COMMON QUARTERLY EXAMINATION - 2024 Reg. No.

IX - MATHEMATICS

Time Allowed : 2.30 Hrs. *Maximum Marks: 100*

Part - I

I. Choose the correct answer: **14 x 1 = 14**

1. The set $P = \{x / x \in Z, -1 < x < 1\}$ is a
   a) singleton set b) power set c) null set d) sub set
2. If $B \subseteq A$, then $n(A \cap B)$ is
   a) $n(A - B)$ b) $n(B)$ c) $n(B - A)$ d) $n(A)$
3. If $A \cup B = A \cap B$, then
   a) $A \subset B$ b) $A \neq B$ c) $A = B$ d) $B \subset A$
4. For any three sets P, Q and R, $P - (Q \cap R)$ is
   a) $P - (Q \cup R)$ b) $(P \cap Q) - R$
   c) $(P - Q) \cup (P - R)$ d) $(P - Q) \cap (P - R)$
5. If A and B are two any two non empty sets such that $A \cup B = A \cap B$, then
   a) $A = B$ b) $A \neq B$ c) $A < B$ d) $A > B$
6. Which one of the following is an irrational number?
   a) $\sqrt{25}$ b) $\sqrt{9/4}$ c) $7/11$ d) π
7. An rational number between 2 and 2.5 is
   a) $\sqrt{11}$ b) $\sqrt{5}$ c) $\sqrt{2.5}$ d) $\sqrt{8}$
8. $\sqrt{27} + \sqrt{12}$ = _____.
   a) $\sqrt{39}$ b) $5\sqrt{6}$ c) $5\sqrt{3}$ d) $3\sqrt{5}$
9. $4\sqrt{7} \times 2\sqrt{3}$ = _____.
   a) $6\sqrt{10}$ b) $8\sqrt{21}$ c) $8\sqrt{10}$ d) $6\sqrt{21}$
10. The root of the polynomial equation $2x + 3 = 0$ is
    a) $1/3$ b) $-1/3$ c) $-3/2$ d) $-2/3$
11. Degree of the polynomial $(y^3 - 2)(y^3 + 1)$ is
    a) 9 b) 2 c) 3 d) 6
12. If $P(a) = 0$ then $(x - a)$ is a _____ of $P(x)$.
    a) divisor b) quotient c) remainder d) factor
13. Cubic polynomial may have maximum of _____ linear factors.
    a) 1 b) 2 c) 3 d) 4
14. The exterior angle of a triangle is equal to the sum of two
    a) exterior angles b) interior opposite angles
    c) alternate angles d) interior angles

Part - II

II. Answer any 10 questions. **10 x 2 = 20**

15. Represent the set in Roster form :
    A = The set of all even natural numbers less than 20
16. Define Set.
17. Write down the power set of B = {1,2,3}
18. Find A – B and B – A for the sets A = {2,6,10,14} and B = {2,5,14,16}
19. Convert the decimal number $0.\overline{3}$ in the form of p/q $(p, q \in Z$ and $q \neq 0)$
20. Express 32 in the form 2^n

21. Rationalise the denominator $\frac{1}{\sqrt{50}}$

22. Represent the following numbers in the scientific notation :
i) 2000.57 ii) 0.0000006000

23. Add the polynomials and find the degree of the resultant polynomial.
$p(x) = 6x^2 + 7x + 2$ $q(x) = 6x^3 - 7x + 15$

24. Find the roots of the polynomial equations : $10x + 9 = 0$

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

26. Find the GCD for $9a^2b^2c^3$, $15a^3b^2c^4$

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

Part - III

III. Answer any 10 questions. $10 \times 5 = 50$

28. i) List the set of letters of the following word in Roster form :
PARALLELOGRAM
ii) Find the cardinal number of the set
$R = \{x : x \text{ is an integer, } x \in Z \text{ and } -5 \leq x < 5\}$
iii) If $n[p(A)] = 256$, find $n(A)$

29. If $U = \{a,b,c,d,e,f,g,h\}$, $A = \{b,d,f,h\}$ and $B = \{a,d,e,h\}$, find the following sets.
i) A' ii) B' c) $A' \cup B'$ iv) $A' \cap B'$

30. Verify $(A \cup B)' = A' \cap B'$ using Venn diagrams.

31. If $A = \{x : x \in Z, -2 < x \leq 4\}$, $B = \{x : x \in W, x \leq 5\}$, $C = \{-4, -1, 0, 2, 3, 4\}$, then verify $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

32. 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.

33. Represent 4.863 on the number line.

34. Arrange surds in descending order : $\sqrt[3]{5}, \sqrt[9]{4}, \sqrt[6]{3}$

35. Rationalise the denominator of $\frac{5+\sqrt{3}}{5-\sqrt{3}}$

36. Write to the following numbers in decimal form :
i) 6.34×10^4 ii) 2.00367×10^{-5}

37. Find the value of m, if $(x - 2)$ is a factor of the polynomial $2x^3 - 6x^2 + mx + 4$

38. i) Expand $(x + 2y + 3z)^2$
ii) Evaluate 98^3 by using Identities

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

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

Part - IV

IV. Answer the following. $2 \times 8 = 16$

41. a) Draw and locate the centroid of the triangle ABC where right angle at A, AB = 4 cm and AC = 3 cm.

(OR)

b) Construct ΔPQR whose sides are PQ = 6 cm, $\angle Q = 60^\circ$ and QR = 7 cm and locate its orthocentre.

42. a) Draw the graph for $y = 3x - 1$

(OR)

b) Draw the graph for $3x + 2y = 14$