DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : MATHS**
Date : **DPP No. : 2**

Topic :- SETS

1. Let $A = \{x: x \text{ is a multiple of } 3\}$ and $B = \{x: x \text{ is a multiple of } 5\}$. Then, $A \cap B$ is given by
   a) {3, 6, 9, ...} b) {5, 10, 15, 20, ...} c) {15, 30, 45, ...} d) None of these
2. If $n(A \times B) = 45$, then $n(A)$ cannot be
   a) 15 b) 17 c) 5 d) 9
3. In order that a relation R defined on a non-empty set A is an equivalence relation, it is sufficient, if R
   a) Is reflective
   b) Is symmetric
   c) Is transitive
   d) Possesses all the above three properties
4. For real numbers x and y, we write $x\,Ry \Leftrightarrow x - y + \sqrt{2}$ is an irrational number. Then, the relation R is
   a) Reflexive b) Symmetric c) Transitive d) None of these
5. In a class of 45 students, 22 can speak Hindi and 12 can speak English only. The number of students, who can speak both Hindi and English, is
   a) 9 b) 11 c) 23 d) 17
6. A, B and C are three non-empty sets. If $A \subset B$ and $B \subset C$, then which of the following is true?
   a) $B - A = C - B$ b) $A \cap B \cap C = B$ c) $A \cup B = B \cap C$ d) $A \cup B \cup C = A$
7. $\left\{x \in R: \frac{2x-1}{x^3+4x^2+3x} \in R\right\}$ equals
   a) $R - \{0\}$ b) $R - \{0, 1, 3\}$ c) $R - \{0, -1, -3\}$ d) $R - \left\{0, -1, -3, +\frac{1}{2}\right\}$
8. If R is a relation from a finite set A having m elements to a finite set B having n elements, then the number of relations from A to B is
   a) 2^{mn} b) $2^{mn} - 1$ c) $2mn$ d) m^n
9. If $A = \{(x, y): y^2 = x; x, y \in R\}$ and $B = \{(x, y): y = |x|; x, y \in R\}$, then
   a) $A \cap B = \phi$
   b) $A \cap B$ is a singleton set
   c) $A \cap B$ contains two elements only
   d) $A \cap B$ contains three elements only
10. Which of the following is an equivalence relation?
    a) Is father of b) Is less than c) Is congruent to d) Is an uncle of
11. From 50 students taking examinations in Mathematics, Physics and Chemistry, 37 passed Mathematics, 24 Physics and 43 Chemistry. At most 19 passed Mathematics and Physics, at most 29 passed Mathematics and Chemistry and at most 20 passed Physics and Chemistry. The largest possible number that could have passed all three examinations is
    a) 11 b) 12 c) 13 d) 14
12. Let A be the non-void set of the children in a family. The relation 'x is a brother of y' on A is
    a) Reflexive b) Symmetric c) Transitive d) None of these
13. In a class of 30 pupils 12 take needls work, 16 take physics and 18 take history. If all the 30 students take at least one subject and no one takes all three, then the number of pupils taking 2 subjects is
    a) 16 b) 6 c) 8 d) 20
14. If R is a relation on a finite set having n elements, then the number of relations on A is

a) 2^n b) 2^{n^2} c) n^2 d) n^n

15. The void relation on a set A is
    a) Reflexive
    b) Symmetric and transitive
    c) Reflexive and symmetric
    d) Reflexive and transitive

16. Suppose $A_1, A_2, \ldots, A_{30}$ are thirty sets, each having 5 elements and $B_1, B_2, \ldots, B_n$ are n sets each with 3 elements, let
$\cup_{i=1}^{30} A_i = \cup_{j=1}^{n} B_j = S$ and each element of S belongs to exactly 10 of the A_i's and exactly 9 of the B_j's. Then, n is equal to
    a) 115 b) 83 c) 45 d) None of these

117. If A is a finite set having n elements, then $P(A)$ has
    a) $2n$ elements b) 2^n elements c) n elements d) None of these

18. Let A and B have 3 and 6 elements respectively. What can be the minimum number of elements in $A \cup B$?
    a) 3 b) 6 c) 9 d) 18

19. Let R be a reflexive relation on a set A and I be the identity relation on A. Then,
    a) $R \subset I$ b) $I \subset R$ c) $R = I$ d) None of these

20. If $A_1, A_2, \ldots, A_{100}$ are sets such that $n(A_i) = i + 2, A_1 \subset A_2 \subset A_3 \ldots \subset A_{100}$ and $\cap_{i=3}^{100} A_i = A$, then $n(A) =$
    a) 3 b) 4 c) 5 d) 6