INTRODUCTION TO SETS.

SETS:

Sets are a collection of well-defined objects or elements.

A set is represented by a capital letter symbol and the number of elements in the finite set is represented as the cardinal number of a set in a curly bracket {...}.

For example, set A is a collection of all the natural numbers, such as A = {1,2,3,4,5,6,7,8,.....∞}.

Sets can be represented in three forms:

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

Cardinal number : The cardinal number of a set V is the number of distinct elements in it, and it is denoted as n(V).Ex : If S={ a, e, I, 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 a 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 is the set of all 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 sets: 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<-> SET B IF n(A)=n(B)

Worksheet

1. Which of the following are SETS?
   i)   The names of the days of the week.
   ii) All the dangerous animals in the jungle.
   iii) The collection of prime numbers.
   iv) A collection of beautiful flowers in a flower garden.
2. Represent the following sets by rule method or set builder form .
   I.   A={a, e, I, o, u}
   II. B={January, February, March, April}
   III. E={1, 2, 3, 4, 5, 6, 7, 8, 9}

3. Represent the following sets by the listing method or roster form.

    I.   O=$\{x|x$ is a vowel in the word HAVE$\}$

    II.   K=$\{x|x$ is a letter in the English alphabet that comes before j$\}$

    III. N=$\{x|x$ is a prime number, $7<x<23\}$

4. What is the cardinal number of each of the following.

    I.   J={Delhi, Mumbai, Kolkata, chennai}

    II.   H={ l, m, n, o, p, q, R, s, t, U, v, w, x}

    III. F={101, 103, 105, 107, 109}

5. Which of the following are equivalent sets?

    i)   A={ a, b, e, g, k}   and B={ p, q, l, m, z}

    ii)   A={x|x is a vowel} and
B={x|x is a consonant}

    iii) A={1, 3, 5, 7, 9} and B={2, 4, 6, 8}

6. Write F for finite set, I for infinite set ,S for singleton set and E for empty set.

    i)   A={x|x is a vowel in the word QICK}

    ii)   X={x|x is number divisible by 3}

    iii) V={Set of natural numbers}

    iv) W={x|x is a month in the year having 42 days.