

## SETS

- A set is a collection of well distinct objects.
- The objects of a set are called the members or elements of the set.

Ex -

$$S = \{x \in \mathbb{N}, x^2 \leq 25\}$$

$$= \{1, 2, 3, 4, 5\}$$

$$2 \in S, 6 \notin S$$

Subset -

If every element of a set 'A' is also an element of a set 'B', then 'A' is called a subset of 'B' and it is denoted by  $A \subseteq B$

Ex -

If  $B = \{1, 2, 3, 4, 5\}$  then the set

$A = \{1, 3, 5\}$  is the subset of B. i.e.,  $A \subseteq B$

Power set -

Denoted by  $P(A)$ .

Power set is a collection of all subsets of set A.



Ex -

$$\text{Let } A = \{a, b\}$$

$$P(A) = \{\phi, \{a\}, \{b\}, \{a, b\}\}$$

Formula of power set =  $2^n$  =  $n$  = number of elements in set

Let  $n = 2$

$$2^n = 2^2 = 4 \text{ elements.}$$

Singleton set -

A set having only one element is called singleton set

Ex -

$\{2\}, \{0\}, \{a\}$  etc are singleton sets.

Null set -

A set having no element is called null set or void set or empty set and it is denoted by  $\phi$ .

Ex -

$$\{\}$$



Equal set -

Two sets  $A$  and  $B$  are said to be equal iff they have the same elements.

Ex -

$A = \{1, 2, 3\}$ ,  $B = \{1, 3, 2\}$  are equal sets

Proper set -

If  $A \subseteq B$  and  $A \neq B$  then set  $A$  is said to be proper subset of  $B$ . It is denoted by  $A \subset B$ .

Ex -

If  $A = \{1, 2\}$  &  $B = \{1, 2, 3\}$  then  $A \subset B$ .

Universal set -

The universal set  $U$  is super set of all the sets under consideration.

Ex -

$$A = \{1, 2, 3\}$$

$$U = \{1, 2, 3, 4, 5\}$$

$$A' \text{ or } A^c = U - A = \{4, 5\}$$

Complement of a set -

Let  $U$  be a universal set and  $A$  be any element of it, then  $A^c$  or  $A'$  is complement of  $A$  given by -



$A' = \{x \in U : x \notin A\}$  clearly  $(A')' = A$ .

Let  $U = \{1, 2, 3, 4, 5\}$  &  $A = \{1, 4\}$

then  $A' = U - A = \{2, 3, 5\}$