COMMON QUARTERLY EXAMINATION - 2024

*   **Standard IX**   Reg.No. ☐☐☐☐☐☐

MATHEMATICS

Time : 3.00 hrs   Marks : 100

Part - I

I. Choose the correct answer: 14 x 1 = 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 B − A is B, then A ∩ B is _____.

   a) A   b) B   c) U   d) φ

3. In a class of 50 boys, 35 boys play carrom and 20 boys play chess, then the number of boys play both games is

   a) 5   b) 30   c) 15   d) 10

4. For any three sets P, Q and R, P − (Q ∪ R) is _____.

   a) P − (Q ∩ R)   b) (P ∩ Q) − R

   c) (P − Q) ∪ (P − R)   d) (P − Q) ∩ (P − R)

5. Which one of the following is not a rational number?

   a) $\sqrt{\dfrac{8}{18}}$ b) $\dfrac{7}{3}$ c) $\sqrt{0.01}$ d) $\sqrt{13}$

6. If $\sqrt{80} = k\sqrt{5}$, then k = _____.

   a) 2   b) 4   c) 8   d) 16

7. $4\sqrt{7} \times 2\sqrt{3}$ = _____.

   a) $6\sqrt{10}$ b) $8\sqrt{21}$ c) $8\sqrt{10}$ d) $6\sqrt{21}$

8. If $\sqrt{9^x} = \sqrt[3]{9^2}$ then x = _____.

   a) $\dfrac{2}{3}$ b) $\dfrac{4}{3}$ c) $\dfrac{1}{3}$ d) $\dfrac{5}{3}$

9. If $x^3 + 6x^2 + kx + 6$ is exactly divisible by (x + 2) then k = ?

   a) −6   b) −7   c) −8   d) 11

10. The root of the polynomial equation $2x + 3 = 0$ is

   a) $\dfrac{1}{3}$ b) $-\dfrac{1}{3}$ c) $-\dfrac{3}{2}$ d) $-\dfrac{2}{3}$

11. If $p(a) = 0$ then $(x - a)$ is a _____ of $p(x)$.

   a) divisor   b) quotient   c) remainder   d) factor

12. Cubic polynomial may have maximum of _____ linear factors.

   a) 1   b) 2   c) 3   d) 4

13. GCD of any two prime numbers is _____.

   a) –1   b) 0   c) 1   d) 2

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. (Q.No.28 is compulsory)** $10 \times 2 = 20$

15. Write the set of letters of the following words in Roster form :

   i) ASSESSMENT   ii) PRINCIPAL

16. Write down the power set of the set $B = \{1, 2, 3\}$

17. Find the symmetric difference between the sets $P = \{2, 3, 5, 7, 11\}$ and $Q = \{1, 3, 5, 11\}$.

18. Draw Venn diagram for (i) $A \cup B$ (ii) $A \cap B$

19. Without actual division, find the kind of decimal expansion of $\dfrac{7}{128}$

20. Find any two rational numbers between 2.2360679 .... and 2.236505500 .....

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

22. Rationalise the denominator : $\dfrac{5}{3\sqrt{5}}$

23. Express in scientific notation :

   i) 9768854   ii) 0.04567891

24. Find the GCD of $9a^2b^2c^3$, $15a^3b^2c^4$

25. Is $(x-1)$ is a factor of $x^3 + 5x^2 - 10x + 4$

26. Factorise : $x^2 + 2x - 80$

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

28. Expand the following : $(x+5)(x+6)(x+4)$

Part - III

III. Answer any 10 questions. (Q.No.42 is compulsory) $10 \times 5 = 50$

29. Find the number of subsets and the number of proper subsets of a set
$X = \{a,b,c,x,y,z\}$

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

31. If $A = \{-2,0,1,3,5\}$, $B = \{-1,0,2,5,6\}$ and $C = \{-1,2,5,6,7\}$, then show that
$A - (B \cup C) = (A - B) \cap (A - C)$

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. Find the value of a and b if $\dfrac{\sqrt{7}-2}{\sqrt{7}+2} = a\sqrt{7}+b$

36. Write the following in scientific notation : $(300000)^3 \times (2000)^4$

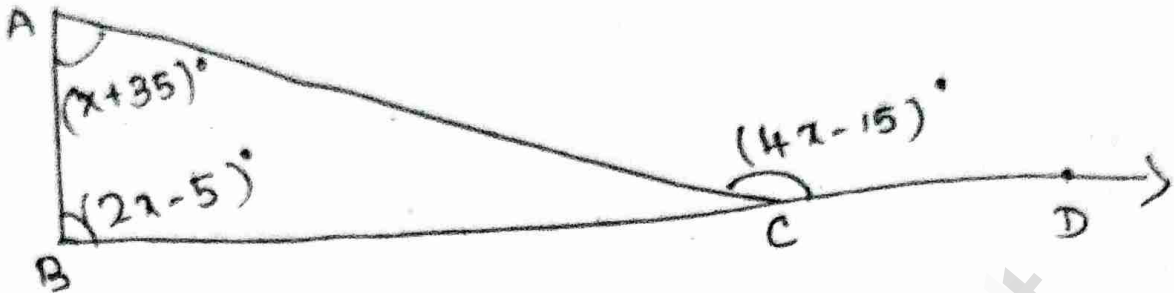37. Find the value of m, if $(x-2)$ is a factor of the polynomial $2x^3 - 6x^2 + mx + 4$

38. Find the quotient and the remainder when $(8y^3 - 16y^2 + 16y - 15) \div (2y-1)$

39. Factorise $x^3 + 13x^2 + 32x + 20$ into linear factors.

40. If the quotient obtained on dividing
$(8x^4 - 2x^2 + 6x - 7)$ by $(2x+1)$ is $(4x^3 - 2x^2 + px + q)$, then find p, q and also the remainder.

41. Find all the three angles of the △ABC.

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

Part - IV

2 x 8 = 16

IV. Answer all the questions.

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

(OR)

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

44. a) Draw a triangle ABC where AB = 8 cm, BC = 6 cm and ∠B = 70° and locate its circumcentre and draw the circumcircle.

(OR)

b) Construct the in-centre of △ABC with AB = 6 cm, ∠B = 65° and AC = 7 cm. Also draw the in-circle and measure its radius.

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