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. Rewrite the following statement using set notation: "0 is a whole number, but 0 is not a natural number."
2. Find the value of x that satisfies the linear equation: $\frac{2-9x}{16+5x} = 0$.
3. If 50 pencils can be bought for ₹120, how many pencils can be bought for ₹108?
4. A, B and C can do a piece of work in 12 days, 15 days and 10 days respectively. What is their combined 1-day work?
5. State whether the collection is a set: "All the pet dogs in Meerut."

SECTION B

(2 Marks Each)

6. In a two-digit number, the units digit is four times the tens digit and the sum of the digits is 10. Find the number.
7. Find the power set of $C = \{2, 4, 6\}$.
8. If a car covers 56.7 km in 4.5 litres of petrol, how many kilometres will it cover in 26 litres of petrol?
9. A can do a certain job in 12 days. B is 60% more efficient than A. Find the number of days taken by B to finish the job.
10. Divide 25 into two parts such that 7 times the first part added to 5 times the second part makes 139.

SECTION C

(3 Marks Each)

11. In a three-digit number, the hundreds digit is twice the tens digit while the units digit is thrice the tens digit. Also, the sum of its digits is 18. Find the number.
12. Let $\xi = \{x \mid x \in N, 4 \leq x < 18\}$, $A = \{x \mid x \text{ is a multiple of } 2\}$, and $B = \{x \mid x \text{ is a multiple of } 3\}$. Verify that $(A \cap B)' = A' \cup B'$.

13. Seven workers working 6 hours a day can build a wall in 12 days. How many days will 3 workers take to build a similar wall, working 8 hours a day?

14. A motorist travelled from town A to town B at an average speed of 54 km/h. On his return journey, his average speed was 60 km/h. If the total time taken is $9\frac{1}{2}$ hours, find the distance between the two towns.

SECTION D

(4 Marks Each - Case Study)

Case Study 1: Water Reservoir Management
Two pipes A and B can separately fill a cistern in 20 minutes and 30 minutes respectively, while a third pipe C can empty the full cistern in 15 minutes.

(i) If only pipes A and B are opened together, in what time will the empty cistern be filled? (2 Marks)

(ii) If all three pipes are opened together, in what time will the empty cistern be filled? (2 Marks)

Case Study 2: Land and Area Calculation
The length of a rectangular plot of land exceeds its breadth by 23 m. If the length is decreased by 15 m and the breadth is increased by 7 m, the area is reduced by 360 m^2.

(i) Let the breadth be x metres. Form a linear equation to represent the condition described. (2 Marks)

(ii) Find the original length and breadth of the plot. (2 Marks)

VIVA VOCE

(5 Marks)

- **Playing With Numbers:** What is the largest natural number by which the difference between a three-digit number and the number obtained by reversing its digits is always divisible?
- **Sets:** Define the term ”Cardinal Number” and provide the notation for it.
- **Direct and Inverse Variation:** If the number of typists increases, does the time taken to type a thesis increase or decrease? Name the type of variation.
- **Time and Work:** If Worker A is twice as good as Worker B, what is the ratio of their one-day work?
- **Linear Equations:** What is the first step you would take to solve $\frac{4x+1}{3} + \frac{2x-1}{2} = 6$?