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# MATHEMATICS MOCK TEST

Class: VIII | Set: 11

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

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NAME: \_\_\_\_\_

ROLL NO: \_\_\_\_\_

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## SECTION A

(1 Mark Each)

1. If  $U = \{x : x \in \mathbb{N}, x \leq 20\}$  and  $A = \{x : x \text{ is a perfect square}\}$ , find  $n(A^c)$ .
2. Solve for  $x$ :  $\frac{3x+4}{2x-3} = 2$ .
3. Find the value of  $\sqrt[3]{-1728}$ .
4. If the diagonals of a quadrilateral bisect each other at  $90^\circ$  and are equal, identify the specific quadrilateral.
5. A map is drawn to a scale of 1 : 5,000,000. If two cities are 3.5 cm apart on the map, find the actual distance in km.

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## SECTION B

(2 Marks Each)

6. Find the smallest number by which 1323 must be divided so that the quotient becomes a perfect cube.
7. Solve the inequation  $3(x - 2) \leq 5x + 8$  and represent the solution set if  $x \in \mathbb{Z}$  (Integers) and  $x \geq -10$ .
8. In a parallelogram  $ABCD$ , the measure of  $\angle A = (3x - 10)^\circ$  and  $\angle B = (2x + 40)^\circ$ . Find the value of  $x$ .
9. 15 men can build a wall in 48 hours. How many men will be required to do the same work in 30 hours?
10. Find the Compound Interest on ₹12,000 for 1 year at 10% per annum, interest being compounded half-yearly.

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## SECTION C

(3 Marks Each)

11. Find the square root of 470.89 using the long division method.
12. If  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ ,  $A = \{2, 4, 6, 8\}$  and  $B = \{3, 4, 5, 6\}$ , verify the De Morgan's Law:  $(A \cup B)' = A' \cap B'$ .

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13. Tap  $A$  can fill a tank in 12 hours and Tap  $B$  can fill it in 15 hours. There is an outlet pipe  $C$  that can empty the full tank in 20 hours. If all three are opened together, how long will it take to fill the empty tank?
14. The difference between the compound interest and simple interest on a certain sum for 2 years at 10% per annum is ₹25. Find the principal amount.

## SECTION D

(4 Marks Each - Case Study)

### Case Study 1: The Cattle Farm Provision

A cattle farm has provisions for 120 cows to last for 20 days. After 5 days, 30 cows are sold to a neighboring farm.

- (i) For how many more days will the remaining provisions last for the remaining cows? (2 Marks)
- (ii) If instead of selling, 30 more cows were added after 5 days, how many days would the remaining food have lasted from that point? (2 Marks)

### Case Study 2: Geometric Property Investigation

An architect is designing a hall in the shape of a quadrilateral. The four angles of the hall are given as  $(x + 10)^\circ$ ,  $(2x + 30)^\circ$ ,  $(x + 50)^\circ$  and  $(x - 30)^\circ$ .

- (i) Find the value of  $x$  and the measure of each angle. (2 Marks)
- (ii) Is it possible for this quadrilateral to be a parallelogram? Justify your answer based on the angles found. (2 Marks)

## VIVA VOCE

(5 Marks)

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- **Cubes:** What is the digit in the units place of the cube of a number ending in 7?
  - **Variation:** Explain with an example what "Constant of Variation" ( $k$ ) means in Direct Variation.
  - **Interest:** Why does the interest amount increase when compounded half-yearly compared to yearly for the same rate?
  - **Quadrilaterals:** Can a trapezium have three right angles? Explain.
  - **Sets:** What is the difference between a "Subset" and a "Proper Subset"?