SRI SAI COLLEGE OF IT & MANAGEMENT  
BUDDAYAPALLI, KADAPA  
MOCK ICET – 2015  
Solutions  
(Set – A)  

Key  
1. 4 21. 2 41. 3 61. 1 81. 2 101. 3 121. 2 141. 3 161. 4 181. 2  
2. 2 22. 3 42. 4 62. 4 82. 1 102. 1 122. 2 142. 3 162. 2 182. 3  
3. 2 23. 1 43. 2 63. 3 83. 4 103. 3 123. 1 143. 2 163. 3 183. 4  
4. 3 24. 4 44. 1 64. 3 84. 3 104. 4 124. 3 144. 4 164. 1 184. 3  
5. 3 25. 3 45. 3 65. 2 85. 1 105. 3 125. 2 145. 3 165. 3 185. 4  
6. 3 26. 3 46. 2 66. 3 86. 3 106. 4 126. 3 146. 2 166. 1 186. 1  
7. 3 27. 3 47. 4 67. 3 87. 2 107. 3 127. 4 147. 4 167. 1 187. 2  
8. 3 28. 2 48. 1 68. 1 88. 4 108. 1 128. 4 148. 2 168. 2 188. 4  
9. 3 29. 3 49. 2 69. 2 89. 2 109. 3 129. 4 149. 1 169. 1 189. 3  
10. 3 30. 2 50. 2 70. 1 90. 1 110. 2 130. 1 150. 4 170. 2 190. 3  
11. 2 31. 4 51. 3 71. 2 91. 1 111. 3 131. 2 151. 2 171. 1 191. 3  
12. 2 32. 2 52. 4 72. 2 92. 3 112. 3 132. 2 152. 3 172. 2 192. 2  
13. 4 33. 2 53. 4 73. 2 93. 2 113. 1 133. 2 153. 4 173. 2 193. 4  
14. 3 34. 1 54. 1 74. 1 94. 1 114. 2 134. 1 154. 1 174. 3 194. 1  
15. 4 35. 2 55. 2 75. 3 95. 3 115. 2 135. 2 155. 4 175. 2 195. 1  
16. 3 36. 4 56. 1 76. 4 96. 4 116. 3 136. 4 156. 2 176. 2 196. 1  
17. 1 37. 2 57. 3 77. 1 97. 2 117. 4 137. 4 157. 3 177. 3 197. 4  
18. 2 38. 3 58. 3 78. 2 98. 1 118. 3 138. 2 158. 3 178. 1 198. 2  
19. 2 39. 1 59. 4 79. 2 99. 1 119. 2 139. 3 159. 1 179. 3 199. 2  
20. 3 40. 1 60. 1 80. 4 100. 2 120. 3 140. 3 160. 3 180. 4 200. 3  

SOLUTIONS  

Section – A  

1. From Statement (i) we cannot find the interior angle as no information is given whether all the sides are equal or not. Whether it is a convex or concave polygon. From statement (ii), the sum of interior angles of that polygon is (6-2) 180. But from this also we cannot say what is angle A, since even if all sides are equal there is no need that all angles should be equal. So statement (ii) is also insufficient. Combining the two given statements, we cannot answer, since we do not know whether all the angles are equal or not. Choice (4)  

2. From statement (i)  
\[ x^2 + \frac{1}{x^2} = 7 \]  
\[ x^2 + \frac{1}{x^2} + 2x \cdot \frac{1}{x} = 7 + 2 \]  
\[ (x + \frac{1}{x})^2 = 9 ] \Rightarrow x + \frac{1}{x} = \pm 3 \]  
Since there are two values of x + 1/x, statement (i) alone is not sufficient. From statement (ii),  
\[ (x^2 + \frac{1}{x^2}) = (x + \frac{1}{x})^2 - 2x \cdot \frac{1}{x} = (3)^2 - 3(3) = 18 \]  
Statement (ii) alone is sufficient. Choice (2)  

3. Statement (i) alone is not sufficient, since the time to cover 200 m is not given. From statement (ii), the distance covered by the man in the moving train = 300 m

Time = 30 seconds  

Speed of the train (Man) = \[ \frac{300}{30} = 10 \text{ m/sec} \]  

Statement (ii) alone is sufficient. Choice (2)  

4. Statement (i) alone is not sufficient, since no numerical value is given. Statement (ii) alone is also not sufficient, since it is not related to the question directly. Using both the statements let the person has Rs.x with him.  

Given \[ \frac{1}{3} (x) = 15,000 \]  
then the amount with Gopal x = Rs.45,000  
Hence, Gopal has 45,000. Choice (3)  

5. Unless the coordinates of all the three points are given we cannot decide about their collinearity. Choice (3)  

Note: In this problem the points are collinear as slope  
AB = Slope BC = Slope CA = \[ \frac{1}{3} \]  

6. From statement (i),  
\[ (x-8)(x-13) > 0 \]  
So x can be greater than 10 or not. Statement (i) alone is not sufficient.  
From statement (ii),  
\[ x - 9 > 0 \]  
When x = 10 it is greater than 10  
When x = 10 then it is not greater than 10.  
So statement (ii) alone is not sufficient. Using both statements, x > 10 so x is also greater than 10. Using both the statements we can answer the question. Choice (3)
7. Statement (I) alone is not sufficient since x can be any positive integer.
From statement (II), $x = 5$ or -5. Statement (II) alone is not sufficient.
Using both statements (I) and (II), we can say that $x = 5$.
Choice (3)

8. Statement (I) alone is not sufficient, since time or interest is not given. Statement (II) alone is not sufficient since only interest is given. Using both the statements we can say that it is simple interest and rate of interest $= \frac{600}{12000} = 5\%$.
Choice (3)

9. Statement (I) alone is not sufficient since average temperature for three days is given. Statement (II) alone is also not sufficient since the average temperature for Monday, Tuesday, and Wednesday is not known. Using both the statements, Monday + Tuesday + Wednesday = 3 x 35 = 105°
Monday + Tuesday = 2 x 34 = 68°
Temperature on Wednesday = 105° - 68°
Choice (3)

10. Statement (I) states that A and F are sitting on either side of B. With this, we do not know where the remaining people are sitting. Hence, we cannot determine who is sitting opposite B. Statement (II) states that there is one person sitting between C and E. With this, we cannot determine who is sitting farthest from B. Combining statements I and II, we get A and F are sitting on either side of B and also C and E have one person between them means D is the person who is sitting opposite B.
Choice (3)

11. I alone is not sufficient, as the year may consist 52 Sundays in case it is a leap year, and it may consist 53 Sundays in case it is a non-leap year. But I alone is sufficient, as the next year begins with Monday, the year required, ends with Sunday implies the year will have 53 Sundays whether it is leap year or not.
Choice (2)

12. If a is odd, 0 will not be the remainder, when a is divided by 2. So a is not congruent to 0. Choice (2)

13. Statement (I) alone is not sufficient, since the length of the track is not given. Statement (II) alone is also not sufficient since no data is given. Using both the statements also we cannot find the time, since the distance (length of track) is not given.
Choice (4)

14. We are required to check whether $b^2 - 4ac < 0$ or not.
From statement (I), we cannot determine the relationship between $b^2$ and $4ac$.
Now $b^2 - 4ac = -3ac < 0$.
$b^2 - 4ac < 0 \text{ or } b^2 - 4ac = 0$.
Statement (II) alone is insufficient.
Using both statements (I) and (II), $b^2 - 4ac = -3ac < 0$.
as $a$ and $c$ are positive integers.
Choice (3)

15. Statement (I) alone is not sufficient, since the dimensions of other sides is not known. Statement (II) alone is also not sufficient, since only altitude is given but base is not given.
Using both statements (I) and (II), we cannot conclude whether it is an isosceles triangle or an equilateral triangle, we cannot find out the area with the given dimensions.
Choice (4)

16. I alone is not sufficient as it is not telling about D. II alone is also not sufficient as it is not telling about B. I and II together From B and C are children of A and D. Hence, we can say that D is the mother of B.
Choice (3)

17. As per statement (I), $(x-1)$ is a factor of f(x), then $f(1) = 0$
\[ f(x) = x^3 - 2(1)^2 + 4(1)^1 + x = 0 \]
\[ p = -7 \]
Statement (I) alone is sufficient.
Choice (1)

18. Statement (I) alone is not sufficient from statement (II).
\[ 3b = b^2 \Rightarrow a = 3, b = 3 \]
Statement (II) alone is sufficient.
Choice (2)

19. Statement (I) alone is not sufficient, since the length of another diagonal is not given. Statement (II) alone is sufficient, since all the sides are equal. The perimeter of the rhombus can be found out.
Choice (2)

20. Statement (I) alone is not sufficient, since there is more than one month with 30 days, i.e., multiple of 2. Statement (II) alone is also not sufficient since three months are starting with J = January, June and July. Using both the statements we can find that the month is June as it has 30 days.
Choice (3)

21. The sequence can be solved, if we divide the given series into groups of four, abcd \( \text{or} \) cdab \( \text{or} \) da \( \text{or} \) bc \( \text{or} \) db \( \text{or} \) ac.
In each term, the first letter is shifted to the last position or the four letters are rotating cyclically towards right. Hence c d a b becomes a b c d.
Choice (2)

22. Here the two letters in each term are a pair of corresponding letters. A' T' N Q' T D' T' Q N W' L' Y' W L' Y' A
Choice (3)

23. The given series is a combination series.
B, C, D, E, F, G, H is a series of first letters.
N, Q, T, W, Y, B, G, D is the series of third letters.
Hence, PBS is the next term.
Choice (1)

24. The given series is a combination series.
ST, G, T, G, T, M, T, K is the series of first letters.
P, Q, M, L, J, G, D is the series of second letters.
I, E, F, A, W, S, G is the series of third letters and W, T, D, Y, I, F, T is the series of fourth letters.
Choice (4)

25. This is an alternate series i.e., A', B', C', D is one series and Z', Y', X', W is the second series. Hence the missing letter is W.
Choice (3)

26. The squares of even natural numbers are added to each number to get the next number in the series.
12$^2$ + 100 = 221 (OR)

Choice (3)
27. The squares of consecutive prime numbers are added.

i.e., $15 + 4 = 19; 19 + 9 = 28$ and so on.

Similarly, $102 + 121 = 223$. 

Choice (3)

28. The given series can be expressed as

$3^2, 6^2, 9^2, 10^2, 12^2, 11^2, \ldots$

The given series is a grouping series of three numbers in each term. In each group the third number is obtained by multiplying the first two numbers.

$2, 3, 6 \Rightarrow 2 \times 3 = 6$

$7, 8, 56 \Rightarrow 7 \times 8 = 56$

Similarly, $12, 11, \ldots \Rightarrow 12 \times 11 = 132$

Hence, the missing number is 132. 

Choice (3)

29. The given series is a grouping series of three numbers in each term. Every third number is obtained by adding the first two numbers in each set.

$5, 6, 11 \Rightarrow 5 + 6 = 11$

$12, 13, 25 \Rightarrow 12 + 13 = 25$

Similarly, $18, 16, \ldots \Rightarrow 18 + 16 = 34$

Hence, the missing number is 34. 

Choice (2)

30. The given analogy is in the form of $n^3$

i.e., $8$ and $(6)^3 = 216$

Similarly, $5^3 = 625$. 

Choice (4)

31. The given series is $4^2, 5^2$, and so on.

It is based on the logic.

$n^2 + n$

$4; 5; 6^2 + 6 = 36$

$5^2 + 5 = 30$. 

Choice (2)

32. The number and its square root number is given.

$n = \sqrt{625}$

$625$ and $\sqrt{625} = 25$

Similarly, $225$ and $\sqrt{225} = 15$. 

Choice (2)

33. The letters in the first half and their corresponding letters in the second half of the alphabet are given.

EFG: RST: KLM:

K = 6, F = 6 and G = 7 in the first half and R = 6, S = 5 and T = 7 in the second half.

Similarly, $K = 11, F = 12$ and $G = 13$ in the first half and $R = 11, S = 12$ and $T = 13$ in the second half.

Hence, the missing pair is TVX. 

Choice (2)

34. From the choices,

A: D: H

E: I: L

C: V: X

Except UXV, all others follow a common format. 

Choice (4)

35. The number of students who play both games is 10. 

Choice (2)
51. Total number of students in Anantapur in 1998 = 35 + 56 = 90
   Those in 1999 = 41 + 59 = 180
   Required percentage = \( \frac{190 - 90}{90} \times 100\% \)
   = 111.11\%
   Choice (3)

52. In Vizag, number of Telugu medium students as a percentage of the number of English medium students
   in 1996 = \( \frac{28}{34} \)  in 1998 = \( \frac{40}{46} \) in 1999 = \( \frac{42}{48} \) in 2000 = \( \frac{47}{53} \)
   = 53
   In the above proper fractions, the difference between the respective numerator and its corresponding denominator is six. Hence, the fraction having the greatest pair of integers as denominator & numerator will be greatest. Correspondingly, the percentage in 2000 will be greatest.
   Choice (4)

53. In the year 2000, the English medium students as a percentage of the total students of both the media
   in Guntur = \( \frac{104}{220} \times 100\% = 47\% \)
   in Nellore = \( \frac{91}{190} \times 100\% = 48\% \)
   in Anantapur = \( \frac{48}{100} \times 100\% = 50\% \)
   in Hyderabad = \( \frac{849}{130} \times 100\% > 50\% \).
   In Hyderabad required percent is the greatest
   Choice (4)

54. Let the total number of students in Hyderabad be \( x \).
   Students belonging to other media = \( 33\frac{1}{3}\% \) of \( x \times x/3 \)
   Number of Telugu medium students = Number of English medium students = \( x/3 \)
   Students of other media = \( 2x/3 \)
   \( 0.67 \times 900 = 1350.\)
   Choice (1)

55. The percentage increase from 1996 to 2000
   in Guntur = \( \frac{104 + 119}{61 + 69} \times 100\% \)
   = \( \frac{90 \times 100\%}{130} = 69.23\% \)
   in Nellore = \( \frac{61 + 59}{83 + 57} \times 100\% = 72.72\% \)
   in Tirupathi = \( \frac{49 + 41}{49 + 41} \times 100\% = 100\% \)
   in Anantapur = \( \frac{31 + 69}{51 + 49} \times 100\% = 77.5\% \)
   The percentage increase is highest in Nellore
   Choice (2)

56. Word: SHOE
   Logic: +1 -1 +1 -1
   Code: T G P D
   Similarity: DRESS is written as
   Word: DRESS
   Logic: +1 -1 +1 -1 +1
   Code: E Q F R T
   Choice (1)

57. Word: TELESCOPES
   Logic: The letter of the word is divided in pairs. In each pair the two letters are interchanged their positions.
   Code: ET LCS E O P S
   Similarly, PROGRAMMES is coded as
   Word: PROGRAMMES
   Logic: The letter of the word is divided in pairs. In each pair, the two letters are interchanged their positions.
   Code: R P G O A R M M S E
   Choice (3)

58. This is based on rearranging the letters.
   R A D I O → A R D I O
   So, FACET → A C F E T
   1 2 3 4 5
   2 3 4 5 1
   Choice (3)

59. This is based on adding the place values of all the letters.
   CORK = 3 + 15 + 18 + 11 + 47
   Similarly, PEAK = 16 + 5 + 1 + 11 + 33
   Choice (4)

60. If we want to read, we ask for textbook and textbook is called pen in that language.
   Choice (1)

51 - 65:

56. Word: SHOE
   Logic: +1 -1 +1 -1
   Code: T G P D
   Similarity: DRESS is written as
   Word: DRESS
   Logic: +1 -1 +1 -1 +1
   Code: E Q F R T
   Choice (1)

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   Code: ET LCS E O P S
   Similarly, PROGRAMMES is coded as
   Word: PROGRAMMES
   Logic: The letter of the word is divided in pairs. In each pair, the two letters are interchanged their positions.
   Code: R P G O A R M M S E
   Choice (3)

58. This is based on rearranging the letters.
   R A D I O → A R D I O
   So, FACET → A C F E T
   1 2 3 4 5
   2 3 4 5 1
   Choice (3)

59. This is based on adding the place values of all the letters.
   CORK = 3 + 15 + 18 + 11 + 47
   Similarly, PEAK = 16 + 5 + 1 + 11 + 33
   Choice (4)

60. If we want to read, we ask for textbook and textbook is called pen in that language.
   Choice (1)

61 - 65:

Given that,
For \( r = 1 \) i.e., \( A \), the code is \( (3/1) - 2^{th} \) letter or \( 1^{st} \) letter which is \( A \).
For \( r = 2 \) i.e., \( B \), the code is \( (3/2) - 2^{th} \) letter or \( 4^{th} \) letter which is \( D \).
For \( r = 3 \) i.e., \( C \) the code is \( (3/3) - 2^{th} \) letter or \( 7^{th} \) letter which is \( G \).
Hence, we can find the codes for all the letters and tabulated as:

| Letter | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| Code   | A | D | G | J | M | P | S | V | W | X | N | O | R | U | K | T | C | F | L | E | H | I | B | Q | S | D | A |

61. GIZZMNGU is the code for the word CURRENCY.
   Choice (1)

62. JMGZMACM is the code for the word DECREASE.
   Choice (4)

63. DRUNK is coded as JZINE.
   Choice (3)

64. \( (A, \ N) \) Two letters are coded for themselves.
   Choice (3)

65. 18 consonants are coded for consonants.
   Choice (2)

66 - 75:

66. My father’s mother’s daughter will be my father’s sister and her only brother will be my father and my father is the husband of my mother.
   Choice (3)
67. From (ii), we can say
\[ A/B = C/D = D/E = E/C = B/A \]
From (ii), we can say
\[ A/B = C/D = D/E = E/C = B/A \]
Now from (i), the final arrangement will be
\[ A/B = D/E = E/C = B/A \]
Hence, D sits to the immediate left of F. Choice (3)

68. Work that can be done by twelve men in 1 day = \[ \frac{1}{20} \]
\[ \therefore \text{Work that can be done by 1 man in 1 day} = \frac{1}{240} \]
Work that can be done by fifteen women in 1 day = \[ \frac{1}{300} \]
\[ \therefore \text{Work that can be done by 1 woman in 1 day} = \frac{1}{300} \]
Hence work that can be done by 20 women in 1 day = \[ \frac{1}{15} \]
Let x men join 20 women so that they can complete the work in 10 days.
\[ \therefore \text{Work that can be done by x men + 20 women in 1 day} = \frac{1}{10} \]
\[ \therefore \text{Work that can be done by x men in 1 day} = \frac{1}{15} - \frac{1}{30} = \frac{1}{30} \]
\[ \therefore \text{Work that can be done by x men in 1 day} = \frac{1}{30} \implies x = 8 \] Choice (1)

69. The path traversed by Raja is as follows:

5 Km → Home

7 Km → Work Place

The distance = \[ \sqrt{(\text{Horizontal distance})^2 + (\text{Vertical distance})^2} \]
Horizontal distance = 8 Km + 7 Km = 15 km.
Vertical distance = 5 Km + 3 Km = 8 km.
\[ \therefore \text{distance} = \sqrt{15^2 + 8^2} = \sqrt{225 + 64} = \sqrt{289} = 17 \text{ km} \] Choice (2)

70. Given \( P \times O = P^2 + Q^2 - PO \)
Hence \( 15 \times 16 = (15)^2 + (16)^2 - 15 \times 16 \)
\[ \Rightarrow 225 + 256 - 240 = 481 - 240 = 241. \] Choice (1)

71. Given \( 3 + 4 = 25 \)
\[ \Rightarrow 3^2 + 4^2 = 9 + 16 = 25 \]
Similarly, \( 6 + 8 + 5^2 = 100 \)
So, \( 17^2 + 11^2 = 289 + 121 = 410. \) Choice (2)

72. Since 2003 is a non-leap year, it consists of 1 odd day.
Similarly, the years and the odd days are given as follows:
Year – odd day
2003 – 1
2004 – 2 (leap year)
2005 – 1
2006 – 1
2007 – 1
Total number of odd days = 7 = 0 odd days
Hence 2007 the 14th November is Wednesday. Choice (2)

73. Let the age of the second son be \( k \) years.
\[ \Rightarrow \text{Age of the first son is } 2k \text{ years and that of the man is } k + 36 \text{ years.} \]
Given, \( \frac{k}{5} + 36 = 2k \)
\[ \Rightarrow k = 4 \text{.} \]
\[ \therefore \text{Age of the man at present is 40 years.} \] Choice (2)

74. We have, \( h = \frac{11}{2} \text{ m} - 30 \text{ h} \)
\[ \therefore \text{Time is 4 hrs. 30 minutes} \]
\[ \Rightarrow h = 4 \text{ and } m = 30 \Rightarrow \text{as } = \frac{11}{2} (30) - 30(4) \]
\[ = 165 - 120 \] or \( t = 45 \text{.} \] Choice (1)

75. Let the incomes of A and B be 4k and 5k respectively.
Given, \( 4k = 8000 = 2 	imes 9k \)
\[ \Rightarrow k = 1000 \]
\[ \therefore \text{The income of B is } 6k = Rs.5000. \] Choice (3)

Section B

78-180:

76. Given \( a + b + c = 0 \)
\[ \Rightarrow a + b = -c \]
\[ \Rightarrow a^2 + b^2 + c^2 = 0 \]
\[ \Rightarrow a^2 + b^2 - c^2 = 2ab = 0. \] Choice (4)

77. \[ (16)^{3/2} = (64)^{1/2} \]
\[ \Rightarrow 256 = 256 \]
\[ \Rightarrow 2 = 2 \]
\[ \Rightarrow 1 = 1 \]
\[ \Rightarrow 1 = 1 \] Choice (1)

78. Given, \( \frac{a}{b} = \frac{c}{d} = \frac{b}{c} \)
\[ \Rightarrow \frac{a}{b} = \frac{ac}{bc} = \frac{bd}{ad} = \frac{ad}{bd} = \frac{bd}{ac} = \frac{2bd}{ac} \]
\[ \Rightarrow a^2 + b^2 + c^2 + d^2 = 8bd + ac = 2(bd + ac). \] Choice (2)

79. \[ \sqrt{3} \times \sqrt{4} = 3^{1/2} \times 4^{1/2} \]
\[ \therefore \text{12 is the LCM of 3 and 4} \]
\[ = (3^3) \times (4^2) \]
\[ = 12 \]
\[ \Rightarrow 0 \]
\[ \Rightarrow 0 \] Choice (2)

80. \( b : d = 3 : 4 \)
\[ a : d = 5 : 8 \]
\[ \Rightarrow \text{Equating the terms of } d \text{ in both the ratios} \]
\[ b : d = 6 : 8 \]
\[ a : e = 5 : 8 \] Choice (2)
95. The ratio of profits of A and B is the compound ratio of their investments and time period.
So, the ratio of profits = \( \frac{3 \times 10}{4 \times 9} = \frac{5}{6} \)
A’s share = 5 parts = Rs.37500
B’s share = 6 parts = 5 \times 37500 = Rs.45540
Choice (3)

96. Each filling pipe can fill \( \frac{1}{10} \) of the tank in 1 hr.
Five filling pipes can fill \( \frac{5}{10} = \frac{1}{2} \) of the tank in 1 hr.
Each emptying pipe can empty \( \frac{1}{8} \) of the tank in 1 hr.
Three emptying pipes can empty \( \frac{3}{8} \) of the tank in 1 hr.
These eight pipes can fill \( \frac{4}{8} - \frac{3}{8} = \frac{1}{8} \) of the tank in 1 hr.
The empty tank can be filled by these pipes in 8 hours.
Choice (4)

97. If A completes a work in \( x \) days,
then B completes it in \( 2x \) days
So \( \frac{1}{x} = \frac{1}{2x} \)
\( \frac{3}{2x} \) = 2x = 21 days.
Choice (2)

98. Let length of platform be \( x \) meters.
Time taken to cross the bridge is the time taken by the train to cover a distance equal to the length of the train plus the length of the platform.
\( \text{Time} = \frac{\text{Length of train} + \text{Length of platform}}{\text{Speed of train}} \)
300 + \( x \) = 40 seconds
54 + \( x \) = 18
300 + \( x \) = 15 x 40
300 + \( x \) = 600 m
\( x \) = 300 m
If the speed is 36 km/hr, time taken to cross the platform is \( \frac{300 + 300}{36} = 60 \) seconds.
\( \frac{36 + 5}{18} = 10 \) seconds.
Alternate method:
As the length of the train and the length of the bridge is
same in both the cases,
\[ \text{Sr} = 5 \text{Sr}_{A} \]
10. \( b = 60 \text{ sec.} \)

99. Let the original speed be 100 m/min.
Increased speed = 120 m/min.
Ratio of speeds = 100 : 120 = 5 : 6
Ratio of time taken = 6 : 5
If original time = 36 minutes
New time = \( \frac{5}{6} \times 36 = 30 \text{ minutes} \)
Time saved = 36 - 30 = 6 minutes.

Choice (1)

100. \( m_1 = 6, d_1 = 9, h_1 = 8 \)
\( m_2, d_2 = 12, h_2 = 9 \)
\( 6 \times 9 \times 8 = m_1 \times 12 \times 9 \)
\[ \frac{6 \times 9 \times 8}{12 \times 9} \]
\[ \frac{1}{2} \]

Choice (2)

101. The work done by A and B together in 1 day
\[ \frac{1}{24} \times \frac{1}{38} = \frac{1}{72} \]
The work done by B and C together in 1 day
\[ \frac{1}{36} \times \frac{1}{38} = \frac{1}{72} \]
To complete the work A and B will take
\[ \frac{144}{72} - \frac{216}{72} \]
\[ \frac{7}{5} - \frac{35}{36} \]
i.e. 6 \( \frac{8}{35} \) days less than B and C together.

Choice (3)

102. Let radius of big circle be \( R \) cm
Radius of a small circle = \( r \) cm
\[ R = 3.5 \text{ cm} \]
Area of the ring
\[ \pi (R^2 - r^2) = 269.5 \]
\[ \frac{22}{7} \times (R^2 - r^2) = 269.5 \]
\[ R^2 - r^2 = \frac{269.5 \times 7}{22} = 24.5 \text{ cm} \]
\[ R + r = 24.5 \text{ cm} \]
\[ R + r - (R - r) = 24.5 - 3.5 \]
\[ 2r = 21 \text{ cm} \]
\[ r = 10.5 \text{ cm} \]

Choice (1)

103. Area of the cardboard = \( 8 \times 6 = 48 \text{ sqcm} \)
Area of the 9 squares = \( 9 \times 2 \times 2 = 36 \text{ sqcm} \)
Remaining area = 48 - 36 = 12 sqcm.

Choice (3)

104. 1 revolution = 2\pi \text{ km}
10,000 revolutions = \( 2\pi \times 10^4 \text{ km} \)
\[ \frac{2\pi}{10^4} = 39.6 \]
\[ 2r = 396 \text{ km} \]
\[ r = 198 \]
\[ \frac{2\pi}{r} = \frac{2\pi}{198} = 2 \]
\[ = 9 \times 63 \text{ km} \]

Choice (4)

105. Given, \( 3^{\frac{3}{2}} \times (3)^2 = 3^x \)
\[ \Rightarrow 3^{\frac{3}{2}} \times 3^2 = 3^x \]
\[ \Rightarrow x = \frac{3}{2} + 2 = \frac{7}{2} \]
\[ \Rightarrow \] (a) is \( \frac{3}{2} \)
\[ \Rightarrow \] (b) is \( \frac{7}{2} \)
\[ \Rightarrow \] (c) is \( -216 \)

Choice (3)

106. \[ p^{x+y} - p^{x-y} \]
\[ = p^{x+y} \cdot q^{x-y} - p^{x-y} \cdot q^{x+y} \]
\[ = p^x \cdot q^y \cdot x - p^y \cdot q^x \cdot x \]
\[ = x^{p^2 + q^2} - x^{p^2 + q^2} \]

Choice (4)

107. Length of the arc of the sector of \( x \)
\[ = \frac{x}{2} \times 2 \pi = \frac{45}{360} \times 2 \pi \times 4 = \frac{45 \pi}{360} \]
\[ = \frac{\pi}{8} \]
Perimeter = \( x + 2r = x + 2 \times 4 = (8 + x) \text{ cm} \)

Choice (3)

108. Cost of 4 pens and 5 books = 110
\[ 4p + 5b = 110 \]
Slightly \( 5p + 4b = 115 \)
By adding both the equations, we get \( 9b + 9b = 225 \)
\[ \Rightarrow \text{Cost of a pen and a book = 15} \]

Choice (2)

109. Number of diagonals = \( \frac{n(n-3)}{2} \)
[where 'n' is the number of sides of a polygon]
\[ = 24 \times \left( \frac{24 - 3}{2} \right) \]
\[ = 24 \times 10.5 = 252 \]

Choice (3)

110. Given \( x = 2 \) (mod 5) \( \Rightarrow \) (1)
\[ x + y = 3 \] (mod 5) \( \Rightarrow \) (2)
By adding both the equations, we get \( y = 1 \)
From options y = 1 only satisfy the above equation.

Choice (2)

111. Altitude of an equilateral triangle
\[ = \frac{\sqrt{3}}{2} \times \text{side} = \frac{\sqrt{3}}{2} \times 2 \text{ cm} \]
Side = 2 cm
Perimeter = 2 \times 3 = 6cm.

Choice (3)

112. Area of the rectangle = (49 \times 24) \text{ sqcm}.
Area of the square = \( 8 \times 49 = 24 \) sqcm.
Side of the square = \( \sqrt{6} \times 7 \times 6 = 84 \text{ cm} \)
Perimeter = 4 \times 84 = 336 \text{ cm}.

Choice (3)

113. Area of square = \( \frac{d^2}{2} \)
New diagonal = \( \sqrt{3}d \)
New area = \( \frac{3d^2}{2} \)
Required percentage = \( \frac{\left( \frac{3d^2}{2} - \frac{d^2}{2} \right)}{\frac{d^2}{2}} \times 100\% = 200\% \)

Choice (1)

114. \( p \land \sim q \)

Choice (2)

115. \( \sim (p \land q) \lor \sim (q \land p) \) (standard result)

Choice (2)

116. \( A \land \sim (A \land B) \)
\[ A \land \sim (A \land B) \land A \sim (A \land B) = A \land B \]

Choice (1)
117. \( \bar{A} \cap B \cup (\bar{A} \cap B) \)
   \[ = \bar{A} \cap (B \cup \bar{B}) \]
   \[ = A \cap \emptyset = \bar{A} \]
   Choice (4)

118. \(|x-1| < 2 \)
   \[ \Rightarrow -2 < x-1 < 2 \]
   \[ \Rightarrow -1 < x < 3 \]
   Choice (1)

119. \( 5cN \) but \( (5, 5) \in R \) since \( 5x5 = 25 \) is odd
   \( R \) is not reflexive.
   \( (x, y) \in R \Rightarrow xy \) is even \( \Rightarrow yx \) is even
   \( (y, x) \in R \)
   \( R \) is symmetric.
   \( R \) is not transitive.
   Choice (2)

120. Sum of the roots = \( -\frac{b}{a} \)
    Product of the roots = \( \frac{c}{a} \)
    \( \sin^2 \theta + \cos^2 \theta = 1 \)
    \( \Rightarrow 2\sin \theta \cos \theta + 2\sin \theta \cos \theta = \frac{b^2}{a^2} \)
    \( \Rightarrow 1 + \frac{c}{a} \cdot \frac{b^2}{a^2} \)
    \( a + 2c \cdot \frac{b^2}{a^2} \)
    \( a^2 + 2ac = b^2 \)
    \( a^2 - b^2 = 2ac \).
    Choice (3)

121. Given \( x^2 + 5 |x| + 6 = 0 \)
    \( (|x| + 2)(|x| + 3) = 0 \)
    \( |x| = -2 \) is not possible.
    But modulus of any number cannot be negative.
    The required number of solutions is 0.
    Choice (2)

122. Product of the roots = 1
    Let \( a, 1/a \) be the roots.
    Sum of the roots, \( a + 1/a = -k \)
    Squaring on both sides,
    \( a^2 + 1/a^2 + 2 = k^2 \)
    Choice (2)

123. Sum of \( n \) terms = \( \frac{n}{2} (a + l) \)
    Where \( a \) = first term, \( l \) = last term
    \( S_n = \frac{n}{2} (a + Lx) = 42 \)
    \( a + Lx = 14 -(1) \)
    \( S_n = \frac{n}{2} (a + Lx) = 30 \)
    \( a + Lx = 12 -(2) \)
    Common difference = \( L \)
    \( a + L \times T_4 = T_6 - T_4 = 14 - 12 = 2 \)
    Choice (1)

124. \( a = -3 \)
    \( d = -1 \)
    \( a + (n-3)d = -1 + 3 = 2 \)
    \( n \)th term = 27
    \( -3 + (n-1)27 = 27 \)
    \( -3 + (n-1)27 = 27 \)
    \( (n-1)2 = 30 \Rightarrow (n-1) = 15 \Rightarrow n = 16 \)
    Choice (3)

125. \( (3x^2 - 2y)^{10} = (3x^2)^{10}(1 - 2y3x)^{10} \)
    \( -2y3x = 2 \times 1/12 = 1/12 \)
    \( r = \frac{n + 1}{1} \times \frac{1}{12} \)
    \( r = \frac{11}{12} \times \frac{1}{12} = \frac{1}{12} \)
    Choice (2)

126. Given \( A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \)
    \( A^2 = \begin{pmatrix} 0 & 1 \\ 1 & 1 \end{pmatrix} \)
    \( A^4 = \begin{pmatrix} 1 & 1 \\ 1 & 0 \end{pmatrix} \)
    \( A^6 = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \)
    Choice (2)

127. Given \( L \begin{pmatrix} \frac{6x^2-x-3}{4x^2-1} \\ 1 \\ 1 \end{pmatrix} \)
    \( L \begin{pmatrix} \frac{6x^2-x-3}{4x^2-1} + 1 \\ 2x-1 \end{pmatrix} \)
    \( L \begin{pmatrix} 6x^2-x+3+2x+1 \\ 4x^2-1 \end{pmatrix} \)
    \( L \begin{pmatrix} 6x^2-x+3+2x+1 \\ 4x^2-1 \end{pmatrix} \)
    \( L \begin{pmatrix} 2x+1 \\ 2x-1 \end{pmatrix} \)
    \( \begin{pmatrix} 3x+2 \\ 2x+1 \end{pmatrix} \)
    Choice (4)

128. \( \frac{d}{dx} \begin{pmatrix} x^2 + 1 \\ x \end{pmatrix} = \begin{pmatrix} 2x \\ 1/x \end{pmatrix} \)
    \( \frac{d}{dx} (x + 1/x) = 1 - 1/x^2 \)
    Choice (4)

129. In triangle BCD, \( \angle C = \angle D \) (angles opposite to equal sides)
    \( \angle C = \angle D = \frac{65}{2} \)
    \( \angle C + \angle D = 130 \)
    \( \angle BDA = 180 - \angle C = 180 - 130 = 50 \)
    \( \angle DBA = 180 - 180 = 20 \).
130. Let AB and CD be two chords of equal length.
\[ PA = 24 \text{ cm} \]
\[ OP = \frac{24}{2} = 12 \text{ cm} \]
Radius OC = 15 cm
PC = \sqrt{OC^2 - OP^2}
\[ = \sqrt{15^2 - 12^2} = \sqrt{225 - 144} = \sqrt{81} = 9 \text{ cm} \]
Length of Chord = 9 + 9 = 18 cm. Choice (1)

131. Let the radius of first circle be \( r_1 = 3 \text{ cm} \) and that of second circle be \( r_2 = 4 \text{ cm} \).
Given that their centres are at a distance of \( d = 8 \text{ cm} \) when this distance is reduced by 1 cm, then
\( d - 1 = r_1 + r_2 \)
The two circles now become externally touching circles.
3 common tangents can be drawn to them. Choice (2)

132. P is the midpoint of AC and BD.
\[ C (-3,4) \text{ and } D (-4,10) \]
Area of parallelogram ABCD
\[ \frac{1}{2} | (-1 - 3) \times 4 - (-4 - 10) \times 2 | = \frac{1}{2} \times 44 = 22 \text{ sq. units.} \]

133. Let \( a \) and \( b \) be \( x \) and \( y \) intercepts respectively
\[ 2a = 3b \]
Equation of the line is \( x/a + y/b = 1 \)
i.e. \( 2x/3 + y/2 = 1 \)
If passes through \((1,1)\)
\[ 2/3 + 1 = b \]
\[ b = 5/3 \]
The equation of the required line is \( 2x + 3y = 5 \). Choice (2)

134. \[ 2x + 3y - 1 = 0 \]
For an equilateral triangle, centroid = circumcentre = \((1,-2)\)

The perpendicular distance of \( G \) from \( BC \) is \( 6\sqrt{13} \)
\[ \text{Perpendicular distance of 'A' from } BC = 3\times \sqrt{13} \]
\[ = 18\sqrt{13} = h \text{ (say)} \]
Area of equilateral triangle is \( \frac{\sqrt{3}}{4} \times \text{side}^2 \)
\[ = \frac{225}{13\sqrt{3}} \text{ sq units} \]

135. Let the angles in increasing order be \( \alpha, \beta \) and \( \gamma \).
Given, \( \beta = \frac{\pi}{2} \)
and \( \alpha + 2\beta = 200^\circ \) ---- (1)
We know that, \( \alpha + \beta + \gamma = 180^\circ \)
\[ \Rightarrow \alpha + \gamma = \frac{\pi}{2} \] ---- (2)
Solving (1) and (2), we get
\[ \alpha = 30^\circ = \frac{\pi}{6} \text{ rad} \]
Choice (2)

136. Given, \( \cos^2 8 = \cos^2 3 \times 16 + \cos^2 3 \times 16 + \cos^2 3 \times 8 \)
\[ = \cos^2 8 + \cos^2 3 \times 8 + \cos^2 3 \times 8 \times \cos^2 3 \times 8 \]
\[ = 1 + 1 + 2 \]
\[ \Rightarrow \cos^2 x + \sin^2 x = 1 \]
Choice (2)

137. Given, \( \sin x + \sin^3 x = 1 \)
\[ \Rightarrow \sin x = \cos^2 x \]
\[ \cos^2 x + 3 \cos^2 x \times 3 \sin^2 x + 3 \sin^2 x \times \sin^2 x \]
\[ = \sin^2 x + 3 \sin^2 x + 3 \sin^2 x \times \sin^2 x \]
\[ = (\sin^2 x + \sin^2 x)^2 = 1^2 = 1 \]
Choice (2)

138. From \( \triangle ABE \), \( \tan 30^\circ = \frac{AE}{EB} = \frac{AE}{100} \)
\[ \Rightarrow AE = \frac{100}{\sqrt{3}} \text{ m} \]
In \( \triangle ADC \), \( \tan 60^\circ = AD/100 \)
\[ \Rightarrow AD = 100 \sqrt{3} \text{ m} \]
\[ ED = AD - AE = 100 \sqrt{3} - \frac{200}{\sqrt{3}} = \frac{200}{\sqrt{3}} \text{ m} \]
Choice (2)

139. Given \[ f(x) = x^4 + 2x^2 - 5x + 6 \]
When \( f(x) \) is divided by \( x-1 \), remainder = \[ f(-1) = (-1)^4 + 2(-1)^2 - 5(-1) + 6 = 1 - 2 + 5 + 6 = 10 \]
Choice (3)

140. We shall solve the problem by back substitution method
If \((x - 2)\) is a factor, then \( f(2) \) should be equal to zero.
But \( f(2) = 2^4 - 15 \times 2 + 12 = -1 \) which is not true.
We find that, \( f(-4) = (-4)^4 - 13 \times (-4) + 12 = -64 + 52 + 12 = 0 \).
\((x + 4)\) is a factor. Choice (3)
141. From the table, the maximum and the minimum values of the data are 39 and 4 respectively.
   Range = 39 – 4 = 35. Choice (3)

142. The mean deviation of two numbers a and b is given by
   \[ \frac{|a-b|}{2} \]
   Only choice (3) satisfies the above condition. Choice (3)

143. The ascending order of the given data is
   5, 8, 8, 8, 11, 15, 20
   The third quartile is \( \frac{(n+1)}{4} \)th observation
   \[ = 3(\times 1+1) = 6 \text{th observation} = 15 \] Choice (2)

144. The first n odd natural numbers are 1, 3, 5, 7, ..., (2n-1)
   The harmonic mean of the reciprocals
   \[ \frac{\sum_{i=1}^{n} \frac{1}{x_i}}{n} \]
   It is true for any value of n. Choice (4)

<table>
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<th>X</th>
<th>Y</th>
<th>R_x</th>
<th>R_y</th>
<th>d = R_x - R_y</th>
<th>d^2</th>
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</tr>
</tbody>
</table>

\[ n = 5, \sum d^2 = 24 \]
\[ \bar{d} = \frac{\sum d^2}{n(n-1)} = \frac{24}{5(5-1)} = 1.2 \]
\[ = 0.2 \]
Choice (3)

146. From the table, the number of students who secured at least 30 marks is 9+2+7 = 18. Choice (2)

147. We know that
   Coefficient of skewness = \( \frac{\text{mean} - \text{mode}}{\text{SD}} \)
   \[ = \frac{9 - 4}{2} = 2.5 \]
Choice (4)

148. P(at least one die shows a prime number)
   \[ = 1 - P(\text{No dice shows prime number}) \]
   \[ = 1 - \frac{3}{6} \]
   \[ = \frac{3}{6} \]
Choice (2)

149. Given \( P(A \cap B) = P(A) + P(B) - P(A \cup B) \)
   \[ = P(A) + P(B) \]
   \[ = 0.55 + 0.15 = 0.7 \]
   \[ P(\bar{A}) = P(B) = 1 - P(A) = P(B) = 1 - 0.7 = 0.3 \]
Choice (1)

150. September contains 30 days = 4 weeks + 2 days
   The 2 days can be (Sun, Mon), (Mon, Tue), (Tue, Wed), (Wed, Thu), (Thu, Fri)
   The required probability is 2/7 Choice (4)

Section - C

151 – 155:

151. The word ‘strait’, which means a situation which has a specified degree of trouble or difficulty, is most appropriate here because the sentence talks about the financial problems faced by a person due to the debts which he incurred. The word ‘dreadful’ is incorrect because ‘dreadful’ is an uncountable noun which cannot be used in the plural. Choice (2)

152. The word ‘saw’ means to see something (a meeting). Hence it is the most appropriate word in the given context. Choice (3)

153. You equate (consider as equal to another) something with something. Hence choice 4 is relevant in the context. The words attached, assigned, and attributed do not collocate with the preposition ‘with’. Choice (4)

154. The word ‘dreadful’ is most appropriate in the given context because atmospheric pollutants are dreadful (horrible) to health. The words ‘despondent (dejected), despicable (deserving hatred)’ and ‘delusional (fantastic)’ are inappropriate. Choice (1)

155. The word ‘despite’ indicates that the word which goes into the blank should contrast with the expression ‘amazing prowess’. Hence logically ‘tyro’ is the most appropriate option. Although he was a tyro (beginner), he displayed amazing prowess. The word ‘adulterer’ (expert), professional and wizard (enchanter) are logically inappropriate. Choice (4)

156 – 160:

156. The word ambiguous (unclear) is closest in meaning to the word equivocal. Choice (2)

157. The word ‘glit’ means fluent or smooth. Choice (3)

158. The meaning of the word ‘adroit’ is skilful. Choice (3)

159. The word ‘sycophant’ means a flatterer or a person who flatters someone important to try to gain favour with them. Choice (1)

160. The word ‘credulous’ means gullible or too ready to believe things. Choice (3)

171 – 175:

171. The tone of the sentence indicates that it is a demand. The inspector is demanding the person to whom he is speaking to come out with the truth. Choice (1)

172. The sentence implies that the employee is neither making a decision nor a demand. He is merely seeking permission to go on leave. Choice (2)
173. The tone of the sentence implies that the speaker is upset about something hence he wants to be left alone. Choice (2)

174. When B says ‘you should know better’, he is being noncommital and refusing to comment on A’s intention. Choice (3)

175. Q says he would be glad if he P visits him the next day evening. This is conveyed only in choice 2. Choice (2)

(176 – 185):

176. The verb ‘nurture’ means to ‘care for’, hence it is most appropriate in the given context. The word ‘pamper’ is inappropriate here because it has a negative connotation because to pamper means doing things for someone or giving them expensive or luxurious things in a way which has a bad effect on their character. Choice (2)

177. The word ‘tardy’ means late if someone is late they apologize for their late arrival. The words appealed (requested), hailed (welcomed) and emphasized (insisted on) are inappropriate. Choice (3)

178. The word ‘preach’ is most appropriate in the given context because to preach means to give moral advice. To practise tolerance and restraint is a moral advice given by all religions of the world. Hence option 1. Choice (1)

179. To apprehend means to seize or arrest someone for doing something unlawful or wrong. The police ‘apprehended’ the thieves for committing the unlawful act of committing a theft. Hence choice 3 is most appropriate when compared to the options admonish (reprimand), criticize and attack. Choice (3)

180. A heinous (wicked) act is not approved or welcomed by people, it is condemned. Option 3 is incorrect due to erroneous collocations (you dissuade some one from doing something) from doing something). Choice (4)

181. The sentence brings out a contrast between Ram and his brother, hence the conjunction but is most appropriate. Choice (2)

182. The adverbial conjunction ‘still’ is most relevant in the given context because it brings out a contrast between the two statements. Choice (3)

183. The sentence states that because he is a devout Christian, he visits the church every Sunday (obviously for praying). When a place is visited for its primary purpose the article should not be used. Here, the article should not be used because the place is visited for the primary purpose of praying. Choice (4)

184. The definite article is used before the names of rivers. Choice (3)

185. An article is not required in the given context because an article is not required before predicative nouns denoting a unique position. Choice (4)

(186 – 200):

Number of words in Reading Comprehension Passages:
Passage I: 263
Passage II: 281
Passage III: 296

186. According to the 4th and 5th sentences of the passage, science is a vehicle of social change because it exercises a tremendous impact on society. Choice (1)

187. Refer to the 6th and 7th sentences of the passage. Choice (2)

188. Refer to the 8th sentence of the passage – “Science being …………..”. Choice (4)

189. According to the 8th and 9th sentences of the passage choice 3 is the answer. Choice (3)

190. Refer to line 3 of the second para. “It was there …………..evolved”. Choice (3)

191. Refer to the first sentence of the passage. Choice (3)

192. Refer to the third sentence of the first para. “These are your digital secretaries”. Choice (2)

193. Refer to the first sentence of para 3. “Then there are tools…………..”. Choice (4)

194. Refer to the first sentence of para 2. “But the best part is …………..?”. Choice (1)

195. Refer to the first sentence of the penultimate paragraph. Choice (1)

196. According to the first sentence of para 3, traditional diets which include adequate amounts of fruits and vegetables provide our body with vitamins and minerals. Choice (1)

197. Refer to the second sentence of para 4. Choice (4)

198. Refer to the penultimate sentence of para 2. Choice (2)

199. Refer to the last sentence of the passage. Choice (2)

200. Refer to the third sentence of para 2 according to which choice 3 is the answer. Choice (3)