

JEE Maths DPP – SETS (Free PDF)

Q1. If $A = \{x \in \mathbb{R} : x^2 - 5x + 6 = 0\}$, $B = \{x \in \mathbb{N} : 1 < x < 5\}$, and $C = \{3, 5\}$, then the set $(A \cup B) \cap C$ is:

- (a) $\{3\}$
- (b) $\{2, 3\}$
- (c) $\{3, 5\}$
- (d) $\{2, 3, 5\}$

Q2. Let U be the universal set and A, B are subsets of U . Which of the following is equivalent to $A \setminus (A \cap B)$?

- (a) $A \cup B$
- (b) $A \cap B'$
- (c) $B \setminus A$
- (d) A'

Q3. If A and B are two sets such that $n(A \cap B) = 15$, $n(A \cup B) = 65$, and $n(A) = 35$, then the number of elements in $B \setminus A$ is:

- (a) 15
- (b) 25
- (c) 30
- (d) 35

Q4. Let $S = \{1, 2, 3, \dots, 10\}$. The number of subsets of S that contain exactly two prime numbers is:

- (a) $2^6 \times 6$
- (b) $2^6 \times 10$
- (c) $2^4 \times 10$
- (d) $2^6 \times \binom{4}{2}$

Q5. The number of non-empty proper subsets of a set having 4 elements is:

- (a) 14
- (b) 15
- (c) 16
- (d) 30

Q6. Let A, B, C be three sets such that $n(A) = 5$, $n(B) = 7$, $n(C) = 6$. If $n(A \cap B) = 3$, $n(B \cap C) = 2$, and $n(A \cap C) = 1$, find the maximum possible value of $n(A \cup B \cup C)$.

- (a) 16
- (b) 15
- (c) 12
- (d) 13

Q7. If $A = \{x \in \mathbb{R} : x^2 + x - 12 < 0\}$ and $B = \{x \in \mathbb{R} : x \leq 1\}$, then the set $A \cap B$ is:

- (a) $[-4, 1)$
- (b) $(-4, 1]$
- (c) $(-3, 1]$
- (d) $(-4, 3)$

Q8. If A and B are two sets, then the set $(A \cup B) \cap (A' \cap B')$ is equal to:

- (a) A
- (b) B
- (c) ϕ
- (d) U (Universal Set)

Q9. Let P be the power set of a set A . If $n(A) = m$, then the number of elements in $P \setminus \{\phi\}$ (the non-empty subsets of A) is:

- (a) 2^m
- (b) $2^m - 1$
- (c) $2^m - 2$
- (d) 2^{m-1}

Q10. Let A be the set of all students who live within 2 km of the school and B be the set of all students who have a bicycle. If $A \cap B$ is the set of students who live within 2 km and have a bicycle, then the number of students who live within 2 km OR have a bicycle is represented by:

- (a) $n(A) + n(B)$
- (b) $n(A \cap B)$
- (c) $n(A \cup B)$
- (d) $n(A \Delta B)$

Q11. Let A, B, C be non-empty sets. If $(A \setminus B) \cup (B \setminus A) = (A \cup B) \setminus (A \cap B)$, which of the following is correct?

- (a) This property is always true for any sets A and B .
- (b) This property is true only if $A \cap B = \phi$.
- (c) This property is true only if $A \subset B$ or $B \subset A$.
- (d) The left side is always a subset of the right side.

Q12. The complement of $(A \cup B)' \cap (A' \cap B)$ is:

- (a) $A \cup B$
- (b) $A' \cap B$
- (c) A
- (d) B'

Q13. Let $A = [2, 5]$ and $B = (3, 7)$. If the universal set is $U = [0, 10]$, then $A' \cap B$ is:

- (a) $(5, 7)$
- (b) $[5, 7)$
- (c) $(3, 5]$
- (d) $(5, 7]$

Q14. In a class of 100 students, the number of students studying different subjects are: English (E): 28, Hindi (H): 30, Sanskrit (S): 42, English and Hindi: 8, Hindi and Sanskrit: 10, English and Sanskrit: 5, and all three subjects: 3. Find the number of students who study exactly one subject. (Final Answer is an Integer)

Q15. Let A and B be two sets. If $n(A \setminus B) = 3x + y$, $n(B \setminus A) = x + 2y$, and $n(A \cap B) = 2x - y$, where x, y are positive integers. If $n(A) = 15$ and $n(B) = 14$, find the value of $n(A \cup B)$. (Final Answer is an Integer)