HALF YEARLY EXAMINATION - 2024

9 Std **MATHEMATICS** Reg No. 9305

Time : 3.00 HR MARKS: 100

Instructions:

- Write clearly and legibly without mistakes and overwriting utilising the maximum time allotted for the exam
- Answers should be in your own style without changing the main core concept.
- Use only black or blue ink pen to write the exam.
- Draw clear diagrams wherever necessary.

PART - I

I Choose the correct answer. **14x1=14**

1. If A = {x,y,z} then the number of non - empty subsets of A is _____
   a) 8 b) 5 c) 6 d) 7
2. If n (A)=10 and n(B)=15, then the minimum and maximum number of elements in AnB is _____ a) 10, 15 b) 15, 10 c) 10, 0 d) 0, 10
3. Which of the following is true?
   a) A - B = A ∩ B b) A - B = B - A c) $(A \cup B)' = A' \cup B'$ d) $(A \cap B)' = A' \cup B'$
4. An irrational number between 2 and 2.5 is _____
   a) $\sqrt{11}$ b) $\sqrt{5}$ c) $\sqrt{2.5}$ d) $\sqrt{8}$
5. $\sqrt{27} + \sqrt{12} =$
   a) $\sqrt{39}$ b) $5\sqrt{6}$ c) $5\sqrt{3}$ d) $3\sqrt{5}$
6. The zero of the polynomial $2x+5$ is _____
   a) $\frac{5}{2}$ b) $-\frac{5}{2}$ c) $\frac{2}{5}$ d) $-\frac{2}{5}$
7. If p(a) =0 then (x-a) is a _____ of p(x).
   a) divisor b) quotient c) remainder d) factor
8. Which of the following is a solution of the equation 2x-y = 6.
   a) (2,4) b) (4,2) c) (3,-1) d) (0,6)
9. GCD of any two prime numbers is _____
   a) -1 b) 0 c) 1 d) 2
10. The angles of the triangle are $(3x-40)^\circ$, $(x+20)^\circ$ and $(2x-10)^\circ$ then the value of x is
    a) 40° b) 35° c) 50° d) 45°

11. If one angle of a cyclic quadrilateral is 75^0, then the opposite angle is _____

a) 100^0 b) 105^0 c) 85^0 d) 90^0

12. The point whose ordiante is 4 and which lies on the y-axis is _____

a) (4,0) b) (0,4) c) (1,4) d) (4,2)

13. The mid - point of the line joining (-a,2b) and (-3a,-4b) is _____

a) (2a,3b) b) (-2a,-b) c) (2a,b) d) (-2a, -3b)

14. If $\tan\theta = \cot 37^0$, then the value of θ is _____

a) 37^0 b) 53^0 c) 90^0 d) 1^0

PART - II

II Answer any 10 questions (Q.No:28 is compulsory). **10x2=20**

15. If A = {a,{a,b}}, write all the subsets of A.

16. If A = {6,7,8,9} and B = {8,10,12}, find A Δ B.

17. Verify that $1 = 0.\bar{9}$

18. Find the value of $64^{\frac{-2}{3}}$.

19. Write in scientific notation : $(50000000)^4$

20. If $P(x) = x^2 - 2\sqrt{2}\,x + 1$, find $P(2\sqrt{2})$.

21. Factorise $6x^2 + 16xy + 8y^2$.

22. The angles of a triangle are in the ratio 1:2:3, find the measure of each angle of the triangle.

23. A chord is 12 cm away from the centre of the circle of radius 15 cm. Find the length of the chord.

24. Find the distance between the points (3,4) and (-7,2).

25. The point (3,-4) is the centre of a circle. If AB is a diameter of the circle and B is (5,-6), find the coordinates of A.

26. Evaluate : $\dfrac{\sec 63^0}{\text{cosec } 27^0}$

27. Find the value of $\sin^2 30^0 - 2\cos^3 60^0 + 3\tan^4 45^0$.

28. Find the GCD of $(a-b)^2$, $(b-c)^3$, $(c-a)^4$.

PART - III

III Answer any 10 questions (Q.No:42 is compulsory). **10x5=50**

29. If A = {p,q,r,s}, B = {m,n,q,s,t} and c = {m,n,p,q,s} then verify the associative property of union of sets.

30. Verify A - (BUC) = (A - B) ∩ (A - C) using venn diagrams.

31. A Survey of 1000 farmers found that 600 grew paddy, 350 grew ragi, 280 grew corn, 120 grew paddy and ragi, 100 grew ragi and corn, 80 grew paddy and corn. If each farmer grew atleast any one of the above three, then find the number of farmers who grew all the three.

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

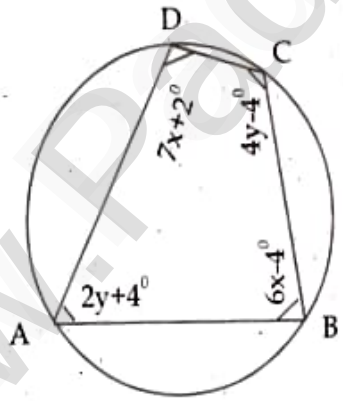
33. If $x = \sqrt{5}+2$, then find the value of $x^2+\frac{1}{x^2}$.

34. If two polynomials $2x^3+ax^2+4x-12$ and x^3+x^2-2x+a leave the same remainder when divided by (x-3), find the value of a and also find the remainder.

35. Factorise $x^3-3x^2-10x+24$ using synthetic division.

36. In a quadrilateral ABCD, $\angle A = 72^\circ$ and $\angle C$ is the supplementary of $\angle A$. The other two angles are $(2x-10)^0$ and $(x+4)^0$. Find the value of x and the measure of all the angles.

37. Find all the angles of the given cyclic quadrilateral ABCD in the figure.



38. Show that the points A(-3,1), B(-6,-7), C(3,-9), D(6,-1) taken in order form the vertices of a parallelogram.

39. What are the coordinates of B if point P(-2,3) divides the line segement joining A(-3,5) and B internally in the ratio 1:6?

40. If 3 cot A = 2, then find the value of $\frac{4\sin A - 3\cos A}{2\sin A + 3\cos A}$

41. Find the value of $\tan 15^\circ \tan 30^\circ \tan 45^\circ \tan 60^\circ \tan 75^\circ$.

42. Solve by the method of elimination.

$2x - y = 3$; $3x + y = 7$

PART - IV

IV Answer all the questions. **2x8=16**

43. Draw ΔPQR with sides PQ = 7 cm, QR = 8 cm and PR = 5 cm and construct its Orthocentre.

(OR)

Draw a triangle ABC, where AB = 8 cm, BC = 6 cm, and $\angle B = 70^\circ$ and locate its circumcentre and draw the circumcircle.

44. Draw the graph of $y = 4x - 1$.

(OR)

Solve graphicallly $x + y = 5$; $2x - y = 4$.

.....