Sets

1

1. If A and B are two sets, then $A \cap (A \cup B)'$ is equal to-
(1) A
(2) B
(3) ϕ
(4) none of these

2. If A is any set, then-
(1) $A \cup A' = \phi$ (2) $A \cup A' = U$
(3) $A \cap A' = U$
(4) none of these

3. If A, B be any two sets, then $(A \cup B)'$ is equal to-
(1) $A' \cup B'$
(2) $A' \cap B'$
(3) $A \cap B$
(4) $A \cup B$

4. If A and B be any two sets, then $(A \cap B)'$ is equal to-
(1) $A' \cap B'$ (2) $A' \cup B'$ (3) $A \cap B$ (4) $A \cup B$

5. Let U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, A = {1, 2, 5}, B = {6, 7} then $A \cap B'$ is-
(1) B'
(2) A
(3) A'
(4) B.

6. If A and B are two sets, then $A \cup B = A \cap B$ iff-
(1) $A \subseteq B$
(2) $B \subseteq A$
(3) A = B
(4) none of these

7. Let A and B be two sets in the universal set. Then A – B equals-
(1) $A \cap B'$
(2) $A' \cap B$
(3) $A \cap B$
(4) none of these

8. Two sets A, B are disjoint iff-
(1) $A \cup B = \phi$ (2) $A \cap B \neq \phi$
(3) $A \cap B = \phi$ (4) A – B = A

9. Which of the following is a null set ?
(1) {0}
(2) {x : x > 0 or x < 0}
(3) {x : $x^2 = 4$ or x = 3}
(4) {x : $x^2 + 1 = 0, x \in R$}

10. If $A \subseteq B$, then $A \cap B$ is equal to-
(1) A
(2) B
(3) A'
(4) B'

11. If A and B are any two sets, then $A \cup (A \cap B)$ is equal to-
(1) A
(2) B
(3) A'
(4) B'

12. If A and B are not disjoint, then $n(A \cup B)$ is equal to-
(1) n(A) + n(B)
(2) n(A) + n(B) – $n(A \cap B)$
(3) n(A) + n(B) + $n(A \cap B)$
(4) n(A).n(B)

13. If A = {2, 4, 5}, B = {7, 8, 9} then n(A x B) is equal to-
(1) 6
(2) 9
(3) 3
(4) 0

14. Let A and B be two sets such that n(A) = 70, n(B) = 60 and $n(A \cup B)$ = 110. Then $n(A \cap B)$ is equal to-
(1) 240
(2) 20
(3) 100
(4) 120

15. Which set is the subset of all given sets ?
(1) {1, 2, 3, 4, ...}
(2) {1}
(3) {0}
(4) { }

16. If $Q = \left\{ x : x = \dfrac{1}{y}, \text{ where } y \in N \right\}$, then-
(1) $0 \in Q$
(2) $1 \in Q$
(3) $2 \in Q$
(4) $\dfrac{2}{3} \in Q$

17. A = {x : x ≠ x} represents-
(1) {0}
(2) { }
(3) {1}
(4) {x}

18. Which of the following statements is true ?
(1) $3 \subseteq$ {1, 3, 5}
(2) $3 \in$ {1, 3, 5}
(3) {3} $\in$ {1, 3, 5}
(4) {3, 5} $\in$ {1, 3, 5}

19. Which of the following is a null set ?
(1) A = {x : x > 1 and x < 1]
(2) B = {x : x + 3 = 3}
(3) C = {ϕ}
(4) D = {x : x ≥ 1 and x ≤ 1}

20. P(A) = P(B) $\Rightarrow$
(1) $A \subseteq B$
(2) $B \subseteq A$
(3) A = B
(4) none of these

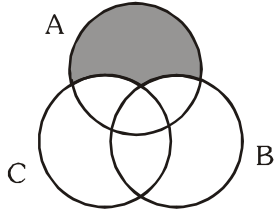## ANSWER KEY   (SETS)   EXERCISE - I

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	3	2	2	2	2	3	1	3	4	1	1	2	2	2	4
Que.	16	17	18	19	20										
Ans.	2	2	2	1	3										

EXERCISE - II   Previous Years JEE MAIN Questions

1. If A, B, C be three sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$, then- **[Roorkee 1991]**
   (1) A = B   (2) B = C
   (3) A = C   (4) A = B = C

2. Sets A and B have 3 and 6 elements respectively. What can be the minimum number of elements in $A \cup B$? **[Roorkee 1991, C.E.T.1992]**
   (1) 3   (2) 6   (3) 9   (4) 18

3. In a college of 300 students, every student reads 5 new spapers and every newspaper is read by 60 students. The number of newspapers is- **[IIT -1998]**
   (1) at least 30   (2) at most 20
   (3) exactly 25   (4) none of these

4. The set of intelligent students in a class is- **[A.M.U.-1998]**
   (1) a null set
   (2) a singleton set
   (3) a finite set
   (4) not a will defined collection

5. The shaded region in the given figure is-

   [N.D.A.-2000]
   (1) $A \cap (B \cup C)$ (2) $A \cup (B \cap C)$
   (3) $A \cap (B - C)$ (4) $A - (B \cup C)$

6. Let $n(U) = 700$, $n(A) = 200$, $n(B) = 300$ and $n(A \cap B) = 100$, then $n(A' \cap B') =$
   (1) 400   (2) 600   (3) 300   (4) 200
   [Karnatake C.E.T. 1998]

7. If $A = \{1, 2, 3, 4, 5\}$, then the number of proper subsets of A is- **[Karnatake C.E.T. 1997]**
   (1) 120   (2) 30   (3) 31   (4) 32

8. Let A and B be two sets such that $n(A) = 0.16$, $n(B) = 0.14$, $n(A \cup B) = 0.25$. Then $n(A \cap B)$ is equal to-
   [Jamia Milia Entrance Exam. 2001]
   (1) 0.3   (2) 0.5
   (3) 0.05   (4) none of these

9. If $A = \{x : x^2 - 5x + 6 = 0\}$, $B = \{2, 4\}$, $C = \{4, 5\}$, then A (B $\cap$ C) is-**[Kerala P.E.T. 2002]**
   (1) {(2, 4), (3, 4)}
   (2) {(4, 2), (4, 3)}
   (3) {(2, 4), (3, 4), (4, 4)}
   (4) {(2, 2), (3, 3), (4, 4), (5, 5)}

10. If $A = \{(x, y) : x^2 + y^2 = 25\}$ and $B = \{(x, y) : x^2 + 9y^2 = 144\}$ then $A \cap B$ contains-
    [A.M.U. 1996, Pb. C.E.T. 2002]
    (1) one point   (2) three points
    (3) two points   (4) four points

11. A class has 175 students. The following data shows the number of students obtaining one or more subjects. Mathematics 100; Physics 70; Chemistry 40; Mathematics and Physics 30; Mathematics and Chemistry 28; Physics and Chemitry 23; Mathematics, Physics and Chemistry 18. How many students have offered Mathematics alone ? **[Kerala C.E.T. 2003]**
    (1) 35   (2) 48   (3) 60   (4) 22

12. The set S : $\{1, 2, 3, ..., 12\}$ is to be partitioned into three sets A, B, C of equal size. Thus $A \cup B \cup C = S$, $A \cap B = B \cap C = A \cap C = \phi$. The number of ways to partition S is- **[AIEEE - 2007]**
    (1) $12!/3!(4!)^3$ (2) $12!/3!(3!)^4$
    (3) $12!/(4!)^3$ (4) $12!/(3!)^4$

13. If A, B and C are three sets such that $A \cap B = A \cap C$ and $A \cup B = A \cup C$, then :- **[AIEEE- 2009]**
    (1) B = C   (2) $A \cap B = \phi$
    (3) A = B   (4) A = C

14. Let $X = \{1, 2, 3, 4, 5\}$. The number of different ordered pairs (Y, Z) that can be formed such that $Y \subseteq X$, $Z \subseteq X$ and $Y \cap Z$ is empty, is :
    [AIEEE - 2012]
    (1) 5^3 (2) 5^2 (3) 3^5 (4) 2^5

EXERCISE - II   Previous Years JEE MAIN/Other Questions

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Ans.	2	2	3	4	4	3	3	3	1	4	3	3	1	3	