

## Topic :-SETS

- If  $R \subset A \times B$  and  $S \subset B \times C$  be relations, then  $(SoR)^{-1} =$   
a)  $S^{-1} \circ R^{-1}$                       b)  $R^{-1} \circ S^{-1}$                       c)  $SoR$                       d)  $RoS$
- If relation  $R$  is defined as :  
 $aRb$  if " $a$  is the father of  $b$ ". Then,  $R$  is  
a) Reflexive                      b) Symmetric                      c) Transitive                      d) None of these
- In a set of teachers of a school, two teachers are said to be related if they "teach the same subject", then the relation is  
a) Reflexive and symmetric  
b) Symmetric and transitive  
c) Reflexive and transitive  
d) Equivalence
- In a battle 70% of the combatants lost one eye, 80% an ear, 75% an arm, 85% a leg,  $x\%$  lost all the four limbs. The minimum value of  $x$  is  
a) 10                      b) 12                      c) 15                      d) None of these
- If  $A = \{1, 2, 3, 4\}$ , then the number of subsets of set  $A$  containing element 3, is  
a) 24                      b) 28                      c) 8                      d) 16
- The relation  $R = \{(1,1),(2,2),(3,3),(1,2),(2,3),(1,3)\}$  on set  $A = \{1,2,3\}$  is  
a) Reflexive but not symmetric  
b) Reflexive but not transitive  
c) Symmetric and transitive  
d) Neither symmetric nor transitive
- The value of  $(A \cup B \cup C) \cap (A \cap B^c \cap C^c)^c \cap C^c$  is  
a)  $B \cap C^c$                       b)  $B^c \cap C^c$                       c)  $B \cap C$                       d)  $A \cap B \cap C$
- If a set  $A$  contains  $n$  elements, then which of the following cannot be the number of reflexive relations on the set  $A$ ?  
a)  $2^n$                       b)  $2^{n-1}$                       c)  $2^{n^2-1}$                       d)  $2^{n+1}$
- If  $A$  and  $B$  are two sets such that  $n(A) = 7, n(B) = 6$  and  $(A \cap B) \neq \phi$ . The least possible value of  $n(A \Delta B)$ , is  
a) 1                      b) 7                      c) 6                      d) 13
- Set builder form of the relation  
 $R = \{(-2, -7), (-1, -4), (0, -1), (1, 2), (2, 5)\}$  is  
a)  $\{(a,b): b = 2a - 3; a, b \in Z\}$   
b)  $\{(x,y): y = 3x - 1; x, y \in Z\}$   
c)  $\{(a,b): b = 3a - 1; a, b \in N\}$   
d)  $\{(u,v): v = 3u - 1; -2 \leq u < 3 \text{ and } u \in Z\}$

11. Out of 800 boys in a school 224 played cricket, 240 played hockey and 336 played basketball. Of the total, 64 played both basketball and hockey; 80 played cricket and basketball and 40 played cricket and hockey; 24 played all the three games. The number of boys who did not play any game is  
 a) 160                      b) 240                      c) 216                      d) 128
12. Two finite sets have  $m$  and  $n$  elements. The number of elements in the power set of first set is 48 more than the total number of elements in the power set of the second set. Then, the value of  $M$  and  $N$  are  
 a) 7, 6                      b) 6, 3                      c) 6, 4                      d) 7, 4
13. Let  $A$  and  $B$  be two sets, then  $(A \cup B)' \cup (A' \cap B)$  is equal to  
 a)  $A'$                       b)  $A$                       c)  $B'$                       d) None of these
14. The relation 'is not equal to' is defined on  $R$ , is  
 a) Reflexive only                      b) Symmetric only                      c) Transitive only                      d) Equivalence
15. If  $A$  and  $B$  are two sets such that  $n(A) = 7, n(B) = 6$  and  $(A \cap B) \neq \phi$ . Then the greatest possible value of  $n(A \Delta B)$ , is  
 a) 11                      b) 12                      c) 13                      d) 10
16. In the set  $A = \{1, 2, 3, 4, 5\}$ , a relation  $R$  is defined by  $R = \{(x,y):x,y \in A \text{ and } x < y\}$ . Then,  $R$  is  
 a) Reflexive                      b) Symmetric                      c) Transitive                      d) None of these
17. If two sets  $A$  and  $B$  are having 99 elements in common, then the number of elements common to each of the sets  $A \times B$  and  $B \times A$  are  
 a)  $2^{99}$                       b)  $99^2$                       c) 100                      d) 18
18. For any two sets  $A$  and  $B$ , if  $A \cap X = B \cap X = \phi$  and  $A \cup X = B \cup X$  for some set  $X$ , then  
 a)  $A - B = A \cap B$                       b)  $A = B$                       c)  $B - A = A \cap B$                       d) None of these
19. Which one of the following relations on  $R$  is an equivalence relation?  
 a)  $a R_1 b \Leftrightarrow |a| = |b|$                       b)  $a R_2 b \Leftrightarrow a \geq b$                       c)  $a R_3 b \Leftrightarrow a \text{ divides } b$                       d)  $a R_4 b \Leftrightarrow a < b$
20. Let  $R$  be a relation defined on  $S$ , the set of squares on a chess board such that  $xRy$  iff  $x$  and  $y$  share a common side. Then, which of the following is false for  $R$ ?  
 a) Reflexive                      b) Symmetric                      c) Transitive                      d) All the above