INSTRUCTIONS TO CANDIDATES
(Read the Instructions carefully before answering)

1. Separate Optical Mark Reader (OMR) Answer Sheet is supplied to you along with Question Paper Booklet for recording your responses. Please read and follow the instructions on the OMR Sheet, fill up the required data and mark your responses.

2. Candidate should write the Hall Ticket Number on the space provided on this page and the OMR Answer Sheet. DO NOT WRITE HALL TICKET NUMBER ANYWHERE ELSE.

3. Immediately on opening this Question Paper Booklet, please check for (i) the same booklet code (A/B/C/D) on each page (ii) serial number of the questions (1 - 200) (iii) the number of pages and (iv) correctness of printing.

IN CASE OF ANY DEFECT, PLEASE REPORT IT TO THE INVIGILATOR AND ASK FOR REPLACEMENT WITHIN FIVE MINUTES FROM THE COMMENCEMENT OF THE TEST.

4. Adoption of any kind of unfair means at the time of examination or attempt of impersonation will result in the invalidation of the claim of the candidate for taking the examination and he/she will be subjected to prosecution under the AP Public Examination Prevention of Unfair means Rules, 1997.

5. Use of Calculators, Mathematical Log Tables, Pages of electronic gadgets and loose sheets of paper is strictly prohibited.

6. Darken the appropriate circles in the OMR Sheet correctly with the "Blue or Black Ball-Point Pen" corresponding to correct answer to the questions in the Question Paper Booklet. Hence, enough care has to be taken while answering the questions on OMR Sheet by darkening the circles. DARKENING OF MORE THAN ONE CIRCLE AGAINST ANY QUESTION AUTOMATICALLY MAKES THE ANSWER INVALID.

7. Rough work should be done only in the space provided for this purpose in Question Paper Booklet.

8. Once the candidate enters the Examination Hall, he/she shall not leave the Hall till the END of the Examination.

9. Ensure that the Invigilator puts his/her signature in the space provided on the OMR Answer Sheet. The Candidate should sign in the space provided on the OMR Answer Sheet.

10. The candidate should write the Question Paper Booklet number and sign in the space provided in the Nominal Rolls.

11. Return the OMR Answer Sheet to the Invigilator before leaving the Examination Hall.

This booklet consists of 32 printed pages (for 200 Questions) including page for Rough Work. Candidate should check this before beginning to answer and bring any discrepancy in this regard to the notice of the Invigilator.
SECTION – A
Analytical Ability

Questions : 75
Marks : 75

(l) Data Sufficiency

Note: In questions numbered 1 to 20, a question is followed by data in the form of two statements labelled as I and II. You must decide whether the data given in the statements are sufficient to answer the questions. Using the data make an appropriate choice from (1) to (4) as per the following guidelines:
(a) Mark choice (1) if the statement I alone is sufficient to answer the question.
(b) Mark choice (2) if the statement II alone is sufficient to answer the question.
(c) Mark choice (3) if both the statements I and II are sufficient to answer the question but neither statement alone is sufficient.
(d) Mark choice (4) if both the statements I and II together are not sufficient to answer the question and additional data is required.

ప్రశ్నలు : 1 నుండి 20 వరకు ప్రశ్నలు అయితే, ప్రశ్నను సమాధానం చేయుటకు రెండు విధానాలు I, II జాతిగా సంపాదించబడితే. సమాధానం చేయుటకు ఇవే రెండు విధానాలు I, II ను సంపాదించబడితే. సమాధానం చేయుటకులో I, II జాతి సంపాదించబడితే, సమాధానం చేయుటకు ఇవే రెండు విధానాలు I, II ను సంపాదించబడితే. సమాధానం చేయుటకు ఇవే రెండు విధానాలు I, II ను సంపాదించబడితే. సమాధానం చేయుటకు ఇవే రెండు విధానాలు I, II ను సంపాదించబడితే. సమాధానం చేయుటకు ఇవే రెండు విధానాలు I, II ను సంపాదించబడితే.

(a) I జాతి సంపాదించబడితే, II జాతి సంపాదించబడితే సమాధానం చేయుటకు (1) గా గమనించాల్సి.
(b) I జాతి సంపాదించబడితే, II జాతి సంపాదించబడితే సమాధానం చేయుటకు (2) గా గమనించాల్సి.
(c) I, II జాతి సంపాదించబడితే, II జాతి సంపాదించబడితే సమాధానం చేయుటకు (3) గా గమనించాల్సి.
(d) I, II జాతి సంపాదించబడితే, II జాతి సంపాదించబడితే, II జాతి సంపాదించబడితే, II జాతి సంపాదించబడితే సమాధానం చేయుటకు (4) గా గమనించాల్సి.
1. What is the positive integer $n$ not exceeding 180?

180 ఇంటికి ఎత్తడి అత్యంత ఎక్కడి $n$ ఎక్కడ?

I. $n$ is divisible by 7.
7 ఇంటికి భాగభాగీ ఉంటుంది.

II. $n$ is divisible by 13.
13 ఇంటికి భాగభాగీ ఉంటుంది.

2. If $ABCD$ is a square and $E$ is a point on $BC$, then what is the area (in square units) of $AECD$?

$ABCD$ అనే చతురస్రం, $BC$ లో $E$ ఒక బిందు, తలపడా అంటే $AECD$ చతురస్రం (చతురస్రం చతురస్రం) ఎల్లాంటి?

I. $BE = 6$.

II. $BE : EC = 1 : 2$.

3. What is the shape of the play ground?

ఎపిస్టేసి ప్లే గరుడు ఎంటా వంటిది?

I. The perimeter of the play ground is 440 m.

$440$ మీటర్ల ఎక్కడు ప్లే గరుడు పరిమితి.

II. The area of the ground is 15400 sq. m.

$15400$ వైపులు ఉంటుంది.

4. What is the remainder when $n$ is divided by 8?

$n$ తో 8 వంటి సంఖ్యా ఎక్కడు వంటా ఎక్కడ?

I. The digit in units place of $n$ is 8.

$n$ ఇంటికి ఉన్న సంఖ్య ఎక్కడ 8.

II. $n$ is the product of eight consecutive positive integers.

$n$ ఎక్కడు ఆక్రమంగా ఎన్ని ఎక్కడు ప్రతి ప్రతియేసిన వైపులు.

5. What is the greatest common divisor of numbers $a$ and $b$?

సంఖ్యలు $a$ మరియు $b$ వంటా పెద్ద ఊహా ఎక్కడ?

I. The least common multiple of $a$ and $b$ is $ab$.

$a$ మరియు $b$ వంటా లేదు గది ఎలాగైనా $ab$.

II. $a + b = 15$.

6. What is the average of $a$, $b$, $c$ and 5?

$a$, $b$, $c$ మరియు 5 వంటా మధ్యప్రభావం ఎక్కడ?

I. $5(a + b + c) + 4 = 45$.

II. $a + b = c + d$.

7. What is the value of \( \frac{x^2 + y}{z^2} \) ?

\( \frac{x^2}{y^2} + \frac{y^2}{z^2} \) ఎంటే ఎక్కడ?

I. \( \left( \frac{x}{y} + \frac{y}{z} \right)^2 = 100 \)

II. $x = 2z$
8. Is \( xy < 0 \) ?
\( xy < 0 \) మీముందు యుక్తి? 
I. \( 5|x| + 3|y| = 0 \)
II. \( 5|x| = 3|y| \)

9. How much time did A take to reach the destination?
అనుకుంటూ దిద్దగా ఆ ప్రాంతాను ప్రవహించాడు కాలం?
I. The ratio between the speeds of A and B is 3 : 4.
\( A, B \) ల వేగాల మధ్య విశేషం 3 : 4.
II. B takes 36 minutes to reach the same destination.
ప్రపంచ గాను దిద్దగా బ్యాలి 36 మినుటులం ప్రవహించాడు.

10. What is the slope of a straight line?
ధర్మాన్నాడు రేగులను రెండు?
I. The straight line passes through the origin.
ధర్మాన్నాడు ఆంధ్ర ప్రదేశ్ ని పొడవు.
II. The straight line makes an angle 30° with the positive direction of the X-axis.
ధర్మాన్నాడు ఆంధ్ర ప్రదేశ్ యుక్తి 30° డిగ్రీ వెంటను ఇదుకు వక్ర.

11. In the matrix \( A = \begin{bmatrix} -5 & 20 \\ 2 & -x \end{bmatrix} \), what is the value of \( x \)?
\( A = \begin{bmatrix} -5 & 20 \\ 2 & -x \end{bmatrix} \) లోకి ఎంత విలువ ఉంది?
I. \( A \) is singular.
\( A \) సింగయారు.
II. \( A \) is symmetric.
\( A \) సిమెట్రిక్.

12. What is the value of \( a + b \)?
\( a + b \) ఎంత విలువ ఉంది?
I. \( a \neq b \)
II. \( a^2 - b^2 = a - b \)

13. Is the quadrilateral a square?
చతుర్భుజం ఒక సరిపదారు ఎంత?
I. All the sides of the quadrilateral are of equal length.
చతుర్భుజం యుక్తి ఎంత విలువ ఉంది.
II. The diagonals of the quadrilateral are of equal length.
చతుర్భుజం అడించబడిన యుక్తి ఎంత విలువ ఉంది.

14. For positive integers \( x, y \) and \( z \), is the product \( xyz \) even?
ధనాత్మక సంఖ్యలకు \( x, y \) ఇవ్వండి యుక్తి \( xyz \) ఇవ్వండి?
I. \( x + y \) is odd.
\( x + y \) ఎందుకండా యుక్తి ఉంది.
II. \( x + y + z \) is divisible by 7.
\( 7 \) విభాజించబడింది.
15. What is the monthly salary of A?
   A మేలం చెంది ఉంది?
I. A gets 15% more than B and B gets 10% less than C.
   B యొక్క A యొక్క 15% అందాబాది, C యొక్క B యొక్క 10% కుటుంబ రోజు చేసుకోడం.
II. C's monthly salary is ₹ 2,500.
    C యొక్క నొమల బాలు ₹ 2,500.

16. Among the real numbers a and b, is b a rational number?
    మేలం న్యూనూవేలా ప్రాంగణాన్ని a, b ఎన్నికైన రైశాలి ప్రతిష్ఠించిన ఉంది?
I. a + b is a rational number.
   a + b రైశాలి ప్రతిష్ఠించిన.
II. a - b is a rational number.
    a - b రైశాలి ప్రతిష్ఠించిన.

17. How many persons are there in the library?
    ప్రాంగణాన్ని ఎత్తి వాడిన జాతీయాలు?
I. If 3 persons leave the library, then the library has less than 8 persons.
    మేలం న్యూనూవేలా 3 ప్రాంగణాన్ని లేదు, త్యే ప్రాంగణాన్ని ఎత్తి వాడికపోయిన.
II. If 3 persons enter the library, then it has more than 12 persons.
    మేలం న్యూనూవేలా 3 ప్రాంగణాన్ని వచ్చి త్యే ప్రాంగణాన్ని ఎత్తి వాడికపోయిన.

18. In the figure given below, what is the value of \( \alpha + \beta + \gamma + \delta \)?
    వెంటనే గ్రహించండి \( \alpha + \beta + \gamma + \delta \) ఎన్నికైన ఉంది?

- \( \alpha + \beta = \gamma + \delta \)
- \( \theta + \phi = 90^\circ \)

19. How much is \( (x + y) : (x - y) \) ?
    \( (x + y) : (x - y) \) ఎన్నికైన?
I. \( x : y = 3 : 2 \)
II. \( x > 0, y > 0 \)

20. If \( p(x) \) is a polynomial, is \( (x - 2) \) a factor of \( p(2x^2 - 1) \)?
    \( p(x) \) ఒక పులియంగా, ఎంతో \( (x - 2) \) ఒక పులియంస ఉండాలి?
I. \( x - 1 \) is a factor of \( p(x) \).
    \( p(x) \) ఒక పులియంస ఉండాలి \( (x - 1) \).
II. \( x - 7 \) is a factor of \( p(x) \).
    \( p(x) \) ఒక పులియంస ఉండాలి \( (x - 7) \).
(ii) Problem Solving

(a) Sequences and Series

Note: In each of the questions numbered 21 to 30 a sequence of numbers and letters that follow a definite pattern is given. Each question has a blank space. This blank space is to be filled by the correct answer from one of the four given options to complete the sequence without breaking the pattern.

21. 7 : 49 :: ____ : 63
   (1) 5   (2) 6   (3) 9   (4) 11

22. 81 : 64 :: ____ : 9
    (1) 16   (2) 18   (3) 24   (4) 34

23. AEF : BIJ :: ____ : OUV
    (1) NOP   (2) MPQ   (3) NOQ   (4) NQR

24. DRIVE : EIDRV :: BEGUM :
    (1) BGMEU   (2) MGBEU   (3) UEBGM   (4) BGMUE

25. E × 1 : 5 × 9 :: ____ : 15 × 21
    (1) L × K   (2) K × L   (3) O × U   (4) U × O

26. ANT : CPV :: ____ : DQZ
    (1) BOX   (2) BRB   (3) FSB   (4) FTB

27. BCEH, ____ , DGKP , EINT
    (1) CDJG   (2) CEJK   (3) CFIM   (4) CEHL

28. K 11 M, ____ , G 15 I, E 17 G
    (1) I 13 K   (2) I 14 J   (3) I 12 J   (4) I 13 M

29. HOSPITAL : PATIENTS :: SCHOOL :
    (1) TEACHERS   (2) CLASS ROOMS
    (3) STUDENTS   (4) BLACK BOARDS

30. If the letters D and E are removed from the English alphabet, then the fourth letter is
    (1) F   (2) C   (3) G   (4) H
Note: In questions 31 to 35 pick the odd thing out:

31. (1) 147 (2) 125 (3) 103 (4) 84
32. (1) (3, 4, 5) (2) (5, 12, 13) (3) (6, 8, 10) (4) (10, 12, 15)
33. (1) April (2) May (3) November (4) September
34. (1) 19/15 (2) 13/11 (3) 7/5 (4) 3/2
35. (1) C 4 E (2) G 8 I (3) L 15 N (4) T 21 V

Note: Each of the questions from 36 to 45 follow a definite pattern. Observe the same and fill in the blanks with suitable answers.

36. \[11\frac{1}{9}, 125, 142\frac{6}{7}, \underline{\text{_____}}, 200, 250\]
   (1) 166\(\frac{2}{3}\) (2) 178\(\frac{4}{7}\) (3) 181\(\frac{2}{5}\) (4) 192\(\frac{3}{7}\)
37. 0, 2, 3, 5, 8, 10, 15, \underline{_____}, 24, 26, 35
   (1) 19 (2) 18 (3) 17 (4) 16
38. \[
\left[\frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \frac{1}{9}\right] \cdot \left[\frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \frac{1}{9}\right] \cdot \left[\frac{1}{25}, \frac{1}{29}, \frac{1}{33}, \frac{1}{37}\right] \cdot \left[\frac{1}{42}, \frac{1}{47}, \underline{\frac{1}{57}}\right]
\]
   (1) \(\frac{1}{50}\) (2) \(\frac{1}{51}\) (3) \(\frac{1}{52}\) (4) \(\frac{1}{53}\)
39. 5, 11, 21, 43, 85, \underline{_____}
   (1) 181 (2) 180 (3) 171 (4) 170
40. 75, 105, 165, 195, \underline{_____}, 285
   (1) 255 (2) 235 (3) 225 (4) 215
41. \(\frac{3}{5}, \frac{5}{9}, \frac{9}{13}, \underline{\text{_____}}, \frac{27}{33}\)
   (1) \(\frac{11}{13}\) (2) \(\frac{17}{27}\) (3) \(\frac{15}{19}\) (4) \(\frac{21}{32}\)
42. (1, Z), (8, Y), (27, X), (125, W), \underline{_____}
   (1) (243, U) (2) (243, V) (3) (343, V) (4) (343, U)
43. AEI, CGK, \underline{_____}, GKO, IMQ
   (1) EJN (2) ENJ (3) EIM (4) EMI
44. If \(\{a_n\}_{n=1}^{\infty}\) is such that \(a_1 = a_2 = 1\) and \(a_k = a_1 + a_2 + \ldots + a_{k-1}\) for \(k \geq 3\), then \(a_7 = \underline{_____}\)
   (1) 16 (2) 32 (3) 64 (4) 128
45. The \(n^{th}\) term in the sequence
   \[1, -2, 3, -4, 5, -6, 7, -8, \ldots\]
   is
   \[\text{the negative of } 1, -2, 3, -4, 5, -6, 7, -8, \ldots\]
   \(\underline{\text{_____}}\) for \(n \geq 1\)
   (1) \((-1)^n\) \(n\) (2) \(-n\) (3) \(n\) (4) \((-1)^{n-1} \cdot n\)
Data Analysis

Note: An automobile company produces four types of vehicles (Cars, Motor bikes, Scooters and Mopeds) at different branches in the country. The production at these units from 2007 to 2012 are given in the table below. Answer the questions 46 to 48 using the table.

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars</td>
<td>3600</td>
<td>6300</td>
<td>8100</td>
<td>10800</td>
<td>16200</td>
<td>19800</td>
</tr>
<tr>
<td>Motor bikes</td>
<td>7000</td>
<td>12250</td>
<td>15750</td>
<td>21000</td>
<td>31500</td>
<td>38500</td>
</tr>
<tr>
<td>Scooters</td>
<td>8000</td>
<td>14000</td>
<td>18000</td>
<td>24000</td>
<td>36000</td>
<td>44000</td>
</tr>
<tr>
<td>Mopeds</td>
<td>9000</td>
<td>15750</td>
<td>20250</td>
<td>27000</td>
<td>40500</td>
<td>49500</td>
</tr>
</tbody>
</table>

46. The ratio of the number of Cars produced in 2008 to the number of Scooters produced in 2011 is

(1) 37 : 40
(2) 27 : 40
(3) 17 : 40
(4) 7 : 40

47. In which year the total number of the four types of vehicles produced was 62100?

(1) 2007
(2) 2008
(3) 2009
(4) 2010

48. If k : 1 is the ratio of the number of Scooters produced in the year 2011 to the number of Scooters produced in 2007, then k =

2011 సంవత్సరంలో మార్గం నాలుగు పంచనున్నది 2007 సంవత్సరంలో మార్గం నాలుగు k : 1 అని అంటే k =

(1) 3
(2) 4
(3) 2
(4) 2/9
Note: The expenditure under six heads A, B, C, D, E and F in an year are as given in the following Pie diagram. Answer the questions 49-53 using the diagram.

49. If the total expenditure in an year is ₹ 54,00,000, then the expenditure (in rupees) under the head E in that year is

(1) 3,60,000  (2) 4,20,000  (3) 6,30,000  (4) 7,20,000

50. If the expenditure under the heads A and B together is ₹ 18,00,000 in an year, then the expenditure under the head D in that year is

A, B  రూ. 20 లక్షలు పట్టు ఉన్నాయి, అంటే దీనిలో ద్వారా E రూ. 18,00,000, అంటే దీనిలో ద్వారా D రూ. 50 లక్షలు పట్టు ఉన్నాయి

(1) 4,20,000  (2) 4,80,000  (3) 5,50,000  (4) 8,50,000

51. If the difference in the expenditure under the heads A and B in an year is ₹ 2.5 lakhs, then the total expenditure (in lakhs of rupees) in that year is

A, B  రూ. 80 లక్షల పట్టు ఉన్నాయి, అంటే దీనిలో ద్వారా E రూ. 2.5 లక్షలు పట్టు ఉన్నాయి

(1) 90  (2) 81  (3) 72  (4) 63

52. If the expenditure under the head E in an year is ₹ 3.5 lakhs, then the expenditure (in lakhs of rupees) under the head D in that year is

పట్టికంలో E రూ. 3.5 లక్షలు పట్టు ఉన్నాయి అంటే D ద్వారా రూ. ఎలా పట్టు ఉన్నాయి?

(1) 3  (2) 3.5  (3) 4  (4) 4.5

53. In any year the expenditure under the heads C and F together is equal to half of the expenditure on B and F together.

(1) B, F  రూ. 10 లక్షల పట్టు ఉన్నాయి.

(2) double the expenditure on C.

(3) the expenditure on D and E.

(4) the expenditure on A.

P.T.O.
Note: Given that \( A = \{n : n \text{ prime}, \ 1 \leq n \leq 20\} \)
\( B = \{n : n \text{ odd}, \ 1 \leq n \leq 20\} \)
and \( C = \{n : n \text{ square}, \ 1 \leq n \leq 20\} \).
Using this answer the questions 54 and 55.

Given: \( A = \{n : n \text{ prime}, \ 1 \leq n \leq 20\} \)
\( B = \{n : n \text{ odd}, \ 1 \leq n \leq 20\} \)
\( C = \{n : n \text{ square}, \ 1 \leq n \leq 20\} \)

54. \( B \cap C = \)
(1) \( \{1, 4, 9, 16\} \) (2) \( \{1, 3, 5, 7, 9, 11, 13, 15, 17, 19\} \)
(3) \( \emptyset \) (4) \( \{1, 9\} \)

55. The number of integers between 1 and 20 which do not lie in \( A \cup B \cup C \) is
\( A \cup B \cup C \) \( \cap \) \( \emptyset \) \( \begin{align*} 1 & \leq n \leq 20 \end{align*} \)
(1) 8 (2) 7 (3) 6 (4) 5

(c) Coding and Decoding Problems (Marks: 10)

Note: The letters A, B, C ....... Z of English alphabet are numbered 1, 2, 3 ....... 26
respectively. A code is designed by shifting \( r \)th letter to \((14 - r)\)th letter if \( 1 \leq r \leq 13 \)
and \( s \)th letter to \((40 - s)\)th letter if \( 14 \leq s \leq 26 \). The reverse process is used for
decoding. Using this answer questions 56-60 given below.

Given: \( \begin{align*} \text{The code word for HYDERABAD is} \end{align*} \)
"HYDERABAD" (1) \( \begin{align*} \text{FOJIVMLMJ} \ (2) \ \text{FJOIVMJML} \ (3) \ \text{FIJOVLMJ} \ (4) \ \text{FIOJMLVMJ} \end{align*} \)

57. The code word for WARANGAL is
"WARANGAL" (1) \( \begin{align*} \text{QMUMZBGM} \ (2) \ \text{QMVMZGBM} \ (3) \ \text{QVMZMBGM} \ (4) \ \text{QVMZMGMBM} \end{align*} \)

58. Which word is coded as IPKFMZGI?
IPKFMZGI \( \begin{align*} \text{ENTRANCE} \ (2) \ \text{ELEGANCE} \ (3) \ \text{EXCHANGE} \ (4) \ \text{EMPATHIE} \end{align*} \)

59. Which word is coded as UIBIKTEYZ?
UIBIKTEYZ \( \begin{align*} \text{SEDUCTION} \ (2) \ \text{SELECTION} \ (3) \ \text{SUGGESTED} \ (4) \ \text{SHOCKINGS} \end{align*} \)

60. The code word for TIRUPATI is
TIRUPATI \( \begin{align*} \text{TEMXVSTE} \ (2) \ \text{TESVXMTE} \ (3) \ \text{TESVSMTE} \ (4) \ \text{TEVSMXTE} \end{align*} \)
61. If TEACHER is coded as UFBDIFS, then the code word for PARENT is

TEACHER చేసేది ఉఫ్పిడిష్, అందు పారంటే ఎండి ఆనాటు

(1) QSBOFU (2) QBSFOU (3) RBSENU (4) QRAESU

62. If BOMBAY is coded as OBZONL, then the code for DELHI is

BOMBAY చేసేది ఒబ్స్యెన్ల, అందు దేశి ఎండి ఆనాటు

(1) QRYUV (2) QYRUV (3) QRYUV (4) RQYUV

63. If COMMERCE is coded as DONNESDE, then the code for BIOLOGY is

COMMERCE చేసేది డాన్నిసేడే, అందు బియోలాజీ ఎండి ఆనాటు

(1) CJPMFHZ (2) CIOMOHZ (3) CIOMOHZ (4) CIOMOZH

64. If FAILURE is coded as EZHKTQD, then the code for SUCCESS is

FAILURE చేసేది ఏఖ్కట్టు ఎండి సాచేసు

(1) RSDDFRR (2) RTDDFRR (3) RTBDDRR (4) RTCBDRR

65. If TRIANGLE is coded as USJBOMHF, then the code word for SQUARE is

TRIANGLE చేసేది ఉస్స్యబాహ్ముఫ్, అందు క్వార్యి ఎండి ఆనాటు

(1) TRUBSF (2) TRVSBF (3) TRUBSF (4) TRVBSF

(d) Date, Time & Arrangement Problems

(Marks : 10)

66. If 26th January of a non-leap year falls on a Sunday, the day on which 15th August of that year falls is

26వ జనవరి చేసేది సంద్యా అందు అగస్టు 15 లో దినంటే ఎండి ఆనాటు

(1) Sunday (2) Wednesday (3) Friday (4) Saturday

67. What is the angle between the two hands of a clock when the time is 5:15 a.m.?

5 రాళ్ళ ఇండి ఎండి ఆనాటు అంశం ను కనిపిస్తే ఎండి ఆనాటు?

(1) 72.5° (2) 67.5° (3) 64° (4) 58.5°

68. A clock strikes once at 1 O'clock, twice at 2 O'clock and so on. The total number of strikes it makes in a day is

1 అండు ధ్య్యం చేసేది 2 అండు ధ్యం ఎండి ఆనాటు, 2 రెండు ధ్యం థియిరి అంశం, ........ రెండు ధ్యం థియిరి అంశం. ఎండి ఆనాటు?

(1) 78 (2) 112 (3) 132 (4) 156

69. D is the only son of his father C. A is B's brother and B is C's sister. How is D related to A?

D చేసేది కాలు చేసేది కాలు. A చేసేది బ్రడర్, B చేసేది కాలు ఎండి ఆనాటు?

(1) Sister (2) Brother (3) Niece (4) Brother's son

P.T.O.
70. A meeting is scheduled at 11.00 am for which a person P who is away at 100 kms from the venue has to attend. If P starts at 9.45 a.m. in a car which moves with a speed of 60 kmph, then the P is late to the meeting by how many minutes?

(1) 5  (2) 15  (3) 25  (4) 35

71. If \( t_1 \) is the time elapsed between 11.10 am to 3.50 pm; and if \( t_2 \) is the time elapsed between 10.15 am to 4.05 pm, then \( t_1 : t_2 = \)

(1) 5 : 4  (2) 2 : 3  (3) 4 : 5  (4) 3 : 2

72. A, B, C, D and E sit around a table such that A is between B and C and is left to B; D is to the right of B; and E is between C and D. Then the person to the immediate left of C is A, B, C, D, E respectively.

(1) D  (2) B  (3) A  (4) E

73. Given that \( a * b = \frac{a^2 + b^2}{ab} \) and \( a \Delta b = \frac{a^2}{b} \) for any real numbers a and b.

If \( x * y = 2 \Delta 2 \), then \( x = \)

(1) \( y \)  (2) \( \frac{y}{2} \)  (3) \( 2y \)  (4) \( 3\frac{y}{2} \)

74. For real numbers a and b, if \( a \circ b = (ab)^{1/5} \), then (243) \( \circ (16807) = \)

(1) 31  (2) 29  (3) 22  (4) 21

75. If \( a \oplus b = (a + b - 1)^2 - 1 \), then \( (1 \oplus 2) \oplus (3 \oplus 3) = \)

(1) 576  (2) 625  (3) 675  (4) 676
Questions: 75
Marks: 75

(i) Arithmetical Ability

76. \[
\left( \frac{1}{z-x} \right) \frac{1}{y-x} \cdot \left( \frac{1}{x-y} \right) \frac{1}{z-x} \cdot \left( \frac{1}{y-z} \right) \frac{1}{x-y} =
\]
(1) a \hspace{1cm} (2) 0 \hspace{1cm} (3) xyz \hspace{1cm} (4) 1

77. If \(\sqrt[3]{3}^a = \left( \sqrt[3]{625} \right)^{\frac{a+3}{2}}\), then a =

\[
\left( \frac{3}{5} \right)^a = \left( \sqrt[3]{625} \right)^{\frac{a+3}{2}}, \text{ hence } a =
\]
(1) 2 \hspace{1cm} (2) 1 \hspace{1cm} (3) -1 \hspace{1cm} (4) -2

78. In a mixture of 35 litres the ratio of milk and water is 4 : 1. If one litre of water is added to the mixture the ratio of milk and water in the new mixture is

35 లిటర్ల పాండుకు యాదాదు, పాంది మాత్రమే చాలాంట. అందుపై ఒక్క లిటర్ పాండి చేసే పాండి యాదాదు కోసం పాండి యాదాదు ఎదిగి వుంటుంది

(1) 2 : 7 \hspace{1cm} (2) 7 : 2 \hspace{1cm} (3) 4 : 3 \hspace{1cm} (4) 2 : 1

79. The salaries of two persons are in the ratio 4 : 7. Both spend 80% of their salaries and save the rest. The ratio of their savings is

మూడు వ్యక్తుల వార్యాలు 4 : 7 రేటుతో యుస్మానం. ఎందుకంటే యుస్మానం 80% వార్యాలు మరణి మరింత క్రోధం ఇంచింది

(1) 8 : 2 \hspace{1cm} (2) 7 : 5 \hspace{1cm} (3) 5 : 3 \hspace{1cm} (4) 4 : 7

80. If \((\sqrt{2})^x + 5 = \left( \frac{\sqrt{2}}{2} \right)^{2x^2 - 2}\), then a value of \((x^2 - 1)\) is

\[(\sqrt{2})^x + 5 = \left( \frac{\sqrt{2}}{2} \right)^{2x^2 - 2}, \text{ hence } (x^2 - 1) \text{ is as follows} \]

(1) 2 \hspace{1cm} (2) 4 \hspace{1cm} (3) 6 \hspace{1cm} (4) 8

P.T.O.
81. \[ \sqrt{10 + 2\sqrt{6} + 2\sqrt{10} + 2\sqrt{15}} + \sqrt{10 - 2\sqrt{6} - 2\sqrt{10} + 2\sqrt{15}} = \]

(1) \( 2(\sqrt{3} + \sqrt{5}) \)  (2) \( 2\sqrt{3} \)
(3) \( 2\sqrt{5} \)  (4) \( 2\sqrt{10} \)

82. The least value of \( k \) such that \( 315 \times k \) is a perfect square is

(1) 35  (2) 31
(3) 21  (4) 15

83. Which among the following numbers leaves remainders 1, 2 and 2 respectively when divided by 2, 3 and 7?

(1) 130  (2) 68
(3) 65  (4) 57

84. The L.C.M. of two integers is 144 and their G.C.D is 12. If one of the integers is 36, then the other integer is

(1) 18  (2) 24
(3) 48  (4) 432

85. The least number that is to be subtracted from 2580 so that it leaves a remainder 4 when divided by 9, 11 and 13 is

(1) 1  (2) 2
(3) 3  (4) 4

86. Three numbers are in the ratio 1 : 2 : 3 and the sum of their squares is 504. The largest of the numbers is

(1) 6  (2) 12
(3) 18  (4) 24
87. The ascending order of the fractions: \( \frac{5}{7}, \frac{6}{8}, \frac{9}{11}, \frac{11}{14} \) is

\[ \frac{5}{7}, \frac{6}{8}, \frac{9}{11}, \frac{11}{14} \]

(1) \( \frac{5}{7}, \frac{6}{8}, \frac{11}{14} \)  (2) \( \frac{5}{7}, \frac{9}{11}, \frac{6}{8}, \frac{11}{14} \)

(3) \( \frac{5}{7}, \frac{11}{14}, \frac{9}{6}, \frac{11}{14} \)  (4) \( \frac{5}{7}, \frac{6}{11}, \frac{9}{14}, \frac{11}{14} \)

88. The persons A, B, C share a property in such a way that A and B get \( \frac{3}{7} \) th and \( \frac{5}{14} \) th and C getting the rest. The person or persons who get the least property

\[ \text{A, B, C ఏ ఏ పెట్టిన ఆ, B ఏ పెట్టిన ఆ, C ఏ పెట్టిన ఆ చేసాడు చేయండి. ఏ పెట్టిన ఆ చేయండి ఆ చేయండి.} \]

(1) C  (2) B

(3) A and B  (4) A and C

A అందమైన B  A అందమైన C

89. The descending order of \( \sqrt{10}, \sqrt{6}, \sqrt{3} \) is

\[ \sqrt{10}, \sqrt{6}, \sqrt{3} \]

(1) \( \sqrt{10}, \sqrt{3}, \sqrt{6} \)  (2) \( \sqrt{10}, \sqrt{6}, \sqrt{3} \)

(3) \( \sqrt{3}, \sqrt{6}, \sqrt{10} \)  (4) \( \sqrt{6}, \sqrt{10}, \sqrt{3} \)

90. In a face to face election the winner got 65% of votes and won by a margin of 12000 votes. The total votes polled (in lakhs) is

\[ \text{వింధి నలుగులు మిగిలిన 65% లో నిలిచి మరింత రెండు 12000 లో నిలిచి వింధి మిగిలిన మరింత రెండు} \]

(1) 4  (2) 0.4

(3) 0.04  (4) 0.004

91. In a library 23% of the books are in Arts, 30% in Commerce, 35% in Science and the rest are in Telugu language. If there are 1440 books in Telugu language, the number of books in Arts is

\[ \text{ప్రతిమా 23% అంతే 30% చార్మెన్స్ రేఖలు సంఖ్యలు మరింత రెండు టెలుగు భాషలో} \]

(1) 2760  (2) 3000

(3) 3600  (4) 4200
92. A person bought a pen and sold it for a loss of 10%. If he had bought it for 20% less and sold it for ₹ 44 more than earlier sale price he would have made a profit of 40%. The cost price of the pen is (in ₹)

(1) 200  (2) 225  (3) 250  (4) 280

93. If an article is sold at a profit of 15% instead of a profit of 9% the person gets ₹ 60 more. The cost price of the article (in rupees) is

(1) 1200  (2) 1050  (3) 1000  (4) 800

94. A and B started a business investing ₹ 10 lakhs and ₹ 15 lakhs respectively. After 6 months C joined them by investing ₹ 20 lakhs. If the profit at the end of the year is ₹ 5.6 lakhs, then the share of A in the profit (in lakhs of rupees) is

(1) 1.6  (2) 2.4  (3) 3.2  (4) 4.8

95. In a joint business A, B and C invested capital in the ratio 5 : 6 : 8. At the end of the business they shared profits in the ratio 4 : 3 : 12. The ratio of the number of months in which A, B and C kept, their capital is

(1) 2 : 1 : 3  (2) 5 : 3 : 12  (3) 8 : 5 : 15  (4) 25 : 18 : 16
96. Pipe A fills a tank in 8 hours while pipe B empties the full tank in 10 hours. If both the pipes A and B are opened simultaneously the time taken (in hours) to fill the tank is

\[ \frac{1}{8} + \frac{1}{10} = \frac{9}{40} \text{ hours} \]

(1) 33\(\frac{3}{2}\) (2) 36\(\frac{1}{2}\) (3) 40 (4) 42

97. Two pipes A and B can fill a tank in 10 hours and 15 hours respectively. If they are opened alternately for one hour each and if A is opened first, the time (in hours) required to fill the tank is

\[ \frac{1}{10} + \frac{1}{15} = \frac{1}{6} \text{ hours} \]

(1) 10 (2) 11 (3) 12 (4) 13

98. If a man starts at A and walks at 5 kmph he will reach B late by 7 minutes. But if walks at 6 kmph he will reach B early by 5 minutes. The distance between A and B (in km) is

\[ \frac{5x}{11} = \frac{6x}{17} - 7 \quad \text{and} \quad \frac{6x}{17} = \frac{5x}{11} + 5 \]

(1) 4 (2) 5 (3) 6 (4) 7

99. A train of 270 metres long crosses a platform of 390 metres length in 33 seconds. The speed of the train (in kmph) is

\[ \frac{270 + 390}{33} = \frac{660}{33} = 20 \text{ kmph} \]

(1) 66 (2) 68 (3) 72 (4) 75

100. Three persons A, B, C together can complete a work in 8 days where as A alone requires 24 days to complete the same work. The number of days required for B and C together to complete the same work is

\[ \frac{1}{8} = \frac{1}{24} + \frac{1}{x} \]

(1) 18 (2) 16 (3) 12 (4) 10

P.T.O.
101. A man completes $\frac{4}{5}$ of the work in $1\frac{1}{2}$ days. The number of hours required to complete the remaining work by him is

$\frac{4}{5}$ of $1\frac{1}{2}$ = $\frac{4}{5} \times \frac{3}{2}$ = $\frac{12}{10}$ = $\frac{6}{5}$

(1) 6  (2) 9  (3) 7  (4) 8

102. A circle is inscribed in an equilateral triangle. If the area of the circle is 462 cm$^2$, then the perimeter (in cm) of the triangle is

Area of circle = $\pi r^2 = 462$ cm$^2$

$r = \sqrt{\frac{462}{\pi}}$

Perimeter of triangle = $3 \times s = \frac{2 \times \pi \times r}{\sqrt{3}}$

(1) 72  (2) 84  (3) 96  (4) 126

103. The area of a rectangular metal sheet is 60 sq.m. The sum of its length and diagonal is equal to 5 times its breadth. Then the difference (in metres) between length and breadth is

Area of rectangle = $l \times b = 60$ sq.m.

$l + \sqrt{l^2 + b^2} = 5b$

(1) 4  (2) 5  (3) 6  (4) 7

104. A cone of height 24 cm and radius of its base 6 cm is made up of clay. If that clay is reshaped in the form of a sphere, then the diameter of that sphere (in cms) is

Volume of cone = $\frac{1}{3} \pi r^2 h = \frac{1}{3} \pi \times 6^2 \times 24$

Volume of sphere = $\frac{4}{3} \pi r^3$

$r = \sqrt[3]{\frac{3 \times \text{Volume of cone}}{4 \pi}}$

(1) 6  (2) 8  (3) 12  (4) 14

105. The surface area of a sphere is same as the curved surface area of a right circular cylinder whose height and diameter are 12 cm each. Then the radius of the sphere (in cm) is

Surface area of sphere = $4 \pi r^2$

Curved surface area of cylinder = $2 \pi rh = 2 \pi \times 6 \times 12$

$r = \sqrt{\frac{\text{Surface area of sphere}}{4 \pi}}$

(1) 3  (2) 4  (3) 5  (4) 6
106. Let 's' be the surface area of a cube of edge 9 cm. This cube is cut into smaller cubes of edge 3 cm each. If 'S' is the sum of the surface areas of all the smaller cubes, then \( s : S = \)

\[
\begin{align*}
(1) & \quad 3 : 1 \\
(2) & \quad 1 : 3 \\
(3) & \quad 3 : 2 \\
(4) & \quad 2 : 3
\end{align*}
\]

107. The number of revolutions made by a wheel of 42 cm diameter in travelling a distance of 1320 metres is

\[
\begin{align*}
1320 & \text{ मित्र } \text{ मोट } \text{ अधिकतम } 42 \text{ रो मी. विमुखता } \text{ तथा } 1320 \text{ मी. बादल } \text{ वांछित} \\
(1) & \quad 300 \\
(2) & \quad 400 \\
(3) & \quad 500 \\
(4) & \quad 1000
\end{align*}
\]

108. The radius \( r \) of a right circular cylinder is the same as that of a sphere. If the volume of the sphere is twice that of the cylinder, then the height of the cylinder is

\[
\begin{align*}
&\text{हे } r \text{ वृत्तीय चक्रधार पर भी री } r \text{ तथा } 2r \text{ वृत्तीय चक्रधारी वास्तवमा।} \\
&\text{संबंध } r \text{ वृत्तीय चक्रधार का वृत्तीय चक्रधारी वास्तवमा,} \\
(1) & \quad \frac{r}{3} \\
(2) & \quad \frac{2r}{3} \\
(3) & \quad \frac{4r}{3} \\
(4) & \quad 2r
\end{align*}
\]

109. The digit in the units place of the number \( 13^{400} \) is

\[
\begin{align*}
13^{400} & \text{ एक } 13 \text{ का } 13 \text{ चतुर्थांश } \text{ संख्या} \\
(1) & \quad 4 \\
(2) & \quad 3 \\
(3) & \quad 2 \\
(4) & \quad 1
\end{align*}
\]

110. If \( a^* = k \) denotes that \( k \) is the remainder when \( 8a \) is divided by 7, then \( 100^* = \)

\[
\begin{align*}
a^* & = k \text{ एक } 8a \text{ का } 7 \text{ विभाज्यता नियम } \text{ प्रेषित,} \\
100^* & = \\
(1) & \quad 1 \\
(2) & \quad 2 \\
(3) & \quad 5 \\
(4) & \quad 6
\end{align*}
\]
(ii) Algebraic and Geometrical Ability

111. For two statements p, q, it is given that \( p \rightarrow ((-p) \lor q) \) is false, then the truth values of p and q are respectively
\[ p, q \in \{ \text{F, T} \} \]
(1) F, T (2) F, F (3) T, T (4) T, F

112. Let p, q be two statements. Then the statement \((\sim p) \lor (p \land q)\) is equivalent to \(p, q \in \{ \text{F, T} \}\). Hence \((\sim p) \lor (p \land q)\) is False
(1) \(q \leftrightarrow p\) (2) \(p \Rightarrow q\) (3) \(q \Rightarrow p\) (4) \(p \Rightarrow \sim q\)

113. If \(1 \leq a \leq 100\) and \(A = \{ a \mid \gcd(a, 100) = 1 \}\), then the number of elements in A is
\[1 \leq a \leq 100, A = \{ a \mid \gcd(a, 100) = 1 \}\] (1) 25 (2) 16 (3) 40 (4) 20

114. Let \(f(x) = \begin{cases} x & \text{if } x \in \mathbb{Q} \\ 1 - x & \text{if } x \in \mathbb{R} - \mathbb{Q} \end{cases}\)
where \(\mathbb{Q}\) is the set of all rational numbers.
Then \(f\) is
\[f(x) = \begin{cases} x & (x \in \mathbb{Q}) \\ 1 - x & (x \in \mathbb{R} - \mathbb{Q}) \end{cases}\]
(1) one-one only (2) onto only
(3) one-one and onto (4) neither one-one nor onto

115. Suppose A and B are two sets. Then a set, among the following, which is not equal to \(A \cup B\), in general, is
\(A, B \in \text{set of elements with } \gcd \\text{as } 1\)
(1) \((A - B) \cup (B - A) \cup (A \cap B)\) (2) \((A^c \cap B^c)\)
(3) \((A - B) \cup B\) (4) \(A \cup (B - A)\)

116. If the lines \(3x - ky + 4 = 0\) and \(4x + y + 2 = 0\) are perpendicular to each other, then \(k^2 - 12k + 4 = \)
\[\text{वर्गसीमा } 3x - ky + 4 = 0, 4x + y + 2 = 0 \text{ में } k^2 - 12k + 4 = \]
(1) 0 (2) 4 (3) 8 (4) 12
117. The length of the line segment intercepted between the axes by the line joining (6, -4) and (-3, 8) is
\[ (1) \quad 4 \quad (2) \quad 5 \quad (3) \quad 6 \quad (4) \quad 7 \]

118. \[ \sin 120^\circ \cos 60^\circ \cot 30^\circ \cosec^230^\circ = \]
\[ (1) \quad 0 \quad (2) \quad 3 \quad (3) \quad -1 \quad (4) \quad \frac{1}{2} \]

119. \[ \tan \theta = \frac{5}{12} \Rightarrow \frac{5 \sin \theta + 4 \cos \theta}{4 \sin \theta + 5 \cos \theta} = \]
\[ (1) \quad \frac{73}{80} \quad (2) \quad \frac{80}{73} \quad (3) \quad \frac{7}{80} \quad (4) \quad \frac{3}{80} \]

120. \[ 4 \cos \theta \sin^3 \theta - 4 \sin \theta \cos^3 \theta = \]
\[ (1) \quad 0 \quad (2) \quad 1 \quad (3) \quad \sin 4\theta \quad (4) \quad -\sin 4\theta \]

121. A pole subtends angles 30°, 45°, 60° respectively at points A, B and C all lying on a horizontal line through the foot of the pole. Then \[ \frac{AB}{BC} = \]
\[ (1) \quad \frac{1}{\sqrt{3}} \quad (2) \quad \sqrt{3} + 1 \quad (3) \quad \sqrt{3} \quad (4) \quad \sqrt{3} - 1 \]

122. \[ x^4 - 4x^3 + 6x^2 - 4x + 1 = 0 \quad (x \neq 0) \]
\[ \Rightarrow x + \frac{1}{x} = \]
\[ (1) \quad \frac{1}{2} \quad (2) \quad 2 \quad (3) \quad \frac{5}{2} \quad (4) \quad \frac{3}{2} \]

123. If \( x - 7 \) is a factor of the polynomial \( f(x) \), then a factor of \( f(2x^2 - 1) \) among the following is
\[ (1) \quad x - 1 \quad (2) \quad x - 2 \quad (3) \quad x + 1 \quad (4) \quad x + 2 \]

124. The remainder obtained when \( 1! + 2! + 3! + \ldots + (2014)! \) is divided by 7 is
\[ (1) \quad 3 \quad (2) \quad 4 \quad (3) \quad 5 \quad (4) \quad 6 \]

125. \[ \sqrt{(x+1)(x+2)(x+3)(x+4)+1} = \]
\[ (1) \quad \pm (x^2 + 5x + 4) \quad (2) \quad \pm (x^2 + 5x + 5) \]
\[ (3) \quad \pm (x^2 + 5x + 6) \quad (4) \quad \pm (x^2 + 6x + 5) \]
126. The sum of seven consecutive even integers is $s$. Then, in terms of $s$, the greatest of these integers is

$$\begin{align*}
(1) \ \frac{s + 20}{5} & \quad (2) \ \frac{s + 72}{9} & \quad (3) \ \frac{s + 42}{7} & \quad (4) \ \frac{s + 30}{6}
\end{align*}$$

127. The maximum value of the expression $2 + 8x - x^2$ is

$$\begin{align*}
(1) \ 16 & \quad (2) \ 17 & \quad (3) \ 18 & \quad (4) \ 19
\end{align*}$$

128. $\frac{b}{a} = \frac{c}{b} = \frac{d}{c} \Rightarrow (a - c)^2 + (c - b)^2 + (b - d)^2 - (d - a)^2 =

$$\begin{align*}
(1) \ 1 & \quad (2) \ 0 & \quad (3) \ -1 & \quad (4) \ 2
\end{align*}$$

129. The sum of first fifty odd natural numbers is

$$\begin{align*}
(1) \ 2500 & \quad (2) \ 625 & \quad (3) \ 10000 & \quad (4) \ 1600
\end{align*}$$

130. The coefficient of $x^3$ in the expansion of $\left(x^2 - \frac{1}{x^3}\right)^9$ is

$$\begin{align*}
(1) \ 9C_3 & \quad (2) \ -9C_3 & \quad (3) \ 9C_5 & \quad (4) \ -9C_4
\end{align*}$$

131. The coefficient of middle term in the expansion of $(1 + x)^{40}$ is

$$\begin{align*}
(1) \ \frac{1 \cdot 3 \cdot 5 \ldots \ 39}{20!} 2^{20} & \quad (2) \ \frac{1 \cdot 3 \cdot 5 \ldots \ 39}{20!} 2^{20} & \quad (3) \ \frac{21 \cdot 22 \ldots \ 40}{20!} & \quad (4) \ 40! 2^{20}
\end{align*}$$

132. $\begin{bmatrix} 2 & 16 \\ -8 & 0 \end{bmatrix} = \begin{bmatrix} a & b^2 \\ c^3 & 0 \end{bmatrix}$, $c < 0, b < 0$

$$\Rightarrow 3a + b + c =

\begin{align*}
(1) \ 2 & \quad (2) \ -2 & \quad (3) \ 4 & \quad (4) \ 0
\end{align*}$$

133. If $A$, $B$ are two matrices such that $AB = A$, $BA = B$, then $A^2 + B^2 =

$$\begin{align*}
(1) \ A + B & \quad (2) \ A - B & \quad (3) \ 2A + B & \quad (4) \ A + 2B
\end{align*}$$

134. $\lim_{x \to 0} \frac{\tan x}{x^2} =

$$\begin{align*}
(1) \ \frac{180}{\pi} & \quad (2) \ \frac{\pi}{180} & \quad (3) \ 1 & \quad (4) \ -1
\end{align*}$$
135. \( x = \sqrt{x + y} \Rightarrow \frac{dy}{dx} = \)

(1) \( 1 - x \)  
(2) \( 1 + x \)  
(3) \( 1 - 2x \)  
(4) \( 2x - 1 \)

136. In a \( \triangle ABC \), D, E, F are the mid points of the sides AB, BC and CA respectively. If \( AB = 8 \text{ cm}, BC = 15 \text{ cm} \) and \( AC = 12 \text{ cm} \), then \( DE + EF + FD = \)

\( \triangle ABC \) లో D, E, F అగ్స్ట్ లు AB, BC, CA లక్షణాలు గలిగితే \( \triangle ABC \) లో D, E, F అగ్స్ట్ లు AB = 8 సెమీ, BC = 15 సెమీ, AC = 12 సెమీ. \( DE + EF + FD = \)

(1) \( 16.5 \text{ cm} \)  
(2) \( 17.5 \text{ cm} \)  
(3) \( 25 \text{ cm} \)  
(4) \( 35 \text{ cm} \)

137. A, B, C are three points on the circumference of a circle with centre O. If, in \( \triangle ABC \), \( \angle B = 60^\circ \) and \( \angle C = 70^\circ \), then \( \angle BOC = \)

అంబిక సరోవరంలో A, B, C అంశాలు గలిగితే \( \triangle ABC \) లో \( \angle B = 60^\circ , \angle C = 70^\circ \), తద్వారా \( \angle BOC = \)

(1) \( 100^\circ \)  
(2) \( 120^\circ \)  
(3) \( 90^\circ \)  
(4) \( 80^\circ \)

138. If P, Q, R, S are the mid points of the sides of a quadrilateral ABCD, then the quadrilateral PQRS is a

వక్తతాబాదులో A, B, C అంశాలు గలిగితే \( \triangle ABC \) లో వక్తతాబాదులో P, Q, R, S అగ్స్ట్ లు వక్తతాబాదులో PQRS చతురస్ర ఉంటుంది

(1) Square  
(2) Parallelogram  
(3) Rectangle  
(4) Rhombus

139. The points A(3, -5) and B(-5, 4) are given. If C is a point such that \( \frac{AC}{CB} = 2 \), then the coordinates of C are

అంబికలు A(3, -5), B(-5, 4) అంశాలుగాను. C అంశాలుగా \( \frac{AC}{CB} = 2 \) అవింతా సరోవరంలో C అంశాలు ఉన్నాయి

(1) \( \left( \frac{7}{3}, 1 \right) \)  
(2) \( \left( -\frac{7}{3}, 1 \right) \)  
(3) \( \left( \frac{7}{3}, -1 \right) \)  
(4) \( \left( -\frac{7}{3}, -1 \right) \)

140. A (4, 2), B (6, 5) and C (1, 4) are the vertices of a \( \triangle ABC \). The median from A meets the side BC at D. Then \( 2AD^2 = \)

A (4, 2), B (6, 5), C (1, 4) అంశాలుగా \( \triangle ABC \) త్రిభుజం. A సరోవరంలో B ఉత్పర్తిన సేటి BC లో D అగ్స్ట్ లు ఉన్నాయి. తద్వారా \( 2AD^2 = \)

(1) 13  
(2) 14  
(3) 15  
(4) 16
141. The mean of the distribution given below is

<table>
<thead>
<tr>
<th>x</th>
<th>10-20</th>
<th>20-30</th>
<th>30-40</th>
<th>40-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>5</td>
<td>10</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

(1) 30  (2) 31  (3) 32  (4) 33

142. For a given data, if the mean is 60 and the mode is 66, then the median is

(1) 63  (2) 64  (3) 60  (4) 62

143. The mode of the following data is

6, 9, 13, 10, 16, 13, 13, 14, 15, 11, 13, 12, 14

(1) 11  (2) 12  (3) 13  (4) 14

144. If \( \sigma \) is the standard deviation of \( x_1, x_2 \ldots x_n \), then the standard deviation of \( 9 + 3x_1, 9 + 3x_2, \ldots, 9 + 3x_n \) is

\[ 9 + 3x, 9 + 3x_2, \ldots, 9 + 3x_n \]

(1) \( 3\sigma - 3 \)  (2) \( \sqrt{9\sigma^2 + 3} \)
(3) \( 3\sigma \)  (4) \( 3\sigma + 9 \)

145. The variance of the first \( n \) even natural numbers is

\[ \frac{n^2 - 1}{3} \]

(1) \( \frac{n^2 - 1}{3} \)  (2) \( \frac{n^2 - 1}{6} \)
(3) \( \frac{n^2 - 1}{12} \)  (4) \( \frac{n^2 + 1}{3} \)

146. The mean of the first \( n \) odd natural numbers is

\[ \frac{n + 1}{2} \]

(1) \( n - 1 \)  (2) \( n + 1 \)
(3) \( n + 2 \)  (4) \( n \)
147. A number is selected at random from the first 80 natural numbers. The probability that it is divisible by 4 or 6 is

\[
\begin{align*}
(1) & \quad \frac{23}{80} \\
(2) & \quad \frac{29}{80} \\
(3) & \quad \frac{27}{80} \\
(4) & \quad \frac{33}{80}
\end{align*}
\]

148. Two fair dice are rolled. The probability that the sum of the numbers on the faces shown is 8 is

\[
\begin{align*}
(1) & \quad \frac{5}{36} \\
(2) & \quad \frac{1}{6} \\
(3) & \quad \frac{7}{36} \\
(4) & \quad \frac{1}{9}
\end{align*}
\]

149. The probability that either of the events A and B to happen is 0.6 and the probability that both of them to happen is 0.2. Then \(P(A') + P(B') = \)

(Here \(A'\) is the complementary event of \(A\).)

\[
\begin{align*}
(1) & \quad 0.4 \\
(2) & \quad 0.75 \\
(3) & \quad 0.8 \\
(4) & \quad 1.2
\end{align*}
\]

150. Suppose \(f(x) = (x - 2)(x - 5)(x - 7)\).

If a number \(\alpha\) is chosen from \{1, 3, 4, 5, 6, 7, 8, 9, 10\} randomly, the probability that it satisfies the equation \(f(\alpha) = 0\), is

\[
\begin{align*}
(1) & \quad \frac{1}{3} \\
(2) & \quad \frac{2}{5} \\
(3) & \quad \frac{3}{7} \\
(4) & \quad \frac{2}{9}
\end{align*}
\]
SECTION – C
Communication Ability

Questions : 50

PART – 1

Choose the correct meaning for the word given :

151. radical
   (1) extreme
   (2) red
   (3) colourful
   (4) slow

152. tether
   (1) teeth
   (2) together
   (3) restrain
   (4) free

153. synergy
   (1) combined size
   (2) joined effort
   (3) related parts
   (4) organized finances

154. pervade
   (1) conquer
   (2) escape
   (3) spread through
   (4) convince

155. nascent
   (1) smelly
   (2) fragrant
   (3) immune
   (4) incipient

156. vacuous
   (1) abandon
   (2) vacate
   (3) unavailable
   (4) expressionless

Fill in the blank choosing the correct word :

157. The rains ______ the fields, washing away the crops.
   (1) stormed
   (2) inundated
   (3) blew
   (4) covered

158. Due to the ongoing controversy the political situation in the state is ______.
   (1) upbeat
   (2) cosy
   (3) turbulent
   (4) sublime

159. England was a great ______ power in the nineteenth century.
   (1) merchant
   (2) army
   (3) mercantile
   (4) navy

160. The ______ mule would not pull the farmer’s plow.
   (1) rigid
   (2) sturdy
   (3) rugged
   (4) stubborn
161. The process of reviewing the performance of employees periodically is called
   (1) performance management (2) employee review
   (3) performance appraisal (4) employee confidential report

162. The interview conducted in a situation not quite pleasant or comfortable to the candidate is called
   (1) unstructured interview (2) depth interview
   (3) stress interview (4) distress interview

163. The medium of outdoor poster in which printed ad message is displayed is called
   (1) cutouts (2) POP
   (3) exhibit (4) bill board

164. A market which is dominated by a few suppliers is known as
   (1) perfect market (2) buyer's market
   (3) oligopoly market (4) monopolist market

165. PERT is
   (1) Programme Evaluation and Review Technique
   (2) Programme Education and Review Teaching
   (3) Programme Enlightenment and Review Technique
   (4) Progress Evaluation and Review Timing

166. Which of the following is used for modulation and demodulation?
   (1) Modern (2) Protocols
   (3) Gateway (4) Multiplexer

167. Linkage between CPU and users is provided by
   (1) storage (2) control unit
   (3) peripheral devices (4) software

168. In a computer system, which device is functionally opposite of a keyboard?
   (1) mouse (2) track ball
   (3) printer (4) pen drive

169. The first mechanical computer designed by Charles Babbage was called
   (1) Abacus (2) Processor
   (3) Calculator (4) Analytical Engine

170. Which of the following is an example of non-volatile memory?
   (1) ROM (2) VLSI
   (3) LSI (4) RAM
PART – 3

Choose the correct answer:

171. A: “There, that’s what you looked like when you were a month old.”
   B: “How awful!”
   In this conversation ‘B’
   (1) is pleased                    (2) is disappointed
   (3) is unhappy                    (4) thinks he looked ugly

172. A: “Could I borrow some money from you?”
   B: “What do you need it for?”
   The conversation implies that ‘B’
   (1) is dodging the issue          (2) is angry
   (3) does not want to give money   (4) wants to know why ‘A’ needs money

173. “It was a knockout. Umesh saw stars in his eyes.”
   The speaker implies that Umesh.
   (1) is exuberant                  (2) is romantic
   (3) is dreaming                   (4) has fallen unconscious

174. The active form of the sentence ‘e-mails have been written by her’ is
   (1) she has written e-mails
   (2) she had written e-mails
   (3) write e-mails to her
   (4) she sent e-mails

175. A: “I’ve got a new job!”
   B: “Great! That should open doors for you.”
   ‘B’ implies that
   (1) ‘A’ can get more opportunities.
   (2) The job will be done outdoors.
   (3) The job will fetch a lot of money.
   (4) ‘A’ will be able to work well.

176. A: “There is a lot of disunity among the people.”
   B: I agree. Unity is the crying need of the hour.”
   ‘B’ implies that
   (1) there is no need for unity among the people.
   (2) there is an urgent need for unity among the people.
   (3) a plan may be made for achieving unity.
   (4) unity may be achieved by crying for it, hour by hour.

177. A: “I want to train myself in yoga practices.”
   B: “I want to follow suit.”
   ‘B’ implies
   (1) that he would put on a suit.
   (2) that he would follow anyone wearing a suit.
   (3) that he would imitate ‘A’.
   (4) that it does not suit his temperament to follow anyone.

Fill in the blanks with the appropriate phrase/verb/preposition:

178. Manish had a poor salary but he didn’t need much to ______.
   (1) live up                    (2) live on
   (3) live after                 (4) live in

179. Anthony ______ his wife to tell her that he would reach home late.
   (1) called up                   (2) called on
   (3) called at                  (4) called away

180. He has to ______ with the eccentricity of his boss.
   (1) put on                     (2) put up
   (3) put away                  (4) put in
181. Great people achieve what the others only dream _______.
   (1) by (2) of (3) with (4) out

182. She saved the child _______ drowning.
   (1) off (2) from (3) for (4) through

183. She’ll be fearful _______ that.
   (1) on (2) of (3) with (4) to

184. Being very tired _______ studying.
   (1) impinges (2) impeaches (3) inhibits (4) inculcates

185. They _______ cultivating the land for twenty years when they moved to the city.
   (1) had been (2) are (3) is (4) have been

PART-4

Read the following passage and answer questions 186-190:

After two decades of growing student enrollments and economic prosperity, business schools in the USA have started to face harder times. Only Harvard's MBA school has shown a substantial increase in enrollment in recent years. Both Princeton and Stanford have seen decreases in their enrollments. Since 1990, the number of people receiving MBA degrees has dropped about 3 percent to 75,000 and the trend of lower enrollment rate is expected to continue.

There are two factors causing this decrease in students seeking MBA degree. The first one is that many graduates of four year colleges are finding that an MBA degree does not guarantee a plush job on Wall Street or in other financial districts of major American cities. Many of the entry level management jobs are going to students graduating with Master of Arts degrees in English and humanities as well as those holding MBA degrees. Students have asked the question, "Is an MBA degree really what I need to be best prepared for getting a good job?" The second major factor has been the cutting of American payrolls and the lower number of entry-level jobs being offered. Business needs are changing, and MBA schools are struggling to meet the new demands.

186. Which of the following business schools has not shown a decrease in enrollment?
   (1) Princeton (2) Harvard (3) Stanford (4) Yale

187. What is the duration of an MBA degree?
   (1) 4 years (2) 3 years (3) 2 years (4) not mentioned in the text

188. What are the two causes of declining business school enrollments?
   (1) Lack of necessity for an MBA and an economic recession.
   (2) Low salary and foreign competition.
   (3) Declining population and low education standard.
   (4) Fewer MBA schools and higher tuition fees.

189. Which are the degrees preferred along with MBA for entry-level management jobs?
   (1) Post Graduation in Linguistics
   (2) Graduation in humanities
   (3) Masters programme in Arts and Literature
   (4) Master in English and Humanities

190. What should be done by business schools to change the situation?
   (1) Charge lower fee
   (2) Examine the changing needs of business
   (3) Change the curriculum
   (4) Improve placement procedure
Read the following passage and answer questions 191-195:

More businesses are addressing social issues through philanthropy. Companies donate a portion of their revenues to charities or a specific social cause. Education is known to be the favourite object for philanthropy in which 75 percent of companies are participating. Although the donations will help a good cause, many companies use philanthropy primarily to improve their reputation or get a tax deduction. Philanthropy is not limited to the mature markets in the West. In emerging markets philanthropy is even more popular. Asia’s millionaires committed 12 percent of their wealth for social causes. While millionaires in North America only contribute 8 percent and those in Europe 5 percent.

Although philanthropy helps society, we should never over estimate its socio-cultural impact. Recent growth in philanthropy is driven by the changes in the society. Even in a recession, 75 percent of Americans still donate to a social cause.

But philanthropy does not stimulate transformation in the society. Transformation in the society drives philanthropy. That is why addressing social issues with philanthropic activities will have a rather short-term impact.

A more advanced form of addressing social challenges is cause marketing – a practice where companies support a specific cause through their marketing activities.

191. Why do companies set aside money in their budget for charities?
   (1) It helps to reduce their tax liabilities.
   (2) People want to help others.
   (3) Companies do not want to attract attention.
   (4) It makes people in the company happy.

192. What is the change that is coming about now?
   (1) Marketing has become easier.
   (2) Companies have started earning more.
   (3) There are more advertising companies.
   (4) There is a growth in social awareness.

193. What is the most favourite area for donations from companies?
   (1) Healthcare
   (2) Education
   (3) Social Ethics
   (4) Public Relations

194. What according to the author, will have only a limited impact on the transformation of society?
   (1) Philanthropy
   (2) Social change
   (3) Recession
   (4) Marketing strategies

195. What is the main idea of this passage?
   (1) Philanthropy focuses only on education.
   (2) Western countries spend more than others on philanthropy.
   (3) Cause Marketing is a better form of marketing.
   (4) Companies donate some part of their income to charities.
Read the following passage and answer questions 196-200:

To many people growing old seems like the end game in chess: life winding down in a series of small moves with lesser pieces. As I age, I have discovered this is not true. I am not an elderly king stripped of my powers, reduced to a ragtag army of pawns. My life is not a defensive struggle of restricted options. Growing old is a game of nerve and imagination and excitement. The outcome is not now a matter of strength, although that still remains, but of faith and courage, hope and wisdom. The aging game is a sport for which childhood and youth and maturity are no more than a preparation. Its scope comes a surprise. It expands my life at a time when I expected it to diminish. It demands an excellence that no longer seemed necessary. It asks me to surpass what I did at the peak of my powers. Age will not accept second best. In the aging game I must be all ever I was and am yet to be. What has gone before is no more than a learning period. A breaking in. Age is the combat for which I was trained. Now I must take this person I have become and make each new day special. I must make good on the promise of every dawn I am privileged to see. Life goes from a minor to a major key. The game builds to a climax. Every move assumes importance. One feels like a virtuoso, the gifts we have been given, the powers that empower us, the marvels that make us marvellous, are evident as never before. The truth is that we have lost nothing. The problem is not that I am less than I was when young, it is that I am not more. It is past time to become my own person.

196. What does growing old mean to many people?
   (1) the end of the challenges  (2) mental degeneration  
   (3) lack of activity  (4) boredom

197. What does aging mean to the author?
   (1) to be negative  (2) to be positive  
   (3) to laze around  (4) to be depressed

198. What should aging lead to?
   (1) perfection  (2) death  
   (3) illness  (4) a marvellous existence

199. Why is the ‘aging game’ referred to as a ‘sport’?
   (1) Old people play games.  (2) Old age makes one young in spirit.  
   (3) Problems of old age have to be overcome.  (4) It is a game in which one loses or wins.

200. What does childhood and maturity prepare are for?
   (1) aging  (2) to face old age with hope and wisdom  
   (3) to rest in old age  (4) to be prepared for illness in old age