MATHEMATICS MOCK TEST

Class: VIII | Set: 12

Time: 2 Hours | Written Marks: 35 | Viva: 5 | Total: 40 Marks

NAME: _____   **ROLL NO:** _____

SECTION A   (1 Mark Each)

1. Find the value of x in the equation: $\frac{2x}{3} = 10$.

2. If a set A has 4 elements, how many subsets does it have?

3. Evaluate: $\sqrt[3]{-216} \times \sqrt[3]{8}$.

4. If 10 men can do a piece of work in 4 days, how many men can do it in 1 day?

5. Name the quadrilateral whose all sides are equal and all angles are $90°$.

SECTION B   (2 Marks Each)

6. Solve the linear equation: $\frac{x-5}{3} = \frac{x-3}{5}$.

7. Solve the inequation $2(3x - 1) \leq 16$ and represent the solution set if $x \in \mathbb{W}$ (Whole Numbers).

8. The denominator of a rational number is greater than its numerator by 3. If the numerator is increased by 7 and the denominator is decreased by 1, the number obtained is $3/2$. Find the rational number.

9. A car travels 240 km in 15 litres of petrol. How much petrol is needed to cover 320 km?

10. Find the simple interest on ₹6500 at 12% per annum for 2 years and 6 months.

SECTION C   (3 Marks Each)

11. Solve the linear equation for x: $\frac{3x+4}{2x-3} = -2$.

12. Verify De Morgan's Law $(A \cup B)' = A' \cap B'$ for $U = \{1, 2, 3, \ldots, 8\}$, $A = \{2, 4, 6\}$ and $B = \{1, 2, 3, 4\}$.

13. Find the compound interest on ₹12,000 for 1 year at 10% per annum compounded half-yearly.

14. The diagonals of a rhombus are 24 cm and 10 cm. Find its perimeter.

SECTION D **(4 Marks Each - Case Study)**

Case Study 1: The Number Riddle
The sum of the digits of a two-digit number is 9. When we interchange the digits, it is found that the resulting new number is greater than the original number by 27.

(i) Form a linear equation to represent the original number using x as the digit at the tens place. (2 Marks)

(ii) Solve the equation to find the original two-digit number. (2 Marks)

Case Study 2: Geometric Architecture
An architect is designing a courtyard in the shape of a parallelogram $ABCD$. The adjacent angles are $(5x - 5)°$ and $(10x + 35)°$.

(i) Calculate the value of x using the property of adjacent angles. (2 Marks)

(ii) Find the measure of all four angles of the courtyard. (2 Marks)

VIVA VOCE **(5 Marks)**

- **Linear Equations:** What is the "Transposition Method" in solving equations?

- **Inequations:** How does multiplying by a negative number change the sign of an inequation?

- **Quadrilaterals:** Explain the difference between a square and a rhombus regarding their angles.

- **Variation:** Give a real-life example of inverse variation.

- **Roots:** Can the square root of a negative number be a natural number?