CLASS : 9

Register Number 009213

COMMON QUARTERLY EXAMINATION-2024-25

Time Allowed : 3.00 Hours] **MATHEMATICS** [Max. Marks : 100

PART – I

14x1=14

I Choose the correct Answer.

1. The set P = {x|x∈Z, -1<x<1} is a
   a) Singleton set b) Power set c) Null set d) Subset
2. Which of the following is correct?
   a) $\phi \subseteq \{a,b\}$ b) $\phi \in \{a,b\}$ c) $\{a\} \in \{a,b\}$ d) $a \subseteq \{a,b\}$
3. If B-A is B, then A∩B is
   a) A b) B c) U d) ϕ
4. For any three sets A, B and C, (A-B) ∩ (B-C)
   a) A only b) B only c) C only d) ϕ
5. In a City, 40% of people like only one fruit, 35% people like only two fruits, 20% people like all the three fruits. How many percentage of people do not like any one of the above three fruits?
   a) 5 b) 8 c) 10 d) 15
6. Which one of the following is an irrational number?
   a) $\sqrt{25}$ b) $\sqrt{\frac{9}{4}}$ c) $\frac{7}{11}$ d) π
7. If $^1/_7 = 0.\overline{142857}$ then the value of $^5/_7$ is
   a) $0.\overline{142857}$ b) 0.714285 c) $0.\overline{571428}$ d) 0.714285
8. If $\sqrt{80} = k\sqrt{5}$, then k =
   a) 2 b) 4 c) 8 d) 16
9. When $(2\sqrt{5} - \sqrt{2})^2$ is simplified, we get
   a) $4\sqrt{5} + 2\sqrt{2}$ b) $22 - 4\sqrt{10}$ c) $8 - 4\sqrt{10}$ d) $2\sqrt{10} - 2$
10. The length and breadth of a rectangle plot are 5×10^5 and 4×10^4 metres respectively. Its area is ------
    a) $9 \times 10^1\ m^2$ b) $9 \times 10^9\ m^2$ c) $2 \times 10^{10}\ m^2$ d) $20 \times 10^{20}\ m^2$
11. The zero of the polynomial 2x+5 is ----------
    a) $\frac{5}{2}$ b) $\frac{-5}{2}$ c) $\frac{2}{5}$ d) $\frac{-2}{5}$
12. Degree of the polynomial $(y^3 - 2)(y^3 + 1)$ is ----------
    a) 9 b) 2 c) 3 d) 6
13. If x-3 is a factor of p(x), then the remainder is
    a) 3 b) -3 c) p(3) d) p(-3)
14. Cubic polynomial may have maximum of --------- linear factors.
    a) 1 b) 2 c) 3 d) 4

PART - II

Answer any 10 questions. Question No. 28 is compulsory. 10x2=20

15. Find the number of subsets and the number of proper subsets of a set X = {a, b, c, x, y, z}.
16. Write down the power set of the set A = {a,b}.
17. Find the symmetric difference between the sets P = {2, 3, 5, 7, 11} and Q = {1, 3, 5, 11}
18. If n(A) = 300, n(A∪B) = 500, n(A∩B) = 50 and n(B') = 350, find n(B) and n(∪)
19. Find any three rational numbers between $\frac{-7}{11}$ and $\frac{2}{11}$

20. Express the decimal expression $2.\overline{327}$ into rational number.
21. Find any three irrational numbers between 0.12 and 0.13.
22. The mass of the Earth is 5.97×10^{24} kg, and that of the Moon is 0.073×10^{24} kg. What is their total mass?
23. Rewrite the polynomial $y^2 + \sqrt{5}y^3 - 11 - {}^7/_3\, y + 9y^4$ into standard form.
24. What is the remainder when $x^{2018} + 2018$ is divisible by x-1.
25. Expand $(a-b+c)^2$
26. Find the GCD of a^{m+1}, a^{m+2}, a^{m+3}.
27. Factorise $(a+b)^2 + 9(a+b) + 18$.
28. The angles of a triangle are in the ratio 1:2:3. Find the measure of each angle of the triangle.

PART - III

Answer the following 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 $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ using Venn diagrams.
31. If U = {4, 7, 8, 10, 11, 12, 15, 16}, A = {7, 8, 11, 12} and B = {4, 8, 12, 15} then verify De-Morgan's Laws of complementation.
32. 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.?
33. Represent $6.\overline{4}$ upto 3 decimal places on the number line.
34. Arrange in surds in descending orders. $\sqrt[3]{5}$, $\sqrt[9]{4}$, $\sqrt[6]{3}$
35. Find the value of a and b, if $\frac{\sqrt{7}-2}{\sqrt{7}+2} = a\sqrt{7} + b$.
36. Simplify: $2\sqrt[3]{40} + 3\sqrt[3]{625} - 4\sqrt[3]{320}$
37. The cost of a chocolate is Rs (x + y) and Amir bought (x + y) chocolates. Find the total amount paid by him in terms of x and y If x = 10, y = 5 find the amount paid by him.
38. If both (x-2) and (x-½) are the factors of ax^2+5x+b, then show that a=b.
39. If $(x+a)(x+b)(x+c) = x^3+14x^2+59x+70$, then find the value of
    i) $a + b + c$ ii) $\frac{1}{a} + \frac{1}{b} + \frac{1}{c}$ iii) $a^2 + b^2 + c^2$ iv) $\frac{a}{bc} + \frac{b}{ac} + \frac{c}{ab}$
40. Factorise $x^3 - 3x^2 - 10x + 24$.
41. If the quotient obtained on dividing $(8x^4 - 2x^2 + 6x - 7)$ by $(2x + 1)$ is $(4x^3 + px^2 - qx + 3)$, then find p, q and also the remainder.
42. If A = {-2, 0, 1, 3, 5}, B = {-1, 0, 2, 5, 6} and C = {-1, 2, 5, 6, 7}, then show that $A-(B \cup C)=(A-B) \cap (A-C)$.

PART - IV

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

43. a) Draw the ΔABC, where AB = 6 cm, $\angle B = 110^o$ and BC = 9 cm and construct its Centroid.

    (OR)

    b) Draw an equilateral triangle of sides 6.5 cm and locate its Orthocentre.

44. a) Draw the graph of y = 3x - 1.

    (OR)

    b) Draw the graph of y = 2x.