ARIYALUR DISTRICT

Reg:No: 1 0 3 0 1

FIRST REVISION EXAMINATION - 2025

MATHEMATICS

CLASS : 10

Marks : 100

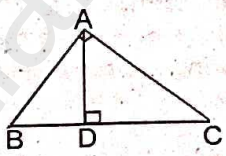
Time : 3.00 Hrs.

PART - I

Note: (i) Answer all the questions. 14 × 1 = 14

(ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1. $f(x) = (x+1)^3 - (x-1)^3$ represents a function which is
   a) linear b) cubic c) reciprocal d) quadratic
2. If there are 1024 relations from a set A = {1, 2, 3, 4, 5} to a set B, then the number of elements in B is
   a) 3 b) 2 c) 4 d) 8
3. $7^{4k} \equiv$ ---------- (mod 100)
   a) 1 b) 2 c) 3 d) 4
4. Given $F_1 = 1$, $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then F_6 is
   a) 3 b) 5 c) 18 d) 11
5. The solution of $(2x-1)^2 = 9$ is
   a) –1 b) 2 c) –1, 2 d) None of these
6. In the adjacent figure $\angle BAC = 90^0$ and AD ⊥ BC then



   a) BD . CD = BC^2 b) AB . AC = BC^2
   c) BD . CD = AD^2 d) AB . AC = AD^2
7. If $(x-6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is
   a) 3 b) 5 c) 6 d) 8
8. A man walks near a wall, such that the distance between him and the wall is 10 units. Consider the wall to be the Y-axis then the path of the man is
   a) $x = 10$ b) $y = 10$ c) $x = 0$ d) $y = 0$
9. $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \operatorname{cosec}\theta)$ is equal to
   a) 0 b) 1 c) 2 d) –1
10. If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is
    a) 1 : 2 b) 1 : 4 c) 1 : 6 d) 1 : 8
11. The sides of two similar triangles are in the ratio 4 : 9. The areas of these triangles are in the ratio
    a) 2 : 3 b) 4 : 9 c) 16 : 81 d) 81 : 16
12. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be
    a) 12 cm b) 10 cm c) 13 cm d) 5 cm
13. The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is a) 2 b) 1 c) 3 d) 1.5
14. If the standard deviation of x, y, z is p then the standard deviation of $5x + 3$, $5y + 3$, $5z + 3$ is
    a) $3p + 5$ b) $3p$ c) $5p$ d) $5p + 3$

PART-II

Note: Answer any 10 questions. Question Number 28 is compulsory. 10x2=20

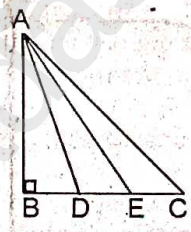
15. If $f \circ f(k) = 5$, $f(k) = 2k - 1$ then find the value of k.
16. 'a' and 'b' are two positive integers such that $a^b \times b^a = 800$. Find 'a' and 'b'.
17. In a G.P 729, 243, 81,... find t_7.
18. Find the excluded values of the expression $\frac{7p+2}{8p^2+13p+5}$
19. If A = {2, –2, 3} and B = {1, –4} then find A X B and B X A.
20. If α and β are the roots of the equation $2x^2 - 7x + 5 = 0$, find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$.

21. A vertical stick of length 6 m casts a shadow 400 cm long on the ground and at the same time a tower casts a shadow 28 m long. Using similarity, find the height of the tower.
22. Find the intercepts made by the line $3x - 8y - 12 = 0$ on the coordinate axes.
23. The line p passes through the points (3, –2), (12, 4) and the line q passes through the points (6, –2) and (12, 2). Is p parallel to q?
24. Prove that $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \sec\theta + \tan\theta$
25. A solid sphere and a solid hemisphere have equal total surface areas. Prove that the ratio of their volumes is $3\sqrt{3} : 4$.
26. Show that the points P(–1.5, 3), Q(6, –2) and R(–3, 4) are collinear.
27. Find the range and coefficient of range of the following data: 25, 67, 48, 53, 18, 39, 44.
28. The external radius and the length of a hollow wooden log are 16 cm and 13 cm respectively. If its thickness is 4 cm then find its T.S.A.

PART - III

Note: Answer any 10 questions. Question Number 42 is compulsory. 10x5=50

29. Find the sum of all natural numbers between 300 and 600 which are divisible by 7.
30. Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm, . . . , 24 cm. How much area can be decorated with these colour papers?
31. Let A = {1, 2, 3, 4} and B = {2, 5, 8, 11, 14} be two sets. Let $f: A \to B$ be a function given by $f(x) = 3x - 1$. Represent this function (i) by an arrow diagram (ii) in a table form (iii) as a set of ordered pairs (iv) in a graphical form.
32. $9x^4 + 12x^3 + 40x^2 + ax + b$ is a perfect square, find the values of a and b.
33. Solve the following system of linear equations in three variables:
$x + y + z = 5$; $2x - y + z = 9$; $x - 2y + 3z = 16$
34. If $A = \begin{pmatrix} 1 & 1 \\ -1 & 3 \end{pmatrix}$, $B = \begin{pmatrix} 1 & 2 \\ -4 & 2 \end{pmatrix}$, $C = \begin{pmatrix} -7 & 6 \\ 3 & 2 \end{pmatrix}$, verify that A(B + C) = AB + AC.
35. In the adjacent figure, ABC is a right angled triangle with right angle at B and points D, E trisect BC. Prove that $8AE^2 = 3AC^2 + 5AD^2$.



36. State and prove Basic Proportionality Theorem.
37. Find the area of the quadrilateral formed by the points (–9, –2), (–8, –4), (2, 2) and (1, –3).
38. 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.
39. From the top of a tower 50 m high, the angles of depression of the top and bottom of a tree are observed to be 30^0 and 45^0 respectively. Find the height of the tree. $(\sqrt{3} = 1.732)$
40. A solid right circular cone of diameter 14 cm and height 8 cm is melted to form a hollow sphere. If the external diameter of the sphere is 10 cm, find the internal diameter.
41. Find the equation of the perpendicular bisector of the line joining the points A(– 4, 2) and B(6, – 4).
42. Two dice are rolled once. Find the probability of getting an even number on the first die or a total of face sum 8.

PART - IV

Note: Answer all the questions. 2×8=16

43. a) Construct a Δ PQR such that QR = 6.5 cm, $\angle P = 60^0$ and the altitude from P to QR is of length 4.5 cm.

(OR)

b) Draw a circle of diameter 6 cm 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 $xy = 24$, $x, y > 0$. Using the graph find (i) y when $x = 3$ (ii) x when $y = 6$.

(OR)

b) Draw the graph of $y = x^2 - 4x + 3$ and use it to solve $x^2 - 6x + 9 = 0$.

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