MATHEMATICS MOCK TEST

Class: VIII | Set: 15

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

NAME: _____ **ROLL NO:** _____

SECTION A

(1 Mark Each)

1. Find the cube of 0.06.
2. If $n(A) = 12, n(B) = 10$ and $A \cap B = \phi$, find $n(A \cup B)$.
3. Solve for x: $0.5x + 3 = 1.2x - 4$.
4. The diagonals of a quadrilateral are equal and bisect each other at right angles. Name the specific quadrilateral.
5. If x and y are in direct variation and $x = 3$ when $y = 12$, find y when $x = 5$.

SECTION B

(2 Marks Each)

6. Find the least number which must be subtracted from 1989 so as to get a perfect square.
7. Solve the inequation $3(x - 2) \geq 5x + 8$ and represent the solution set if $x \in \mathbb{Z}$ (Integers).
8. Find the smallest number by which 675 must be multiplied so that the product is a perfect cube.
9. The area of a rhombus is 240 cm^2 and one of its diagonals is 16 cm. Find the length of the other diagonal.
10. Calculate the simple interest on ₹8600 for 2 years at 5% per annum.

SECTION C

(3 Marks Each)

11. A, B and C can do a piece of work in $12, 15$ and 20 days respectively. How many days will they take to finish the work if they work together?
12. Find the square root of 150.0625 using the long division method.
13. Verify that $(A \cup B)' = A' \cap B'$ if $U = \{1, 2, 3, \ldots, 10\}$, $A = \{2, 4, 6, 8, 10\}$ and $B = \{3, 6, 9\}$.
14. Find the compound interest on ₹$10,000$ for 1 year at 20% per annum, compounded half-yearly.

SECTION D

(4 Marks Each - Case Study)

Case Study 1: The Water Supply Project
A municipal corporation is installing two types of pipes to fill a water reservoir. Pipe A can fill the reservoir in 10 hours and Pipe B can fill it in 15 hours. However, a drainage pipe C can empty the full reservoir in 12 hours.

(i) If only Pipe A and Pipe B are opened together, how long will it take to fill the empty reservoir? (2 Marks)

(ii) If all three pipes (A, B, and C) are opened together, in how many hours will the reservoir be completely filled? (2 Marks)

Case Study 2: Geometric Angles in Architecture
A designer is working on a quadrilateral-shaped lobby $PQRS$. The four angles are represented as $(x + 10)^\circ, (2x + 20)^\circ, (3x - 30)^\circ$ and $(x + 50)^\circ$.

(i) Use the angle sum property of a quadrilateral to find the value of x. (2 Marks)

(ii) Determine the measure of all four angles and check if the lobby is in the shape of a parallelogram. (2 Marks)

VIVA VOCE

(5 Marks)

- **Variation:** Explain with an example what happens to the value of y in inverse variation if x is tripled.
- **Sets:** What is a "Power Set" and how many elements does the power set of a null set have?
- **Quadrilaterals:** State the property that distinguishes a Square from a Rhombus.
- **Roots:** How do you identify if a number is not a perfect square just by looking at its unit digit?
- **Interest:** Why is the compound interest always greater than simple interest for $n > 1$ years?