

## BRINDHAVAN HR SEC SCHOOL,SUKKIRANPATTI

## MODEL PUBLIC EXAMINATION 2025

## 10th Standard

## Maths

Date : 04-03-25

Reg.No. : 

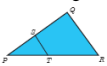
Total Marks : 100

14 x 1 = 14

Exam Time : 03:00 Hrs

## PART - A

## CHOOSE THE CORRECT ANSWER

- 1) If  $g = \{(1,1), (2,3), (3,5), (4,7)\}$  is a function given by  $g(x) = \alpha x + \beta$  then the values of  $\alpha$  and  $\beta$  are  
(a) (-1,2) (b) (2,-1) (c) (-1,-2) (d) (1,2)
- 2) If  $n(A) = p$ ;  $n(B) = q$ ; then the total number of functions that exist between A and B is \_\_\_\_\_  
(a)  $q^p$  (b)  $p^q$  (c)  $2^{pq} - 1$  (d)  $2^{pq}$
- 3) Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are  
(a) 0, 1, 8 (b) 1, 4, 8 (c) 0, 1, 3 (d) 0, 1, 3
- 4) The value of  $(1^3 + 2^3 + 3^3 + \dots + 15^3) - (1 + 2 + 3 + \dots + 15)$  is  
(a) 14400 (b) 14200 (c) 14280 (d) 14520
- 5) A system of three linear equations in three variables is inconsistent if their planes  
(a) intersect only at a point (b) intersect in a line  
(c) coincides with each other (d) do not intersect
- 6) For the given matrix  $A = \begin{pmatrix} 1 & 3 & 5 & 7 \\ 2 & 4 & 6 & 8 \\ 9 & 11 & 13 & 15 \end{pmatrix}$  the order of the matrix  $A^T$  is  
(a)  $2 \times 3$  (b)  $3 \times 2$  (c)  $3 \times 4$  (d)  $4 \times 3$
- 7) In a given figure ST || QR, PS = 2 cm and SQ = 3 cm. Then the ratio of the area of  $\triangle PQR$  to the area  $\triangle PST$  is  
  
(a) 25 : 4 (b) 25 : 7 (c) 25 : 11 (d) 25 : 13
- 8) The point of intersection of  $3x - y = 4$  and  $x + y = 8$  is  
(a) (5, 3) (b) (2, 4) (c) (3, 5) (d) (4, 4)
- 9) Find the number of straight lines perpendicular to the line  $2x - 3y + 6 = 0$   
(a) Only one solution (b) Two solutions (c) Infinitely many solutions  
(d) No solution

- 10) The angle of depression of the top and bottom of 20 m tall building from the top of a multistoried building are  $30^\circ$  and  $60^\circ$  respectively. The height of the multistoried building and the distance between two buildings (in metres) is  
(a) 20,  $10\sqrt{3}$  (b) 30,  $5\sqrt{3}$  (c) 20, 10 (d) 30,  $10\sqrt{3}$
- 11) The total surface area of a cylinder whose radius is  $\frac{1}{3}$  of its height is  
(a)  $\frac{9\pi h^2}{8}$  sq.units (b)  $24\pi h^2$  sq.units (c)  $\frac{8\pi h^2}{9}$  sq.units (d)  $\frac{56\pi h^2}{9}$  sq.units
- 12) If the volume and surface area of a sphere are numerically equal, then the radius of the sphere is \_\_\_\_  
(a) 3 units (b) 2 units (c) 4 units (d) 6 units
- 13) The sum of all deviations of the data from its mean is  
(a) Always positive (b) always negative (c) zero (d) non-zero integer
- 14) The probability a red marble selected at random from a jar containing p red, q blue and r green marbles is  
(a)  $\frac{q}{p+q+r}$  (b)  $\frac{p}{p+q+r}$  (c)  $\frac{p+q}{p+q+r}$  (d)  $\frac{p+r}{p+q+r}$

## PART - B

10 x 2 = 20

## ANSWER ANY 10 QUESTIONS .QUESTION NO. 28 IS COMPULSORY

- 15) A Relation R is given by the set  $\{(x, y) / y = x + 3, x \in \{0, 1, 2, 3, 4, 5\}\}$ . Determine its domain and range.
- 16) Show that the function  $f: N \rightarrow N$  defined by  $f(m) = m^2 + m + 3$  is one-one function.
- 17) Show that the square of an odd integer is of the form  $4q + 1$ , for some integer q.
- 18) Find the sum of  $1^3 + 2^3 + 3^3 + \dots + 16^3$
- 19) If  $\alpha$  and  $\beta$  are the roots of  $x^2 + 7x + 10 = 0$  find the values of  $(\alpha - \beta)$
- 20) Find the length of the tangent drawn from a point whose distance from the centre of a circle is 5 cm and radius of the circle is 3 cm.
- 21) Show that the given points are collinear: (-3, -4) , (7, 2) and (12, 5)
- 22) Find the equation of a straight line which is parallel to the line  $3x - 7y = 12$  and passing through the point (6, 4).
- 23) A kite is flying at a height of 75m above the ground, the string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is  $60^\circ$ . find the length of the string, assuming that there is no slack in the string.
- 24) Find the diameter of a sphere whose surface area is  $154 \text{ m}^2$ .

- 25) An aluminium sphere of radius 12 cm is melted to make a cylinder of radius 8 cm. Find the height of the cylinder.
- 26) If the standard deviation of a data is 3.6 and each value of the data is divided by 3, then find the new variance and new standard deviation.
- 27) If  $P(A) = 0.37$ ,  $P(B) = 0.42$ ,  $P(A \cap B) = 0.09$  then find  $P(A \cup B)$ .
- 28) Find the Quadratic equation whose roots are  $7 + \sqrt{3}$  and  $7 - \sqrt{3}$

**PART - C**

10 x 5 = 50

**ANSWER ANY 10 QUESTIONS .QUESTION NO. 42 IS COMPULSORY**

- 29) The function 't' which maps temperature in Celsius (C) into temperature in Fahrenheit (F) is defined by  $t(C) = F$  where  $F = \frac{9}{5}C + 32$ . Find,
  - (i)  $t(0)$
  - (ii)  $t(28)$
  - (iii)  $t(-10)$
  - (iv) the value of C when  $t(C) = 212$
  - (v) the temperature when the Celsius value is equal to the Fahrenheit value.
- 30) If  $f(x) = 2x + 3$ ,  $g(x) = 1 - 2x$  and  $h(x) = 3x$ . Prove that  $f \circ (g \circ h) = (f \circ g) \circ h$ .
- 31) If  $p_1^{x_1} \times p_2^{x_2} \times p_3^{x_3} \times p_4^{x_4} = 113400$  where  $p_1, p_2, p_3, p_4$  are primes in ascending order and  $x_1, x_2, x_3, x_4$  are integers, find the value of  $p_1, p_2, p_3, p_4$  and  $x_1, x_2, x_3, x_4$
- 32) Find the GCD of  $6x^3 - 30x^2 + 60x - 48$  and  $3x^3 - 12x^2 + 21x - 18$ .
- 33) A bus covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hour more it would have taken 30 minutes less for the journey. Find the original speed of the bus.
- 34) Given that  $A = \begin{bmatrix} 1 & 3 \\ 5 & -1 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 5 & 2 \end{bmatrix}$ ,  $C = \begin{bmatrix} 1 & 3 & 2 \\ -4 & 1 & 3 \end{bmatrix}$  verify that  $A(B + C) = AB + AC$ .
- 35) State and prove Pythagoras Theorem
- 36) Find the value of k, if the area of a quadrilateral is 28 sq. units, whose vertices are  $(-4, -2)$ ,  $(-3, k)$ ,  $(3, -2)$  and  $(2, 3)$
- 37) Find the equation of a line which passes through  $(5, 7)$  and makes intercepts on the axes equal in magnitude but opposite in sign.
- 38) if  $\sin\theta + \cos\theta = p$  and  $\sec\theta = p$  and  $\sec\theta + \operatorname{cosec}\theta = q$ , then prove that  $q(p^2 - 1) = 2p$
- 39) A funnel consists of a frustum of a cone attached to a cylindrical portion 12 cm long attached at the bottom. If the total height be 20 cm, diameter of the cylindrical portion be 12 cm and the diameter of the top of the funnel be 24 cm. Find the outer surface area of the funnel.
- 40) The number of televisions sold in each day of a week are 13, 8, 4, 9, 7, 12, 10. Find its standard deviation.

- 41) Three fair coins are tossed together. Find the probability of getting
  - (i) all heads
  - (ii) atleast one tail
  - (iii) at most one head
  - (iv) at most two tails
- 42) The sum of three consecutive terms that are in A.P. is 6 and their product is 120. Find the three terms.

**PART - D**

2 x 8 = 16

**ANSWER THE QUESTIONS .**

- 43) a) Construct a triangle similar to a given triangle PQR with its sides equal to  $\frac{7}{4}$  of the corresponding sides of the triangle PQR (scale factor  $\frac{7}{4} > 1$ )
 

(OR)
- b) Construct a  $\triangle PQR$  such that  $QR = 6.5$  cm,  $\angle P = 60^\circ$  and the altitude from P to QR is of length 4.5 cm.
- 44) a) Draw the graph of  $y = x^2 + x - 2$  and hence solve  $x^2 + x - 2 = 0$ 

(OR)
- b) A two wheeler parking zone near bus stand charges as below
 

Time in hours (x)	4	8	12	24
Amount Rs. (y)	60	120	180	360

Check if the amount charged are in direct variation or in inverse variation to the parking time. Graph the data. Also

  - (i) find the amount to be paid when parking time is 6 hr;
  - (ii) find the parking duration when the amount paid is Rs. 150.

\*\*\*\*\*