T

COMMON HALF YEARLY EXAMINATION - 2024

Reg.No. | | | | | | |

Standard - IX

MATHEMATICS

Time: 3.00 hrs. *Marks:100*

PART - I

I. Answer all the questions: 14×1=14

1. B ⊆ A then n(A∩B) is
   1) n(A–B) 2) n(B) 3) n(B - A) 4) n(A)
2. For any three sets A, B and C (A – B) ∩ n(B –C) is equal to
   1) A only 2) B only 3) C only 4) ϕ
3. $\sqrt{27} + \sqrt{12} =$
   1) $\sqrt{39}$ 2) $5\sqrt{6}$ 3) $5\sqrt{3}$ 4) $3\sqrt{5}$
4. When written with the rational denominator the expression $\frac{2\sqrt{3}}{3\sqrt{2}}$ can be simplified as
   1) $\frac{\sqrt{2}}{3}$ 2) $\frac{\sqrt{3}}{2}$ 3) $\frac{\sqrt{6}}{3}$ 4) $\frac{2}{3}$
5. Zeros of (2 - 3x) is _____.
   1) 3 2) 2 3) $\frac{2}{3}$ 4) $\frac{3}{2}$
6. $(a + b - c)^2$ is equal to _____.
   1) $(a - b + c)^2$ 2) $(-a - b + c)^2$ 3) $(a + b + c)^2$ 4) $(a - b - c)^2$
7. Find the value of M from the equation 2x + 3y = M. If its one solution is x = 2 and y = -2.
   1) 2 2) -2 3) 10 4) 0
8. The angle of the triangle are 3x - 40°, x + 20° and 2x + 10° then the value of x is
   1) 40° 2) 35° 3) 50° 4) 45°
9. A chord is at a distance of 15cm from the centre of the circle of radius 25cm. The length of the chord is
   1) 25cm 2) 20cm 3) 40cm 4) 18cm
10. If one angle of a cyclic quadrilateral is 75° then the opposite angle is
    1) 100° 2) 105° 3) 85° 4) 90°
11. If $P\left(\frac{a}{3}, \frac{b}{2}\right)$ is the mid-point of the line segment joining A (-4 , 3) and B(-2, 4) then (a, b) is
    1) (-9, 7) 2) $\left(-3, \frac{7}{2}\right)$ 3) (9, -7) 4) $\left(3, \frac{-7}{2}\right)$

12. The ratio in which the x axis divides the line segment joining the points (6, 4) and (1, -7) is

1) 2 : 3 2) 3 : 4 3) 4 : 7 4) 4 : 3

13. The value of $\frac{1-\tan^2 45^\circ}{1+\tan^2 45^\circ}$ is

1) 2 2) 1 3) 0 4) ½

14. The value of $\tan 1^\circ \tan 2^\circ \tan 3^\circ \ldots\ldots \tan 89^\circ$ is

1) 0 2) 1 2) 2 4) $\frac{\sqrt{3}}{2}$

PART - II

Answer any 10 questions. Question No.28 is compulsory: **10×2=20**

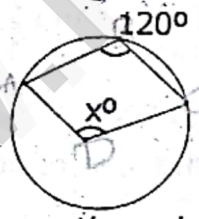
15. Represent the following sets in Rostes form $D = \{x / x \in z, -5 < x \leq 2\}$
16. If A = {6, 7, 8, 9} and B = {8, 10, 12} find AΔB.
17. Find any three rational numbers between $\frac{-7}{11}$ and $\frac{2}{11}$.
18. Find the 5th root of $\frac{1024}{3125}$
19. Simplify the following using addition and subtraction properties of surds.

$3\sqrt{75} + 5\sqrt{48} - \sqrt{243}$

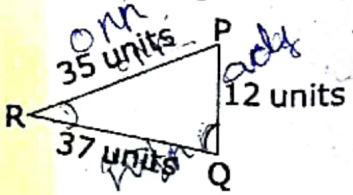
20. Write the coefficient of x^2 and x in each of the following polynomials

$\sqrt{3}x^2 + \sqrt{2}x + 0.5$

21. Expand $(a - b + c)^2$
22. Find the GCD of the following $64x^8$, $240x^6$
23. Find the value of x°



24. Find the distance between the points (-4, 3) (2, -3)
25. Find the centroid of the triangle whose vertices are A(6, -1), B(8, 3) and (10, -5)
26. Evaluate $\sin 30^\circ + \cos 30^\circ$
27. Evaluate $\frac{\sin 49^\circ}{\cos 41^\circ}$
28. For the measures in the figure compute sine, Coseine and tangent ratio of the angle Q.



PART - III

Answer any 10 questions. Question No.42 is compulsory. **10×5=50**

29. If A = {-2, 0, 1, 3, 5} B = {-1, 0, 2, 5, 6} and c = {-1, 2, 5, 6, 7} then show that A - (B ∪ C) = (A - B) ∩ (A - C).
30. Verify $(A \cap B)' = A' \cup B'$ using venn diagrams.
31. In a class, all students take part in either music or drama or both 25 students take part in music, 30 students take part in drama and 8 students take part in both music and drama. Find
    i) The number of students who take part in only music.
    ii) The number of students who take part in only drama.
    iii) The total number of students in the class.
32. Represent the following members on the number line $4.\overline{73}$ upto 4 decimal places.
33. Given $\sqrt{2} = 1.414$ find the value of $\frac{8-5\sqrt{2}}{3-2\sqrt{2}}$ (to 3 places of decimals)
34. If $\left(y-\frac{1}{y}\right)^3 = 27$ then find the value of $y^3 - \frac{1}{y^3}$
35. Find the quotient and remainder for the following using synthetic division $(x^3 + x^2 - 7x - 3) \div (x - 3)$
36. Solve 3x - 4y = 10 and 4x + 3y = 5 By the method of cross Multiplication.
37. Find the length of a chord which is at a distance of $2\sqrt{11}$ cm from the centre of a circle of radius 12 cm.
38. Find the value of a such that PQ = QR where P, Q and R are the points whose co-ordinates are (6,-1) (1,3) and (a,8) respectively.
39. The mid point of the sides of a triangle are (2,4) (-2, 3) and (5, 2). Find the Co-ordinates of the vertices of the triangle.
40. Using section formula show that the points A (7, -5) B (9, -3) and C (13, 1) are collinear.
41. If $\tan A = \frac{2}{3}$ then find all the other trignometric ratios.
42. Find the value of the following $\frac{\cot\theta}{\tan(90^\circ-\theta)} + \frac{\cos(90^\circ-\theta)\tan\theta\sec(90^\circ-\theta)}{\sin(90^\circ-\theta)\cot(90^\circ-\theta)\operatorname{cosec}(90^\circ-\theta)}$

PART - IV **2×8=16**

43. A) Construct the ΔLMN such that LM = 7.5 Cm MN = 5Cm and LN = 8Cm Locate the centroid. **(OR)**
    B) Construct the incentre of ΔABC with AB = 6cm ∠B = 65° and AC = 7 cm Also draw the in circle and measure in radius.
44. A) Draw the graph : 3x + 2y = 14 **(OR)**
    B) Solve graphically : x + y = 7; x - y = 3.
