RS 4

FOURTH REVISION EXAMINATION- 2025

10 - Std MATHEMATICS

TIME : 3.00 Hrs **MARKS : 100**

PART - I

CHOOSE THE CORRECT ANSWER: **14X1=14**

1. The range of the relation R = {(x,x^2) | x is a prime number less than 13} is
(a) {2,3,5,7} (b) { 2,3,5,7,11} (c) {4,9,25,49,121} (d) { 1,4,9,25,49,121}

2. If f(x) = $2x^2$ and g(x)= $\frac{1}{3x}$, then f o g is (a) $\frac{3}{2x^2}$ (b) $\frac{2}{3x^2}$ (c) $\frac{2}{9x^2}$ (d) $\frac{1}{6x^2}$

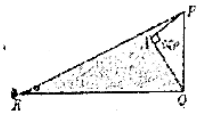
3. If 7 times the 7th term of an A.P. is equal to 5 times the 5 thterm , then its 12th term is
(a) 5 (b) -2 (c) 0 (d) 3

4. 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) 1,3,5

5. $\frac{x}{x^2-25} - \frac{8}{x^2+6x+5}$ gives
(a) $\frac{x^2-7x+40}{(x-5)(x+5)}$ (b) $\frac{x^2+7x+40}{(x-5)(x+5)(x+1)}$ (c) $\frac{x^2-7x+40}{(x+1)(x^2-25)}$ (d) $\frac{x^2+10}{(x+1)(x^2-25)}$

6. Which of the following should be added to make y^2 + 100 a perfect square
(a) $10y^2$ (b) -20y (c)-$10y^2$ (d)20y

7. In the given figure, PR= 26cm, QR= 24 cm, $\angle PAQ = 90°$, PA = 6cm and QA = 8 cm. Find $\angle PQR$ (a) 80° (b) 85° (c) 75° (d) 90°



8. The straight line given by x =11 is (a) parallel to X axis (b) parallel to Y axis
(c) passing through the origin (d) passing through the point (0,11)

9. When proving that a quadrilateral is a parallelogram by using slopes you must find
(a) The slopes of two sides (b) The slopes of two pair of opposite sides
(c) The lengths of all sides (d) Both the lengths and slopes of two sides .

10. The angle of depression of the top and bottom of 20 m tall building from the top of a multistoried building are 30° and 60° 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. A spherical ball of radius 3cm is melted and recast into a cone of the same radius. The height of the cone is (a) 3 cm (b) 6 cm (c) 12 cm (d) 18 cm

12. If the radius of the base of a cone is tripled and the height is doubled then the volume is
(a) 6 times (b) made 18 times (c) made 12 times (d) unchanged

13. The mean of 100 observations is 40 and their standard deviation is 3. The sum of squares of all observations is (a) 40000 (b) 160900 (c) 160000 (d) 30000 .

14. Three fair coins are tossed once. The probability of getting at least two heads is
(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{7}{8}$ (d) $\frac{3}{8}$

PART - II

ANSWER ANY 10 QUESTIONS. QUESTION NO.28 IS COMPULSORY: **10X2=20**

15. A Relation R is given by the set { (x,y)| y= x+3, x ∈ {0,1,2,3,4,5}. Determine its domain and range.

16. If f(x) = x^2 -1 , g(x) = x-2 find a, if g o f(a) =1.

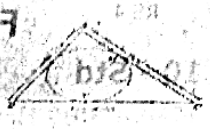
17. Find the least number that is divisible by the first ten natural numbers.

18. Find the sum of 1+3+5+... to 40 terms.

19. Solve the quadratic equation 3 (p^2 -6) = p (p+5)by factorization method.

20. If the difference between a number and its reciprocal is $\frac{24}{5}$, find the number.

21. If $A = \begin{pmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & \frac{1}{2} \\ 8 & 3 & 1 \end{pmatrix}$ then verify $(A^T)^T = A$.



22. From the given figure ΔABC is circumscribing a circle. Find the length of BC.
23. If the points (2,3), (4,a) and (6, -3) are collinear find the value of 'a'.
24. Show that $\frac{1-\tan^2\theta}{\cot^2\theta-1} = \tan^2\theta$
25. If the ratio of radii of two spheres is 4:7, find the ratio of their volumes.
26. If the mean and coefficient of variation of a data are 15 and 48 respectively, then find the value of standard deviation.
27. What is the probability that a leap year selected at random will contain 53 saturdays.
28. A hollow cylindrical pipe is made up of copper. It is 2.1m long. The outer and inner diameter of the pipe are 16cm and 12 cm respectively. Find the volume of the copper used to make the pipe(in cm^3)?

PART - III

ANSWER ANY 10 QUESTIONS. QUESTION NO.42 IS COMPULSORY: **10X5=50**

29. Let A = The set of all natural numbers less than 8, B= The set of all prime numbers less than 8, C = The set of even prime number. Verify that (A ∩ B) X C = (A X C) ∩ (B X C).
30. Find x if gff(x) = fgg(x) , given f(x) = 3x + 1 and g(x) = x + 3.
31. Find the sum to n terms of the series 3 + 33 + 333 + ... to n terms.
32. Find the sum of the series $(2^3 - 1^3) + (4^3 - 3^3) + (6^3 - 5^3) +$ ... to (i) n terms (ii) 8 terms .
33. Solve the following system of linear equation in three variables
$x + 20 = \frac{3y}{2} + 10 = 2z + 5 = 110 - (y+z)$.
34. If α, β are the roots of the equation $2x^2 - x - 1 = 0$ then form the equation whose roots are (i) $\alpha^2\beta, \beta^2\alpha$ (ii) $2\alpha+\beta$, $2\beta+\alpha$.
35. State and prove Pythagoras theorem.
36. Find the area of the quadrilateral whose vertices are at (−9, −2), (−8, −4), (2,2) and (1, −3).
37. If $\frac{\cos\theta}{1+\sin\theta} = \frac{a}{b}$, then prove that $\frac{a^2-1}{a^2+1} = \sin\theta$
38. Arul has to make arrangements for the accommodation of 150 persons for his family function. For this purpose, he plans to build a tent which is in the shape of cylinder surmounted by a cone. Each person occupies 4 sq.m of the space on ground and 40 cu.meter of air to breathe. What should be the height of the conical part of the tent if the height of cylindrical part is 8m?
39. Seenu's house has an overhead tank in the shape of a cylinder. This is filled by pumping water from a sump (underground tank) which is the shape of a cuboid. The sump has dimensions 2mx 1.5mx1m. The overhead tank has its radius of 60cm and height 105cm. Find the volume of the water left in the sump after the overhead tank has been completedly filled with water from the sump which has been full, initially.
40. The marks scored by the students in a slip test are given below. Find the standard deviation of their marks.

4	6	8	10	12
7	3	5	9	5

41. Two dice are rolled. Find the probability that the sum of outcomes is (i) equal to 4 (ii) greater than 10 (iii) less than 13.
42. The area of a triangle is 5 sq.units. Two of its vertices are (2,1) and (3, -2). The third vertex lies on the line y = x+3. Find the third vertex.

PART - IV

ANSWER ALL THE QUESTIONS: **2X8=16**

43. (a) Draw a triangle ABC of base BC = 5.6 cm, $\angle A = 40°$ and the bisector of $\angle A$ meets BC at D such that CD = 4cm. ***(OR)***
(b) Draw a circle of diameter 6cm from a point P, which is 8 cm away from its centre. Draw the two tangents PA and PB to the circle and measure their lengths.
44. (a) Draw the graph of $y = x^2 + 3x + 2$ and use it to solve $x^2 + 2x + 1 = 0$. ***(OR)***
(b) A garment shop announces a flat 50 % discount on every purchase of items for their customers. Draw the graph for the relation between the Marked Price and the Discount. Hence find (I) the marked price when a customer gets a discount of₹ 3250 (from graph) (ii) the discount when the marked price is ₹ 2500.