragraph a distinct unit in prose writing. ‘C’ cannot follow D immediately, neither can ‘A’ follow ‘B’.
   Choice (3)

Solutions for question 60:

60. Statement B follows ‘1’ because “These” in ‘B’ refers to the “cultural police” in 1. Further “They” in D also refers to the cultural police and the word “dressing” finds a continuation in ‘A’. that is, the word
"costume" in 'C' is a continuation of the idea expressed in A. Hence BDA go together and is followed by C. Choice (2)

Solutions for questions 61 to 63:
61. Observing the markets 0.8 from ACs is the largest segment and Hitachi having 50 per cent share in that segment.
   ⊙ Definitely Hitachi controlled the highest share of the AC market in 2000-01.
   ⊙ The required percentage share
   \[
   \frac{244000 \times \frac{1}{2} + 56000 \times \frac{3}{10} + 76000 \times \frac{15}{100}}{244000 + 56000 + 76000} \times 100
   \]
   = 39.9 per cent Choice (1)
62. We cannot calculate percentage change in the market share of Kelvinator as we do not know its share in 0.8 tonne and 1.0 tonne ACs. The market share of LG in 2000-01 hence we cannot determine as to which type of A/C registered the highest percentage increase.
   Choice (4)
63. Hitachi's market in 1.0 tonne ACs category = 56000 × \frac{30}{100} + 74000 × \frac{38}{100} = 44920
   Hitachi’s market in 0.8 tonne ACs category = 244000 × \frac{10}{100} + 368000 × \frac{40}{100} = 269200
   ⊙ The required percentage is = \frac{269200 - 44920}{44920} \times 100 = 99.3 per cent Choice (3)

Solutions for questions 64 to 67:
64. The required percentage increase
   \[= \frac{(420 + 530 + 640) - (320 + 350 + 380)}{320 + 350 + 380} \times 100 = 51.4 \text{ per cent} \quad \text{Choice (2)}
65. The maximum value of total sales comes from division III for each company in 2002.
   \[
   \begin{align*}
   &\frac{310}{440} \times 100, \quad \frac{330}{500} \times 100, \quad \frac{330}{1100} \times 100, \\
   &\frac{1500}{1680} \times 100, \quad \frac{750}{1050} \times 100
   \end{align*}
   \]
   is the maximum which is equal to 41.3 per cent Choice (3)
66. Of 540 – 390 = \frac{390}{750} = \frac{540}{870} = \frac{720}{1500} = \frac{1050}{1680} and \frac{1680 – 1440}{1440} = \frac{1500 – 1050}{1050} is the highest. Choice (4)
67. The required percentage
   \[
   = \frac{300 + 360 + 350 + 640 + 650}{750 + 900 + 950 + 1590 + 1800} \times 100 = \frac{2300}{5990} \times 100 \approx 38.4 \text{ per cent} \approx 38 \text{ per cent} \quad \text{Choice (1)}
   \]

Solutions for questions 68 to 73:
68. The required percentage is = \frac{20 - 18}{18} \times 100 = 11\% \text{ per cent} \quad \text{Choice (2)}
69. As \frac{30 - 8}{8} > \frac{190 - 68}{68}, the correct option is (1) Choice (1)
70. Clearly, if the number of degree students or non-degree students increases, the total numbers of students also increase.
   ⊙ The increase in the total number of students is the highest. Choice (3)
71. Of \frac{18}{112}, \frac{20}{124}, \frac{22}{132}, \frac{25}{148}, and \frac{28}{168}, \frac{25}{148} is the greatest. Choice (3)
72. The required percentage is \frac{190 - 68}{68} \times 100 = 179\% \text{ per cent} \quad \text{Choice (2)}
73. Of \frac{85 - 72}{72}, \frac{112 - 92}{92}, \frac{168 - 148}{148}, \frac{190 - 168}{168}, \frac{112 - 92}{92} is the greatest. Choice (2)

Solutions for questions 74 to 77:
74. The amount spent on cloth in 2004 = 80,000 × \frac{20}{100} = Rs 16,000 which is equal to 160 per cent of Rs 10,000 and is the amount spent on rent and health together in 2001. Choice (2)
75. The amount spent on clothes in 2001 = 50000 × \frac{18}{100} = Rs 9000
   Which is 150 per cent of Rs 6000 and is the amount spent on transport in 2001. Choice (3)
76. The total expenditure spent on food
   = 50000 × \frac{20}{100} + 80000 × \frac{22}{100} = Rs 27600
   ⊙ The required fraction = \frac{27600}{130000} = 0.21 \quad \text{Choice (3)}
77. The amount spent on clothes in 2004 = 80000 × \frac{20}{100} = Rs 16,000.
   The amount spent on transport and food in 2001 = \frac{32}{100} × 50000 = Rs 16,000
   The amount spent on entertainment and health in 2004 = \frac{22}{100} × 80000 = Rs 17600
   Choice (1)
78. Of the amounts spent on rents and others in 2001 = \frac{32}{100} × 50000 = Rs 16,000
   Choice (2)

Solutions for questions 78 to 80:
78. Of \frac{40}{200}, \frac{120}{240}, \frac{30}{360}, \frac{130}{390} and \frac{90}{260}, \frac{120}{240} is the greatest Choice (1)
79. Average of sales of the company
   = \left(\frac{200 + 240 + 360 + 390 + 260 + 350}{6}\right) \times 10^7
   = Rs 300 crore
   In 2000, 2001 and 2003, the sales of the company is greater than Rs 300 crore.
   Choice (3)
80. The required percentage = \frac{360}{1800 - 360} \times 100 = 25 \text{ per cent} Choice (2)

Solutions for questions 101 to 120:
101. Total selling price
   = \left(\frac{75 \times 150 + 25 \times 130}{100 + 100 + 100}\right) \times 80000
   = 90000 + 26000
   = 116000 - 80000 = Rs 36000. Choice (1)
102. Distance covered by X in 50 seconds = 450 m. Speed of X = 450/50 = 9 m/s.
   Distance covered by Y in 50 seconds = 350 m.
   ⊙ Speed of Y = 350/50 = 7 m/s
   Time taken by A and B to meet for the first time in the same direction = 900/2 = 450 seconds. Choice (4)
103. Let the speed of A be x m/sec. Speeds of B and C are 2x m/sec and x m/sec respectively.
   Let the lengths of A and C be a m and c m respectively.
   \[\text{Length of B} = \frac{a + c}{2}\ m.\]
   \[\frac{a + 100}{x} = 20 \Rightarrow \frac{a}{x} = \frac{100}{x} = 20; \]
   \[\frac{c + 100}{x} = 30 \Rightarrow \frac{c}{x} = \frac{100}{x} = 30 \Rightarrow \frac{a + c}{2} + 100 \quad \text{Required time} = \frac{2}{2x}\]
Area of the Rhombus ABCD = 4 (Area of \( \triangle AOB \)) = 4 \( (1/2)(6)(6\sqrt{3}) \) cm\(^2\) = 72\( \sqrt{3} \) cm\(^2\) Choice (1)

10. \( 12 \times \text{Avg. wt. of 12 persons} + (P - 50) \)

\[ = \text{Avg. wt. of 12 persons} - 0.5 \]

Where P is the weight of the new person.

\[ P - 50 = -12 \times 0.5 \Rightarrow P = 50 - 12 \times 0.5 = 44 \text{ kg} \]

Choice (2)

11. We can choose any 2 points from side AB and a point from either AC or BC. The number of triangles in this case would be \( ^{3}C_{2} \times ^{5}C_{1} = 27 \).

Choice (4)

12. Since each vessel has to be full of oil and the entire quantity of oil (in litres) of each variety has to be stored, the capacity of each vessel (in litres) has to be a factor of 95, 133 and 152.

As we need the least number of vessels, the capacity has to be the greatest common factor, that is, 19. The number of vessels needed for the three varieties is 95/19, 133/19 and 152/19, that is, 5, 7 and 8 respectively. The total number of vessels needed for the three years of oil is 20.

Choice (2)

13. The curved surface area of the conical tent = The area of cloth required.

\[ \Rightarrow \pi \times 8 \times \sqrt{6^2 + 15^2} = 6 \times \text{length} \]

\[ \Rightarrow \text{length} = \frac{22 \times 8 \times 17}{7 \times 6} = 71.24 \text{ m} \]

Choice (1)

14. Two particular girls occupy middle two places, therefore the remaining girls can be arranged in remaining eight places. That is, 8\(! \times 2! \) ways and two girls in the middle can be arranged in 2 ways.

\[ \Rightarrow \text{All 10 girls according to given condition can be arranged is } 8! \times 2! \text{ ways.} \]

Choice (1)

15. First 3 prizes from 15 prizes can be given to a particular student in \( ^{15}C_{3} \) ways. Remaining 12 prizes to the remaining 5 students in \( ^{5}C_{12} \) ways. Number of ways of distributing \( = ^{5}C_{12} \times ^{15}C_{3} \). Total number of ways = \( 6^{15} \)

Required probability = \( \frac{2 \times ^{15}C_{3} \times ^{5}C_{12}}{6^{15}} \)

Choice (4)

16. C – 1, 0 – 2, M – 1, P – 1, E – 1, T – 2, 1 – 2, N – 1

Required number of arrangements (Vowels together) are \( \frac{7! \times 1!}{2!} = \frac{7!}{2!} \)

Choice (4)

17. Let AB and CD represent the two towers.

\[ \tan 45^\circ = \frac{h_2}{BX} \Rightarrow h_2 = BX. \tan 30^\circ = \frac{h_1}{DX} \]

\[ \Rightarrow h_2 = \frac{DX}{\sqrt{3}} \]

Hence, ratio \( \frac{h_1}{h_2} = \frac{DX}{\sqrt{3}} = \frac{1}{\sqrt{3}} \)

Choice (2)

18. Every year the tree grows by 21 per cent.

\[ \Rightarrow \text{Six months, it grows by } 10 \text{ per cent to } 110 \text{ per cent.} \]

After 3 periods of six months, it grows to (1.1)\(^3\) = 1.331 times its initial size. Therefore, as the initial height is 100 ft, after 1\(\frac{1}{2}\) years it is 133.1 ft.

Choice (3)

19. Probability of picking a black ball = \( \frac{6}{9} = \frac{2}{3} \)

\[ P(B) = 1 - \frac{2}{3} = \frac{1}{3} \]

Odds in favour of black = \( \frac{2}{3} : \frac{1}{3} = 2 : 1 \)

Choice (2)

20. Probability of picking a prime-numbered ball = \( \frac{4}{10} = \frac{2}{5} \)

Probability of picking an even-numbered ball = \( \frac{5}{10} = \frac{1}{2} \)
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131. Only statement 1 is not true. Para 9 – first three lines. Statement 2 is true – Para 7. Statement 3 is true – Para 10, (first three lines). Statement 4 is true – Para 7 (lines 2, 3 and 4) Choice (1)

132. Para 8 says that the regulators seem to have been successful in telecom market, gas industry and electricity companies. Choice (2)

133. Refer to the first 3 lines of the last para. The ‘transitional instrument’ is ‘our reasoning power’. Choice (3)

134. Line 4, para 6 shows A to be true. The first sentence of last para shows B to be true. Line 4, para 1 shows C to be true. Para 2 shows D to be true. Choice (4)

135. The phrase “a hidden illimitable consciousness” in lines 2 and 3 of para 1 shows that option 1 is the right choice Choice (1)

136. Refer to the last two lines of the passage. Choice (3)

Solutions for questions 137 to 140:

137. Choice 1 is the best answer. The Chinese government sought to appease its critics. The best way to achieve this would have been to produce Wang Wei Lin alive. Their failure to do this suggests that he was indeed executed. Choice 2 states that the government punishes its opponents; it does not state that it executes them. Therefore this may not lend credence to the conjecture. Choice (3) presents a totally different situation. Whereas, in the situation mentioned in choice (3), the Chinese government chose to ignore international condemnation, in the Tiananmen square episode, they did their best to appease their critics. Thus, choice (3) does not present an analogous situation, and therefore, it neither strengthens, nor weakens the conjecture. One cannot arrive at a conclusion based on choice 4. Choice (1)

138. The given para assumes the price of gold is determined by demand and supply within the country. Option 1 points out that gold price is determined at the international level. Choice (1)

139. The butter made from the milk of Holstein cows is paler means that the amount of colorless Vitamin A must be higher. Therefore, Choice 2 is the best answer. Choice 1 cannot be concluded from the passage as nothing is mentioned about the amount of butterfat in the milk. Choice 3 and 4 are contrary to what is mentioned in the facts mentioned in the passage. Choice (2)

140. Since POTA was introduced terrorist related to crimes have increased. Therefore POTA is ineffective Terrorists could have increased because of other factors too. POTA need not necessarily be ineffective. This is best brought out by option 3. Option 2 only takes the opinion of people who might not be a correct judgement. Choice (3)

Solutions for questions 141 to 144:

141. Total exports in 2006 = 565 crore. Total exports in 2005 = 495 crore. Required per cent $= \frac{70}{100} = 14.14$ Choice (4)

142. When the exports of both the years are considered, they were highest in the month of October that is 130 crore. Choice (1)

143. Total duty paid in 2005-06 = 495 crore

$\times \frac{1}{100} = Rs \ 495 \text{ lakh. Total duty paid in 2006-07}$

$= Rs \ 565 \text{ crore} \times \frac{1}{100} = Rs \ 565 \text{ lakh. Required difference} = Rs \ 70 \text{ lakh}$

Choice (2)

144. Average exports $= \frac{565 \times 12}{10} = 47 \text{ crore. Exports are less than average in 6 months.}$ Choice (2)

Solutions for questions 145 to 149:

145. Total number of spoiled apples with Vendor A = $200 \times \frac{20}{100} = 40$; Vendor B = $250 \times \frac{30}{100} = 75$

Vendor C = $160 \times \frac{15}{100} = 24$;

Vendor D = $300 \times \frac{16.66}{100} = 50$;

Vendor E = $180 \times \frac{10}{100} = 18$

total number of apples spoiled $= 40 + 75 + 24 + 50 + 18 = 207$

Choice (4)

146. Weight of oranges with vendor A = $150 \times 60 = 9000 \text{ gms}$;

vendor B = $100 \times 75 = 7500 \text{ gms}$

vendor C = $80 \times 50 = 4000 \text{ gms}$;

vendor D = $200 \times 100 = 20000 \text{ gms}$;

vendor E = $240 \times 90 = 21600 \text{ gms}$

Total weight of all oranges $= 9 + 7.5 + 4 + 20 + 21.6 = 62.1 \text{ kgs}$ Choice (3)

147. Unspoiled Bananas with vendors: A = $600 \times \frac{90}{100} = 540$; B = $800 \times \frac{80}{100} = 640$;

C = $1000 \times \frac{65}{100} = 650$;

D = $1200 \times \frac{83.33}{100} = 1000$; E = $900 \times \frac{80}{100} = 720$. Vendor D has the highest number of unspoiled bananas.

Alternate method:

By observation, we can say that vendor D has the maximum number of unspoiled bananas as he is having the maximum number of bananas and the spoiled percentage is minimum. Choice (1)

148. Unspoiled oranges of vendor E = $240 \times \frac{75}{100} = 180 \rightarrow \text{ (A)}$

Spoiled bananas of vendor C = $1000 \times \frac{35}{100} = 350 \rightarrow \text{ (B)}$

$\therefore \text{ A is 170 less than B.}$

$\therefore \frac{170}{350} \times 100 = \frac{17}{35} \times 100$

50 per cent of 35 is 17.5, so required answer must be very close to 50 per cent but less than 50 per cent. Choice (4)
149. Weight of oranges A, B, C = 9 + 7.5 + 4 = 20.5 kgs
Weight of Bananas with Vendor A = 600 × 60 = 36 kgs; Vendor B = 800 × 85 = 68 kgs
Vendor C = 1000 × 40 = 40 kgs; Vendor D = 1200 × 38 = 45.6 kgs; Vendor E = 900 × 50 = 45 kgs
Total weight of bananas = 234.6 kgs.
∴ Required per cent = \[ \frac{20.5}{234.6} \times 100 = 8.7 \text{ per cent.} \] Choice (4)

Solutions for questions 150 to 153:

150. From the above information, the number of girls who qualified in both the subjects = 10 Choice (1)

151. The number of boys who qualified only in Physics = 10 Choice (3)

152. Required percentage = \[ \frac{10}{18} \times 100 = \frac{55}{9} \] per cent Choice (4)

153. The number of students who did not qualify in Physics = 60 Choice (2)

Solutions for questions 154 and 155:

154. \[ \frac{35}{75} \times 40 = \frac{55}{90} \times 115 = \frac{45}{80} \times 20 = \frac{25}{65} \times 25 \] is the least. By observation of the bar diagram, it can be seen that only for classes IX and X there is a significant difference in the number of boys and girls. Hence one of them must have the least percentage of girls. As class IX has less boys than girls, it cannot have the least percentage of girls.
∴ Class X has the least percentage.
Choice (4)

155. The required percentage = \[ \frac{40-35}{45-35} \times 100 = 50\% \] Choice (3)

Solutions for questions 156 to 160:

156. \( a^2 b - a b^2 = a b (a - b) \).
From statement I, \( a > b \) ⇒ when a and b are positive then \( a > b \)
When a and b are negative then \( a < b \) so a > b or a < b. If \( a > b \), then \( a b^2 - a b^2 \) is positive.
If \( a < b \), then \( a b^2 - a b^2 \) is negative. Hence statement A alone is not sufficient.
From statement II, \( a^2 b > a b^2 \) ⇒ \( a > b \). Hence \( a b^2 - a b^2 \) is always positive.
Thus the question can be answered using statement II, alone.
Choice (1)

157. If \( x \) is the total mixture, then \( 2x/3 \) is milk from the main statement. From statement I, we get \( (60 \times 2/3) = (.60 + y)1/3 \), where \( y \) is the water added. Hence, \( y \) can be determined. From statement II, we know that water in the initial mixture is 20 litres and hence, milk should be 40 litres. Now 60 litres of water is to be added to make the ratio of milk and water equal to 1:2. Hence, statement II alone is sufficient. Choice (3)

158. From statement I, the number can be either a square of 45 or 75, as both the numbers end in five and the sum of the digits is a multiple of nine. Here, in 45² = 2025, we have one zero and in 75² = 5625, we do not have any zero.
∴ Statement I alone is not sufficient.
From statement II, the number is a perfect cube, which ends in one, which means it should be a cube of 11 or 21. But 11³ is not a multiple of 9.
21³ is a multiple of 9 and is the number. As we know the exact number, we can find the number of zeroes in that.
∴ Statement II alone is sufficient.
Choice (1)

159. From statement I, either C or B sits to the immediate right of A. The possible arrangements are BAC and CAB. Hence, statement I alone is not sufficient from statement II, B is not at extreme left and D is not at extreme right. We have no information about A and C. Hence, statement II alone is not sufficient. By combining both the statements the possible arrangement is DBA both the statements together are sufficient.
Choice (4)

160. From statement I, we can say that year is not a leap year. Hence we can find 20th June of previous year to year x and hence we can find 20th June of year x. ∴ Statement I alone is sufficient.
Choice (2)

Solutions for questions 181 to 185:

181. C is granddaughter of E. Choice (4)
182. If there are four males, then A must be a male that is, A is nephew of I. Choice (4)
183. I and F are married couple. Choice (1)
184. The number of pairs of siblings are three that is, C is granddaughter of E. Choice (4)
185. D is brother-in-law of F. Choice (4)

Solutions for question 186:

186. The path followed by Manoj is

Stating point

Solutions for questions 187 to 190:

When a cube is painted on all of it’s face and cut into smaller cubes then,
(1) the eight cubes at eight corner of larger cube are painted on three faces.
(2) the cubes along each side except those at the corners are painted on two of its faces.
(3) the cubes on each face except those along the sides are painted only on one of it’s faces.
(4) all the cubes which do not appear out sides are not painted at all.

In the given question, the larger cube is cut into $5 \times 5 \times 5 = 125$ cubes.

187. Eightcubessarepaintedonthreeoftheirfaces. Choice (3)

188. Number of cubes painted on only one face $= 6 \times 3 \times 3 = 54$. Choice (2)

189. Number of cubes which are not painted on any one of it’s faces $= (5 - 2)^3 = 3^3 = 27$. Choice (1)

190. Number of cubes painted on at least two of their faces $= Number$ of cubes which are painted on 2 more faces (that is 2 and 3) $= 12 (5 - 2) + 8 = 36 + 8 = 44$. Choice (4)

**Solutions for questions 191 to 193:**

191. Sumaya’s husband’s mother-in-law is Sumaya’s mother and her mother only son is Sumaya’s brother whose grandfather’s only son can be his father or mother’s brother. Choice (4)

192. $\frac{50 \times 30}{50 + 30} = \frac{1500}{80} = \frac{150}{8} = \frac{75}{4}$. Choice (2)

193. $17 \text{ per cent}2 = (17 - 2)^2 = 225$ $19 \text{ per cent}5 = (19 - 5)^2 = 196$. Similiarly $24 \text{ per cent}11 = (24 - 11)^2 = 169$. Choice (3)

**Solutions for questions 194 to 198:**

It is given that thee are two married couples and one pair of siblings. There are grandparents Hence the arrangement is as follows.

From (iii), usha belongs to the 2nd generation and both Asha and Vital belong to the 3rd generation.

From (i) and the above result it can be concluded that Lata is the grand mother and Sachin is the husband of Usha.

From (ii) and (iv), Usha and Sachin are of 22 kg and 72 kg weight in any order.

From (i), Sachin cannot be the heaviest. 
⇒ Sachin weight 22 kg and Usha weighs 72 kg.
⇒ Lata weights 42 kg.

1. the eight cubes at eight corner of larger cube are painted on three faces.
2. the cubes along each side except those at the corners are painted on two of its faces.
3. the cubes on each face except those along the sides are painted only on one of it’s faces.
4. all the cubes which do not appear out sides are not painted at all.

Now, we know that Piyush belongs to the first generation.

From (iii) and (v), it can be concluded that Piyush’s weight is 32 kg, Vital’s weight is 52 kg and Asha’s weight is 62 kg.

The final arrangement is as follows.

**Solutions for questions 199 and 200:**

199. It is given that D is the only daughter of A and B is son-in-law of A. Hence, A’s daughter’s husband is B that is, D’s husband is B. Choice (4)

200. January 1st 2101 will be Saturday. Hence 31st December 2100 is Friday. Choice (3)

**Solutions for questions 1 to 3:**

1. The given series can be written as $2^{-1}, 3^{2+1}, 10^{3+0}, 39^{-4-0}, 172^{5-2}$
   The next number must be $(172 \times 5) + 25 = 885$
   Hence, 885 is the next term. Choice (3)

2. The given series is a combination of three series.
   - $B^4, C^3, E^2, H^1, L$
   - $D^2, F^4, I^4, M^4, R$
   - $G^3, J^4, N^4, S^4, Y$
   Hence, LRY is the next term. Choice (2)

3. The given series is a combination of three series.
   - $B^4, F^5, J^4, N^4, R$
   - $9, 49, 121, 225, 361$
   - $D^4, H^4, L^4, P^4, T$
   Hence, R361T is the next term. Choice (3)

**Solutions for questions 4 to 8:**

4. The following diagrams represents the given statements.

   From diagram (i):
   ![Diagram](image1)

   Conclusion: I (negative) is true. II (affirmative) is false. III (affirmative) is true IV (negative) is true. Choice (4)

5. The following diagrams represent the given statements.

   From diagram (i):
   ![Diagram](image2)

6. The following diagrams represent the given statements.

   From diagrams (i) and (ii):
   ![Diagram](image3)
Conclusion: I (negative) is true. II (negative) is true. III (negative) is true and IV (negative) is true. Hence, all follow. Choice (4)

7. The following diagrams represent the given statements.

From diagram (i):

Conclusion: I (negative) is true. II (negative) is true. III (affirmative) is false and IV (affirmative) is false.

From diagram (ii):

Conclusion: I is false. Hence, only I follows. Choice (3)

8. The basic diagram for the given statement is as follows.

Conclusion
I, negative, is true. II, negative, is false. III, affirmative, is false. IV, negative, is true.

To prove “Some walls are not door”, to be false we have to prove “All walls are doors”, which is not possible.

To prove “Some ceilings are not windows” to be false we have to prove “All ceilings are windows”, which is not possible. Hence, only I and IV follow. Choice (4)

Solutions for questions 9 to 11:

9. The problem is depletion of forest cover. The suggestions made are irrelevant. One is referring to recruitment of IAS officers while the other is referring to tourism. Neither of them explained how the suggestion would increase the forest cover. ∴ Neither I nor II follows. Choice (3)

10. The problem is unnecessary honking of horns. I is an extreme action. It is disproportionate in view of the present problem. Hence, I does not follow. Creating awareness would mitigate the problem. Hence, II follows.

∴ Only II follows. Choice (2)

11. The problem is global warming. I is disproportionate as the suggestion can make very little difference. The heat generated by stoves is negligible as compared to the present problem. II follows as deforestation and green house gases are the reasons for global warming. Hence, only II follows. Choice (2)

Solutions for questions 12 to 16:

12. RI is a reason because it is a well known fact that villages in the vicinity of big dams get affected. RII is not a reason as such constructions may be useful from the employment point of view and may be harmful in view of environmental aspects. Choice (1)

13. RI is a reason as when a company makes huge profits normally the employees are given a bonus. RII is not a reason, as such action would not have the effect of employees getting a bonus. Choice (1)

14. The popularity or otherwise of a contestant is not the only criterion that affects an election result. Choice (3)

15. RII is a reason as missiles are one of the weapons used to defend the country’s territory from external aggression. RI is not a reason as the neighbouring country buying a particular type of missile cannot be the reason for a country purchasing a particular type of missile. Choice (2)

16. RI is a reason as the late detection of fire would render it difficult to control. RII is a reason as the speed with which it spreads makes it difficult to control. Choice (4)

Solutions for questions 17 to 20:

17. Since, the statement is informative and based on the facts, it is not based on any assumption. Choice (3)

18. In the statement, nothing is mentioned in the statement regarding the performance of Dhoni as a Captain. Therefore assumption I is not implicit. ∴ It is said that ‘rarely’ therefore assumption II is also not implicit. Choice (3)

19. The statement is not talking about those who do not love luxury and elegance, therefore assumption I is not implicit. Advertises considers that the vehicle matches the expectations of those who love luxury and elegance, therefore assumption II is implicit. Choice (2)

20. The given statement is not based on the assumption but is based on the facts. Choice (3)

Solutions for questions 21 to 25:

The following table can be obtained from the given information. However, students should only calculate those values that are required to solve specific questions.

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Total</th>
<th>Cars</th>
<th>Bikes</th>
<th>Scooters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delhi</td>
<td>9,00,000</td>
<td>62.5% = 5,62,500</td>
<td>37.5% = 3,37,500</td>
<td>0%</td>
</tr>
<tr>
<td>Mumbai</td>
<td>8,00,000</td>
<td>25% = 2,00,000</td>
<td>25% = 2,00,000</td>
<td>50% = 4,00,000</td>
</tr>
<tr>
<td>Kolkata</td>
<td>7,00,000</td>
<td>50% = 3,50,000</td>
<td>25% = 1,75,000</td>
<td>25% = 1,75,000</td>
</tr>
<tr>
<td>Chennai</td>
<td>6,00,000</td>
<td>50% = 3,00,000</td>
<td>12.5% = 75,000</td>
<td>37.5% = 2,25,000</td>
</tr>
<tr>
<td>Hyderabad</td>
<td>5,00,000</td>
<td>25% = 1,25,000</td>
<td>50% = 2,50,000</td>
<td>25% = 1,25,000</td>
</tr>
<tr>
<td>Bangalore</td>
<td>4,00,000</td>
<td>0%</td>
<td>75% = 3,00,000</td>
<td>25% = 1,00,000</td>
</tr>
<tr>
<td>Total</td>
<td>39,00,000</td>
<td>15,37,500</td>
<td>13,37,500</td>
<td>10,25,000</td>
</tr>
</tbody>
</table>

21. Highest number of bikes = 3,37,500, Lowest number of bikes = 75,000, Total = 4,12,500. Choice (3)

22. Number of car owners in Chennai = 3,00,000; Number of scooter Owners in Hyd = 1,25,000

Total = 1,75,000 Choice (1)

23. The total number of bike-owners for all the six cities is 13,37,500, as can be observed in the table. Choice (3)

24. Required percentage

\[
\frac{75,000}{1,00,000 + 1,25,000} \times 100 = 33.33\% \\
\]

Choice (3)

25. Total number of car-owners = 15,37,580; Total number of scooter-owners = 10,25,000

Required percentage

\[
\frac{15,37,500 - 10,25,000}{10,25,000} \times 100 = 50\% \\
\]

Choice (3)
Solutions for questions 26 to 29:

26. Of \( \frac{25}{100}, \frac{30}{100}, \frac{52}{100}, \frac{15}{100}, \frac{37}{100}, \frac{20}{100} \) and \( \frac{51}{100}, \frac{35}{100}, \frac{37}{100}, \frac{20}{100} \) is the least. Choice (3)

27. Colleges which do not offer risk-management course may or may not offer management. Choice (4)

28. The required number of B-schools = \( (\frac{86}{100} \times \frac{30}{100} \times \frac{80}{100} \times \frac{15}{100} \times \frac{74}{100} \times \frac{20}{100} \times \frac{68}{100} \times \frac{35}{100}) \times 2000 = 1528 \) Choice (1)

29. The required percentage = \( \frac{2680 \times 100}{32.5 \text{ per cent}} \) Choice (2)

Solutions for questions 30 to 34:

30. Let us assume that the sales of each bike is \( 'Z' \) in the year 1990; Sales of Suzuki in 2000 = \( x \times 1.2 \times 1.25 = 1.5z \)

Sales of Kawasaki in 2000 = \( x \times 1.1 \times 1.2 = 1.32z \); Sales of Honda in 2000 = \( x \times 1.1 \times 1.2 = 1.32z \)

Sales of Ducati in 2000 = \( x \times 1.1 \times 1.3 = 1.43z \); Sales of Aprilia in 2000 = \( x \times 1.1 \times 1.2 = 1.21z \)

∴ Highest percentage increase is for Suzuki Hayabusa Choice (3)

31. Sales of Ducati in 2002 = 42900; we know sales in 1990 = \( x \times 1.1 \times 1.3 = 42900 \)

∴ sales in 1990 = \( \frac{42900}{1.1 \times 1.3} = 30000 \); Projected sales of Ducati in 2005 = 42900 \( \times 1.4 \)

= 60060 ∴ difference in projected sales and the sales in 1990 is 60060 – 30000 = 30,060 Choice (2)

32. In 1990, sales of Kawasaki = \( \frac{264000}{1.1 \times 1.2} = 200000 \)

Sales of Aprilia AS \( \times 100 = \frac{544500}{1.1 \times 1.1 \times 1.5} = 300000 \)

Ratios of sales of Kawasaki to that of Aprilia is 2 : 3 Choice (1)

33. Sales of Suzuki in 1990 = \( \frac{235,950}{1.2 \times 1.25} = 1,57,300 \) Sales of Kawasaki in 1990 = \( \frac{235,950}{1.1 \times 1.2} = 1,78,750 \)

Solutions for questions 35 and 36:

35. Of \( \frac{130}{130} - \frac{110}{110} - \frac{122}{122} - \frac{104}{104} - \frac{98}{98} - \frac{76}{76} - \frac{112}{112} \) and \( \frac{88-64}{88-64} \) is the highest.

\[ \frac{110+104+76+104+64}{550} = \frac{458}{550} \times 100 = 83\frac{1}{11} \text{ per cent} \] Choice (4)

36. The required percentage = \( \frac{110+104+76+104+64}{550} \times 100 = \frac{458}{550} \times 100 = \frac{91600}{11} = 83\frac{1}{11} \text{ per cent} \) Choice (1)

Solutions for questions 37 to 40:

37. On four occasions, the total literacy rate increased over the previous decade. Choice (4)

38. The total literacy rate was the maximum in 2001. Choice (4)

39. The maximum increase occurred from 1971 to 1981, that is, 78 – 62 = 16. Choice (3)

40. The highest increase in the literacy rate of any decade over the previous one during the pre-independence period was 12 per cent. The increase for the post-independence period was 16 per cent. Choice (1) is true. Choice (1)

Solutions for questions 41 to 60:

41. The ratio of profits of A and B = \( \frac{10,000 \times 12 + 5000 \times 12 + 2000 \times 10 + 8 + 6 + 4 + 2}{120 : 60 + 2 (30) = 1 : 1} \). Each will get Rs 300 Choice (2)

42. CP of 1 apple = \( \frac{1}{4} \), SP of 1 apple = \( \frac{1}{3} \)

per cent profit = \( \frac{\text{profit}}{\text{CP}} \times 100\% \) = \( \frac{1 - \frac{1}{3}}{\frac{1}{4}} \times 100 = 33\frac{1}{3} \text{ per cent} \) Choice (3)

43. First discount = Rs 20 by value. Price after discount = Rs 180

If the second discount = x per cent, Second discount = Rs \( \times 100 \times 180 \) by value x/100 (180) = 180 – 162 = 18; x = 10 Choice (3)

44. Suppose B worked for x days. Since, A worked for 4 days, \( \frac{4}{20} \times \frac{x}{10} = 1 \Rightarrow x = 8 \) Choice (2)

45. The part of the tank filled in the first 12 minutes. = \( 12 \left( \frac{1}{30} + \frac{1}{45} \right) \times \frac{12}{18} = \frac{2}{3} \)

The part of the tank emptied per minute. When the tank is full

= \( \frac{1}{15} + \frac{1}{30} + \frac{1}{45} = \frac{2}{3} \)

∴ The time taken to empty two-thirds of the tank = \( \frac{3}{1} \times 60 = 60 \text{ minutes} \). Choice (2)

46. Let the fixed charges be Rs x and Rate per call be Rs y.

When 100 calls are made average cost per call = \( \frac{x}{100} + y = 11 \) ------ (1)

When 200 calls are made it is \( \frac{x}{200} + y = 6 \) ------ (2)

Solving (1) and (2), x = Rs 1000 and y = Rs 1)

When he paid Rs 9/call

Let the number of calls be n, \( \frac{1000}{n} + 1 = 9; \frac{1000}{n} = 8; \frac{1000}{8} = n; n = 125 \) Choice (2)

47. Cost price of the article = Rs 9. He gains 205 gain = \( 1.2 \times 95 = 114 \)

114 forms 80 per cent of marked price, \( n.M.P = Rs 142.5 \) Choice (1)

48. In one day, work done by A = 1/18. Work done by B = 1/24
In 2 days the part of the work completed
= \frac{1}{24} = \frac{4 + 3}{72} = \frac{7}{72}.

Let 1 unit of time = 2 days
In 10 units of time (i.e. 20 days) the part of the work completed = 70/72, Remaining work
= 2/72 = 1/36
If A starts the work on the first day, A works on the 21st day.
The time taken by A on 21st day
= 1/36 \times 18 = 1/2 day
Totally in 20\frac{1}{2} days the work is completed
If the work is started by B, the time taken by B on 21st day 1/36 \times 24 = 2/3 days.
The difference = \frac{2}{3} - \frac{1}{2} = \frac{1}{6} days

Choice (4)

49. Length of the train = 300 m. Let the speed of the train be x m/s
Speed of the man = 18 \times \frac{5}{18} = 5 m/s.
Time taken to cross the man \Rightarrow \frac{300}{x - 5} = 15
\Rightarrow \frac{300}{x} = 20, x = 25 m/s
Distance to be travelled to cross the platform = (300 + 450) = 750 metre. Time taken = \frac{750}{25} = 30 seconds

Choice (3)

50. Number of girls = \frac{3}{7} \times 560 = 240.

Choice (3)

51. Let the cost price be Rs x, the selling price be Rs 1.4x. If the C.P is 0.8x, S.P is 1.4x – 20 and profit is 0.4x
\Rightarrow 1.4x – 0.8x = 0.4x \Rightarrow \frac{0.2x}{0.2} = 20
\Rightarrow x = 100

Choice (3)

52. On every 960 gms he uses 900 gms that is, his gain is 60 gms on every 900 gms.
\Rightarrow \text{Gain Percentage} = \frac{60}{900} \times 100 \text{ per cent} = 6\frac{2}{3}\% \text{ per cent}

Choice (1)

53. The ratio of speeds of A and B is 5: 4. It means, for every 5 metre that A travels, B travels only 4 metres.
It means for every 5 metre of travel, A will reduce the distance between them by 1 m.
A needs to travel 50 \times 5 metre to clear the gap between them.
\Rightarrow They will meet at a point that is 250 metres from the starting point.

Choice (2)

54. The snow that falls from 8 a.m. to 2 p.m.
= 6 \times \frac{2}{3} = 5 inches.
\Rightarrow \text{Total snow on the ground at 2 p.m.} = 5 + 5 = 10 inches.

Choice (1)

55. The speed of the road roller per hour = \frac{40}{60 + 40} \times 60 = 24.

Choice (2)

56. The required percentage
= \frac{90}{100} \times \frac{20}{100} = 18\% 

Choice (2)

57. Let the price of the first article be Rs x
25 per cent of x = 20 per cent of x = Rs 1000.
\Rightarrow 5 per cent of x = Rs 1000 \Rightarrow x = Rs 20,000
Let the price of second article be Rs y
30 per cent of y = 20 per cent of y = Rs 1000 \Rightarrow y = Rs 10,000.

Choice (3)

58. Let the forward and the return speeds of the car be f kmph and r kmph respectively.
Average speed of the car = \frac{2fr}{f + r} = \frac{f + r}{2} \Rightarrow (f + r)^2 – 4fr = 0
f^2 + r^2 + 2fr – 4fr = 0; (f – r)^2 = 0 \Rightarrow f = r
\Rightarrow \text{Forward travel time} = \text{return travel time} = 10/2 = 5 hours.
Speed for its forward journey = 400/5 = 80 kmph.

Choice (3)

59. Given That \frac{x_1 + x_2 + \ldots + x_8}{15} = 36;
\frac{x_1 + x_2 + \ldots + x_15}{36 \times 15} = 540
\frac{x_1 + x_2 + \ldots + x_8}{8} = 32; \frac{x_1 + x_2 + \ldots + x_8}{256} ---- (1)
\frac{x_1 + x_2 + \ldots + x_15}{38 \times 8} = 304 \quad ---- (2)
Adding (1) and (2) \frac{x_1 + x_2 + \ldots + x_8 + x_9}{540} = 560; \therefore x_9 = 20

Choice (1)

60. Let the weight of the full bottle be x kg.
\Rightarrow \text{The weight of the liquid in the bottle when it is full is} \frac{7x}{10} \text{ kg}
\Rightarrow \text{The weight of the liquid removed} = \frac{6x}{10}; \Rightarrow \text{The required fraction} = \frac{10}{7x} = \frac{6}{7}

Choice (1)

Solutions for questions 61 to 64:

61. The first blank must be filled in with a positive word which means ‘peace’. Hence choice (3) is ruled out. The second blank demands a positive word which means ‘secure’. Hence choices (1) and (4) are ruled out. Choice (2)

62. The first blank should be filled in with a positive word. Hence choice (1) is eliminated. Since the word ‘priceless’ is used, the words ‘enriched’ and ‘endowed’ are more suitable than ‘supplied’. ‘Hardly inconspicuous’ means ‘evident’ which is not in keeping with the idea that is sought to be conveyed.

Choice (4)

63. ‘Seductively’ is inappropriate in the context. Hence choice (4) is ruled out. A belief can neither be ‘scurrilous’ nor ‘wanton’. ‘Scurrilous’ means ‘grossly abusive’ and ‘wanton’ means ‘motivless’. Choices (1) and (3) are ruled out. Choice (2)

64. ‘Aphoristic’ which means ‘in the nature of a short wise saying’, evidently does not fit in the context. Choice (3) is ruled out. ‘….. a mindset that reflect’ is grammatically incorrect. ‘Reflects’ is the correct word. Hence, choice (4) is ruled out. ‘Dwell’ means ‘to brood or linger over something that is best forgotten’. Hence, the word is inappropriate. Choice (1)

Solutions for questions 65 to 68:

65. ‘Inappropriate’ means something that is not suitable but cannot be used in this context. ‘Inconvenient’ is ‘unsuitable’ though not unfortunate. ‘Inclement’ is used with weather. Hence only ‘inopportune’ can replace the underlined phrase.

Choice (2)

66. Something fast and intense comes like a flood. Hence the suitable replacement for the phrase is ‘inundated’ which means flooded. ‘Invasive’ means something undesirable which spreads very quickly. ‘Intruding’ is unsuitable because it means something unwelcome.

Choice (2)

67. To be fastidious means to be very particular about accuracy and detail. The words ‘diligent’ and ‘industrious’ which are synonyms which mean hardworking and the word ‘squeamish’ which means having very strong moral views are not suitable in the context.

Choice (2)

68. Decisions that are not based on army principle, plan or system can be called ‘arbitrary’ decisions. They are not ‘illegal’ or ‘unfair’. ‘Mediatory’ means arriving or trying to arrive at a settlement.

Choice (4)

Solutions for questions 69 to 72:

69. The word ‘than’ indicates comparison. Therefore the word ‘more’ would be appropriate. This rules out options (1) and (4) and (5) erroneous. Option (2) is grammatically correct.

Choice (2)
70. Options (1) and (4) omit the word ‘how’, which follows ‘know’ before a verb. Option (2) has a parallelism error. Only option (3) follows the correct parallel construction. Choice (3)

71. Options (1) and (2) are wrong because the pronoun ‘it’ in option (1) and the pronoun ‘they’ in option (2) do not have a clear antecedent. Option (4) has inconsistency in tense. Also, the pronoun ‘it’ has no antecedent. Option (3) is grammatically correct. Choice (3)

72. It is stated that Louis Braille designed a form of communication enabling people to do something. Only the phrase ‘by incorporating’ answers the question ‘how’. This rules out options (1) and (2) where the meaning is distorted. Between options (3) and (4), option (3) would be appropriate because the absence of an article (‘a series’) in option (4) makes it erroneous. Choice (3)

**Solutions for questions 73 to 76:**

73. Statement A is erroneous in using ‘where’ with a period of time. ‘When’ is more appropriate. Statement B uses the modal ‘could’ in place of ‘would’. ‘Could’ is used as the past tense of ‘can’ which shows ability. ‘Would’, the past tense of ‘will’ to indicate a past tense is appropriate. Statement C is error free. Statement D uses the preposition ‘for’ instead of ‘over’ which, in this context means ‘because of’ which is appropriate. Choice (3)

74. Statement A is incorrect because the adverb ‘dramatically’ is not immediately followed by the adjective it is supposed to modify (that is, novel). It should be followed by the adjective or another adverb like ‘recognizably’. Statement D is incorrect because the adjective ‘dramatic’ and the adverb ‘recognizably’ are not joined by the conjunction ‘and’. The appropriate structure is “something dramatically, recognizably novel……..”. The two adverbs used must be as close as possible to the word ‘novel’. Further, in option C, “would soon occur” and “would change” are erroneous because the whole sentence is in the present tense, which is why a part of the sentence cannot be in the past tense. Choice (2)

75. Since the selection procedure is singular, it is ‘an ill defined selection procedure’ (rules out choices 1 and 2). The choice is ‘subject to’ not ‘subjected with’ (rules out choice 4). Choice (3)

76. In ‘A’ the words “unlike those that of antiquity” is the first error. Here, in this sentence, ‘a modern democracy’ is being compared with the democracies of the past. Hence the correct way of writing it is as in ‘B’. Further in ‘A’ ‘expects of them’ is erroneous because the subject is plural. Hence it should be ‘expect of them’. Further in A and D ‘expected of ordinary citizen’ is erroneous. It should be ‘the ordinary citizen’ since the reference is being made to every citizen of the country. In ‘C’ the words “and will expect ……” make the sentence erroneous. The subject ‘A’ modern democracy’ is singular, hence it should be ‘expects of them’. Choice (2)

**Solutions for questions 77 to 79:**

77. D opens the paragraph by introducing us to the subject, on which the para is based, that is the link between blood lots and frequent flying C further explains D and mentions the name of the disease. B follows C by carrying the idea forward. C concludes the paragraph by talking about the seriousness of the condition. Hence DBCA is the correct order. Choice (3)

78. Statement C is appropriate as the opening statement as it is generalized and introduces us to a topic ‘friendly fire’. Statement A which describes what a ‘friendly fire’ is, ideally follows C as the two statements are linked. Statement D talks about the reference to ‘friendly fire’ in non-military terms by Amartya Sen. Choice B is a continuation of D. Hence CADB.

Choice (4)

79. Statement B is the opening statement as it introduces us to the topic of the passage that is the Western Ghats which are a ‘treasure trove of biodiversity.’ Statement D follows B as it continues the description of the Western Ghats. Statement A follows D as ‘this varied mosaic’ in A refers to the ‘variety of interconnected ecosystems’ mentioned in D. Statement C is conclusive in nature. Hence BDAC.

Choice (4)

**Solutions for question 80:**

80. Statement ‘I’ says ‘the hospital is a mega project’. ‘A’ follows ‘I’, because the hospital is very much relevant to the patients, and it says that it has become a ray of hope to the people of Central Kerala. Further B, C, D tell us about the facilities provided. B gives the extent of the facility whereas C gives more specific information on the rooms. Hence B should be before C. Choice (1)

**Solutions for questions 101 to 104:**

By observing the input at each step we can determine the rule followed in each step

Step I: The sum of digits in the numbers of input are taken in the same order

Step II: The numbers of step I are doubled.

Step III: The numbers of step II are rearranged in ascending order.

Step IV: 9 is subtracted from each number of step III

Step V: 4 and 3 are added to the alternate numbers of step IV

101. Input: 19 22 48 37 28 15

Step I: 10 14 12 10 10 6

Step II: 20 8 24 20 20 12

Step III: 8 12 20 20 20 24

Choice (3)

102. Among the steps II and IV the step III is the rearrangement of the numbers in ascending order. Hence, the step I cannot be determined by giving step IV.

Choice (4)

103. Input: 12 15 19 11 34 22

Step I: 3 6 10 2 7 4

Step II: 6 12 20 4 14 8

Step III: 4 6 8 12 14 20

Step IV: –5 –3 –1 3 5 11

Step V: –1 0 +3 6 9 14

Choice (1)

104. Input: 8 4 9 3 2 1

Step I: 16 8 18 6 4 2

Step II: 2 4 6 8 16 18

Step IV: –7 –5 –3 –1 7 9

Step V: –3 –2 1 2 11 12

Choice (2)

105. Let actually N, E, S and W are the pointers of the compass which points North, East, South and West respectively. But the pointer W of the damaged compass showing north as show below.

```
N
S
W
E
```

The person going towards the direction which is shown by pointer S of the compass is West.

:. He is actually going towards West.

Choice (3)

**Solutions for questions 106 and 107:**

106. After conversion the expression is 25 + 15 – 10 × 30 + 10 = 40 – 10 × 3 = 40 – 30 = 10.

Choice (3)

107. After conversion the expression is 81 + 9 + 42 + 7 + 2 × 10 = 9 + 6 + 20 = 15 + 20 = 35.

Choice (3)

**Solutions for questions 108 to 111:**

Given P × W; W × S; S × Q; S × R; T × U; M × N; M × V
108. If V and Q are selected in the team, then M must be selected in the same team as P.
Choice (4)

109. As P and W are in different teams and W and S are in different teams.
∴ P and S must be in the same team.
Choice (3)

110. If team A has 6 members, it should have W, Q, R, N, V and T/U. Team B must have M, P, S and T/U.
Choice (2)

111. In this case, W must be in the same team as M.
Choice (4)

Solutions for questions 112 and 113:
Let us represent the given data in the venn diagram as follows

```
Physics   Chemistry
x         g         y
h
```

It is given that the number of students those passed in both the subjects is equal to the number of students failed in both the subjects.
∴ g = h.

For every one student who passed in only Chemistry there are two students passed in only Physics.
∴ x = 2y

Half of the students those passed in Chemistry passed in Physics also
∴ g = y
∴ g = h = y = \( y/2 \)
∴ and it is given that x + y + g + h = 100
\[ x + \frac{x}{2} + \frac{y}{2} + \frac{x}{2} = 100 \Rightarrow 5x = 200 \]
The final diagram is as follows:

```
Physics   Chemistry
40         20
20
h = 20
```

∴ x = 40 and
g = h = y = 20.

112. 40 passed in Chemistry. Choice (1)

113. Students those failed in Physics = h + y = 40. Choice (2)

Solutions for questions 114 and 115:

114. The clock gains 15 minutes in 24 hours. Hence, to gain (8 + 2), that is 10minutes, it takes 16 hours.
∴ The clock will be 2 minutes fast at 10 pm on Monday.
Choice (2)

115. If 1st of February is a Sunday the number of odd days is

February ⇒ 1; March ⇒ 3
April ⇒ 2; May ⇒ 3
June ⇒ 2; July ⇒ 3
As the number of odd days between February 1st and August 1st is zero. The day of the week on February 1st is same as that on August 1st.
Choice (2)

Solutions for questions 116 to 120:
It is given that C got the least total points.
Hence, the total points of C is either 3 (1 + 2) or 4 (1 + 3)
Given, A got 1 point in strength.
∴ C got 1 point in intelligence and either 2 or 3 in strength.
Case (i): - If C got 2 points in strength, E would have got 3 points and 2 points in strength and intelligence respectively (∴ E got 5 points in total).
Given D got 4 points in intelligence. Hence, D would have got 5 points in strength and B would have got 4 points in strength.
Now B cannot get 5 points in intelligence (total points of D and B will be 9).
B would get 3 points and A would get 5 points in intelligence.
The assigned points are as below:

<table>
<thead>
<tr>
<th>Strength</th>
<th>Intelligence</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>E</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Case (ii): If C got 3 points in strength, E would have got 2 points in strength and 3 points in intelligence.
As D got 4 points in intelligence, B gets 4 points and D gets 5 points in strength.
Now B cannot get 5 points in intelligence (total points of B and D will be 9 then).
Hence B gets 2 points and A gets 5 points in intelligence.
But total points of A and B will be 6, which is a contradiction.
Only case (i) is to be considered.

116. A got 5 points in intelligence. Choice (1)
117. A gains the third position in overall. Choice (1)
118. As D got the highest total points, D is Mr. India. Choice (3)
119. B got 7 points and E got 5 points Difference = 2. Choice (2)
120. Average points in a category
\[ = \frac{1 + 2 + 3 + 4 + 5}{5} = 3 \] only B and D got at least 3 points in each category. Choice (3)

Solutions for questions 121 to 140:

121. Let the speeds of the boat in still water and the stream be x kmph and y kmph respectively.
\[
\frac{40}{x+y} = \frac{40}{2x+y} \rightarrow (1)
\]
If the speed of the boat in still water doubled, time taken by it to cover the downstream same journey = \( \frac{40}{2x+y} \rightarrow (2) \) Usual time for downstream journey < usual time for upstream journey.
(1) ⇒ usual time for downstream journey < \( \frac{24}{2} < 12 \) hours. (2) ⇒

\[
\frac{40}{2x+y} < \frac{40}{x+y} \Rightarrow \frac{x+y}{2} < \frac{x+y}{2}
\]
= 6 hours. Only choice (4) violates this condition. Choice (4)

122. Let the quantity of the cheaper variety mixed be x kg
\[
\frac{5 \times 20 + x \times 16}{5 + x}
\]
is the cost price;
\[
\frac{100 + 16x}{5 + x}
\]
\[
\rightarrow 18.2.
\]
\[
\frac{100 + 16x}{5 + x} = \frac{1820}{105}
\]
⇒ x = 10 Choice (4)

123. The part of the work completed by Ajay and Bharath together in one day
\[
\frac{1}{6} + \frac{1}{9} = \frac{5}{18}
\]
∴ The number of days required to complete the work = 18/5 = 3.6 Choice (4)

124. Quantity of alcohol in first solution = 7 l. Quantity of alcohol in second solution = 8 l
Concentration of resulting solution
\[
\frac{15}{10 + 20} \times 100 = 50 \text{ per cent} \quad \text{Choice (3)}
\]

125. Let the height of the tower be y the distance between the foot of the tower and of the building be x.
133. Let the number of men in the group be \( x \).

Job = 10\(x \) man days

The total number of man days

\[ = 1 + 2 + 3 + \ldots x = \frac{x(x+1)}{2} \]

Given,

\[ \frac{x(x+1)}{2} = 10x \]

\[ x = 19 \quad \text{Choice (2)} \]

134. \[ \left( \frac{2 \times \frac{22}{7} \times r}{t} \right) \times 200 = 550 \]

\[ \Rightarrow 2r = 875 \text{ mm.} \quad \text{Choice (1)} \]

135. Volume of cylinder = \( \pi r^2 h = 14^2 \times 21 \)

Volume of cone = \( \frac{1}{3} \pi r^2 h = \frac{1}{3} \times 21^2 \times 14 \)

Ratio of volumes = \( 14^2 : 21 : \frac{1}{3} \times 21^2 \times 14 = 2 : 1 \quad \text{Choice (3)} \)

136. The letters A, E, H, R and T can be arranged in 5! ways that is, 120 ways.

\[ \Rightarrow \text{The required probability} = \frac{1}{120} \quad \text{Choice (4)} \]

137. Form 3P3 = 6 ways.

\[ \Rightarrow \text{The required probability} = \frac{1}{120} \quad \text{Choice (3)} \]

138. \[ \text{Required total} = 0.72 \]

139. When a sum is invested to earn compound interest, the amount it becomes at the end of a certain year becomes the principal for the next year.

\[ \text{The rate of interest} = \frac{8640 \times 100 - 7200 \times 100}{7200} = 20 \text{ per cent} \quad \text{Choice (3)} \]

140. \[ \text{The required percentage} = \frac{100 \times 27}{200}= 20.8 \text{ per cent} \quad \text{Choice (1)} \]

141. Number of employees in division A of consumables section = \( 150/360 \times 1080 = 450 \)

Number of employees in division A of durables section = \( 160/360 \times 1080 = 480 \).

\[ \Rightarrow \text{The difference} = 30 \quad \text{Choice (2)} \]

142. Since the total number of employees in durables section is not known, the required value cannot be determined.

\[ \Rightarrow \text{Choice (4)} \]

143. Let the total employees in the consumables and the durable sections be 2x and 3x respectively.

Number of employees in division D of consumables section

\[ = 40/360 \times 2x = 2x/9 \quad \text{(1)} \]

Number of employees in division B of durables section = \( 80/360 \times 3x = 2x/3 \quad \text{(2)} \)

Required percent = \( \frac{2x}{9} \times \frac{100}{2x} = 33\frac{1}{3} \% \quad \text{Choice (3)} \)

144. Let the total employees in the consumables and durable sections be 4x and 3x respectively.

The number of employees in the division

\[ B \text{ of consumables section} = \frac{90}{360} \times 4x = 600 \]

\[ \Rightarrow x = 600. \quad \text{Choice (3)} \]

145. The required percentage

\[ = \frac{20 \times 1.3}{100 \times 1.25} \times 100 \approx 20.8 \text{ per cent} \quad \text{Choice (1)} \]

146. As we do not know percentage increase or decrease in revenue of any city apart from Bangalore, we cannot answer the question.

\[ \Rightarrow \text{Choice (3)} \]

147. The required percentage

\[ = \frac{100 \times 27}{100} = 370.4 \text{ per cent} \quad \text{Choice (3)} \]
Solutions for questions 148 to 151:

148. The required percentage
   \[ \frac{0.84 \times 50 + 0.92 \times 100 + 0.68 \times 200 + 0.78 \times 250 + 0.88 \times 150 \times 100}{50 + 100 + 200 + 250 + 150} = \frac{597 \times 100}{750} \]
   = 79.6 per cent Choice (1)

149. The required average
   \[ \frac{66 + 84 + 78 + 77 + 83}{5} \times 100 = 194. \]
   ≈ 85.5 per cent Choice (2)

150. The required percentage
   \[ \frac{0.80 \times 100 + 0.90 \times 200 + 0.84 \times 250}{100 + 200 + 250} \times 100 = \frac{470 \times 100}{550} = 85.5 \text{ per cent} \]
   Choice (2)

151. The required total = 0.72 × 50 + 0.68 × 100 + 0.65 × 200 + 0.83 × 250 + 0.92 × 150
   = 579.5 Choice (2)

Solutions for questions 152 to 156:

152. Among the given countries in the choices, only in India, the production of rice increases every year. Choice (2)

153. The required percentage
   \[ \frac{172 - 115}{115} \times 100 = 47.6\% \]
   Choice (2)

154. The required difference
   \[ (350 - 150) + (400 - 180) + (440 - 170) \]
   \[ + (480 - 190) + (500 - 200) \]
   \[ = 5 \]
   = 256 million tonnes Choice (1)

155. The average production of rice over the given period for China
   \[ = \frac{400 + 450 + 500 + 480 + 600}{5} \]
   = 486 million tonnes; Choice (3)

156. The average production of rice for all the given countries over the given period
   \[ = \frac{980 + 1130 + 1225 + 1322 + 1472}{5} \]
   = 1225.8 million tonnes which is closest to 1225 million tonnes which is the total production of the given countries in the year 1992. Choice (2)

Solutions for questions 157 to 160:

157. From the first statement alone, as \( c < 13 \) and \( 5 < a < b < c, a = 7, b = 9 \) and \( c = 11 \)
   The first statement alone is sufficient. From the second statement alone,

158. The first statement alone is not sufficient as we do not know the length and breadth of the aquarium.
   The second statement alone is not sufficient as we have information about the length and breadth of the aquarium. Even by combining both the statements, we cannot answer the question.

159. The first statement alone is sufficient as we know the number of members voted for the resolution. The second statement alone is not sufficient as 12 members voted against the resolution, the number of members voting in favour depends upon the number of members not taking a stand.

160. The first statement alone is not sufficient as we do not know the number of boys or girls or the total number of students admitted.
   The second statement alone is sufficient as we know the number of girls in terms of the number of boys. Choice (2)

Solutions for questions 181 to 196:

181. The first line of para 8 (--- our adoration of the motor car) and para 9 (I am not free of the disease myself) makes it clear that the ‘disease’ is ‘admiration of the motor car’. Choice (1)

182. Para 1, line 2 makes it clear that he hates the take-off stage the most. Choice (4)

183. The second sentence in para 3 “this odd result is explained by the method which divides deaths by passenger miles ---” makes option II correct. Option 2 says “the inverse relationship of … miles and deaths …” Choice (2)

184. “The different attitude” is to regard roads as safe. Option 1 is the correct choice. The first sentence of para 6, “If we regard the railway and the skies as carrying risk,” gives the answer. Choice (1)

185. Refer to para 3. Choice (4)

186. Refer to para 8. Choice (2)

187. Refer to para 6. Choice (2)

188. Refer to para 2. Choice (4)

189. Para 4, line 8 Choice (3)

190. Para 2, line 18. Choice (2)

191. Conation means ‘desire or will to perform an action’. Choice (1)

192. Para 3, lines 7 – 8 Choice (3)

193. Para 5 gives the authors view and validates options C and D. Options A and B are the views of ‘others’ given in para 6. Choice (2)

194. Para 3 shows that colonialism was an offshoot of industrialisation, and not its ‘aftermath’. Choice (2)

195. The last paragraph deals with ‘development’ as a whole and not in the area of ‘science and technology’ alone. Choice (4)

196. A reading of the first four paragraphs leads to choice 1. Choice (1)

Solutions for questions 197 to 200:

197. The given statement says that scale driven strategy will succeed. That is, a focus on large scale will succeed given India’s demographic. All the options exemplify or validate this approach except Choice 4 which says this approach is not suitable for emerging markets like India. Choice (4)

198. Choice 4 if true suggests the acid rain worsens the situation by significantly increasing the amount of decaying organic matter. This seriously weakens the argument. Choice 1 compares the acidity levels of mountain lakes with those of other lakes but makes no mention of acid rain. So will not weaken.

Choice 1 talks about underestimating the effects of acidity levels while the argument is about the role played by acid rain in determining acidity levels. So irrelevant.

Choice 2 dwells on where acid rain is found and not on the effect of acid rain on mountain lakes.

Choice 3 is irrelevant to the argument as it is not about the causes of acid rain. Choice (4)

199. Choice (1) if true would mean that men spend longer periods of time on the dentist’s chair than do women (assuming that serious problems take longer to rectify than do the not so serious cases). This could explain the statistics mentioned. Choice (1)

200. The author clearly indicates that references about socio-economic conditions of people are more important. But, he does not say anywhere that political events or military campaigns are not important and should not be included (option 1). He also does not claim that existing history does not talk at all about the socio-economic conditions of that time (option 2). Option
**Solution Manual**

### Solutions for questions 21 to 25:

21. By observation, we can see that only in the case of Oriental Bank the MC has increased by more than 100 per cent (doubled) which is not the case with any other bank. The refinery with the highest growth rate is MrPL which has seen its MC increase by more than 500 per cent. ∴

{(A) as a percentage of (B)}

22. 100 per cent growth implies that the MC has doubled, similarly a 116.66 per cent growth implies that the MC has becomes more than 21/2 times the original figure. This is happening with Orchid and Lupin, 2 companies out of the 10 companies listed. (excluding others). Hence 8 companies have not registered an increase of more than 116.66 per cent Choice (3)

23. MC of all Banks, Fertiliser, Pharma and Refinery companies is Rs 280505 crores. This is 20 per cent of the MC of all companies listed on BSE.

{(Orchids, Auropharm, and Lupin) have more than 20 per cent in their MC that}

24. All Banks have registered an increase of more than 20 per cent in their MC. As the profit = Income × profit percentage, profit in 2002 was the least. Choice (4)

25. MC of all Pharma companies excluding others in 2000 = Rs 36590 crores → (A)

{(A) as a percentage of (B)}

### Solutions for questions 26 to 30:

26. Prince’s projects for the quarter ended 31-12-02 = 120

Prince’s projects for the project ended 31-12-01 = 120

{(A) as a percentage of (B)}

### Solutions for questions 31 to 35:

31. The percentage change in income for different years is as follows:

- 2000 to 2001 = 13 × 100% = 25%
- 2001 to 2002 = 37.5 × 100% = 60%
- 2002 to 2003 = 10 × 100% = 33%
- 2004 to 2005 = 19 × 100% = 29%

Choice (1)

32. By observation, in the year 2002 the income as well as the profit percent were the least. As the profit = Income × profit percentage, profit in 2002 was the least. Choice (4)

33. It happened in none of the years. Choice (1)

34. Income in the year 2006 = 120 × 84 = Rs 100.8 crores; Profit in the year 2005 = 40 per cent of 84 = Rs 33.6 crores Profit in year 2006 = 130 per cent of 33.6 = Rs 43.68 crores Percentage of profit in the year 2006 = 43.68 × 100% = 43 percent. Choice (2)

35. Profit in the year 2002 = 20 per cent of 30 = Rs 6 crores Profit in the year 2004 = 30 per cent of 65 = Rs 19.5 crores; Required difference = Rs 13.5 crores Choice (4)

### Solutions for questions 36 to 40:

36. Number of women players participating in Volleyball = 10/100 x 1,10,000 = 11,000

Total number of players participating in Hockey (both male and female) = 6/100 x 1,50,000 + 4/100 x 1,10,000

= 6 x 1,500 + 4 x 1,100 = 9,000 + 4,400 = 13,400

Required per cent age = 11,000 × 100 = 84.6%

13,400

37. For Golf: No. of male players = 4

100 x 1,50,000 = 6000; No. of trainers = 3

x 5000 = 150

For Basket ball: No. of female players = 3

100 x 1,10,000 = 3300; No. of trainers
38. For track events : Number of Coaches = \( \frac{40}{100} \times \frac{13}{100} \times 5000 = 260 \)
Number of Female players = \( \frac{33}{100} \times 22 \times 1,10,000 = 7260 \)
Number of male players = \( \frac{20}{100} \times \frac{21}{100} \times 1,50,000 = 6300 \)
Number of sports persons/ coach = \( \frac{7260+6300}{260} = 52 \) Choice (3)

39. For Cricket : Total earnings for male players = \( \left( \frac{28}{100} \times 150,000 \right) \times (1,00,000) = Rs\ 42 \times 10^6 \)
Total earnings for female players = \( 20 \times 1,10,000 \times 5,00,000 = Rs\ 11 \times 10^8 \)
Total earnings for cricket players = \( 53 \times 10^6 \)
For Lawn Tennis : Total earnings for male players = \( 6 \times 1,00,000 \times 5,00,000 = Rs\ 45 \times 10^7 \)
Total earnings for female players = \( 8 \times 1,10,000 \times 200,000 = Rs\ 17.6 \times 10^8 \)
Total earnings of Lawn Tennis players = \( 62.6 \times 10^8 \) Required % = \( \frac{62.6 - 53}{53} \times 100 = 18 \) per cent Choice (2)

40. Given that Chess players = 1/2 Wrestlers
Also Chess players + Wrestlers = \( \left( \frac{1}{2} \times \frac{4}{100} \right) \times 150,000 + \frac{3}{100} \times 110,000 = 10150 \) Chess players = \( \frac{10150}{3} = 3380 \) Choice (2)
Now, no. of female basket ball players = \( \frac{3}{100} \times 110,000 = Required \ha\pace\right)\% = \frac{3380}{3300} \times 100 \approx 101 \) per cent Choice (2)

41. S.P of each type of fan = Rs 12,000 ;
C.P of ceiling fan = 12,000 \times 100/120 = Rs 10,000
As the C.P's are in the ratio of 5 : 6, C.P of table fan = 6/5 \times 10,000 = Rs 12,000
As C.P of S.P. of table fan are equal, there is neither profit, nor loss. Choice (3)

42. A \alpha, B, A \alpha 1/C^2 and A \alpha D^2 \Rightarrow A \alpha \frac{BD^2}{C^2} \) Choice (1)

43. For A, discounted price = 36,000 - 0.08 \times 20,000 = 0.05 \times 16,000 = 33,600
For B, discounted price = 36,000 \times 0.93 = 33,480 ; Difference = Rs 120 Choice (2)

44. If 'x' is the number of days A, B, C together take to complete the work, then (A + B) take \( x + \frac{1}{2} \) days and (B + C) take \( x + 200 \) per cent of x days = 3x days. (work done by A, B in one day) + (work done by A, B, C in one day) = work done by B in one day
\Rightarrow \frac{2}{2x+1} + \frac{1}{3x} = \frac{1}{x} \Rightarrow Work of B per day
\Rightarrow \frac{6x + 2x + 1 + 6x - 3}{3x(2x + 1)} = \frac{2x - 3}{3x(2x + 1)} \) \( \quad \ldots (1) \)
B's share of total earnings = \( \frac{400}{1800} = \frac{2}{9} \) \( \ldots (2) \)

45. A and B work together for 5 days. : the work done = \( \frac{5}{10} + \frac{5}{15} = \frac{15 + 10}{30} = \frac{5}{6} \)
Remaining work = \( 1 - \frac{5}{6} = \frac{1}{6} \) Time taken by A to complete the remaining work = \( \frac{1}{6} \times 10 = 5/3 \) days = \( \frac{1}{2} \) days Choice (2)

46. Consider the following two cases:
Case 1 Men Women Case 2 Men Women
No. 3x 2x No. 2x 3x
Average a b Average a b
\begin{align*}
3ax + 2bx &= 26 \\
5x &= 2ax + 3bx \\
2a + 3b &= 130 \quad \ldots (1) \\
2a + 3b &= 120 \quad \ldots (2)
\end{align*}
Solving (1) & (2) a = 30 and b = 20 Required difference = 30 - 20 = 10 years Choice (4)

47. The fastest way is to check from the answer choices. For example, taking choice (1), that is, \( x = 25 \), the length is decreased by 25 per cent and breadth by 100 per cent. So, the new length is 0.75 times the original length and the new breadth will be twice the original breadth. Hence the new area will be 0.75 \times 2 = 1.5 \) times the original area, that is, it is not remaining the same here and hence this is not the correct choice. Similarly the other choices can be checked mentally and the correct answer can be found. Choice (3)

48. Let the speed of the car be \( x \) kmph and wind speed be \( y \) kmph.
\begin{align*}
\frac{100 + 160}{x + y} = 6 \quad \ldots (1) \\
\frac{200 + 60}{x - y} = 5.5 \quad \ldots (2)
\end{align*}
Solving the equations, \( x = 50 \) and \( y = 40 \) Choice (2)

49. Given \( x = y = 2 : 3 \) and \( x : y = 4 : 5 \)
\begin{align*}
\therefore x : y = 4 \times 4 \times 3, \quad y : z = 3 \times 4 \times 3 \times 5 & \quad \ldots (1) \\
x : y = 8 : 12, \quad y : z = 12 : 15 & \quad \ldots (2) \\
\therefore \text{Share of } x = \frac{8}{35} \times 700 = 160 \)
Choice (3)

50. Suppose Original price = Rs 100. After 1st decrease, Price = 90. After 2nd decrease, Price = 90/100 \times 90 = 81. Price to be increased to get the original Price = 100 - 81 = 19. Required percent increase = \( \frac{19}{81} \times 100 \) per cent = \( \frac{19}{100} \) per cent Choice (2)

51. Time taken to meet = \( \frac{\text{Initial distance between them}}{\text{Relative speed}} \)
\begin{align*}
\therefore \text{Relative speed} &= \frac{175}{27.5 + 22.5} = 3.5 \text{ hours} \\
\text{So they will meet} \quad 3 \frac{1}{2} \text{ hours after} 6:00 \text{ a.m. that is at} \quad 9:30 \text{ a.m.} \\
\therefore \text{Choice (3)}
\end{align*}

52. Let the number of benches in the class be \( x \). When 3 students are sitting per bench, total number of students = \( 3x + 3 \) ---- (1)
When four students are sitting per bench, total number of students = \( 4(x - 3) \) ---- (2)
By equating (1) and (2) \( 4x - 12 = 3x + 3 \)
\( x = 15 \) Number of students = \( 4(12) = 48 \) Choice (1)

53. New ratio = \( 3 \times 1.75 : 4(1.60) : 5(1.90) \)

54. A's investment = 80 per cent of 10,000 = Rs 8,000 ; B's Investment = 50 per cent of 32,000 = Rs 16,000
Let C's investment = x per cent of 36000 = Rs 360x ; Ratio of profits = 1 : 1 : 1
\( \Rightarrow 8000 \times 12 = 16000 \times 6 : 360 \times x = 1 : 1 : 1 \)
\( \Rightarrow 6x = 400 \Rightarrow x = 66.66 \) Choice (4)

55. Let speed of John be \( x \) kmph. Wind speed = \( 5 \) kmph
56. Let the speed of the boat in still water be \( x \) kmph. Let both the trains meet \( t \) hours after 10:00 a.m. and \( x \) kmph. Let both the trains meet \( t \) hours after 10:00 a.m.

Case 1

Time taken for the entire journey

\[
\begin{align*}
\frac{16}{x-y} + \frac{24}{x+y} &= 6 \quad \text{(1)} \\
\frac{12}{x-y} + \frac{36}{x+y} &= 6 \quad \text{(2)}
\end{align*}
\]

\[
\therefore x = 8 \text{ kmph}, y = 4 \text{ kmph} \quad \text{: Speed of the boat in still water} = 8 \text{ kmph}. \quad \text{Choice (3)}
\]

57. Now, a(a – c) = b2

Substituting equation (3) in (2), we get

\[
2bc = a^2 + ab - ac \quad \text{(4)}
\]

Substituting (5) in (4), we get

\[
2bc = ac \quad \text{(5)}
\]

58. Substituting (3) in (2), we get

\[
(2)^2 - 2 \frac{c}{b} \cdot 1 = \frac{c}{b} = \frac{2}{3} \quad \text{Choice (1)}
\]

59. Substituting (3) in (2), we get

\[
(2)^2 - 2 \frac{c}{b} \cdot 1 = \frac{c}{b} = \frac{2}{3} \quad \text{Choice (1)}
\]

60. Let the number of one rupee coins with Karan be \( x \). Number of two rupee coins with him = 30 – \( k \)

\[
x + 2(30 - x) = 52 \quad \Rightarrow x = 8 \quad \text{Choice (1)}
\]

61. Choice (3) is the right answer. ‘Cower’ and ‘grovel’ do not fit in the second blank, ruling out choices (1) and (2) respectively. In choice (4) ‘conjecture’ would not be appropriate.

Choice (3)

62. Choice (3) is the right answer ‘Avoid’ would not be appropriate in the first blank, ruling out choice (1). In choice (2), ‘penetration’ does not fit in. ‘Defy’ would not be appropriate in this context, ruling out choice (4) Choice (3)

63. Choice (2) is the best answer. In choice (1), ‘despondent’ and ‘systematic’ do not go together. An expression cannot be ‘planned’, ruling out choice (3). In choice (4), ‘sober’ and ‘desultory’ do not go together.

Choice (2)

64. Choice (3) is the most appropriate answer ‘Incentive’ and ‘service’ do not fit in the second blank, ruling out choices (1) and (2) respectively. In choice (4), ‘milestone’ is not appropriate.

Choice (3)

65. In this context, the word that has to go into the first blank has to be more or less synonymous with ‘separation’. The only word that is appropriate is ‘division’. All the other choice are ruled out.

Choice (2)

66. The passage talks about the problems caused due to the different response time in computer systems. (D) would be appropriate as the introductory sentence. (A) follows, giving one more instance where problems are caused. DA having been about slow response time, (B) follows, talking about fast response time. (C) then talks about the optimum response time and (E) concludes.

Choice (2)

67. Choice (4) is the best answer. (D) opens the passage by talking about the central budget. BC go together – (B) talking about growth and (C) bringing out the obstacle for it. (E) follows elaborating on (C) and (A) concludes.

Choice (4)

68. The passage talks about common colds. (A) would be appropriate as the opening statement. (D) follows, elaborating (A). CB go together, (C) talking about structural problems and (B) giving an example.

Choice (3)

69. The passage talks about the Indian auto components industry. (B) introduces the subject. DC then follow, (D) elaborating (B) and (C) giving in example for (D). (E) then follows, showing that in spite of all this, there are still problems. (A) concludes.

Choice (1)

70. (A) introduces the topic. (C) follows, for the ‘it’ in (C) refers to the agreement mentioned in (A). BC go together, (C) elaborating on (B).

Choice (2)

71. Choice (4) is the best answer. In choice (1), ‘of being’ us not idiomatic. In choices (2) and (3), ‘is owed much’ is not idiomatic.

Choice (4)

72. Choice (3) is the best answer. Choice (1) is verbose and awkward. In choices (2) and (4), ‘more’ is inappropriate. It should be ‘most’

Choice (3)

73. Choice (3) is the most appropriate answer.

Choices (1) and (4) contain misplaced modifiers and seem to suggest that the ‘notes’ were asked to speak at the convention. Similarly, choice (2) also suggests that the convention members were asked to speak.

Choice (3)

74. Choice (2) is the best answer. Choice (1) is verbose and awkward. Choice (3) is also awkward in construction – the two ‘-ing forms have to be separated with a conjunction. Choice (4) is grammatically incorrect because the conjugated verb ‘screamed’ immediately before the verb ‘were’ is not possible.

Choice (2)

75. Choice (3) is the best answer. ‘Gas’ is not a feature, ruling out choices (1) and (4).

In addition, ‘air condition’ in choice (4) is inappropriate. In choice (2), it should be ‘safety devices’ and not ‘safe devices’.

Choice (3)

76. Option 1 is erroneous because the to + verb + ing form structure is erroneous. The to infinitive cannot go with the ‘ing’ form. Option 3 is erroneous because the word ‘avoiding’, that is the ing form of the verb, is not in keeping with the preceding verbs (explain and understand etc) which are all in the simple present. Option 4 is incorrect because the word ‘improvement’ which is a noun is incorrect as it is not in keeping with the preceding verbs. Therefore only choice 2 is correct.

Choice (2)
Solutions for questions 77 to 80:

77. Part 3 is erroneous. The word ‘have’ does not agree with the subject ‘relationship’ which is singular. The correction is ‘The relationship between -------- has changed --------’.
   Choice (3)

78. The error lies in part 3. The verb ‘give’ does not agree with the subject ‘control’. The correction is ‘control over intangible assets -------- gives companies --------’.
   Choice (3)

79. The word ‘apotheosis’ should be followed by the preposition of. Something is an ‘apotheosis’ of something. Hence part 2 has an error.
   Choice (2)

80. Part 4 has an error. The word ‘stringent’ should be followed by the preposition ‘in’.
   Choice (4)

Solutions for questions 81 to 85:

81. E belongs to T.
   Choice (1)

82. In case (1) D is sitting at the extreme right end, where A who is from P is sitting at the extreme left end.
   Choice (2)

83. In case (2) the student from S can sit at the extreme right end, where A is sitting to the immediate right of the student from Q.
   Choice (3)

84. In either case B can be from Q.
   
   ∴ We cannot determine the position of E.
   Choice (4)

85. In case (2) exactly one person is sitting between A and E, where A is sitting between the students from S and Q.
   Choice (1)

Solutions for questions 86 to 90:
The code for each of the next person is obtained by rearranging the words as shown below.
First person: get set bet let pet wet
1 2 3 4 5 6
Second person: wet get let bet set pet
6 1 4 3 2 5
86. 1: cat sat fat hat rat mat; 2: mat cat hat fat sat rat
3: rat mat fat hat cat sat; 4: sat rat hat fat mat cat
   Choice (4)

87. Here, we need to follow the reverse process of rearrangement that is number the words as
   6 1 4 3 2 5
   and rearrange them as
   1 2 3 4 5 6
   for the previous code.
3: hit sit fit bit kit wit; 2: sit kit bit fit wit hit
1: kit wit fit bit hit sit
   Choice (2)

88. 2: bar car far jar tar war; 3: war bar jar far car tar
4: tar war far jar bar car; 5: car tar jar far war bar
   Choice (3)

89. By continuing the series given in the data,
3: pet wet bet let get set
4: set pet let bet wet get
5: get set bet let pet wet
Here the 5th and the 1st are the same. Hence, the password will be repeated after the fourth person logs in.
   Choice (1)

90. 3: tin bin kin sin pin win; 4: win tin sin kin bin pin
5: pin win kin sin tin bin; 6: bin pin sin kin win tin
Alternate solution:
Here, the passwords for the sixth and the second persons are the same.
3: tin bin kin sin pin win; 2: bin pin sin kin win tin
   Choice (3)

Solutions for questions 91 to 95:

91. The basic diagrams for the given statements is According to the above diagram:
   Conclusion: I (affirmative) is true.
   II (affirmative) is true, hence it is always true.
   III (negative) is true and IV (negative) is true.
   Choice (3)

92. The following diagrams can be drawn for the given statements:

93. The following diagrams represent the given statements.

94. The following diagrams represent the given statements.
III (negative) is true and IV (affirmative) is true.
Hence, all follow. Choice (4)

95. The following diagrams represent the given statements.

![Diagram](image)

From diagram (i):
Conclusion: I (affirmative) is false.
II (affirmative) is true.
III (affirmative) is false and
IV (negative) is true.
From diagram (ii):
Conclusion: I is true.
IV is false.
III is true.
Hence either I or III and II follows. Choice (4)

**Solutions for questions 96 to 100:**
From (1) and (2), we get,

(i) B/D C D/B
(ii) B/D C D/B

Also given that E and F sit together.
∴ The above arrangement becomes

(i) B/D C D/B E/F F/E
(ii) E/F E/F B/D C A B G

From (3) and (5), we get the above possible cases as follows.

(i) G D A C B E/F F/E
(ii) E/F E/F D C A B G

96. From the given condition, we get-
(i) G D A C B E F
(ii) F E D C A B G

in both the cases, the number of persons between A and E is two. Choice (3)

97. F can be adjacent to B in (i) hence, we get

G D A C B F F/E

Here A is third from left. Choice (1)

98. From (i) and (ii), only B, D and F can be adjacent to E. Choice (2)

99. In (i), the number of persons between D and G is ‘0’ but in (ii), it is ‘3’. Choice (4)

100. Among the given statements, A and C are adjacent to each other in both (i) and (ii).

Choice (4)

**Solutions for questions 101 to 120:**

101. Boric acid Water

![Solution](image)

Let x cm$^3$ of water be added. Then,

$\frac{\text{76}}{\text{40}} + \frac{x}{x} = \frac{\text{20}}{\text{40}}$

$\Rightarrow x = \frac{32 + 0.05}{32.05} = 32.05 \text{ cm}^3$ Choice (2)

102. Let the total number of goods be G. Number of second quality goods sold is

$G \times \frac{5}{6} = \frac{G}{6}$

Required fraction $= \frac{\frac{1}{4}}{\frac{3}{4}} = \frac{1}{4}$ Choice (1)

103. Let the original strength in each section be ‘x’. Let the average weight of the two sections.

From diagram (i):
$P(A) = \frac{10}{10+x}$

The probability of getting a green ball = $\frac{2}{2}$.

From diagram (ii):
$P(A) = \frac{10}{10+x}$

104. To cover 39 km time taken by the train (without stoppages) $= \frac{60}{45} \times 39 = 52 \text{ min}$

The train takes 60 min to cover 39 km when it stops. So the train stopped for 60 – 52 = 8 min in one hour. Choice (2)

105. We know that, correct mean = wrong mean + $\Sigma$ (correct observation – wrong observation)

$= \frac{32 + (17+15)-(7+23)}{40} = \frac{32 + 2}{40}$

$= \frac{32 + 0.05}{32.05} = 32.05 \text{ cm}^3$ Choice (2)

106. Edge of the cube = 5 cm. Thickness of the smaller slice = 1 cm. l = 5 cm, b = 5 cm

Area of each small slice, which is in the form of a cuboid = $2h(l + b) + 2lb = 2 \times 1 \times (5 + 5) + 2 \times 5 \times 5$

$= 20 + 50 = 70 \text{ cm}^2$ Choice (1)

107. Area of the room available to the students = $(18 - 2)(16 - 2) = 224 \text{ m}^2$

As each student requires 1 m$^2$ area, a total of 224 students can be accommodated in the classroom. Choice (1)

108. The total ways of arranging the speeches are 6!. Of these, in half the cases, Atal speaks before Sonia and the other half, after Sonia. So the number of ways, in which Atal speaks after Sonia is $\frac{6!}{2!} = 360$ Choice (1)

109. There are 26 black cards, 4 kings and 2 black kings.

∴ By Addition theorem, Required Probability $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$= \frac{26}{52} + \frac{4}{52} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13}$ Choice (3)

110. Let the number of green balls be x When a ball is drawn at random, the probability of getting a red ball = $\frac{x}{10+x}$

The probability of getting a green ball = $\frac{2}{(10+x)}$ Choice (3)

111. From $\Delta \text{PTB}$

$\tan 60^\circ = \frac{h}{x}$

$h = \sqrt{3} x \ldots \ldots (1)$

From $\Delta \text{PTA}$, tan $30^\circ = \frac{1}{\sqrt{3}} = \frac{h}{50+x}$

$h = \frac{\sqrt{3}}{50+x}$ \Rightarrow $x = \sqrt{3} h - 50 \ldots \ldots (2)$

From equations (1) and (2) we get

$h = \frac{1}{\sqrt{3}} = \frac{1}{\sqrt{3}}$ \Rightarrow $50 \Rightarrow h = 25$

$\sqrt{3} \text{ metres}$ Choice (1)

112. As the sum triples to Rs 1200 in four years at C.I., \( Sum = Rs 400 \)

Now Rs 1200 is the principal. It amounts to Rs 3600 in another four years. \Rightarrow \ :
Interest for first eight years = $3600 - 400 = Rs 3200$ Choice (4)

113. A regular polygon with fixed perimeter has a maximum area if it is a regular polygon. Among all these regular polygons of the fixed perimeter, greater the number of sides, greater the area. Choice (4)

114. When A had run 500 m B would have run 485 m. When B had run 500 m C would have run 480 m.

When D had run 500 m C would have run 475 m. When D had run 500 m A would have run

$= 500 \left( \frac{500}{485} \times \frac{500}{480} \times \frac{475}{500} \right) = 490.10 = 490.$
So A beats D by 10 m approximately. Choice (2)

115. The number of seconds after which they toll together is \( \text{LCM} (6, 7, 8, 9, 12) = (2^2 \times 3^2 \times 7) \) sec.
The number of times they toll together in 1 hour = \( \frac{60 \times 60}{2^2 \times 3^2 \times 7} \approx 7.14 \approx 7 \) Choice (3)

116. Perimeter of Rectangle = 2 \((l + b) = 4 \times 20 \)

\[ l = 4 \times 20 = 80 \]

\[ \therefore \text{Area of Rectangle} = \frac{l \times b}{2} = \frac{80 \times 15}{2} = 600 \text{ cm}^2 \]

Choice (1)

117. It is given that the radius and depth of the conical vessel are 6 cm and 8 cm respectively.

Volume of the water over flown = Volume of the sphere = \( \frac{4}{3} \pi (3)^3 \). Required ratio

\[ \frac{4}{3} \pi (3)^3 = \frac{3}{8} \]

Choice (1)

118. For any values of \( x \) and \( y \), two successive discounts of \( x \) per cent and \( y \) per cent is always equal to two successive discounts of \( y \) per cent and \( x \) per cent and is less than or equal to a single discount of \((x + y)\) per cent.

But two successive discounts of \( x \) per cent and \( y \) per cent is more than for \((x + y)\) or equal to \((x + y)\) per cent.

Choice (4)

119. Since the vertical angle of the right circular cone is 90°, Its radius = Its height \( \Rightarrow r = h \)

Volume of the solid = volume of cylinder + volume of cone = \( \pi \left( \frac{7}{2} \right)^2 \times 10 + \frac{1}{3} \pi \left( \frac{7}{2} \right) \)

\[ = \pi \left( \frac{7}{2} \right) \left[ \frac{7}{2} \right] \left[ \frac{7}{3} \right] = \frac{22}{7} \times 49 \times \frac{37}{3} = 1899 \]

\[ \frac{1}{3} \text{ cubic centimetre} \]

Choice (4)

120. Let the price be Rs \( x \). The increased price will be Rs \((1.3)x\). As \( x \) is an integer, the increased price must be a multiple of 1.3. Among the given choices, 7.00 is not a multiple of 1.3. Choice (3)

\red{\text{Solutions for questions 141 to 145:}}

141. Total value of Kerosene consumed = \( 60,000 \times \frac{12}{100} = 7200 \text{ Crores} \)

Total Kerosene consumed by India (Quantity) = 150 lakh kilolitres.

\[ \therefore \text{Value of 1 litre of Kerosene} = \frac{7,200 \times 100}{150 \times 1000} = 4.8 \text{ Rs} \]

Choice (2)

142. The graph here shows the consumption of electricity by India but does not state anything about the production of electricity. Hence the amount of electricity generated in India cannot be estimated. Choice (4)

143. Price of 1 Barrel of crude oil imported by India = \( \frac{60,000 \times 0.3}{25} \) (250 million = 2500 lacs = 25 crores)

\[ \therefore \text{Price of 1 barrel of Crude oil imported by India} = \text{Rs 720} \]

Price of 1 barrel of oil that Oman sells to India = Rs 720.
Price of Crude oil in Oman (domestic) is 25 per cent more than Rs 720 = Rs 900. Choice (1)

144. Current Domestic Production of Crude oil = \( 250 \times \frac{25}{100} = 62.5 \text{ million barrels} \)

16 per cent of TRR = 62.5 million Barrels; \( \therefore \text{TRR} = \frac{62.5 \times 100}{16} = 390.625 \text{ million Barrels} \).

We know that 100 per cent more implies twice. Similarly 200 per cent more implies thrice.

In the scene every 4000 per cent more implies 41 times. \( \therefore \text{TER are 41 times the TRR.} \)

\[ \therefore \text{TER} = 41 \times 390.625 = 16000 \text{ million barrels} \]

Choice (4)

145. Total value of Crude oil consumed in India = \( 60,000 \times 0.3 = 18,000 \text{ crores} \).

Domestic production = \( 250 \times 0.25 = 62.5 \text{ million barrels} \).

Crude oil from sources other than Domestic = 187.5 Mn barrels. Assuming 1 barrel from other sources costs Rs X, then the price of 1 barrel of Domestic Crude costs

\[ \frac{3X}{4} \]

\[ \therefore \text{187.5 X + 62.5} \times \frac{3X}{4} = 18000. \]

\[ \Rightarrow 234,375 X = 18000 \Rightarrow X = \frac{18,000 \times 100}{234,375 \times 10} \text{(in lacs)} \]

\[ \Rightarrow X = \text{Rs 768} \]

Choice (2)

\red{\text{Solutions for questions 146 to 151:}}

146. The student obtained maximum marks in mathematics with 90.

Choice (2)

147. The student obtained the least in Botany with 30 marks.

Choice (3)

148. The maximum difference between the marks obtained by student and average marks is \( 90 – 20 = 70 \) for mathematics. Choice (1)

149. The convergence between the marks obtained by student and average male marks exists in commerce. Choice (2)

150. There is a difference between the marks obtained by student and average female marks for all values. Choice (4)

151. The marks obtained by the student is not closest to either average male marks or average female marks. Choice (4)

\red{\text{Solutions for questions 152 to 156:}}

152. Let the original cost of each book and original number of books be denoted by 'c' and 'b'.

From statement I, \((c – 10) (b + 20) = c . b\) From statement II, \((c + 15) (b – 20) = c . b\)

Neither of the statement is independently sufficient to find the value of \(c\) as there are two unknowns and one equation. Using both the statements, the C.P of each book can be found. Choice (3)

153. Statement I gives the total amount of debt.

Statement II gives the period in which the debt has to be repaid. But no information regarding the rate of interest is given in either statement. Hence the question cannot be answered. Choice (4)

154. Since the direction in which A and B are travelling is not known, the distance between them cannot be found. Choice (4)

155. From statement I, \(8n + 5n\) is divisible by \(8 + 5 = 13\). This is possible for only odd values of \(n\) as \(8n\) is always even.

Choice (1)

156. Using both the statements also the question cannot be answered as neither the cost price nor the list price (or the selling price) is mentioned. Every thing is mentioned in terms of percentages. Hence the question cannot be answered. Choice (4)

\red{\text{Solutions for questions 157 to 160:}}

157. \(x + y = 12 \)

\(x - z = 10 \) \(\Rightarrow (1)\)

\(y + z = 2 \) (subtracting \((2)\) from \((1)\)) \(y + z = 2 \) is less than 3. Choice (2)

158. By cross-multiplying, \(x^2 = 36 \Rightarrow x = \pm 6 \) or \(\Rightarrow x = -6 \)

If \(x = 6\), the values in both the columns is equal. If \(x = -6\), the value in column \((A)\) is less.

\[ \therefore \text{The relationship cannot be determined.} \]

Choice (4)
Solutions for questions 165 to 169:

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<th>Number</th>
<th>Even number</th>
<th>First or last digit is perfect square</th>
<th>Middle digit is prime number</th>
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<td>✔</td>
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</table>

Solutions for questions 177 to 180:

177. C’s sibling’s father is C’s father as well. B is C’s mother. C’s father’s sister is C’s aunt, B’s (C’s mother) sister-in-law. C’s sibling’s father is C’s father as well.

178. Between 2007 and 2001, the number of years is 6, of them only one year is a leap year. Hence the number of odd days is \(-6 + 1\) = -5.

179. The normal clock runs for 180 minutes, the clock in question runs for 179 minutes. Hence, the clock in question runs for 179 minutes.

180. At 11hr 30min, if the minute hand points towards west then at 2/0 clock the hour hand will point towards South east.
Variations are bound to occur while evaluating essay type questions because unlike in objective type questions where dry facts and figures are being tested, in essay type questions it is the cogency, clarity and the manner of presentation which determine the number of marks awarded. Hence there is no objective standard for measurement in essay type questions.

200. The second sentence of the para clearly states that the Indian security structure has not taken the spirit of democracy into consideration. Hence option 1 is supported by the passage. Choice 4 can be ruled out because it is not stated in the passage that the freedom fighter fought for democratic rule in India. Choice (1)

7. B begins the paragraph by posing a query whether corporate prediction markets become a powerful tool by really spotting broader industry trends. A states there have been some attempts to find out. Find out what? The answer for the question posed in A. D offers an explanation by citing an example. C which carries forward the idea follows D. Hence BADC is the correct sequence. Choice (2)

8. Statement A which is a general statement ideally begins the paragraph. C is a continuation of A. ‘That’ in C refers to the scientists being worried about the changes in the ocean currents. Hence A and C are linked. This AC combination is seen only in 4. Further, statement B follows B as B is a continuation of C. D is conclusive in nature. Hence ACBD. Choice (4)

Solutions for questions 9 to 12:

9. Rather than ‘as well’ we need a conjunction that connects “many individuals” and “some groups”’. As well’ makes sentence (1) to be ruled out. In Choice (2) the singular verb has makes it wrong. Choice 4 has a wrong structure. Only option (3) is the correct sentence. Choice (3)

10. We use the ‘remaining’ when we can measure the quantity. “Remt” is used when it is uncountable or unknown. Therefore Choice (3). Choice (3)

11. The phrase is “last but not the least”. Therefore option (1) is wrong. The adverb ‘thoroughly’ should precede the verb discuss. Therefore 4 is correct. Choice (4)

12. “Admit” is always followed by ‘to’ and ‘attention’ cannot be ‘received’ (accepted). Attention is given. Therefore option (4) (the original sentence) is correct. Choice (4)

Solutions for questions 13 to 16:

13. The noun ‘programmes’ either in singular or plural does not alter the meaning. “Either” refers to a singular noun. We can say “either candidate” or “either of the candidates”. Option (3) is ruled out. Further, since the subject is singular, the pronoun ‘his’ is correct. This rules out (2). We say split “into” something and not ‘onto’. The correct structure would be in the past perfect. ‘Could offer’ in (4) rules it out. Hence (1)

14. The phrase “Local causes or ------” is connected to two parts, i.e., ‘explained’ and ‘attributed’ hence both should be of the same structure and should be followed by a preposition. The correct form is “explained by” and “attributed to” as seen in option (3). This rules out (1) and (4).
As the sentence is of a general nature, the auxiliary verb ‘can’ is correct. Choice (3)

15. The phrase “should have been” in 1 and 2 is totally irrelevant in the context and so is ruled out. In option (3), the adverb ‘tentatively’ is wrongly placed and so is incorrect. Option (4) is the correct answer choice. Choice (4)

16. The “if – condition” is an unreal/imaginary situation. So if one was ‘…..’ is informal so incorrect. It should be “if one were…….” Option (1) is therefore ruled out. The object of the verb is ‘men’ which is in plural and therefore, it should be ‘their’. This rules out option (2) “Custums of the world” in (3) is erroneous and it should be “customs in the world”. Only statement (4) is correct. Choice (4)

Solutions for questions 17 to 20:

17. A, B and C are grammatically incorrect. The word ‘advancing’ in A makes no sense. The correction is ‘recent advance in orchid cultivation’. In B the error is in the tense. The word ‘ago’ is used hence it should take the simple past tense. The correction is ‘scientists started……’. In C the correction is ‘from an orchid shoot’. Choice (2)

18. In B the words ‘through the world’ make the sentence incorrect. The correction is ‘throughout the world’ or ‘across the world’. ‘Damages’ is not the appropriate word in C, ‘damages’ means ‘the compensation to be paid’. The correction here is ‘skin damage’. The correction in D is ‘the sale’. Choice (2)

19. A and D are grammatically incorrect. The correction in A is ‘the young’. The words ‘on a risk’ are incorrect in D. The correction is ‘at risk’. Choice (4)

20. B is erroneous because it should be ‘a powerful panacea’. D is also incorrect because of the usage of the preposition ‘to’, the correction is ‘possibility of curing’. Choice (4)

Solutions for questions 21 to 23:

21. The events A and B are related events and B occurs after A. The price rise is the principal cause, but the government’s inaction is the immediate cause. Hence, B is the effect but A is not in immediate cause. Choice (4)

22. The events A and B are related events and a occurs before B. As the water of the people in slums consume is not protected, it leads to water born diseases. Hence, A is the effect and B is its immediate and principal cause. Choice (1)

23. The given events are related events and A occurs before B. It is given that there are few people who take advantage of the loopholes in the system. It is not said that every person is taking advantage. Hence, it depends on the individuals, not just the existence of loopholes. Hence, B is the effect but A is not its immediate and principal cause. Choice (4)

Solutions for questions 24 to 26:

24. Govind’s mother’s husband’s sister’s mother is Govind’s paternal grandmother whose husband, Aravind is Govind’s grandfather, hence Govind’s brother’s is grandson of Aravind. Choice (2)

25. The path followed by Rajesh is as shown in the following diagram.

Starting position 10 km
He is now facing south. Choice (3)

26. The angle between the hands at 11, 20 is

$$\theta = \frac{11}{2} \cdot 30 \times h = \frac{11}{2} \times 20 - 30 \times 11 = 220$$

As angle must be less than 180°, the angle is (360° - 220°) that is, 140° Choice (4)

Solutions for questions 27 to 29:

Given, IM was organised on Thursday
Also TB was not organized on first and last day; HR and ET were on consecutive days; PD and ES were on consecutive days ⇒ TB was on Wednesday
As ET was organised after PD, PD and ES were on consecutive days

As HR and IM were not organised on consecutive days, ET and HR were organised on Friday and Saturday respectively.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Product</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday</td>
<td>Telecom</td>
<td>Billing</td>
</tr>
<tr>
<td>Thursday</td>
<td>Infrastructure</td>
<td>Management</td>
</tr>
<tr>
<td>Friday</td>
<td>Emerging</td>
<td>Technologies</td>
</tr>
<tr>
<td>Saturday</td>
<td>Human</td>
<td>Resources</td>
</tr>
</tbody>
</table>

27. ‘Enterprise Solutions’ was organized on Tuesday. Choice (2)

28. ‘Human Resources’ was on the last day. Choice (4)

29. Two seminars were organized between Emerging Technologies and Enterprise Solutions. Choice (3)

Solutions for question 30:

30. The man in the photograph is the lady’s only sibling’s wife’s mother’s husband that is, her sibling’s father-in-law. Thus, the man in photograph is her brother’s son’s grandfather. Choice (4)

Solutions for questions 31 to 33: Total 80

In the above diagram, in each area, let the top letter be the number of boys and the bottom letter be the number of girls. It is given that, Boys who watch only football = students who watch none = 2 (girls who watch both) a = g + h = 2f = 2x (say)

50 per cent of the students who watch only football are girls that is, a = b = 2x 50 per cent of the students who watch football also watch cricket that is, a + b = e + f = 4x

As f = x, e = 3x; The number of girls who watch football is same as the number of girls who watch cricket. that is, b = d = 2x; 50 per cent of boys who watch football ⇒ a + e = c + g. As a + e = 2x + 3x = 5x ⇒ c + g = 5x

Total boys = 10x; 70 per cent of boys watch cricket that is, c + e = 7x
c = 4x and g = x ⇒ h = x

<table>
<thead>
<tr>
<th>Monday</th>
<th>Product</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Football</td>
<td>Cricket</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

31. 15 boys watch both the games. Choice (2)

32. The number of boys = 50 and the number of girls = 30; the required ratio = 5 : 3 Choice (4)

33. 5/30 = 16.66 per cent of the girls did not watch any of the two games.

Choice (1)

Solutions for questions 34 to 36:

34. The wins of different teams can be as follows. The teams are arranged in descending order of the number of wins. If a team wins 4 matches, there can not be 3 other teams with a better performance.
Solutions for questions 61 to 80:

61. \(4x + 8y = 12 \Rightarrow 8x + 16y = 24\)
\(8x + 16y = a + b\) if \(a = 24\), then the given equations will be the same. \(\therefore\) They have infinite solutions.
Choice (1)

Total increase in tourists from 2000 to 2003 = 65 per cent; that is Inflow of tourists in 2003 = 6600
Percentage increase in tourists form 2002 to 2003 = 600/6000\(\times\)100 = 10 per cent
Choice (3)

63. As the number is divisible by 72 it is divisible by 8 and 9 also. The sum of the digits 44x8y is 16 + x + y. For the number to be divisible by 9, the least value of \(x + y\) should be 2. As the number is divisible by 8, the last three digits have to be divisible by 8. \(\therefore\) x8y cannot be 082 as it is not divisible by 8 but it can be 280. that is \(x = 2\) and \(y = 0\).
Choice (3)

64. The rest of the tank to be filled is the part of the tank which all the taps can fill in 1 hour.
The part of the tank which can filled in one hour by the three taps together = \(\frac{1}{5} + \frac{1}{4} + \frac{1}{15}\)
Work taken to fill the tank = \(\frac{15}{10} = \frac{3}{2}\) hour
Choice (1)

65. \(x + 3z = 25\)
\(2y + z = 10\)
\(x - y = 5\)
Subtracting equation (3) from (1); we get \(3z + y = 20\)
Multiplying the equation (4) by 2 and subtracting it from equation (2), we get \(z = 6, y = 2\).
\(\therefore\) \(2x + y - z = 2\times7 + 2 - 6 = 10\)
Choice (2)

66. As the work is same in both the case, the number of man days in both the cases is also the same.
Let the work done by a boy and girl per day be B and G respectively.
\((8B + 16G)6 = (16G + 4B)8 \Rightarrow B = 2G;\)
Work done by 8 boys and 16 girls = \(8\times2G + 16G = 32G\)
Also work done by 17 boys and 20 girls = \(17\times2G + 20G = 54G\)
Now applying formula \(M_1D_1H_1 = M_2D_2H_2\), we have \(32\times6 = 54\times d_1 d_2 = 32\times 6 = 3\times\frac{1}{4}\) days.
Choice (2)

67. Let the distance from P to Q be \(x\) km and that from Q to R be \(y\) km.
Average speed = \(\frac{x + y}{\frac{x}{20} + \frac{y}{35}}\)
\(\Rightarrow x : y = 4 : 7\)
Choice (3)

68. \(3x = 4y = 6z = k\) (say); \(x = k/3; y = k/4; z = k/6\)
\(x : y : z = \frac{k}{3} : \frac{k}{4} : \frac{k}{6} = 4:3:2; z = \frac{2}{9} \times 36\) = 8 dozen.
Choice (3)

69. The total distance = \((3)(20) + (4)(15) + (3)(30) = 210\) km; The average speed = \(\frac{210}{3+4+3}\)
= 21 kmph
Choice (1)

70. The required remaining work = \(\frac{1}{7} \times \frac{4}{3} \times \frac{3}{4} \times \frac{9}{28}\)
Choice (1)

71. 24 men + 12 women can do the work in 6 days. 18 men + 24 women can do the work in \(\frac{7}{4}\) days.
\(\therefore\) 144 men + 72 women = 81 men + 108 women \(\Rightarrow 63\) men = 36 women \(\Rightarrow 7\) men = 4 women
Now, 24 men + 12 women = 24 men + 21 men can do in 6 days working 6 hours a day.
that is, 45 men can do the work in 6 days working 6 hours a day.
we have \(M_1D_1H_1 = M_2D_2H_2\); \(45 \times 6 = 6\times24\)
= \(24 \times 9 \times D_2 D_3 = 6 \times 45 \times x = \frac{15}{2}\) days
Choice (4)

72. The distance between the first post and the eighteenth post = 17x m.
The distance between the eighteenth post and the thirty fourth post = 16x m.
Time taken to cover 16x m = \(\frac{306}{17x}\) = 288 sec
Choice (3)

73. Let the strength of the class be \(x\).
\(x \times 10 = 10 \times 10 \times 50 \Rightarrow 10 = 10 \times (80 - 50)\)
\(\therefore\) \(x = 30\)
Choice (2)
74. Given data can be represented as a diagram as shown.

If \(BA\) be represented by \('x'\), then \(BD = x\).

![Diagram](image)

Median on to the hypotenuse of a right-angled triangle, is half the hypotenuse; that is \(BD = 1/2 AC\) \(\Rightarrow AC = 2BD = 2x\) that is, in \(\triangle ABC\), right angled at \(B\), Hypotenuse \(AC = 2x = 2 AB\), \(\Rightarrow \angle BCA = 30^0\) and \(\angle BAC = 60^0\). . . \(1\)

Given \(CE\) is perpendicular to \(CB\).

Hence, angle \(ECA = 90^0\) as shown.

\(\Rightarrow AE = CA = 2x\) . . \(4\)

Given that \(AC\) is the bisector of the angle \(\angle BAE\), \(\Rightarrow \angle BAC = \angle CAE = 60^0\), \(\Rightarrow \triangle AEC\) is equilateral; \(\Rightarrow AE = EC = CA = 2x\) . . \(4\)

In \(\triangle ABC\), \(\angle BAC = \angle BCA = 60^0\), \(\Rightarrow AC = 2x\), \(AB = x\), hence, \(BC = \sqrt{3}x\) . . \(5\)

Ratio of \(BC\) to \(AE = \sqrt{3}x : 2x = \sqrt{3} : 2\) \(\Rightarrow AE = \sqrt{3}x = 2 \times \sqrt{3} = 2\) \(\Rightarrow AE = \sqrt{3}x = 2 \times \sqrt{3} = 2\)

Choice (3)

75. A’s capital = Rs 5000; B’s capital = Rs 8000; A’s time period = 12 months

B’s time = \((3 + 3) = 6\) months; C’s capital = Rs14,000; C’s time = 12 – 3 = 9 months

The ratio of profits of A, B and C = 5000 \times 12; 8000 \times 6; 14000 \times 9 = 10 : 8 : 21

10 parts of total profit = Rs 1400; 8 parts of total profit = \(\frac{8 \times 1400}{10} = Rs 1120\)

Choice (4)

76. Let the price per unit be Re.1, Sales be 100, Revenue = Rs 100 \(--\) \(1\)

When the price is decreased by 30 per cent. The new price = Rs 0.7, Sales = 120

Revenue = 120 \times 0.7 = Rs 84

Decrease in the revenue = Rs 16. Percentage decrease in the revenue = 16 per cent

Choice (1)

77. The probability of the missiles (A, B, C and D) to hit the target is 0.4, 0.3, 0.2 and 0.1 respectively.

The probability of a missile hitting the target = 1 – [Probability of none of the missiles hitting the target]

\[1 - [P(A) \times P(B) \times P(C) \times P(D)]\]

Now the probability of missiles hitting the target = \[1 - (1 - 0.4) (1 - 0.3) (1 - 0.2) (1 - 0.1)]

\[= 1 - (0.6) (0.7) (0.8) (0.9) = 1 - 0.3024 = 0.6976\] Choice (4)

78. Share of P = \(\frac{12}{24}\) = Rs 675; Share of Q = \(\frac{12}{36}\) = Rs 450;

Share of R = 1350 – 675 – 450 = Rs 225

Choice (3)

79. The speed of a boat in still water = \(\frac{150}{100}\) = 1.5 kmph; Downstream time = \(\frac{24}{8+12}\) = 1.2 hours

Upstream time = \(\frac{24}{12-8}\) = 6 hours; Average speed = \(\frac{242(2)}{1.2+6} = 6\frac{2}{3}\) kmph 

Choice (3)

80. Quantity of mangoes purchased = 40 kg;

Rate of mangoes per kg = Rs 30

Total cost price = Rs 1200

Transportation = Rs 200

Total cost = Rs 1400; Expected profit = 21 per cent

Total expected selling price = \(\frac{1400 \times 120}{100} = Rs 1680\); Quantity of mangoes = Rs 35 kg

Total selling price of spoiled mangoes \(\times 40 = 5\) kgs

Required selling price = \(\frac{1575}{35} = Rs 45\)

Choice (4)

81. Either statement alone is not sufficient as we do not know whether town B is between towns A and C or not. The second statement is not sufficient as it gives no information about the distance. Even by combining both the statements, we cannot answer the question, because the locations of A, B and C are not known. Choice (4)

82. Clearly, either statement alone is not sufficient. Even by combining both the statements, we cannot answer the question. Choice (4)

83. From the first statement above, as both Mahendar and Shilpa are standing together, the ratio of their Shadows is the same as their respective ratio of heights. Second statement is redundant.

Choice (1)

84. The first statement alone is not sufficient as we do not know whether town B is between towns A and C or not. The second statement is not sufficient as it gives no information about the distance. Even by combining both the statements, we cannot answer the question, because the locations of A, B and C are not known. Choice (4)

85. Either statement alone is not sufficient as they contain partial information. Combining both the statements, Let x be the number of employees. . The number of employees having cars = 0.32x : The number of employees having a car and owning a house = 0.32x (0.6) = 0.192x , which is 19.2 per cent of x. Choice (3)

86. Either statement alone is not sufficient as we do not know the weight of Neeru. By combining both the statements, we can answer the question as we have the sum of their weights and the ratio of their weights.

Choice (3)

Solutions for questions 87 to 91:

87. Profit from steel division = 21 per cent of (20 per cent of 35) crores = \(\frac{21 \times 20}{100} \times 35\) crores = 1.47 crores. Choice (4)

88. Only for Pharma, Steel and Software development division, the profit percent is more compared to the percentage of revenue distribution. So highest profit percent is from these sectors only.

Profit percent from Pharma division = \(\frac{9 \times 7}{6 \times 37}\) = 30 per cent

Profit percentage from Steel division = \(\frac{21 \times 7}{18 \times 35}\) = 23 1/3 per cent

Profit percent from Software development division = \(\frac{36 \times 7}{50 \times 35}\) = 24%

Choice (4)

89. Revenue from FMCG division = 24 per cent of 35; Profit from Software development = 36 per cent of 20 per cent of 35. Required ratio = 24 per cent of 35 : 36 per cent of 25 per cent of 35 = 10 : 3.

Choice (1)

90. Revenue from Cement division = \(\frac{22}{300} \times 35 = 7.7\) crore

Profit from Cement division = \(\frac{14}{100} \times 35 \times 20\) per cent

Expenditure on Cement division = 7.7 0.98 = 6.72 crores.

Choice (2)
91. Revenue from Steel division = 18 per cent of 35 = 6.3 crores; Profit from Steel division = 21 per cent of (20 per cent of 35) = 1.47 crores.
Revenue from FMCG division = 24 per cent of 35 = 8.4 crores
Profit from FMCG division = 20 per cent of (20 per cent of 35) = 1.4 crores.
Profit percent on Steel division = \(\frac{1.47}{6.3} \times 100\% = 23.1\%\)
Profit percent on FMCG division
\(= \frac{1.4}{8.4} \times 100\% = 16.7\%\); Required percentage points = \(\left(\frac{23.1 - 16.7}{3}\right) \times \frac{6}{3} = 2.35\) crores

and 1500 – 1400 = 1200 – 1100 = 1400 – 1100
is the greatest.

is the greatest. Choice (2)

94. Of 10 \(\times\) \(\frac{30}{1100}\) = \(\frac{30}{1100}\) \(\times\) \(\frac{1300}{1400}\) = \(\frac{1300}{1400}\) \(\times\) \(\frac{1500}{1500}\)
is the greatest. Choice (3)

95. As \(\frac{10}{1100}\) \(\times\) \(\frac{20}{1200}\) = \(\frac{20}{1200}\) \(\times\) \(\frac{30}{1300}\) = \(\frac{30}{1300}\) \(\times\) \(\frac{45}{1400}\) = \(\frac{45}{1400}\) \(\times\) \(\frac{50}{1500}\), the correct answer is (3). Choice (3)

96. Total shares of Zee Telefilms = \(\frac{1000}{100}\) = 10 crores
Number of shares held by Indian promoters = \(10 \times \frac{23.5}{100} = 2.35\) crores

97. Value of share holding of Indian promoters = \(1000 \times \frac{23.5}{100} = Rs\ 235\) crores

98. Value of Share holding of Metlife in June 2003 = \(1000 \times \frac{23.5}{100} = Rs\ 23.5\) crores
Value of Share holding of FI's in March 2003 = \(1000 \times \frac{6.9}{100} = 69\) crores
Value of Share holding of Metlife in June 2003 as a percentage of that of FI's in March 2003.
\(= \frac{23.5}{69} \times 100 = 34.05\) per cent

99. The maximum percentage change would mean either an increase or a decrease in the share holding value
Others (Increase of 2.8 percentage points) = \(\frac{0.4}{9.8} \times 100 = 4.08\) per cent
Public (Decrease of 0.4 percentage points) = \(\frac{0.5}{4.9} \times 100 = 10.20\) per cent
FI's (Decrease of 1.6 percentage points) = \(\frac{1.6}{6.9} \times 100 = 23.18\) per cent

100. per cent Share holding of FI’s in March ’03 = 26.6 per cent; per cent Share holding of ‘others’ = 5 per cent of 26.6 per cent = 1.33 per cent
Sunshine investments is 10 per cent of its total shareholding of Zee Telefilms.

101. Average speed = \(\frac{2x}{x + \frac{2x}{40}} = \frac{2(40)(60)}{40 + 60}
= 48\) kmph

Solutions for questions 101 to 120:

102. Let the present ages of father, mother, son and daughter be f, m, s and d respectively.
Given \(f + m + s + d = 24\); \(f = 4(m + s)\) and \(d = 6 \Rightarrow f + \frac{5f}{4} + 6 = 96\); \(\Rightarrow f = 40\) years Choice (1)

103. Time taken to meet for the first time at the starting point
\(= \text{LCM of } \left(\frac{18}{3}, \frac{18}{6}\right) = \text{LCM of } (6, 3) = 6\) hours. Choice (3)

104. \(t_1 = 1; \ t_2 = 2; \ t_3 = t_1 + 2t_2 + 5 = 1 + 2(2) + 5 = 10;\)
\(t_4 = t_2 + 2t_3 + 5 = 2 + 2(10) + 5 = 27;\)
\(t_5 = t_3 + 2t_4 + 5 = 10 + 2(27) + 5 = 69\) Choice (2)

105. Let the length of the train be x m. Its speed = \(\frac{72 \times 5}{18} = 20\) m/s
\(x = 20 \times 22.5 = 450\) m. Time taken by it to cross the tunnel = \(\frac{450 + 350}{20} = 40\) seconds Choice (2)

106. From choices.
(1) \(\left(\sqrt{5} + 1 - \sqrt{2}\right)^2 = 8 + 2\sqrt{5} - 2\)
(2) \(\left(\sqrt{5} + \sqrt{2} - 1\right)^2 = 8 + 2\sqrt{10} - 2\sqrt{5}\)
(3) \(\left(\sqrt{5} - \sqrt{2} + 1\right)^2 = 8 + 2\sqrt{10} + 2\sqrt{5}\)
(4) \(\left(\sqrt{5} - \sqrt{2} - 1\right)^2 = 8 - 2\sqrt{10} - 2\sqrt{5}\)

107. When A, would have run 1000 m B would have run 900 m and C would have run 850 m.
So in a 900 m race, B beats C by 900 – 850 = 50 m. In a 2250 m race, B beats C by \(= \frac{2250 \times 50}{900} = 125\) m Choice (2)

108. Sum of the angles in a triangle is 180°
\(\Rightarrow x + 2k + x + x + 3k = 180°; \Rightarrow 3x + 5k = 180°\)
\(k = 36 - \frac{3x}{5}\). The largest possible angle = \(x + 3k = x + 3\left(36 - \frac{3x}{5}\right)\)
\(= 108 - \frac{4x}{5}\)
109. Let the length of the race be \( x \) m. Let the speed of B be \( y \) m/s. Speed of A = \( \frac{4y}{3} \) m/s. A and B finish the race simultaneously. So time taken by A to cover \( x \) m is the same as that taken by B to cover \( (x - 120) \) m.

\[
\frac{x}{4y/3} = \frac{x - 120}{y} = 3x
\]

\[4(x - 120) = 480 \quad \text{Choice (2)}
\]

110. The total area covered

\[10 \times 2 \times \frac{22}{7} \times (0.7) \times 4 = 176 \text{ m}^2\]

Choice (2)

111. The favourable combinations are A, A R A, A R A R A, … and so on. :: The required probability is

\[
\frac{1}{2} \times \frac{1}{8} + \frac{1}{32} + \ldots = \frac{5}{2} - \frac{2}{3} = \frac{1}{6}
\]

Choice (3)

112. The area of the path = \( \frac{22}{7} \times (21^2 - 14^2) = 770 \text{ m}^2 \). The cost of gravelling the path = \( 770 \times 5 = \text{Rs 3850} \)

Choice (4)

113. When three coins are tossed, sample space has \( 2^3 = 8 \) outcomes, of which (HHH) is the only favourable case. Required probability = \( n(E)/n(S) = 1/8 \)

Choice (1)

114. The required number of coins

\[\frac{\pi(6)^2(20)}{\pi(2)^2(0.3)} = 600\]

Choice (2)

115. The required probability =

\[
\left(\frac{1}{6}\right) \left(\frac{1}{6}\right) \left(\frac{1}{6}\right) - \frac{1}{216}
\]

Choice (3)

116. \( 2r = 14 \Rightarrow r = 7 \) and \( h = 20 \). :: Volume of the cylinder = \( \pi \times 7 \times 7 \times 20 = 3080 \text{ cm}^3 \). :: Volume of the wood wasted = \( 14 \times 14 \times 20 = 3080 = 840 \text{ cm} \)

Choice (4)

117. Let the length of the room be \( x \) m

\((4 \times x + 4 \times 3x) \times 2 = 96 \Rightarrow x = 3 \text{ m} \). The volume = \( 9 \times 3 \times 4 = 108 \text{ m}^2 \). Choice (3)

118. Let AB be wall and AC be ladder

Given, \( \frac{AB}{AC} = 1:2 \), \( \Rightarrow \frac{AB}{AC} = \frac{1}{2} \)

119. For the 1st year, sum borrowed by Mr. Sanjay = Rs 25000

Amount at the end of 1st year = 25000 \( \left(1 + \frac{28}{100}\right) = 25000 \times \frac{28}{25} = 28000 \)

Amount paid = Rs 8000. Principal for the 2nd year = Rs 20000

Amount at the end of the 2nd year = \( 20000 \times \frac{28}{25} = 800 \times 28 = 22400 \)

Amount paid at the end of the second year = Rs 8000. Principal for the 3rd year = Rs (22,400 – 8000) = 14,400. Amount to be paid at the end of the 3rd year to clear the debt = \( 14,400 \times \frac{28}{25} = 144 \times 4 \times 28 \) = Rs 16,128

Choice (4)

120. Let PC = \( x \) and BC = \( h \)

In triangle PBC

\[\tan 45^\circ = \frac{h}{x} \Rightarrow h = x \quad \text{(1)}\]

Now, in triangle PAC, \( \tan 60^\circ = \frac{300}{x} \)

Equating (1) and (2), \( h = \frac{300 \sqrt{3}}{3} = 100 \sqrt{3} \)

\( m = 173.2 \text{ m} \)

Choice (4)

121. The statement has no reference to weight lifting. Hence, I does not follow. The words ‘there ought to be’ indicate that at present there is no such law. Hence, II follows.

Choice (2)

122. It is a general statement made by Brian Lara and so it does not necessarily imply that he plays on Saturdays and Sundays. Hence, I does not follow. From his statement, it can be concluded that, he is aware of the difficulties of playing on Saturdays and Sundays. Hence II follows.

Choice (2)

123. The statement does not indicate whether there is any other reason that can cause erosion of ethnic culture. Hence, neither I nor II follows.

Choice (3)

124. From the statement it is clear that the number of states in the country is at least 12. But the statement is not clear whether there are more states in the country than that indicated in the statement. Hence, I does not follow. II is out of context. Hence, neither I nor II follows.

Choice (3)

125. The words ‘fate decided otherwise’ indicate that Sabita did not pursue the profession that her parents wanted her to. Hence, I follows. The statement does not reflect Sabita’s opinion. Hence, II does not follow.

Choice (1)

Solutions for questions 126 to 129:

Given

<table>
<thead>
<tr>
<th>Shirt</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trouser</td>
<td>Black</td>
<td>Green</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C and E have no colour in common

\( \Rightarrow B, C, D \) and E cannot wear green; \( \Rightarrow A \) wears green.

Given E did not wear Blue. But blue shirt should be to the right of white shirt.

\( \Rightarrow A \) and B (or) E and F should wear white and blue shirt respectively.

Solutions for questions 121 to 125:

From (1) and (2), we get,

(i) B/D C D/B

(ii) B/D C D/B

Also given that E and F sit together.

\( \Rightarrow \) The above arrangement becomes

(i) B/D C D/B E/F E/F

From (3) and (5), we get the above possible cases as follows,

(i) G D A C B E/F E/F

(ii) E/F E/F D C A B G

Case (i): If A and B wear white and Blue shirts respectively, D wear Black shirt. As the person who ears Red shirt should wear white trousers, it can be only E.

\( \Rightarrow F \) wear s Indigo shirt, D wears Blue trousers, C wears Indigo trousers and B wears Red trousers.
Similarly case (ii) can be operated. (But it contradicts the conditions given)
It can be tabulated as follows.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shirt</td>
<td>White</td>
<td>Blue</td>
<td>Green</td>
<td>Black</td>
<td>Red</td>
</tr>
<tr>
<td>Trouser</td>
<td>Green</td>
<td>Red</td>
<td>Indigo</td>
<td>Blue</td>
<td>White</td>
</tr>
</tbody>
</table>

126. Eswar is wearing a red shirt.
127. Amar is wearing green trousers.
128. Dinesh is wearing a black shirt.
129. Amar is wearing a white shirt and green trousers.

Solutions for questions 130 to 134:

130. From the words ‘in the event of mid-air emergency’ I follows. The statement has no reference to the President. Hence, II does not follow. Since a helicopter was kept on high alert, III follows. Choice (3).
131. The statement refers to the Indian IT sector being taken by storm with the announcement by IBM. It could be that such a big investment is after a long time and not necessarily for the first time. Hence, I and II do not follow. There is no reference to the status of the company. Hence, III does not follow. Choice (4).
132. The statement does not relate pioneers with the ability to give international standard flight training. Hence, I does not follow. From the statement, it cannot be found out what the people do not prefer. Hence, II does not follow. The first statement indicates ‘being pioneers’ as the reason for the ability to understand flying better. Hence, III follows. Choice (4).
133. ‘Giving away the rights’ is called foolish. Hence, II follows. The reason for which the rights were given away is not mentioned in the statement. Hence, either I or II and III follow. Choice (4).
134. There is no information in the statement to indicate that radio is not available to any one other than the common man. Hence, I does not follow. Statement II indicates that there was no programme broadcast on radio, which airs songs of listeners’ choice until 1980, Hence, II does not follow.

The statement has no reference to various programmes that are broadcast on radio. Hence, III does not follow. Choice (4).

Solutions for questions 135 to 139:

Let us represent the people with the first letter of their names.

Now a project must contain a senior faculty member and a junior student. The other project must contain a junior faculty member and a senior student.

If R is selected, then C and S cannot be selected and one among B and M is not selected (which is a contradiction since two students must be selected).

R is not selected.

G is selected (from (1)) and C is selected (from (4)).

From (5) either both A and B are selected or both are rejected.

If A and B are selected, then A, B, C and G are the persons who are selected (which satisfy all conditions).

If A and B are not selected, P and M are selected and as P is selected, S should be selected (from (3)).

But here none among C and R is selected (from (4)).

Hence, A, B and C and G are selected where B is a senior student, C is junior student, G is a junior faculty and A is a senior faculty.

B and G are assigned to a project and A and C are assigned to the other.

135. Chandu is selected. Choice (1).
136. Bimal and Govind are assigned a project. Choice (3).
137. Only Govind is a junior. Choice (1).
138. Bimal and Surya are both senior students. Choice (3).
139. Mayur is junior student is the only true statement. Choice (4).

Solutions for question 140:

140. Word: S U M M E R

Pattern: +1 +1 +1 +1 +1 +1 +1

Code: T V N N F S

Similarly, the code for WINTER is XJOUFS. Choice (3).

Solutions for questions 141 to 156:

141. Refer to the first two sentences of para 1 which state that the supply of uranium stopped when India used the plutonium generated in reactors for making a bomb. Choice (1).

According to the second sentence of para 5 choice (1) is true. Choice (2) is true according to the last and penultimate sentences of para 5. para 6 and 7 imply that choice (4) is true. Refer to the last line, of para 7- ‘Once this gets established’.

Choice (3) is not true because it is stated (in the last line of para 7 that India’s energy independence is likely to be achieved around 2050. Choice (3).

143. It is stated in some places in the passage, particularly the last line of the passage that the author feels obliged to the U.S. in one way or the other. Choice (3).

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145. The penultimate sentence of para 1 states that choice (4) is the answer to this question. Choice (4).

146. It is stated in the last sentence of para 2 that the European Commission has the power to impose its own fines. Choice (1).

147. The first sentence of para 4 states that 3 is the answer. Choice (3).

148. The seventh para of the passage states that choice (2) is the answer. Choice (2).

149. Para 6 of the passage states that the phrase ‘the very cradle of life on earth’ implies that oceans are a place from where life originated. Choice (1).

150. Refer to para 8 of the passage. The line – ‘well over 60 per cent of the marine world…’ Indicates that choice 2 is the answer. Choice (2).

151. Refer to para 4 of the passage which states that the rate at which we exploit nature is in excess of restoration efforts. (refer to the line –) it is a pace of change that has outstripped our institutions and conservation efforts. Choice (4).

152. The UN said humankind’s exploitation of the deep rear and oceans was ‘rapidly passing the point of no return’. (refer to the first para of the passage). This implies that the damage to the environment is irredeemable. Choice (3).

153. According to the first para of the passage fuel cells, at present are being used for increasing the life of batteries. (refer to the penultimate sentence of para 1) Choice (2).

154. According to the 1st sentence of para 3, choice 3 is the answer. Choice (3).

155. Refer to the third and fourth sentences of para 2 which state that choice 1 is the answer. Choice (1).

156. Refer to the first sentence of the last para. Choice (4).

Solutions for questions 157 to 160:

157. The industrialised nations had agreed to lower pollution level through climate policies. According to the paragraph the reduction in pollution levels would suggest that the industrialised nations were on their way to fulfill their promise. But (3) shows that the reduction was not due to implementation of climate polices but due to a political development. Hence (3) is the correct answer. (1) is incorrect as the argument is not about the number of factories (2) is wrong as it is about non-industrialised nations (4) is incorrect as the question is only about the result and not the means of achieving it. Choice (3).
158. As the economic growth has reached only a small fraction of the population the income of this small fraction must have increased substantially. The incomes of the poor have not increased significantly. Hence economic growth has actually widened the gap between the income level (4) is correct Choice (4)

159. According to the passage after every terrorist attack the investigating authorities go into the details. But this has not been able to prevent future attacks. If (2) were true it is bound to happen as the authorities won’t be prepared for the innovative attack (2) is correct. Though (1) may give the reason why terrorism continues, if does not explain the reason for the failure (3), (4) is only the reason why terrorist attacks are generally successful. Choice (2)

160. Inflation causes an erosion of money value. This would require the poverty line to be raised. So if old standards are applied some of those who are really poor may be deemed out of poverty line. So this might have decreased the percentage of the poor and not the measures taken by the government as claimed by it. So (1) is the correct answer. (2) If anything can only strengthen the government claim (3) and (4) are not relevant to the argument. Choice (1)

Solutions for questions 181 to 185:

181. By observation, we can find that the highest return could be in 5th week for company A or B, or in 8th week for company A, or in 3rd for company B. The increase in the prices for each of the above three instances is Rs 150. To get the highest return, the denominator should be the lowest which is there in case for company A in the 4th week, so it has to be the highest.

\[ \therefore \text{The return is} \frac{150}{250} \times 100 = 60\% \]

Choice (1)

182. A outperformed C in the following weeks 1st, 3rd, 5th, 6th, 8th Choice (3)

183. The weeks are 3rd, 4th and 7th. Totally, 3 weeks Choice (3)

184. In a span of 8 weeks, Stock of A goes up by 50 per cent (300 \rightarrow 450)

Stock of B goes up by 36.36 per cent (330 \rightarrow 450)

\[ \therefore \text{Value of Stock A is} 9900 \times 1.5 = 14850 \]

Value of Stock B is 9900 \times 1.5 = 14850 \times 1.5 = 13500 

\[ \therefore \text{Total worth of the stock} = \text{Rs} (14850 + 13500) = \text{Rs} 28,350. \] Choice (2)

185. Since, the market index is showing a positive return on investment, at least one of the 500 different companies making up the index should record a positive return. Choice (2)

Solutions for questions 186 to 190:

186. Total sales of A and B in 1990

\[ = (320 + 290) = 610 \]

Total sales of A and B in 1993

\[ = (500 + 420) = 920 \]

Hence percentage increase

\[ = \frac{(920 - 610)}{610} \times 100 = 310/610 \times 100 = 50 \% \] Choice (3)

187. Total sales of A = (320 + 380 + 370 + 500) = 1570; Total sales of B = (290 + 300 + 500 + 420) = 1510

As the sales of A and B are given for same number of years, the required percentage can be calculated on totals. Hence percentage increase

\[ \frac{1570 - 1510}{1510} \times 100 = 60/1510 \times 100 \approx 4 \% \] Choice (1)

188. Clearly by looking at the graph the maximum increase between any two consecutive years is for B from 1991 to 92. Also by looking at the graph no where the sales of A or B increased by more than half except for B in 1992. Hence percentage increase will be maximum for B at = 200/300 \times 100 = 66.66 \% Choice (1)

189. Sales of A in 1991 = 380

Sales of A in 1992 = 370

Hence percentage decrease

\[ = \frac{(380 - 370)}{380} \times 100 = 10/380 \times 100 = 2.63 \% \] Choice (2)

190. Sales of A in 1993 = 500; Sales of A in 1994 = 500 \times 1.2 = 600

Sales of B in 1993 = 420; Sales of B in 1994 = 420 - 420/3 = 420 - 140 = 280

Required percentage = 280/600 \times 100 = 80/6 \times 46 \% Choice (3)

Solutions for questions 191 to 195:

191. We need the car for which the ratio of

\[ \frac{M}{A} \]

is least by observation, Zen (50 per cent) and Versa (66 per cent) are amongst the last and the correct answer is Zen. Choice (4)

192. Profit = 3000 x (9.3 - 7.6) lacs = 1.7 \times 10^6 x 3000 = 51 crores; 2 per cent of 51 crores = 1.02 crores

Bonus per engineer = \frac{1.02 \times 10^7}{2040} = \text{Rs} 50,000. Choice (2)

193. Zen \rightarrow 500 cars/day; Profit/ car = 1.5 lacs/car; City = 600 cars/day; Profit/ car = 0.8 lacs/car

Total profit for Zen = 750 lacs/day; Total profit for City = 480 lacs/day 750 \times 156 = \text{Rs} 115,000 Choice (2)

194. Manufacturing cost = \frac{M}{M + A} is least

\Rightarrow \frac{M + A}{M} \] is highest \Rightarrow 1 + \frac{A}{M} \] is highest

\Rightarrow A is per cent of M is highest, this is true for Zen. \therefore Least for Zen Choice (2)

Solutions for questions 196 to 200:

196. By squaring the inequality, we get \( x^2 - 10 < 100 \Rightarrow 91 < x^2 < 100 \)

If \( x > 91; x > \pm \sqrt{91} \); If \( x > \sqrt{91} \) then \( x > 6 \).

If \( x^2 < 110 \Rightarrow x < 9 . ; x < 5 \) may be less than 6.

\therefore The relationship cannot be determined. Choice (4)

197. \[ \frac{x}{100} = \frac{z}{100} \times \frac{p}{x} = \frac{p}{100} \times \frac{x}{z} = \frac{p}{100} \times \frac{x}{z} = \frac{p}{10,000} \times x \]

The two quantities are equal. Choice (3)

198. If \( x = 0 \) \( x \) is definitely equal to 0. If \( y \) is positive \( y > 0, x < y \); If \( y \) is negative, \( x > y \) The relationship cannot be determined. Choice (4)

199. \[ x = 4 \frac{x}{100} \times 1330 = 152 ; y \]

Since \( 247 < 300 \) and \( 4 < 5 \Rightarrow 247 x 4 < 300 x 5 \). \therefore < x 

Since \( x \) is positive. We can say that \( x > y \). Choice (1)

200. Let the population in 1992 be 100. \therefore Population in 1997 = 120 (20 per cent increase on 100)

Also population in 2002 = 140 (20 per cent increase on 100); \therefore Percentage increase in population from 1997 to 2002 = \[ \frac{20 \times 100}{120} = 16.66 \% \] Choice (1)