

5. Let  $A = \{(n, 2n) : n \in \mathbf{N}\}$  and  $B = \{(2n, 3n) : n \in \mathbf{N}\}$ . What is  $A \cap B$  equal to?  
 (a)  $\{(n, 6n) : n \in \mathbf{N}\}$  (b)  $\{(2n, 6n) : n \in \mathbf{N}\}$   
 (c)  $\{(n, 3n) : n \in \mathbf{N}\}$  (d)  $\phi$
6. If  $a\mathbf{N} = \{ax : x \in \mathbf{N}\}$  and  $b\mathbf{N} \cap c\mathbf{N} = d\mathbf{N}$ , where  $b, c \in \mathbf{N}$  are relatively prime, then  
 (a)  $d = bc$  (b)  $c = bd$   
 (c)  $b = cd$  (d) None of these
7. In a class of 55 students, the number of students studying different subjects are 23 in Mathematics, 24 in Physics, 19 in Chemistry, 12 in Mathematics and Physics, 9 in Mathematics and Chemistry, 7 in Physics and Chemistry and 4 in all the three subjects. The number of students who have taken exactly one subject is  
 (a) 6 (b) 9  
 (c) 7 (d) All of these
8. A set  $A$  has 3 elements and another set  $B$  has 6 elements. Then  
 (a)  $3 \leq n(A \cup B) \leq 6$  (b)  $3 \leq n(A \cup B) \leq 9$   
 (c)  $6 \leq n(A \cup B) \leq 9$  (d)  $0 \leq n(A \cup B) \leq 9$
9. If  $A = \{1, 2, 5\}$  and  $B = \{3, 4, 5, 9\}$ , then  $A \Delta B$  is equal to  
 (a)  $\{1, 2, 5, 9\}$  (b)  $\{1, 2, 3, 4, 9\}$   
 (c)  $\{1, 2, 3, 4, 5, 9\}$  (d) None of these
10. At a certain conference of 100 people, there are 29 Indian women and 23 Indian men. Of these Indian people 4 are doctors and 24 are either men or doctors. There are no foreign doctors. How many foreigners and women doctors are attending the conference?  
 (a) 48, 1 (b) 34, 3  
 (c) 46, 4 (d) 42, 2
11. Let  $X$  and  $Y$  be two non-empty sets such that  $X \cap A = Y \cap A = \phi$  and  $X \cup A = Y \cup A$  for some non-empty set  $A$ . Then  
 (a)  $X$  is a proper subset of  $Y$   
 (b)  $Y$  is a proper subset of  $X$   
 (c)  $X = Y$   
 (d)  $X$  and  $Y$  are disjoint sets
12. Let  $A$  and  $B$  are two sets in a universal set  $U$ . Then which of these is/are correct?  
 (a)  $A - B = A' - B'$   
 (b)  $A - (A - B) = A \cap B$   
 (c)  $A - B = A' \cap B'$   
 (d)  $A \cup B = (A - B) \cup (B - A) \cup (A \cap B)$
13. If  $A$  and  $B$  are non-empty sets such that  $A \supset B$ , then  
 (a)  $B' - A' = A - B$  (b)  $B' - A' = B - A$   
 (c)  $A' - B' = A - B$  (d)  $A' \cap B' = B - A$
14. In a town of 10,000 families, it was found that 40% families buy newspaper  $A$ , 20% families buy newspaper  $B$  and 10% families buy newspaper  $C$ . 5% families buy  $A$  and  $B$ , 3% buy  $B$  and  $C$  and 4% buy  $A$  and  $C$ . If 2% families buy all the newspapers, then  
 (a) 3,300 families buy  $A$  only  
 (b) 1,400 families buy  $B$  only.  
 (c) 4000 families buy none of  $A$ ,  $B$  and  $C$   
 (d) All are correct