CHENNAI IAS ACADEMY – Vellore / 9043211 311 / 411

CHENNAI IAS ACADEMY
Vellore

TNPSC
GROUP – I,II,IIA,IV
Prelims & Mains

MATHS 5 YEARS PREVIOUS QUESTIONS with key answers

# 5, old by-Pass Road, National Theatre (Near- opp - Benzz Park) Vellore- 4

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http://www.trbtnpsc.com/2013/09/tnpsc-group-2-group-4-vao-exam-study.html
1. \( f(x) = \frac{1}{x^2} \) and \( g(x) = e^{-9x} \) then \((fog)(x)\) is.
   A) \( \frac{1}{e^{18x}} \)  
   B) \( \frac{1}{e^{-18x}} \)  
   C) \( \frac{1}{e^{-18x^2}} \)  
   D) \( \frac{1}{e^{18x^2}} \)

2. Standard deviation of a set of 50 observation is 6.5. If value of each observation is increased by 5, then the standard deviation is.
   A) 2.5  
   B) 1.5  
   C) 6.5  
   D) 1.0

3. What is the value of \( \left( 0.0104 - 0.002 \right) \times 0.12 \)?
   A) 0.1001  
   B) 0.1101  
   C) 0.12  
   D) 0.13

4. If \( A = \left[ \begin{array}{rr} 1 & 4 \\ 2 & -1 \end{array} \right] \), \( f(x) = -x^2 - 9 \), then \( f(A) \) is.
   A) \( \left[ \begin{array}{cc} 8 & 5 \\ 5 & -8 \end{array} \right] \)  
   B) \( \left[ \begin{array}{cc} 0 & 0 \\ 0 & 0 \end{array} \right] \)  
   C) -16  
   D) 12

5. A bought a horse for Rs.10,000 and sold it to B at 10% profit and B sold it to C at 10% loss. The amount paid by C is.
   A) Rs. 10,000  
   B) Rs.9,900  
   C) Rs.9,999  
   D) Rs.11,000

6. The packing fraction of a face centered cubic lattice is.
   A) 36%  
   B) 52%  
   C) 68%  
   D) 74%

7. A shopkeeper marks his goods to gain 30%. But he allows 10% discount for down cash payment. His profit per cent is.
   A) 20%  
   B) 17%  
   C) 15%  
   D) 13%

8. Function(s) of statistics is/are.
   A) Collection of data.  
   B) Compilation and tabulation of data.  
   C) Analysis of data  
   D) All of these.

9. The total expenditure of a family is Rs.1,080 and they are spending Rs.450, for food. Then to draw a pie diagram the degree value is.
   A) 1350  
   B) 864  
   C) 150  
   D) 100

10. Find out the missing observation of the following data with mean 5. 2,6,5,3,8,2,_, 9,7,7,6,4.
    A) 3  
    B) 2  
    C) 1  
    D) 0

11. Relative frequency is defined as.
    A) \( \frac{\text{Total frequency}}{\text{Class frequency}} \)  
    B) \( \frac{\text{Class frequency}}{\text{Total frequency}} \)  
    C) \( \frac{\text{Class frequency} \times 100}{\text{Total frequency}} \)  
    D) None of these

12. Marks obtained by 7 students in computer science are 45,40,60,90,80,65,55. The median value for the data is.
    A) 90  
    B) 60  
    C) 80  
    D) 55.
13. Given the following:

<table>
<thead>
<tr>
<th>Cause of Accident</th>
<th>Fire</th>
<th>Traffic</th>
<th>Falls</th>
<th>Burns</th>
<th>Falling objects</th>
<th>Misc</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Of. Accident</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>15</td>
<td>35</td>
<td>5</td>
</tr>
</tbody>
</table>

The suitable diagram for the above data is
A) Bar – diagram   B) Histogram   C) Pei- diagram   D) Squares

14. The table below gives the distribution of the age of women at the time of marriage:

<table>
<thead>
<tr>
<th>Age group (in years)</th>
<th>No. of women</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 - 19</td>
<td>11</td>
</tr>
<tr>
<td>20 - 24</td>
<td>36</td>
</tr>
<tr>
<td>25 - 29</td>
<td>28</td>
</tr>
<tr>
<td>30 - 34</td>
<td>13</td>
</tr>
<tr>
<td>35 - 39</td>
<td>8</td>
</tr>
<tr>
<td>40 - 44</td>
<td>3</td>
</tr>
<tr>
<td>44 - 49</td>
<td>2</td>
</tr>
</tbody>
</table>

The given distribution is.
A) Not continuous   B) Continuous.  
C) Cumulative distribution   D) Smoothened distribution

15. Consider the following Statements:
Assertion (A) : Diagrams can be used for comparison only.
Reason (R) : Diagrams cannot study mathematical relationship.
Now select your answer according to the coding scheme given below:
A) Both (A) and (R) are true
B) (A) is true, but (R) is false.
C) (A) is false, but (R) is true
D) Both (A) and (R) are false.

GROUP – I PRELIMS - 2014

16. _______ is the binary equivalent of \((12)_{10}\)
(A) 0001 0010   (B) 1100   (C) 1101   (D) 1010

17. From the following graph which of the following years was the ratio of income to expenditure the minimum.
18. The mean of 5 observations is 25, if one of the observation is excluded the mean becomes 20. The excluded number is.

(A) 45  (B) 40  (C) 20  (D) 10

19. The mean of first five prime number is.

(A) 5.0  (B) 4.5  (C) 5.6  (D) 6.5

20. If ‘l’ is the standard deviation of the elements $\alpha, \beta, \gamma$. Then the standard deviation of the elements $\alpha + 3, \beta + 3, \gamma + 3$ is

(A) 1 + 3  (B) 1 – 3  (C) 1  (D) 3l

21. If the arithmetic mean of 7, 5, 13, x and a be 10, then the value of x is.

(A) 10  (B) 16  (C) 12  (D) 15

22. If $\frac{P}{Q} = \frac{1}{3}$ then $\frac{27P - 34Q}{36P - 3Q}$ is

(A) $\frac{14}{3}$  (B) $\frac{-14}{3}$  (C) $\frac{-25}{9}$  (D) $\frac{25}{9}$

23. In 2013, the population of a town is 1, 25,000. If it is increased by 7% in the next year. Find the population in 2014.

(A) 8750  (B) 1,33,750  (C) 1,16,250  (D) 1,25,000

24. Salaries of Ravish and Sumita are in ratio 2:3. If the salary of each is increased by Rs.4,000, the new ratio becomes 40:57. What is Sumita’s present salary?

(A) Rs.32,000  (B) Rs.34,000  (C) Rs.38,000  (D) Rs.40,000

25. Which is largest in 28%, 2.8%, $\frac{2}{9}$ and 0.25?

(A) 28%  (B) 2.8%  (C) $\frac{2}{9}$  (D) 0.25

26. A horse and two cows together cost Rs. 680. If a horse cost Rs.80 more than a cow then the ratio of cost of horse and cow is.

(A) 7:5  (B) 5:7  (C) 8:9  (D) 9:8

27. $\frac{1}{4}$ of $\frac{2}{5}$ of a number is 54. Then the number is.

(A) 280  (B) 300  (C) 320  (D) 350

28. If $A:B = \frac{1}{3} : \frac{4}{7}, B:C = \frac{5}{6} : \frac{7}{12}, C:D = \frac{2}{7} : \frac{5}{14}$ then $A:B:C:D$ is

(A) 40:28:35:30  (B) 30:40:28:35  (C) 28:30:40:35  (D) 35:30:28:40

29. If $(3x+2y):(3x-2y) = 5:2$. Then $x:y$ is.

(A) 5:2  (B) 14:9  (C) 9:14  (D) 2:5

30. A rectangular carpet has an area of 60sq.m. Its diagonal and longer side together equals 5 times the shorter side. The length of the carpet is

(A) 5 m  (B) 12 m  (C) 13 m  (D) 14.5 m

31. The number of small cubes with edge 10 cm that can be accommodated in a cubical box of edge 1 m is

(A) 10  (B) 100  (C) 1000  (D) 10000

32. The diameter of a sphere is 6cm. It is melted and drawn into a wire of diameter 2mm. The length of the wire is.

(A) 12 m  (B) 18 m  (C) 36 m  (D) 66 m
33. A uniform circular path of width 4 m is laid out around a circular park of radius 48 m. Find the area of the circular path.
   (A) 1256 m$^2$  (B) 1255 m$^2$  (C) 400 m$^2$  (D) 1254 m$^2$

34. If B = 2, BALL = 27 then BOOK =?
   (A) 40  (B) 41  (C) 42  (D) 43

35. Find the missing number:

```
7   3   ?
11  27  5
2   7   14
9   4   6
```
   (A) 10  (B) 9  (C) 8  (D) 7

36. Three view of a cube are given below. What is the letter opposite to A?

(A) H  (B) P  (C) B  (D) M

37. If
   1. Rama scored more than Rani.
   2. Rani scored less than Rathna.
   3. Rathna scored more than Rama and.
   4. Ramya scored more than Rama but less than Rathna then who scored the highest?
   (A) Rama  (B) Rani  (C) Rathna  (D) Ramya.

38. If $8 - 5 \times 4 = 44$ and $15 - 3 \times 3 = 48$ then $16 - 4 \times 5 = ?$
   (A) 0  (B) 69  (C) 20  (D) 25

39. Find the next diagram:

```
A)   B)   C)   D)
     .   .   .   .
     o   o   o   o
     o   o   o   o
```

40. If the sum of two numbers is 1020 and their difference is 140 then the numbers are.
   (A) 680,440  (B) 540,580  (C) 580,440  (D) 520,500

41. Monthly expenditure of a person whose monthly salary is 9000 is as shown in the diagram. The percentage of money spent for medical expenses is.
   Food expenses 144°
   Savings 36°
   108° Other Expenses
   72° Medical expenses

   (A) 10%  (B) 20%  (C) 30%  (D) 40%

42. The value of $\frac{2.48 \times 2.48 - 1.52 \times 1.52}{0.96}$ is
   (A) 4.0  (B) 4.4  (C) 1.4  (D) 1.0

43. If $2^{x+y} = 2^{x-y} = 16$ then $y$ is
   (A) 2  (B) 4  (C) 0  (D) 1

44. If $x+y=12, xy=32$ then $\frac{1}{x} + \frac{1}{y}$ is
   (A) $\frac{1}{8}$  (B) $\frac{1}{2}$  (C) $\frac{1}{4}$  (D) $\frac{3}{8}$

45. $1 + \frac{1}{5} \times \frac{6\frac{3}{10} - \frac{2}{9}}{5} = ?$
   (A) 1  (B) 0  (C) 2  (D) $\frac{1}{2}$

46. By selling an article for Rs.480, a person lost 20% for what amount should he sell it to make a profit of 20%?
   (A) Rs.800  (B) Rs.760  (C) Rs.720  (D) Rs.680

47. The highest common factor and lowest common multiple of two numbers are 12 and 144 respectively. If one number is 36. Find the other number.
   (A) 49  (B) 50  (C) 36  (D) 48

48. Three numbers are in the ratio 3:4:5 and their LCM is 240. Then the HCF of these numbers is.
   (A) 4  (B) 8  (C) 12  (D) 20

49. LCM of two numbers is 14 times their HCF. The sum of LCM and HCF is 600. If one number is 280 then the other number is.
   (A) 40  (B) 60  (C) 80  (D) 100

50. The compound interest on Rs.30,000 at 7% per annum is Rs.4,347. The period in years is
   (A) 2  (B) $2\frac{1}{2}$  (C) 3  (D) 4
51. A sum of money doubles itself in 20 years in simple interest. Then the rate of interest per annum is.
   (A) 5%  (B) 4%  (C) 5.5%  (D) 4.5%

52. The difference between compound interest and the simple interest on Rs.1,250 for 2 years at 8% is
   (A) Rs. 2  (B) Rs.4  (C) Rs.6  (D) Rs.8

53. A flower garden is in the shape of a rhombus. The length of its diagonals is 18m and 25m. Find the area
   of the flower garden.
   (A)450m²  (B) 225m²  (C)324m²  (D) 18m²

54. If a square and a rhombus stand on the same base, then the ratio of the area of the square and the
   rhombus is
   (A) Greater than 1  (B) equal to 1  (C) equal to 1/2  (D) equal to 1/4

55. Two taps A and B can fill a tank in 10 hours and 15 hours respectively. Both the taps are opened for 4
   hours and then B is turned off. The time taken by A to fill the remaining tank is.
   (A)12 5/10 hours  (B) 13 1/10 hours  (C) 6 hours  (D) 16 2/3 hours

56. A and B can do a work in 12 days B and C can do it in 15 days C and A can do it in 20 days. Then the
   number of days required to complete the work A, B, C together is.
   (A)5  (B) 10  (C) 15  (D) 20

57. If 9 girls can prepare 135 garlands in 3 hours, number of girls to prepare 270 garlands in 1 hour is.
   (A) 20  (B) 54  (C) 43  (D) 19

58. The sum of numbers common to two diagram is
   (A)118  (B) 110  (C) 108  (D) 130

59. (1) D is taller than C but not as tall as B.
    (2) C is taller than A.
    Who among A, B, C and D is the tallest?
    (A) A  (B) B  (C) C  (D) D

60. Find the next diagram:
61. Find the missing number in the following series:
1, 8, 9, 64, 25, ?, 49.
(A) 210  (B) 212  (C) 214  (D) 216

62. Among the 50 students in a class, what percentage of students biology and chemistry?

<table>
<thead>
<tr>
<th>Subjects</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>6</td>
</tr>
<tr>
<td>Physics</td>
<td>12</td>
</tr>
<tr>
<td>Chemistry</td>
<td>15</td>
</tr>
<tr>
<td>Biology</td>
<td>8</td>
</tr>
<tr>
<td>Computer science</td>
<td>9</td>
</tr>
</tbody>
</table>

A) 64%  B) 46%  C) 23%  D) 77%

63. For any n observation of data, what is the value of \((\bar{x} - n \bar{x})\)?
(A) \(n(\bar{x})\)  (B) \((n-2) \bar{x}\)  (C) \((n-1) \bar{x}\)  (D) 0

64. Simplify: \(\frac{0.728 \times 0.728 - 0.272 \times 0.272}{0.456}\)
(A) 0.456  (B) 1  (C) 0.728  (D) 0.272

65. If \(\frac{x}{y} = \frac{3}{5}\), then \(\frac{5x+2y}{5x-2y}\) is equal to.
(A) 3  (B) 5  (C) \(\frac{2}{5}\)  (D) \(\frac{5}{2}\)

66. A Person’s present age is two-fifth of the age of his mother. After 8 years, he will be one half of the age of his mother. How old is the mother at present?
(A) 42  (B) 40  (C) 45  (D) 48

67. Find the value of \(\frac{1.2 \times 1.2 \times 1.2 - 0.2 \times 0.2 \times 0.2}{1.2 \times 1.2 + 1.2 \times 0.2 + 0.2 \times 0.2}\)
(A) 1.2  (B) 1  (C) 0.2  (D) 1.4

68. A bicycle marked at Rs.1, 500 is sold for Rs.1, 350. What is the percentage of discount?
(A) 12  (B) 15  (C) 11  (D) 10

69. Which one of the following is the smallest ratio?
7:13, 17:25, 7:15, 15:23
(A) 7:13  (B) 17:25  (C) 7:15  (D) 15:23

70. In a mixture of 60 litres, the ratio of milk and water is 2:1. If this ratio is to be 1:2 then what is the quantity of water to be further added?
(A) 20 L  (B) 30L  (C) 50 L  (D) 60 L
71. Two numbers are in the ratio 3:5. If 9 be subtracted from each, then they are in the ratio 12:23. Find the second number.
   A) 52  B) 53  C) 54  D) 55

72. Sum of square of three positive numbers is 608 and they are in the ratio 2:3:5. Then find the numbers.
   A) 6,9,15  B) 8,12,20  C) 10,15,25  D) 14,21,35

73. If 30% of A = 0.25 of B = \frac{1}{5} of C, then find the ratio A:B:C
   A) 15:12:10  B) 12:15:10  C) 10:12:15  D) 10:15:12

74. What is the third proportional to 0.034 and 0.50?
   A) 0.74  B) 0.75  C) 0.76  D) 0.77

75. In a cylinder, if radius is doubled and height is halved then what happens to the curved surface area?
   A) Halfed  B) Doubled  C) Does not change  D) Four times

76. The length of side of a rhombus is 5 m and one of its diagonal is 8m. Then what is the length of other diagonal?
   A) 5m  B) 7m  C) 6m  D) 8m

77. A, B and C can complete a piece of work in 24, 6 and 12 days respectively. If they work together, in how many days they will complete the same work?
   A) \frac{1}{24} day  B) \frac{7}{24} day  C) 24/7 days  D) 24/11 days

78. 12 men complete the 2400 sq.m ploughing work in 10 days. How many men are required to complete 3600 sq.m ploughing work in 18 days?
   A) 10 men  B) 15 men  C) 18 men  D) 20 men

79. 2 men and 7 boys can do a piece of work in 14 days. 3 men and 8 boys can do the same in 11 days. In how many days, 3 times the work can be completed by 8 men and 6 boys?
   A) 21 days  B) 18 days  C) 24 days  D) 36 days.

80. The length and height of a hall are 8m, 10m, 4m, respectively and the hall has one door of area 3m × 1.5m. find the cost of painting the walls at the ratio of Rs.200 per square metre.
   A) Rs. 28,800  B) Rs.59,900  C) Rs.27,900  D) Rs.60,800

81. If the capacity of a cylindrical tank is 1848 m³ and the diameter of its base is 14m, then find the depth of the tank?
   A) 12m  B) 14m  C) 15m  D) 18m

82. The length of a chain used as the boundary of a semicircular park is 72m. What is the area of the park?
   A) 77 m²  B) 91 m²  C) 126m²  D) 308 m²

83. Find the least number which when divided by 5, 6, and 7 and 8 leaving a remainder 3, but when divided by 9 leaves no remainder.
   A) 1677  B) 1683  C) 2523  D) 3363

84. Find the next number in the following series. 4,6,9,13 \frac{1}{2}
   A) 20\frac{1}{4}  B) 22\frac{1}{4}  C) 19  D) 17 \frac{1}{2}

85. If the time taken by a cup of tea to cool from 85°C to 75 °C is 1 minute, then time taken by it cool form 65°C to 55 °C is
   A) 50 Seconds  B) exactly 1 minute  C) more than 1 minute D) 30 Seconds
86. What is the standard deviation of the first n natural numbers?
   A) \( \sqrt{\frac{n^2-1}{12}} \)  
   B) \( \sqrt{\frac{n^2+1}{12}} \)  
   C) \( \sqrt{\frac{n(n+1)}{2}} \)  
   D) \( \sqrt{\frac{n(n+1)(2n+1)}{6}} \)

87. In the series.
   6 4 1 2 8 7 4 2 1 5 3 8 6 2 1 7 1 4 1 3 2 8 6
   How many pairs of alternate numbers have a different of 2?
   A) 2  
   B) 4  
   C) 6  
   D) 8

88. If + means \( \times \), \( \times \) means -, \( \div \) means + and – means \( \div \) then what is the value of
   \( (175 - 25) \div (5+20) \times (3+10) \)
   A) 265  
   B) 78  
   C) 77  
   D) 354

89. In a geometric series, if the fourth term is \( \frac{2}{3} \) and seventh term is \( \frac{16}{01} \), then what is the first term of the series?
   A) \( \frac{2}{3} \)  
   B) \( \frac{4}{9} \)  
   C) \( \frac{8}{27} \)  
   D) \( \frac{9}{7} \)

90. Find the percentage increase in the area of a triangle if its each side is doubled.
   A) 100%  
   B) 200%  
   C) 300%  
   D) 400%

91. The sequence follows a regular pattern. Find the correct letter for question mark, to complete the sequence. C E I K O Q?
   A) R  
   B) S  
   C) T  
   D) U

92. Find the Least Common Multiple of \( \frac{4}{5} \), \( \frac{3}{10} \) and \( \frac{7}{15} \).
   A) \( \frac{94}{5} \)  
   B) \( \frac{5}{84} \)  
   C) \( \frac{2}{15} \)  
   D) \( \frac{12}{15} \)

93. Three numbers are in the ratio 1:2:3. Their highest common factor is 12. Find the numbers.
   A) 12,24,36  
   B) 24,48,72  
   C) 12,24,48  
   D) 48,60,72

94. If the two numbers are in the ratio of 2:3 and the product of their highest common factor and least common multiple is 150, then find the sum of the numbers.
   A) 5  
   B) 10  
   C) 20  
   D) 25

95. Alex invested an amount of Rs.8,000 in a fixed deposit scheme for 2 years at compound interest rate 5% per annum. How much amount will Alex get on maturity of the fixed deposit?
   A) Rs.8,600  
   B) Rs.8,620  
   C) Rs.8,820  
   D) Rs.8,840

96. The different between the compound interest and simple interest on a certain sum at 8% per annum for 2 years is Rs.240. Find the sum.
   A) Rs.35,000  
   B) Rs.35,700  
   C) Rs.37,500  
   D) Rs.40,000

97. If the rate of simple interest is 12% per annum, then find the amount that would get interest of Rs.6,000 per annum.
   A) Rs.82,000  
   B) Rs.50,000  
   C) Rs.72,000  
   D) Rs.45,000

98. Three solid metal cubes, whose edges are 6 cm,8cm and 10 cm are melted and a new cube is made. Find the length of edge of the new cube.
   A) 12cm  
   B) 24 Cm  
   C) 20 Cm  
   D) 48 cm

99. Find the number in the place of question mark:
   21,25,34,50,?,111,160
100. A can do a work in 10 days and B can do the same work in 15 days. They earn Rs.1,500 together. How will they share this amount?
   A) Rs.850 and Rs.650  
   B) Rs. 900 and Rs.600  
   C) Rs. 950 and Rs.550  
   D) Rs.1,000 and Rs.500

101. If 6 men and 8 boys can do a piece of work in 10 days while 26 men and 48 boys can do the same work in 2 days, then what is the time taken by 15 men and 20 boys to complete the same type of work?
   A) 4 days  
   B) 5 days  
   C) 6 days  
   D) 7 days.

102. A plot of land is in the form of a quadrilateral where one of its diagonals is 100 m long. If two vertices on either side of this diagonal are 50 m away from the diagonal. Find the area of the plot of land.
   A) 5000 m$^2$  
   B) 1000 m$^2$  
   C) 10000 m$^2$  
   D) 500 m$^2$

103. If “NOIDA” is written as 39658, how will “INDIA” be written?
   A) 36568  
   B) 63568  
   C) 63569  
   D) 65368

104. Read the following statements:
   1. Either A and B are of the same age or A is older than B.
   2. Either C and D are of the same age or D is older than C.
   3. B is older than C.

Which one of the conclusions can be drawn from the above statements?
   A) A is older than C  
   B) D is older than C  
   C) A is older than B  
   D) B and D are of the same age.

105. The minute hand of a circular clock is 14 cm long and that of hour hands is 7 cm. Find how far does the tip of the minute and hour hand move in 30 minutes?
   A) 88 cm, 3.66 cm  
   B) 22 cm, 0.915 cm  
   C) 44 cm, 1.83 cm  
   D) 1.83 cm, 88 cm

106. A heap of paddy is in the form of a right circular cone whose diameter is 4.8 m and height 1.8 m. If the help is to be covered exactly by a canvas to protect it from rain, find the area of the canvas required.
   A) 22.6 m$^2$  
   B) 27.2 m$^2$  
   C) 13.6 m$^2$  
   D) 11.3 m$^2$

107. If $a^x=b$, $b^y=c$, $c^z=a$, then what is the value of xyz?
   A) 3  
   B) 4  
   C) 9  
   D) 1
1. A man earns Rs. 28,000 as monthly salary. His expenditure and savings are given in the diagram. The percentage of savings compared to foods.
2. The minimum no. of square size tiles to fill the floor of a room measuring \(9m \times 6 \frac{2}{5}m\) is
   A) 1240  B) 1400  C) 1440  D) 1660

3. Ogive can be used to obtain
   A) Percentiles  B) Mean deviation  C) Skewness  D) correlation

4. Of the three numbers, the second is half of the first and the third is three times the first. If the average of the three numbers is 27. The smallest numbers.
   A) 10  B) 9  C) 8  D) 18

5. The three quartiles of a frequency distribution of marks obtained by male students are 20, 40 and 50. The coefficient of quartile deviation is _______
   A) 1/3  B) 1/9  C) 3/7  D) 15

6. How many students does not like chemistry?

<table>
<thead>
<tr>
<th>Subject</th>
<th>No. of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
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<tr>
<td>Physics</td>
<td>12</td>
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<tr>
<td>Chemistry</td>
<td>15</td>
</tr>
<tr>
<td>Biology</td>
<td>8</td>
</tr>
<tr>
<td>Computer science</td>
<td>9</td>
</tr>
</tbody>
</table>

   A) 32  B) 35  C) 41  D) 42

7. The length of CD is
   A) 6  B) 9  C) 12  D) 8

GROUP – II - 2013

8. Find the missing number in the place?

   \[
   \begin{array}{cccc}
   5 & 13 & 25 & \? \\
   2 & 3 & 4 & 5
   \end{array}
   \]

   A) 41  B) 35  C) 30  D) 28
9. Find the missing term

\[
\begin{array}{ccc}
5 & 3 & 26 \\
2 & 4 & \hline \\
\end{array}
\quad \begin{array}{ccc}
4 & 2 & \hline \\
5 & 8 & \hline \\
\end{array}
\quad \begin{array}{ccc}
3 & 1 & \hline \\
8 & ? & \hline \\
\end{array}
\]

A) 12  B) 18  C) 16  D) 24

10. A sum was put at simple interest at a certain rate for 2 years. Had it been put at 3% higher rate, it would have fetched Rs. 300 more. Find the sum.

A) Rs. 5,000  B) Rs. 4,000  C) Rs. 10,000  D) Rs. 1,000

11. A and V can do piece of work in 10 days. B and C in 15 days. C and A in 18 days. In how many days can B alone do it?

A) 30 days  B) 20 days  C) 12 days  D) 18 days

12. In a certain code, LABOUR is written as KBAPTS. How is CANDID written in that code?

A) DBOEJE  B) BBMCHC  C) DZOCJC  D) BBMEHE

13. If the radius of a circle is increased by 25% then its area is increased by

A) 50%  B) 25%  C) 56.25%  D) 46.25%

14. In a mixture of 28 liters, the ratio of milk and water is 5:2 litres of water is added to the mixture, find the ratio of milk and water in the new mixture.

A) 2:1  B) 1:2  C) 2:3  D) 1:3

15. A, B and C together can finish a piece of work in 4 days. A alone can do in 12 days and B alone in 18 days. How many days will be taken by C to do it alone?

A) 10 days  B) 12 days  C) 9 days  D) 18 days

16. Find the value of \(58 + \sqrt{31 + \sqrt{21 + \sqrt{11 + \sqrt{25}}}}\)

A) 7  B) 8  C) 9  D) 6

17. 5% income of X is equal to 15% income of Y and 10% income of Y is equal to 20% income of Z. If income of Z is Rs. 3,000 then total income of X, Y and Z Rupees is

A) 18,000  B) 12,000  C) 27,000  D) 16,000
18. From the following graph, find the percentage of increase in the from 2004 to 2005

A) 20%  B) 50%  C) 66 2/3%  D) 71 2/3%

19. One litre of water is added to 5 liters of a 20% solution of alcohol in water. The strength of alcohol in the new solution is
A) 16 2/3%  B) 15%  C) 20%  D) 16%

20. If the cost of 12 Articles is equal to the selling price of 10 Articles, the profit percent in the transaction is
A) 48%  B) 16 2/3%  C) 20%  D) 25%

21. The difference between the present ages of P and Q is 8 yrs and the ratio of their present ages is 2:3 respectively. What is P’s Present age?
A) 16 years  B) 24 years  C) 12 years  D) 30 years

22. Divide Rs. 680 among A,B,C so that a gets 3 times more to B and B gets 4 times to C
A) Rs.160, Rs.40, Rs.480  B) Rs. 480, Rs.160, Rs.40
C) Rs. 480, Rs.40, Rs.160  D)Rs.160, Rs.480, Rs.40

23. The length, breadth and height of a room are respectively 12 metres, 9 metres and 6 metres. How many cubic boxes are needed to fill the room if the side of each box is 1.5 metres?
A) 1072  B) 648  C) 324  D) 192

24. Find the next figure in the given sequence:

A)  B)  C)  D)

25. If A’s height is 25% less than that of B, then how much percent is B, height more than that of A?
A) 50%  B) 45%  C) 22 ½%  D) 33 1/3%
26. Five articles A, B, C, D and E are priced differently and the value of C is Rs. 100. If “A” is cheaper than C but costlier than B and “E is costlier than C but cheaper than D” then which of the article is the costliest?
A) B  B) C  C) D  D) E

27. Find the next figure in the given sequence:

A) \( \diagup \)  B) \( \diagup \diagup \)  C) \( \diagup / \)  D) \( \diagup / / \)

28. The circle graph given shows the spending of a family on various items and its savings during a year. If the total income of the family is Rs. 75,000, then the expenditure on Education was:

A) Rs.7,500  B) Rs.8,000  C) Rs.8,500  D) Rs.9,000

29. A, B, C at the same time in the same direction to run a round a rectangular garden. A completes a round in 252 seconds. B in 308 seconds and C in 198 seconds starting at the same point. After what time will they meet again at the starting point?
A) 20 minutes 18 seconds  B) 40 minutes 20 seconds  C) 46 minutes 12 seconds  D) 30 minutes

30. Find the greatest number which will divide 2112 and 2792 leaving the remainder 4 in each case
A) 63  B) 64  C) 68  D) 78

31. Rs.800 amounts to Rs.920 in 3 years at simple interest. If the interest rate is increased by 3% it would amount to
A) Rs.1,092  B) Rs.992  C) Rs.1,882  D) Rs.1,182

32. A table is sold for Rs. 414 at a profit of 15%. How much did it cost?
A) Rs. 400  B) Rs.314  C) Rs.326  D) Rs.360
33. If ‘HYDROGEN’ is represented as JCJZYSSD, how “ANTIMONY” will be represented as.
   A) CPVKOQPA   B) CRZQWABO   C) ERXMQSRC   D) GTZOSUTE.

34. Arrange in descending order:
\begin{align*}
\sqrt{12}, \sqrt{20}, \sqrt{25}, \sqrt{80}, \sqrt{112} \\
A) \sqrt{80}, \sqrt{12}, \sqrt{20}, \sqrt{25}, \sqrt{112} \\
B) \sqrt{80}, \sqrt{12}, \sqrt{20}, \sqrt{112}, \sqrt{25} \\
C) \sqrt{12}, \sqrt{80}, \sqrt{20}, \sqrt{25}, \sqrt{112} \\
D) \sqrt{25}, \sqrt{112}, \sqrt{12}, \sqrt{80}, \sqrt{20}
\end{align*}

35. Find the range of the following data:
\begin{align*}
25.67, 78, 43, 21, 17, 49, 54, 76, 92, 20, 45, 86, 37, 35 \\
A) 78   B) 75   C) 92   D) 86
\end{align*}

36. A is B's sister, C is B's mother, D is C's father, E is D's mother. Then, A is the ________ of D.
   A) Grand mother   B) Grand father   C) Daughter   D) Grand daughter.

37. A is richer than B, C is richer than A, D is richer than C, E is the richest of all. If they are made to sit in
   the above degree of richness, who will have the central position?
   A) A   B) B   C) C   D) D

38. A hollow cylindrical iron pipe is of length 35 cm. Its outer and inner diameter are 10 cm and 8 cm
   respectively. Find the weight of the pipe if 1 cu.cm of iron weights 7 gm.
   A) 6.93 kg   B) 9.90 kg   C) 7.53 kg   D) 7.93 kg

39. Find the missing term in the given alphabet series. AZ, GT, MN, ______, YB.
   A) JH   B) SH   C) SK   D) TS

40. 7 men can complete a work in 52 days. In how many days will 13 men finish the same work?
   A) 20 days   B) 13 days   C) 7 days   D) 28 days

41. If \( \frac{a}{b} = \frac{9}{5} \) then \( \frac{a+b}{a-b} = ? \)
   A) \( \frac{3}{7} \)   B) \( \frac{7}{3} \)   C) \( \frac{2}{7} \)   D) \( \frac{7}{2} \)

42. Find the LCM of 4\(^{12}\), 4\(^{-81}\), 4\(^{12}\), and 4\(^{7}\).
   A) 4\(^{12}\)   B) 4   C) 4\(^{2}\)   D) 4\(^{-2}\)

43. Find the missing number in the following:
   \begin{align*}
4242, 4254, 4266, 4218, 4278, \_____ \\
A) 4264   B) 4272   C) 4228   D) 4206
\end{align*}

44. The average of 4 values is 20 and when a quantity is added to each value the average is 22. Find the
   quantity.
   A) 1   B) 2   C) 3   D) 4

45. If \( x + \frac{1}{x} = 2 \), find the value of \( x^3 + \frac{1}{x^3} \).
   A) 1   B) 2   C) 3   D) 4

46. Find the HCF of \( \frac{4}{9}, \frac{2}{5}, \frac{6}{8}, \frac{2}{5} \)
47. Find the principal that yield a compound interest of Rs.1,632 in 2 years at 4% rate of interest per annum.
   A) Rs.10,000  B) Rs.20,000  C) Rs.30,000  D) Rs.40,000

48. Mohan started from point P and walked 2 m towards west. He then took a right turn and walked 3m before taking a left turn and walked 5m. He finally took a left turn, walked 3 m and stopped at a point Q. How far is point Q from point P?
   A) 2 m  B) 6m  C) 7m  D) 8m

49. Richard is fifteenth from the front in a column of boys. There were thrice as many behind him as there were in front. How many boys are there between Richard and the seventh boy from the end of the column?
   A) 33  B) 31  C) 35  D) 36

50. If 12 compositors can compose 60 page of a book in 5 hours, how many compositors will compose 200 pages of the book in 20 hours?
   A) 8  B) 10  C) 12  D) 14

51. If the length of a rectangle is decreased by 50% and the breadth is increased by 80%, then the % change in the area of rectangle is.
   A) Decreased by 10%  B) Increased by 10%
   C) Decreased by 20%  D) Increased by 20%

52. The difference between simple and compound interest for a sum of Rs.5,000 lent at 12% per annum in 2 years is.
   A) Rs.720  B) Rs. 12  C) Rs. 72  D) Rs.700

53. What percent is 20 paise of 5 rupees 80 paise?
   A) $\frac{213}{29}\%$  B) $\frac{13\%}{29}$
   C) $\frac{413\%}{29}$  D) $5\frac{13\%}{29}$

54. A voluntary organization planted a total of 106 trees along the road side. Some of the trees were fruit bearing trees. If the number of non-fruit bearing trees was two more than thrice the number of fruit bearing trees, what was the number of fruit bearing trees planted?
   A) 20  B) 22  C) 24  D) 26

55. If “ORIENT” is written as “532146” and “SOUL” is “7598”, how will you write “LINE”?
   A) 9241  B) 6341  C) 8241  D) 6241

56. If 7 is related to 56 then 10 is related to.
   A) 74  B) 64  C) 50  D) 90
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TNPSC - GROUP - II PRELIMS - PREVIOUS YEAR KEYS - MATHS
1. Find the missed figure is the sequence.
   1) 2) 3) 4) ? 5)

2. Arrange the given words in a meaningful sequence:
   A) 1,3,4,2 B) 2,1,4,3 C) 2,3,1,4 D) 4,3,2,1

3. 30 percent of a number is 15 less than 3/5th of that number. What is the number?
   A) 48 B) 52 C) 50 D) 70

4. When a number is divided by 13, the remainder is 11. When the same number is divided by 17, the remainder is 9. Then the number is.
   A) 339 B) 369 C) 349 D) 359

5. The following table gives the life time of 500 CFL lamps:

<table>
<thead>
<tr>
<th>Life time (months)</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>More than 14</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of lamps</td>
<td>26</td>
<td>71</td>
<td>82</td>
<td>102</td>
<td>89</td>
<td>53</td>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>

A bulb is selected at random. The probability that the life time of the selected bulb is atmost 11 months is given by.
   A) \( \frac{82}{500} \) B) \( \frac{179}{500} \) C) \( \frac{97}{500} \) D) \( \frac{268}{500} \)

6. If 7 Spiders make 7 webs in 7 days, then 1 spider will make 1 web in how many days?
   A) 1 B) \( \frac{7}{2} \) C) 7 D) 49

7. Identify the next figure:

   A)  B)  C)  D)  

A)  B)  C)  D)  

8. Malini deposited Rs.7,000/- with a finance company for 3 years at an interest of 15% per annum. What is the compound interest and the amount that Malini will get after 3 years?

A) Compound interest - ₹ 3,246  
   Amount - ₹ 13,246
B) Compound interest - ₹ 3,646  
   Amount - ₹ 10,646
C) Compound interest - ₹ 6,436  
   Amount - ₹ 16,046
D) Compound interest - ₹ 4,636  
   Amount - ₹ 14,636

9. The average salary of all workers in the factory ₹ 60. The average salary of 12 officers is ₹ 400. The average salary of rest is ₹ 56. Find the total no of workers in the factory.

A) 1116  B) 1032  C) 1212  D) 1132

10. How many straight lines are there in the figure below?

A) 10  B) 12  C) 16  D) 8

11. Find the missing number in the diagram.

A) 25  B) 30  C) 96  D) None of these

12. The sum of three prime numbers is 101. The difference of two of them is 24. What are the numbers?

A) 5,59,37  B) 41,53,7  C) 11,37,53  D) 3,61,37

13. A started from a place. After walking for a kilometer, in a direction, he turns to the left, then walking for a half kilometer; he again turns to the left. Now he is going eastwards. In what direction did he originally started?

A) West  B) East  C) North  D) South
14. The circle-graph given here shows the spending of a country on various sports during a particular year. Study the graph and answer the question.

What percent of the total spending is spent on Tennis?
A) 12 1/2 %  B) 22 1/2 %  C) 25%  D) 45%

15. The sides of a triangle are in the ratio 1/2 : 1/3 : 1/4 and its perimeter is 104 cm. The length of the longest side is,
A) 52 cm  B) 48 cm  C) 32 cm  D) 26 cm.

16. If A’s salary is 20% less than B’s salary, by how much percent is B’s salary more than A’s?
A) 24%  B) 25%  C) 20%  D) 22%

17. The volume of a cube is 125 cm³. The surface area of the cube is
A) 625 cm²  B) 125 cm²  C) 150 cm²  D) 100 cm²

18. If 50% of (x-y) = 30% of (x+y) then what percent of x is y?
A) 25%  B) 50%  C) 75%  D) 100%

19. The least number which when increased by 1 is divisible by 12, 18, 24, 32 is
A) 278  B) 288  C) 287  D) 279

20. The missing term in the series is 9, 225, 16, 196, 25, 169, ?, 144
A) 81  B) 121  C) 36  D) 49

21. Find x in 4²x × 64²x = 10⁶⁺⁵
A) 1  B) 5  C) 4  D) 2

22. At simple interest Rs.1,000 becomes Rs.1,150 in 3 years. If the interest rate in increased by 3% then the total amount is.
A) 1,140  B) 1,300  C) 1,140  D) 1,240

23. If 18% of the total number of oranges in a basket is 36. Then the total number of oranges is.
A) 100  B) 150  C) 200  D) 300

24. The ratio of the prices of two cows was 23:16. Two years later the price of the first cow rises by Rs.477 and that of the second by 10% and the ratio of their prices became 20:11. Find the original prices.
A) Rs.1,219, Rs.848  B) Rs.1,218, Rs.848  C) Rs.1,210, Rs.850  D) Rs.1,219, Rs.840
25. A ladder of 25ft length reaches a window which is 24ft above the ground level on the side of the street. Keeping its foot at the same point the ladder is turned the other side of the street and now reaches a window of 7 ft high. Then the width of the street.
   A) 30   B) 32   C) 29   D) 31

26. If a:b = 6:7 and b:c = 8:9 then a:c is equal to?
   A) 16:21   B) 6:9   C) 27:28   D) 1:2

27. Mean of 25 observations was found to be 78.4. But later it was found that 96 was mis-read as 69. Then the corrected mean is
   A) 79.48   B) 76.54   C) 81.32   D) 78.4

28. Find the next alphabet in the sequence B, E, I, N,?
   A) U   B) V   C) T   D) S

29. If √784 + x = 78% of 500, then the value of x is
   A) 342   B) 352   C) 362   D) 372

30. Find the greatest number that will divide 43,91 and 183 so as to leave the same remainder in each case
   A) 4   B) 7   C) 9   D) 13

31. Find the missing letters in the series AZ, GT, MN, ?, ?, YB
   A) JH   B) SH   C) SK   D) TS

32. Murali’s present age is half of his father’s age. Before 10 years, his father’s age was thrice his age. Find the present age of Murali and his father.
   A) 16, 32 years   B) 15, 30 years   C) 20, 40 years   D) 17, 34 years

33. Find the length of the altitude of an equilateral triangle of side 3√3 cm
   A) 27 cm   B) 9√3 cm   C) 9 cm   D) 4.5 cm

34. First pipe can fill a tank in 12 hours. Second pipe can fill the same tank in 6 hours. Third pipe in 4 hours. How long will it take to fill the tank if all the 3 pipes are opened simultaneously?
   A) 2 hrs.   B) 3 hrs.   C) 4 hrs.   D) 12 hrs.

35. If x² + 4y² = 4xy, then x : y is
   A) 2:1   B) 1:2   C) 1:1   D) 1:4

36. A sum of Rs. 1,550 was lent partly at 5% and partly at 8% per annum at simple interest. The total interest received after 3 years was Rs. 300. The ratio of the money lent at 5 % to the lent at 8% is
   A) 5:8   B) 8:5   C) 16:15   D) 31:6

37. A sum of Rs.800 amounts to Rs.920 in 3 years at a simple interest. If the interest rate is increased by 3%. What would Rs. 800 amount to?
   A) 950   B) 970   C) 992   D) 1000

38. At what rate of compound interest per annum will a sum of Rs. 1,200 become Rs. 1348.32 in 2 years
   A) 6%   B) 6.5%   C) 7%   D) 7.5%

39. Seven men working 9 hours a day can do a piece of work in 30 days. In how many days will 10 men working for 7 hours a day do the same work?
   A) 28 days   B) 30 days   C) 32 days   D) 27 days
40. If $5 \oplus 3 = 34$ and $6 \oplus 2 = 40$ then, the value of $7 \oplus 1$ is
   A) 54  
   B) 34  
   C) 50  
   D) 30

41. Six bells commence tolling together; afterwards they toll at intervals of 2, 4, 6, 8 and 12 seconds respectively. In 30 minutes, how many times do they toll together?
   A) 4  
   B) 10  
   C) 15  
   D) 16

42. If $a/b = 4/5$ and $b/c = 15/16$ then, the value of $\frac{c^2-a^2}{c^2+a^2}$
   A) $\frac{1}{7}$  
   B) $\frac{7}{25}$  
   C) $\frac{3}{4}$  
   D) $\frac{1}{4}$

43. Find the odd number in the series given 25, 36, 49, 81, 121, 169, 225
   A) 36  
   B) 49  
   C) 169  
   D) 225

44. A can do a certain job in 12 days. B is 60% more efficient than a. How many days does B alone take to do the same job?
   A) 6 days  
   B) 7 ½ days  
   C) 8 days  
   D) 8 ½ days

45. If $5^a = 6; 6^b = 7; 7^c = 5$, then find the value of $abc$:
   A) 0  
   B) -1  
   C) 2  
   D) 1

46. The value of $\frac{x^{\sqrt{y}}}{\sqrt{\sqrt{a}}}$ is
   A) $\sqrt{a^{x^2}}$  
   B) $\frac{x^{y^2}}{\sqrt{a^2}}$  
   C) $\frac{x^{y^z}}{\sqrt{a}}$  
   D) $\sqrt[2]{a^{yz}}$

47. How much time will it take for an amount Rs. 2,000 to double at a simple interest rate 8%?
   A) 25 ½ years  
   B) 10 ½ years  
   C) 8 ½ years  
   D) 12 ½ years

48. The length of a rectangle is increased by 60%. By what percent would the width have to be decreased so as to maintain the same area?
   A) 37 ½%  
   B) 60%  
   C) 75%  
   D) 120%

49. A sum of Rs. 53 is divided among ABC in such a way that a gets Rs. 7 more than what B gets and V gets Rs. 8 more than what C gets. The ratio of their share is
   A) 16:9:18  
   B) 25:18:10  
   C) 18:25:10  
   D) 15:8:30

50. A cone, a hemisphere and a cylinder stand on equal bases and have the same height. Find the ratio of their volumes
   A) 3:2:1  
   B) 1:2:3  
   C) 3:1:2  
   D) 1:3:2
TNPSC - GROUP – II (A) PRELIMS - PREVIOUS YEAR KEYS - MATHS

1. A fair die is rolled. The probability of getting an even number on the face of the die is
   A) 1/4   B) 3/4   C) 1/3   D) ½

2. The area of a triangle with base 9 cm and height 12 cm is
   A) 108 Cm²   B) 21 Cm²   C) 42 Cm²   D) 54 Cm²

3. The value of $5\sqrt{2} + \sqrt{32}$
   A) 21√2   B) 5√2   C) 32√2   D) 9√2

4. If the principal is Rs. 3000 and rate of interest 4% then the difference between simple interest and compound interest is
   A) Rs. 80.00   B) Rs. 4.80   C) Rs. 6.80   D) Rs. 48.00

5. 29, 23, 25, 29, 30, 25, 28 is
   A) 29   B) 23   C) 28   D) 30

6. If n(A) = 5 then n(P(A)) is
   A) 32   B) 16   C) 8   D) 64
7. The sum of the first 11 term of the A.P. 3, 8, 13, …… is
   A) 380   B) 318   C) 308   D) 388
8. If \(a=5, b=3\) then the value of \(a^2 + ab\) is
   A) 80   B) 40   C) 60   D) 45
9. The mid point of the line segment joining the points (-1, -3) and (-5, -7) is
   A) (3, 5)   B) (-3, 5)   C) (-3, -5)   D) (3, -5)
10. The marked price of a bicycle is Rs. 1,700. If the company gives 10% discount, then the selling price of the bicycle is
    A) Rs. 1,500   B) Rs. 1,350   C) Rs. 1,530   D) Rs. 1,300

**GROUP – IV - 2012**

11. The harmonic mean and geometric mean of two values are 6.4 and 8 respectively. The values are
    A) 8 and 8   B) 32 and 2   C) 4 and 16   D) 10 and 6
12. If the sum of 3 consecutive integers is 540 then integers are
    A) 178, 179, 183   B) 176, 186, 178   C) 178, 180, 182   D) 179, 180, 181
13. From the group of 5 men and women, two persons are chosen at random. The probability that one of them is man and the other woman is
    A) \(\frac{2}{5}\)   B) \(\frac{3}{5}\)   C) \(\frac{5}{9}\)   D) \(\frac{4}{9}\)
14. A box contains 4 red, 5 blue and 6 green balls of identical size. Two balls are drawn at random. The probability that one is blue and the other is green is
    A) \(\frac{5 \times 6}{35 \times 2}\)   B) \(\frac{5 \times 6 \times 2}{35 \times 2}\)   C) \(\frac{4 \times 5 \times 2}{14 \times 2}\)   D) \(\frac{4 \times 5 \times 2}{14 \times 15}\)
15. Five boys A, B, C, D & E are sitting in a park in a circle. A is facing south west D is facing south east. B and E are right opposite to A and D respectively and C is equidistant between D and B. Which direction is C facing to?
    A) West   B) South   C) North   D) East
16. A man earns Rs. 28,000 as monthly salary. His expenditure and savings are given in the diagram. How much did he spend on entertainment?

   ![Expenditure and Savings Diagram]

    A) Rs. 1,950   B) Rs. 1,960   C) Rs. 1,970   D) Rs. 1,980
17. The traders marks his goods at 20% above cost price and allows 10% discount. Then the gain per cent is
    A) 6%   B) 8%   C) 10%   D) 12%
18. In a division sum the divisor is 12 times the quotient and 5 times the remainder. If the remainder is 24 then the dividend is
A) 1224    B) 1242    C) 1222    D) 120

19. Rolling of tongue is a dominant character in human beings out of 80 students in a class 72 students are capable of rolling their tongue and 8 students not. Find the percentage of dominant and recessive character.
A) dominant 90% recessive 10%    B) dominant 10% recessive 90%
C) dominant 20% recessive 80%    D) dominant 80% recessive 20%

GROUP –IV - 2013

20. Consider the following table:

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<td>Number of poor in India (in million):</td>
<td>321</td>
<td>307</td>
<td>320</td>
<td>260</td>
</tr>
</tbody>
</table>

The year in which number of poor in India a sharp increase over that of the preceding year is

21. In the products $2a \times 1b = 41a$; $2b \times 1b = 37b$, $a$ and $b$ represent positive integers. Then $a+b=$
A) 15    B) 11    C) 7    D) 13

22. Find the odd man out in the following:
1, 144, 16, 25, 49, 81, 121, 36, 62
A) 1    B) 49    C) 121    D) 62

23. The world-wide Tea product of 5 countries for the year 2011-2012

```
25%

E

D

C

B

A

20%

10%

30%

15%
```

A) 15°    B) 30°    C) 54°    D) 72°

24. In an examination 30% of total students failed in English 40% of students failed in Hindi and 20% in both. Find the percentage of students who passed in both the subjects.
A) 50%    B) 20%    C) 10%    D) 60%

25. Three positions of the same die are given. Find the numbers opposite to the side represented by 2.

A) 5    B) 3    C) 6    D) 1
26. If RIVER is coded as OFSBO then WATER is decoded as
   A) ZDWIU     B) ZDWHU     C) ZCWIV     D) ZCUJW
27. A can complete 2/3 part of a work in 10 days. A can complete 1/3 part of the same work in
   A) 3 days     B) 4 days     C) 5 days     D) 6 days
28. Rs. 800 becomes Rs. 956 in 3 Years at certain simple rate of interest. If the rate of interest is increased
    by 4%
    What amount will Rs. 800 become in 3 years?
    A) Rs. 1,020.80    B) Rs. 1,025    C) Rs. 1,052    D) Rs. 1,080.20
29. Amala invests Rs. 6,000 in abond which gives interest at 4% per annum during the first year, 5% during
    the second year, 10% during the third year. How much does she gets at the end of the third year?
    A) Rs. 7,300    B) Rs. 7,007.2    C) Rs. 7,200    D) Rs. 7,207.2
30. What will come in the place of a question mark?

   T
   W   S
   J
   T

   A) 9     B) 6     C) 7     D) 3
31. Find out the wrong number in the sequence.
    623, 251, 543, 356
    A) 543    B) 251    C) 623    D) 356
32. Find out the wrong number in the sequence.
    121, 264, 312, 462, 583
    A) 583    B) 264    C) 121    D) 312
33. If $2 \div 3 = 89$, $3 \div 4 = 2716$, $4 \div 3 = 649$ then $1 \div 2 = ?$
    A) 24    B) 14    C) 4    D) 10
34. Five distinct items A, B, C, D and E are to be placed in distinct boxes numbered as 1, 2, 3, 4, 5 items B and
    E cannot be grouped together. Maximum number of boxes can be left out without items is
    A) 1    B) 2    C) 3    D) 0
35. SALES BY TWO CATEGORY FOR ABC PRESS, 2000-2010 (in thousands of books).

In how many years did the sales of science books exceed the sales of arts books from 2000 to 2009?
A) 4 Years  B) 5 Years  C) 6 Years  D) 7 Years

36. Five persons A,K,L,R, and U are sitting around a circular table. K is immediate left to U and R is between A and U, then immediate neighbours of L are
A) K and A  B) U and A  C) K and R  D) A and R

37. A circular ground of radius 7 m has a path of width 7 m around it on its outside. The area of the path is approximately equal to
\[\pi \approx \frac{22}{7}\]
A) 154 sq.m  B) 308 sq.m  C) 462 sq.m  D) 616 sq.m

38. A can do a work in 12 days, B in 6 days and C in 3 days. A and B start working together and after a day, C join them. The total number of days required to complete the work is
A) \(\frac{22}{7}\) days  B) \(\frac{7}{2}\) days  C) \(2\frac{1}{7}\) days  D) \(1\frac{1}{7}\) days

39. At what rate percent compound interest does a sum of money become nine fold in 2 years?
A) 100%  B) 200%  C) 300%  D) 150%

40. Simplify: \(\sqrt[4]{\sqrt[3]{x^2}}\)
A) \(x^{1/6}\)  B) \(x^{1/12}\)  C) \(x^{1/3}\)  D) \(x^{1/4}\)

41. Find the missing block.
A)  
B)  
C)  
D)  

42. Find the greatest number that will divide 43,91,183 so as to leave the same remainder in each case.
A) 4  B) 7  C) 9  D) 8
43. The number-pairs lying between 40 and 100 with their H.C.F. as 15 is
   A) 3   B) 4   C) 5   D) 2

44. A, B, C, D start at the same time to run around a circular garden in the same direction. A completes a
    round in 30 minutes, B in 60 minutes, C in 90 minutes and D in 105 minutes. After what time will they
    meet again at the starting point?
   A) 15 hours   B) 10 hours   C) 21 hours   D) 20 hours

45. Find the greatest number of 4 digits which is divisible by 15, 25, 40 and 75
   A) 9600   B) 3000   C) 9800   D) 8540

GROUP – IV - 2014

46. From the fig. find the value of ‘x’

   A) 30°   B) 60°   C) 90°   D) 45°

47. Find the height of a parallelogram whose area is 30 cm² and base 15 cm is
   A) 10 cm   B) 15 cm   C) 20 cm   D) 30 cm

48. Ram is 7 times as old as his daughter Nanthini. After 5 years he will be 5 times as old as his daughter. What are their present ages?
   A) 5, 35   B) 6, 42   C) 9, 63   D) 10, 70

49. If \( \frac{a}{b} = \frac{4}{3} \) then the value of \( 6a + 4b \) \( 6a - 5b \)
   A) -1   B) 3   C) 4   D) 5

50. Find the missing number in the place?

   A) 10   B) 11   C) 13   D) 14

51. Simplify \( \sqrt{214 + \sqrt{112 + \sqrt{74 + \sqrt{49}}} } \)
   A) 15   B) 18   C) 25   D) 17

52. Divide Rs.700 among A, B, C so that A gets 2 times more than B and B gets 2 times more than C how much of
    amount they are getting?
   A) Rs.100, Rs.200, Rs.400   B) Rs.200, Rs.300, Rs.200
   C) Rs. 300, Rs.200, Rs.200   D) Rs. 400, Rs.200, Rs.100

53. A cone, hemisphere, and cylinder have equal bases. If the heights of the cone and a cylinder are equal and
    are same as the common radius then find the ratio of their respective volumes
   A) 2:3:4   B) 1:2:3   C) 2:1:3   D) 3:2:5
54. Using Identities x-y = -6; xy = 4, Find the value of x^2 – y^2
   A) -288  B) -388  C) -268  D) -278

55. Two taps can fill a tank in 30 minutes and 40 minutes. Another tap can empty it in 24 min. If the tank is empty and all the three taps are kept open, in how much time the tank will be filled.
   A) 1 ½ hours  B) two hours  C) one hour  D) 2 ½ hours

56. The radius of a wheel is 1.75. How many revolutions will it make in travelling 11 km?
   A) 10  B) 100  C) 1000  D) 10000

57. Monthly expenditure of a person is shown in the figure. Find the amount has in his savings?

   ![Savings Diagram]

   A) Rs.800  B) Rs.900  C) Rs.1,000  D) Rs.750

58. Find the missing number in the place?

   ![Number Sequence]

   A) 18  B) 19  C) 20  D) 21

59. Number of prime numbers between 20 and 30
   A) 1  B) 2  C) 3  D) 4

60. If the area of the ∆ ABC is 68 sq. units and the vertices are A(6,7), B(-4,1) and C( a, -9) taken in order. Find the value of a.
   A) -2  B) 3  C) 5  D) 2

61. If the mean of x, x+2, x+4, x+6, x+8 is 20 then find the value of x
   A) 32  B) 16  C) 8  D) 4

62. By selling a car for Rs. 1,40,000 a man suffered a loss of 20% what was the cost price of the car?
   A) Rs.1,50,000  B) Rs.1,25,000  C) Rs.2,00,000  D) Rs. 1,75,000

63. In the given figure △ B: C = 2:3 find B

   ![Triangle Diagram]
A) 120°  B) 52°  C) 78°  D) 130°

64. Find the point of intersection of the straight line 9x-y-2 =0, 2x+y-9=0
A) (-1,7)  B) (7,1)  C) (1,7)  D) (-1,-7)

65. The cost of a dining table is Rs. 8,400 A wants to buy it in 10 instalments. His E.M.I is Rs.875.Find the rate of interest?
A) 3%  B) 5%  C) 8%  D) 10%

66. If (x+m) (x+n) =x²+6x+5 find m² + n²
A) 25  B) 26  C) 27  D) 28

67. Choose the best answer.
Two numbers differ by 5. If their products is 336, then the sum of two number is
A) 21  B) 28  C) 37  D) 51

68. Find the missing number.

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A) 136  B) 156  C) 176  D) 189

69. Find the simple interest and the amount due on Rs. 6,750 for 219 days at 10 % per annum
A) 205  B) 305  C) 405  D) 415

70. Three numbers are in the ratio 3:4:5 and their L.C.M is 2400. There H.C.F is
A) 40  B) 80  C) 120  D) 200

GROUP –IV - 2016

71. (-1 \frac{2}{7})+ (-3 \frac{5}{7}) + (6 \frac{4}{7}) is __________
A) 3/7  B) 5/7  C) 11/7  D) 10/7

72. The population of a city in the year 2014 is 1,80,000 and increases at a rate of 20% per year. Find the population of the city in the year 2016?
A) 2,40,000  B) 2,59,200  C) 2,55,000  D) 2,54,300

73. 3 -25 here, which of the following number is a suitable in -, so that the number will be a perfect square?
A) 1  B) 0  C) 4  D) 6

74. The average mark of 10 children is 80 then their total mark is.
A) 200  B) 300  C) 800  D) 400

75. A man and woman are engaged in a work. A man can do a piece of work in 4 days and the woman can do in 12 days. Find how many days will they take to finish it together?
A) 6 days  B) 5 days  C) 4 days  D) 3 days
76. Which of the following set of measurements will form a right angle triangle?
   A) 6,9,12  B) 5,8,10  C) 5,5,\(\sqrt{2}\)  D) 3,4,4\(\sqrt{2}\)

77. The value of \(\sqrt{609 + \sqrt{248 + \sqrt{60 + \sqrt{7} + \sqrt{81}}}\)}
   A) 20  B) 25  C) 16  D) 9

78. The price of a house is decreased from rupees fifteen lakhs to rupees twelve lakhs. The percentage of decrease is.
   A) 10%  B) 20%  C) 30%  D) 40%

79. If \(3(t-3) = 5(2t + 1)\) then \(t = ?\)
   A) -2  B) 2  C) -3  D) 3

80. The value of \(\frac{1.75 \times 1.75 \times 2 \times 1.75 \times 0.75 + 0.75 \times 0.75}{1.75 \times 1.75 - 0.75 \times 0.75}\)
   A) 3.5  B) 6.25  C) 1  D) 2.5

81. The value of \(16^3 + 7^3 - 23^3\) is
   A) -7728  B) 7028  C) 7728  D) -7718

82. Find the next term of 4 in the series is 1,1,2,8,3,27,4,…
   A) 31  B) 29  C) 16  D) 64

83. Three angles of a triangle are \(x-30^\circ\), \(x - 45^\circ\), \(x+15^\circ\), find the value of \(x\).
   A) 60°  B) 40°  C) 80°  D) 100°

84. The difference between simple interest and compound interest for a sum of Rs.12,000 lent at 10% per annum in 2 years, is
   A) Rs.80  B) Rs.90  C) Rs.120  D) Rs.100

85. The base of a triangle is four times its height and its area is 50 \(m^2\). The length of the base is
   A) 10 m  B) 15 m  C) 20 m  D) 25 m

86. A can do a piece of work in 20 days and B can do it in 25 days. Both of them finished the work and earned Rs.3, 600. Then A’s share is:
   A) Rs.1,600  B) Rs.2,000  C) Rs.3,000  D) Rs.3,100

87. If \((\frac{7}{12})^4 \times (\frac{7}{12})^{3x} = (\frac{7}{12})^{15}\), then the value of \(x\) is
   A) -1  B) 1  C) 2  D) 3

88. If 22 men can build a wall of 110 meters in 10 days. The length of a similar wall built by 30 men in 6 days is
   A) 100 mts  B) 90 mts  C) 80 mts  D) 70 mts

89. If the ratio of length and breadth of a rectangle is 4:7. Find the length while its breadth is 77 cm
   A) 22 cm  B) 33 cm  C) 44 cm  D) 55 cm

90. A room is 5 m 70 cm long and 4 m 50 cm broad. Its Area is
   A) 23.4 \(m^2\)  B) 24.3\(m^2\)  C) 25 \(m^2\)  D) 98.01 \(m^2\)

91. Simplify:
   \(5^\frac{1}{4} + 4^\frac{3}{4} + 7^\frac{5}{8} + 6^\frac{7}{8} + 11^\frac{3}{4}\)
92. Find the rate of interest at which, a sum of money becomes \( \frac{9}{4} \) times in 2 years?

A) \( 69 \frac{1}{2} \% \)  
B) \( 67 \frac{1}{2} \% \)  
C) \( 62 \frac{1}{2} \% \)  
D) \( 61 \frac{1}{2} \% \)

93. The breadth, height and volume of a cuboid are 10 cm, 11 cm and 3080 cm\(^3\) respectively. Find the length of the cuboid.

A) 21 cm  
B) 28 cm  
C) 24 cm  
D) 30 cm

94. A man bought an old bicycle for Rs.1,500. He spends Rs.500 on its repair and sells it for Rs.1,800. Find the percentage of his loss.

A) 10\%  
B) 15\%  
C) 20\%  
D) 5\%

95. Find the LCM of \( a^3b^4 \), \( ab^5 \) and \( a^2b^7 \)

A) \( a^7b^3 \)  
B) \( a^3b^7 \)  
C) \( a^2b^5 \)  
D) \( ab^5 \)