



## Sri Raghavendra Tuition Center

Full test

10th Standard

Maths

Date : 02-01-25

Reg.No. :

Exam Time : 03:00 Hrs

Total Marks : 100

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Centum Book Available

I. Multiple Choice Question. Compulsory answered **28th** question.

14 x 1 = 14

- 1) If  $n(A \times B) = 6$  and  $A = \{1,3\}$  then  $n(B)$  is  
(a) 1 (b) 2 (c) 3 (d) 6
- 2) Let  $n(A) = m$  and  $n(B) = n$  then the total number of non-empty relations that can be defined from A to B is  
(a)  $m^n$  (b)  $n^m$  (c)  $2^{mn}-1$  (d)  $2^{mn}$
- 3) Euclid's division lemma states that for positive integers a and b, there exist unique integers q and r such that  $a = bq + r$ , where r must satisfy  
(a)  $1 < r < b$  (b)  $0 < r < b$  (c)  $0 \leq r < b$  (d)  $0 < r \leq b$
- 4) The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is  
(a) 2025 (b) 5220 (c) 5025 (d) 2520
- 5) Given  $F_1 = 1$ ,  $F_2 = 3$  and  $F_n = F_{n-1} + F_{n-2}$  then  $F_5$  is  
(a) 3 (b) 5 (c) 8 (d) 11
- 6)  $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$  is  
(a)  $\frac{9y}{7}$  (b)  $\frac{9y^2}{(21y-21)}$  (c)  $\frac{21y^2-42y+21}{3y^2}$  (d)  $\frac{7(y^2-2y+1)}{y^2}$
- 7) The square root of  $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$  is equal to  
(a)  $\frac{16}{5} \left| \frac{x^2z^4}{y^2} \right|$  (b)  $16 \left| \frac{y^2}{x^2z^4} \right|$  (c)  $\frac{16}{5} \left| \frac{y}{xz^2} \right|$  (d)  $\frac{16}{5} \left| \frac{xz^2}{y} \right|$
- 8) Find the matrix X if  $2X + \begin{pmatrix} 1 & 3 \\ 5 & 7 \end{pmatrix} = \begin{pmatrix} 5 & 7 \\ 9 & 5 \end{pmatrix}$   
(a)  $\begin{pmatrix} -2 & -2 \\ 2 & -1 \end{pmatrix}$  (b)  $\begin{pmatrix} 2 & 2 \\ 2 & -1 \end{pmatrix}$  (c)  $\begin{pmatrix} 1 & 2 \\ 2 & 2 \end{pmatrix}$  (d)  $\begin{pmatrix} 2 & 1 \\ 2 & 2 \end{pmatrix}$
- 9) If in triangles ABC and EDF,  $\frac{AB}{DE} = \frac{BC}{FD}$  then they will be similar, when  
(a)  $\angle B = \angle E$  (b)  $\angle A = \angle D$  (c)  $\angle B = \angle D$  (d)  $\angle A = \angle F$
- 10) If (5, 7), (3, p) and (6, 6) are collinear, then the value of p is  
(a) 3 (b) 6 (c) 9 (d) 12
- 11) If  $\sin \theta + \cos \theta = a$  and  $\sec \theta + \operatorname{cosec} \theta = b$ , then the value of  $b(a^2 - 1)$  is equal to  
(a) 2a (b) 3a (c) 0 (d) 2ab
- 12) The curved surface area of a right circular cone of height 15 cm and base diameter 16 cm is  
(a)  $60\pi \text{ cm}^2$  (b)  $68\pi \text{ cm}^2$  (c)  $120\pi \text{ cm}^2$  (d)  $136\pi \text{ cm}^2$

- 13) Which of the following is not a measure of dispersion?  
 (a) Range (b) Standard deviation (c) Arithmetic mean (d) Variance
- 14) A purse contains 10 notes of Rs. 2000, 15 notes of Rs. 500, and 25 notes of Rs. 200. One note is drawn at random. What is the probability that the note is either a Rs. 500 note or Rs. 200 note?  
 (a)  $\frac{1}{5}$  (b)  $\frac{3}{10}$  (c)  $\frac{2}{3}$  (d)  $\frac{4}{5}$

II. Answer any **TEN** question.

10 x 2 = 20

- 15) If  $A \times B = \{(3,2), (3, 4), (5,2), (5, 4)\}$  then find A and B.
- 16) Let  $A = \{1,2,3\}$  and  $B = \{x \mid x \text{ is a prime number less than } 10\}$ . Find  $A \times B$  and  $B \times A$ .
- 17) Find the value of  
 $1 + 2 + 3 + \dots + 50$
- 18) If  $13824 = 2^a \times 3^b$  then find a and b.
- 19) Find the LCM of the following  
 $8x^4y^2, 48x^2y^4$
- 20) What length of ladder is needed to reach a height of 7 ft along the wall when the base of the ladder is 4 ft from the wall? Round off your answer to the next tenth place.



- 21) Solve  $x^2 + 2x - 2 = 0$  by formula method
- 22) If  $A = \begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & \frac{5}{2} \\ 8 & 3 & 1 \end{bmatrix}$  then verify  $(A^T)^T = A$
- 23) Show that the given points are collinear:  $(-3, -4)$ ,  $(7, 2)$  and  $(12, 5)$
- 24) Find the slope of the straight line  $6x + 8y + 7 = 0$ .
- 25) A tower stands vertically on the ground. from a point on the ground, which is 48m away from the foot of the tower, the angel of elevation of the top of the tower is  $30^\circ$ .find the height of the tower.
- 26) The radius of a conical tent is 7 m and the height is 24 m. Calculate the length of the canvas used to make the tent if the width of the rectangular canvas is 4 m?
- 27) Find the range and coefficient of range of the following data: 25, 67, 48, 53, 18, 39, 44.
- 28) A coin is tossed thrice. What is the probability of getting two consecutive tails?

III. Answer any **TEN** question. Compulsory answered **42th** question.

10 x 5 = 50

- 29) Let  $A = \{x \in W \mid x < 2\}$ ,  $B = \{x \in N \mid 1 < x \leq 4\}$  and  $C = (3,5)$ . Verify that  
 $A \times (B \cup C) = (A \times B) \cup (A \times C)$
- 30) If the function  $f: R \rightarrow R$  defined by  

$$f(x) = \begin{cases} 2x + 7, & x < -2 \\ x^2 - 2, & -2 \leq x < 3 \\ 3x - 2, & x \geq 3 \end{cases}$$
 (i)  $f(4)$   
 (ii)  $f(-2)$   
 (iii)  $f(4) + 2f(1)$   
 (iv)  $\frac{f(1)-3f(4)}{f(-3)}$
- 31) In an A.P., sum of four consecutive terms is 28 and their sum of their squares is 276. Find the four numbers.
- 32) Find the sum to n terms of the series  $5 + 55 + 555 + \dots$

- 33) If  $A = \frac{x}{x+1}$ ,  $B = \frac{1}{x+1}$ , prove that  $\frac{(A+B)^2 + (A-B)^2}{A+B} = \frac{2(x^2+1)}{x(x+1)^2}$
- 34) Find the square root of  $64x^4 - 16x^3 + 17x^2 - 2x + 1$
- 35) If  $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$  show that  $A^2 - 5A + 7I_2 = 0$
- 36) Find the area of the quadrilateral whose vertices are at  $(-9, -2)$ ,  $(-8, -4)$ ,  $(2, 2)$  and  $(1, -3)$
- 37) Two ships are sailing in the sea on either sides of a lighthouse as observed from the ships are  $30^\circ$  and  $45^\circ$  respectively. if the lighthouse is 200 m high, find the distance between the two ships. ( $\sqrt{3} = 1.732$ )
- 38) The radius and height of a cylinder are in the ratio 5 : 7 and its curved surface area is 5500 sq.cm. Find its radius and height.
- 39) Two unbiased dice are rolled once. Find the probability of getting  
 (i) a doublet (equal numbers on both dice)  
 (ii) the product as a prime number  
 (iii) the sum as a prime number  
 (iv) the sum as 1
- 40) A right circular cylindrical container of base radius 6 cm and height 15 cm is full of ice cream. The ice cream is to be filled in cones of height 9 cm and base radius 3 cm, having a hemispherical cap. Find the number of cones needed to empty the container.
- 41) Pythagoras Theorem

IV. Answer **ALL** question.

2 x 8 = 16

- 42) a) Construct a  $\triangle PQR$  in which  $QR = 5$  cm,  $\angle P = 40^\circ$  and the median  $PG$  from  $P$  to  $QR$  is 4.4 cm. Find the length of the altitude from  $P$  to  $QR$ .

(OR)

- b) Take a point which is 11 cm away from the centre of a circle of radius 4 cm and draw the two tangents to the circle from that point.

- 43) a) Draw the graph of  $y = x^2 + 3x - 4$  and hence use it to solve  $x^2 + 3x - 4 = 0$

(OR)

- b) Varshika drew 6 circles with different sizes. Draw a graph for the relationship between the diameter and circumference of each circle as shown in the table and use it to find the circumference of a circle when its diameter is 6 cm.

Diameter (x)cm	1	2	3	4	5
Circumference (y)cm	3.1	6.2	9.3	12.4	15.5

**All the best**

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