BRINDHAVAN HIGHER SECONDARY SCHOOL

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HTJ

HALF YEARLY EXAMINATION -2025

9 - Std

MATHEMATICS

நேரம் : 2.30 மணி

Marks :100

I **Choose the correct answer and write it with option.** **14×1=14**

1. If A={x, y, z} then the number of non-empty subset of A is
(1) 8 (2) 5 (3) 6 (4) 7
2. In a class of 50 boys, 35 boys play carom and 20 boys play chess then the number of boys play both game is
(1) 5 (2) 30 (3) 15 (4) 10
3. Which one of the following, regarding sum of two irrational numbers, is true?
(1) always an irrational (2) may be a rational or irrational number
(3) always a rational number (4) always an integer
4. The length and breath of a rectangular plot are 5×10^5 and 4×10^4 meters respectively. Its area is
(1) 9×10^1 m² (2) 9×10^9 m² (3) 2×10^{10} m² (4) 20×10^{20} m²
5. The type of the polynomial $4-3x^3$ is
(1) constant polynomial (2) liar polynomial
(3) quadratic polynomial (4) cubic polynomial
6. Degree of the constant polynomial is
(1) 3 (2) 2 (3) 1 (4) 0
7. The exterior angle of a triangle is equal to the sum of two
(1) Exterior angles (2) Interior opposite (3) Alternate angles (4) Interior angles
8. If one angle of a cyclic quadrilateral is 75°, then the opposite angle is
(1) 100° (2) 105° (3) 85° (4) 90°
9. If the y-coordinate of a point is zero, then the point always lies
(1) in the I quadrant (2) in the II quadrant (3) on x-axis (4) on y-axis
10. The mid point of the line joining the points (-a, 2b) and (-3a,-4b) is
(1) (2a, 3b) (2) (-2a,-b) (3) (2a, b) (4) (-2a,-3b)
11. If sin 30° = x and cos 60° = y then $x^2 + y^2$ is
(1) ½ (2) 0 (3) sin90° (4) cos 90°
12. The value of tan 72° tan 18° is (1) 0 (2) 1 (3) 18° (4) 72°
13. If A={1,b, b, {4,2},{x, y, z}, d, {d} }, then n(A) is (1) 5 (2) 6 (3) 7 (4) 4
14. If the degree of the polynomial is zero then the polynomial is
(1) Linear polynomial (2) Cubic polynomial
(3) Constant polynomial (4) Quadratic polynomial

II. **Answer any 10 questions. Q. No 28 is compulsory.** **10×2=20**

15. Write the set of letters of the following words in Roster form
(i) ASSESSMENT (ii) PRINCIPAL
16. Let U={0,1,2,3,4,5,6,7} A={1,3, 5, 7} and B={0, 2, 3, 5, 7} find the following sets
(i) A′ (ii) B′
17. Write the number 2000.57 in scientific notation.
18. Rationalise the denominator of $\frac{7}{\sqrt{14}}$.
19. Add the following polynomials and find the degree of the result polynomial
$p(x) = 6x^2 - 7x + 2$ and $q(x) = 6x^3 - 7x + 15$.

20. Show that (x+2) is a factor of $x^3 - 4x^2 - 2x + 20$

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

22. 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.

23. Find the distance between the pair of points (3,4) and (-7,2).

24. If the centroid of a triangle is at (4,-2) and two of its vertices are (3,-2) and (5,2) then find the third vertex of the triangle.

25. If $\tan A = \frac{2}{3}$ then find all other trigonometric ratios.

26. Verify the equality $\sin 30° \cos 60° + \cos 30° \sin 60° = \sin 90°$.

27. Solve by the method of elimination : $2x - y = 3$; $3x + y = 7$.

28. If (3, x) is the mid-point of the line segment joining the points A(8, -5) and B (-2, 11), then find the value of x.

III Answer any 10 questions. Q. No 42 is compulsory. 10×5=50

29. If A={b, c, e, g, h}, B = {a, c, d, g, i} and C = {a, d, e, g, h} then show that A-(BUC) =(A-B) ∩ (A-C)

30. In a college, 240 students play cricket, 180 students play football, 164 students play hockey, 42 play both cricket and football, 38 play both football and hockey, 40 play both cricket and hockey and 16 play all the three games,. If each student participate in atleast one game, then find (i) the number of students in the college (ii) the number of students who play only one game.

31. Arange in ascending order $\sqrt[3]{2}$, $\sqrt[3]{4}$, $\sqrt[4]{3}$

32. Simplify $(2.75 \times 10^7) + (1.23 \times 10^8)$

33. Find quotient and the remainder when f(x) is divided by g(x) $f(x) = 8x^3 - 6x^2 + 15x - 7$, $g(x) = 2x + 1$.

34. Factorise $x^3 - 5x^2 - 2x + 24$ using synthetic division method.

35. The angles of a quadrilateral are in the ratio 2:4:5:7. Find all the angles.

36. Show that the points A (7,10), B (-2,5), C (3,-4) are the vertices of a right angled triangle.

37. The mid-point (x, y) of the line joining (3,4) and (p, 7) lies on 2x + 2y + 1= 0, then what will be the value of p?

38. Find the values of (cos 0° + sin 45° + sin 30°) (sin90° - cos45° + cos 60°).

39. Find the value of 8 sin2x cos 4x sin 6x, where x = 15°.

40. Find the coordinates of the point which divides the line segment joining the points (3,5) and (8,-10) internally the ratio 3:2.

41. If the quotient on dividing $x^4 + 10x^3 + 35x^2 + 50x + 29$ by (x + 4) is $x^3 - ax^2 + bx + 6$, then find the value of a, b and also reminder.

42. Verify (A ∪ B)′ = A′ ∩ B′ using Venn diagram.

IV. Answer the following question.

43. (a) Construct the △LMN such that LM=7.5 cm. MN=5cm, and LN=8cm. Locate its centroid. ***(OR)***

(b) Construct the right angled triangle PQR whose perpendicular sides are 4.5cm and 6 cm. Also locate its circumcentre and draw the circumcircle.

44. (a) Draw the graph for y=4x-1. ***(OR)***

(b) Solve graphically 3x + 2y = 49 ; 9x + 6y - 12=0.