

Set Theory

SET THEORY

A set is defined as a collection of object united by a common rule. It can be also defined as 'a well-defined collection of objects', which can be interpreted as a rule with all the members of the set are associated with.

Types of Set

1. **Empty or Null Set** A set having no element and it is denoted as ϕ or $\{ \}$.

Example: A = set of even prime numbers excluding 2.

2. **Singleton Set** A set having only one element.

Example: A = set of even prime number/s.

3. **Finite Set** A set whose elements can be counted and get terminated at some point, say 'n'.

Cardinal number of a finite set: In the above explanation, 'n' is known as cardinal number of that set and is denoted by $n(A)$.

Example: A = set of positive odd numbers below 100.

4. **Infinite Set** A set whose elements cannot be counted.

Example: A = set of all irrational numbers between 1 and 2.
or a set of all odd numbers below hundred.

5. **Equal Sets** Two sets are said to be equal sets if all the element of set A are included in set B and all the element of set B are included in set A.

If two sets A and B are equal then it is represented by $A = B$ and if A and B are not equal then it is written as $A \neq B$, that is, all the elements of set A are not included in set B and all the elements of set B are not included in set A.

Example: A = {a, b, c} are equal sets. Hence, in the case we can write Set A = Set B or simply $A = B$

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Some Important Result

If A and B are any two sets, then

1. $A - B = A \cap B'$
2. $B - A = B \cap A'$
3. $(A - B) \cup B = A \cup B$
4. $(A - B) \cap B = \phi$
5. $(A - B) \cup (B - A) = (A \cup B) - (A \cap B)$