Sets and there different types.

Introduction to Sets

Def: Set is a collection of similar types of elements i.e. a set is a collection of object which has some common properties

Set is generally denoted by capital letters like A={1,2,3,4,5}

For example:

A={1,2,3,.....0} is a set of number.

Different methods of writing sets

1. Roster Method / Listing Method / Tabular Method / Enumeration Method
2. Set Builder Method / Rule Form / Set Selection Method

Roster Method

In this method elements of a set are described by writing them in curly braces.

For ex:

The vowels of English alphabet can be represented by

$$A=\{a,e,i,o,u\}$$

No element in the set should be repeated

Set Builder Method

In this method, set is described by specifying the property which determines the elements of the set uniquely.

For example:

A={a,e,i,o,u} is written in the set builder method as A={x:x is a vowel in English alphabet}

Types of sets

1. Finite Set
2. Infinite Set
3. Singleton Set
4. Empty Set or Null Set
5. Equal Set or Equality of Sets
6. Equivalent Sets
7. Sub Set
8. Proper Subset
9. Power Set
10. Universal Set

Finite Set

A set is finite if it contains finite number of elements

For example:

1. The set of days in a week.
2. The set of students in the class.
3. The set of alphabets in English

Infinite Set

A set which contains infinite number of elements is known as infinite set.

For example:

1. N={1,2,3,4,5,........} the set of Natural numbers.
2. I={.....,-3,-2,-1,0,1,2,3,.....} the set if Integer.

Singleton Set

A set which contains only one element is called singleton or unit set.

For example:

1. $A=\{2\}$
2. $B=\{x:4<x<6 \text{ and } x \text{ is an integer}\}$

Empty Set or Null Set

A set which does not contains any element is called an empty set or a null set.
An empty set is denoted by $\varnothing$ or {}.

For example:
The set of all integers whose square is 7.

Equal Sets or Equality of Sets

Two sets A and B are said to be equal if every element of A is an Element of B, and every element of B is an Element of A.
The equality of two sets A and B is denoted by A=€
Symbolically: A=B iff x € A ↔ x € B

For example:
If A={5,2,8} and B={2,8,5} then we can say A=B

Equvalent Sets

If the elements of one set can be put into one-to-one correspondence with the elements of another set, then the two sets are called equivalent sets. In another words, two sets A and B are said to be equivalent sets if and only if there exist one-to-one correspondence with the elements. By one-to-one correspondence we mean that for each element in A there exist match with one element in B and vice versa. The symbol Ξ is used to denote equivalent sets.

Equvalent Sets

For example:
A={1,2,3,4} and B={a,b,c,d} are equivalent sets or A Ξ B

Subset

Let A and B be any two sets. If every element of A is an element of B, then A is called a subset of B, or A is said to be included B or B includes A.
Symbolically, this relation is denoted by $A \subseteq B$ or $B \supseteq A$.

For example:
If $A=\{1,2,3\}$ and $B=\{3,4,2,1,7\}$ then we can say that $A \subseteq B$.

Proper Subset

A set B is called as proper subset of a set C if $B \subseteq C$ and $B \neq C$.
Symbolically it is written as $B \subset C$.

For example:
If $A=\{1,2,3\}$ and $B=\{3,4,2,1,7\}$ then we can say that $A \subset B$.

Power Set

For a set A, a collection of all possible subsets of A is called the power set of A or the family of A. The power set of A is denoted by β(A) or 2^A

For example:
If $A=\{1,2,3\}$ then
$2^A=\{\varnothing,\{1\},\{2\},\{3\},\{1,2\},\{1,3\},\{2,3\},\{1,2,3\}\}$.

Universal Set

In application of set theory all the sets under discussion are assumed to be the subsets of the fixed large set, called the universal set. This set is usually denoted by ∪ or E. The set ∪ is a super set of every set

For example:
All the people in the world constitute the universal set in any study of human population

Thanking you……..