

## Worksheet: Sets

CBSE · Class 11 · Mathematics · 9 questions · 25 marks

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 25

**Q1.** Write the set  $A = \{x : x \text{ is an integer, } x^2 = 9\}$  in roster form, and  $B = \{5, 10, 15, 20, 25\}$  in set-builder form. [2 marks]

**Q2.** Classify each as empty, finite, or infinite: (i)  $\{x : x \text{ is a natural number and } x+3=2\}$ , (ii) the set of lines through a fixed point in a plane, (iii)  $\{x : x \text{ is an even prime number}\}$ . [2 marks]

**Q3.** Write  $\{x : x \text{ is a real number, } -2 \leq x < 5\}$  as an interval, and write the interval  $(0, 10]$  in set-builder form. [2 marks]

**Q4.** How many subsets and how many proper subsets does a set with 5 elements have? List one subset containing exactly 2 elements as an example. [3 marks]

**Q5.** If  $A = \{1, 2, 3, 4, 5\}$  and  $B = \{4, 5, 6, 7\}$ , find  $A \cup B$ ,  $A \cap B$ , and state whether  $A$  and  $B$  are disjoint. [3 marks]

**Q6.** If  $A = \{2, 4, 6, 8, 10\}$  and  $B = \{4, 8, 12\}$ , find  $A - B$  and  $B - A$ , and explain why they are different sets. [3 marks]

**Q7.** If  $U = \{1, 2, \dots, 10\}$ ,  $A = \{1, 2, 3, 4, 5\}$ ,  $B = \{4, 5, 6, 7\}$ , find  $A'$  and  $B'$ , and hence find  $A' \cup B'$ . [3 marks]

**Q8.** If  $U = \{1, 2, \dots, 9\}$ ,  $A = \{1, 3, 5, 7\}$ ,  $B = \{2, 3, 5, 8\}$ , verify De Morgan's second law:  $(A \cap B)' = A' \cup B'$ . [4 marks]

**Q9.** Let  $A = \{2, \{3\}, 4, \{5, 6\}\}$ . State, with reasons, whether each is true: (i)  $3 \in A$ , (ii)  $\{3\} \in A$ , (iii)  $\{3\}$  subset  $A$ , (iv)  $\{5, 6\}$  subset  $A$ . [3 marks]