29/08/xx Class-XI^{sc} (MATHS) K.Kanhaiya

Topic : Set

Operation on set.

(a) Union of Sets :-
Let A and B be any two sets, the union of A and B is the set which consist of all the elements of A and all the elements of B, the common elements taken only one.

The symbol '$\cup$' is used to denote the union.

Ex→ $A = \{2, 4, 6, 8,\}$
$B = \{6, 8, 10, 12\}$

$A \cup B = ?$

Ans→ $A \cup B = \{2, 4, 6, 8, 10, 12\}$

Ex-2, Let $A = \{a, e, i, o, u\}$

$B = \{a, i, u\}$

Show that $A \cup B = A$

Ans> We have $A \cup B = \{a, e, i, o, u\} = A$.

i.e if $B \subset A$ then $A \cup B = A$

Generally

$$A \cup B = \{x : x \in A \text{ or } x \in B\}$$

Some more properties of the operations of Union.

(I) $A \cup B = B \cup A$ (Commutative law)

(II) $(A \cup B) \cup C = A \cup (B \cup C)$ {Associative law}

(III) $A \cup \phi = A$ (Law of identity element ϕ)

(IV) $A \cup A = A$ (Idempotent law)

(V) $U \cup A = U$

Find union of following :-

(I) $X = \{1, 2, 3, 5\}$, $Y = \{1, 2, 3\}$

(II) $A = \{x : x \in N \text{ and multiple of } 3\}$
$B = \{x : x \in N \text{ and less than } 6\}$

(III) $A = \{x : x \in N \text{ and } 1 < x \leq 6\}$
$B = \{x : x \in N \text{ and } 6 < x < 10\}$

(IV) $A = \{1, 2, 3\}$, $B = \phi$.

Teacher's Signature :