

INTRODUCTION TO SETS

SETS :

Sets are a Collection of well-defined Object or element

A Set is represented by a Capital letter Symbol and the number of element in finite Set is represented as the Cardinal number of a Set in a curly bracket $\{ \dots \}$

For example Set A is a Collection of all the Natural numbers, Such as $A = \{1, 2, 3, 4, 5, 6, 7, 8, \dots, \infty\}$

Sets Can be represented in three forms :-

1. Roster Form or Tabular form or listing method :
Example - Set of even number less than 8 = $\{2, 4, 6\}$
2. Set Builder Form or Rule method : Example :
 $A = \{x | x \text{ is a natural number, } 10 < x < 20\}$

Cardinal number :- The Cardinal of a Set V is the number of distinct elements in it, and it is denoted as $n(V)$ Ex: If $S = \{a, e, l, o, u\}$
 $n(S) = 5$.

TYPES OF SETS

A Set has many types, Such as ;

- 1 Empty Set or Null Set : It has no element present in it. Example : $A = \{\}$ is Null Set
- 2 Finite Set : It has a limited number of elements
Example : $A = \{1, 2, 3, 4\}$
- 3 Infinite Set : It has an infinite number of elements
Example : $A = \{x : x \text{ is the set of whole numbers}\}$
- 4 Equal Set : Two Sets which have the same members.
Example : $A = \{1, 2, 5\}$ and $B = \{2, 5, 1\}$: Set A = Set B
- 5 Singleton Set : A Set which contains only one element is known as a singleton Set. Example : $A = \{1\}$, $P = \{5\}$
- 6 Universal Set : A Set which consists of all elements of other sets present in a Venn diagram.
Example : $A = \{1, 2\}$, $B = \{2, 3\}$, The Universal Set here will be, $U = \{1, 2, 3\}$
- 7 Equivalent Set : If the number of elements in Set A is equal to number of elements in Set B, Set A and Set B are said to be Equivalent to each other
 $SET A \leftrightarrow SET B \text{ IF } n(A) = n(B)$

Disjoint, Overlapping, or intersecting Sets: When two Sets have one or more than one elements in Common, the Sets are known as Overlapping Sets.

$$\text{Set } X = \{a \mid a = 2p, p \in \mathbb{N}\} \\ = \{2, 4, 6, 8, 10, 12, \dots\}$$

$$\text{Set } Y = \{d \mid d = 3q, q \in \mathbb{N}\} \\ = \{3, 6, 9, 12, 15, \dots\}$$

Set X and Set Y are Overlapping Sets

9 **Disjoint Sets**: When two elements have no elements in Common, the Sets are known as disjoint Sets