MATHEMATICS MOCK TEST

Class: VIII | Set: 13

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

NAME: _____ **ROLL NO:** _____

SECTION A

(1 Mark Each)

1. If $U = \{x : x \leq 15, x \in \mathbb{N}\}$ and $A = \{x : x \text{ is a prime number}\}$, find $n(A^c)$.
2. Solve for y: $0.3(y - 2) = 0.4(y + 1)$.
3. Find the value of $\sqrt[3]{-4096}$.
4. Find the measure of each interior angle of a regular octagon.
5. If x and y are in direct variation and $x = 15$ when $y = 45$, find the constant of variation k such that $y = kx$.

SECTION B

(2 Marks Each)

6. Find the smallest number by which 2916 must be divided so that the quotient becomes a perfect cube.
7. Solve the inequation $2(3x - 1) + 4 < 18$ and represent the solution set if $x \in \mathbb{W}$.
8. Find the area of a rhombus whose side is 13 cm and one of its diagonals is 10 cm.
9. 8 kg of tea costs ₹560. How many kg of tea can be purchased for ₹840?
10. Find the simple interest on ₹8400 at 10% per annum for 9 months.

SECTION C

(3 Marks Each)

11. Find the square root of 47.61 using the long division method.
12. In a class of 60 students, 40 students like Mathematics, 35 like Science and 20 like both. Draw a Venn diagram and find how many students like neither Mathematics nor Science.
13. A, B and C can do a piece of work in 12, 15 and 20 days respectively. If they all work together, in how many days will the work be completed?
14. The difference between compound interest and simple interest on a certain sum for 2 years at 5% per annum is ₹15. Find the sum.

SECTION D

(4 Marks Each - Case Study)

Case Study 1: The Water Reservoir Management
A municipal water reservoir is filled by two pipes, P1 and P2. P1 can fill the reservoir in 15 hours and P2 can fill it in 10 hours. Due to a leak at the bottom, it takes 30 hours to empty the full reservoir.

(i) If both pipes P1 and P2 are opened together in an empty reservoir, how long will it take to fill it? (2 Marks)

(ii) If both pipes P1, P2 and the leak are all active together, in how much time will the reservoir be filled? (2 Marks)

Case Study 2: Geometric Angle Investigation
A student is analyzing the property of a quadrilateral $PQRS$. The measures of $\angle P, \angle Q, \angle R$ and $\angle S$ are given in the ratio $3 : 4 : 5 : 6$.

(i) Find the measure of each angle of the quadrilateral. (2 Marks)

(ii) Is it possible for this quadrilateral to be a trapezium? Give a reason based on the sum of adjacent angles you calculated. (2 Marks)

VIVA VOCE

(5 Marks)

- **Variation:** If speed is halved, what happens to the time taken to cover a fixed distance?
- **Quadrilaterals:** What is the specific name of a parallelogram whose diagonals bisect each other at 90° but are not equal?
- **Interest:** Why is the interest for the second year in Compound Interest higher than the interest for the first year?
- **Sets:** Define a ”Disjoint Set” and give an example.
- **Equations:** How many solutions does a linear equation in one variable have?