Important Points:

- A *set* is a well-defined collection of objects.

- A set which does not contain any element is called the empty set or the *null* set or the *void* set.

-A set which is empty or consists of a definite number of elements is called finite otherwise, the set is called infinite.

-Two sets A and B are said to be equal if they have exactly the same elements and we write A = B. Otherwise, the sets are said to be unequal and we write A ≠ B.

-A set A is said to be a subset of a set B if every element of A is also an element of B. We denote it as A ⊂ B.

-The union of A and B is the set which consists of all the elements of A and all the elements of B. The symbol ‘∪’ is used to denote the union.

Some Properties of the Operation of Union

(i) A ∪ B = B ∪ A (Commutative law)

(ii) (A ∪ B) ∪ C = A ∪ (B ∪ C) (Associative law)

(iii) A ∪ φ = A (Law of identity element, φ is the identity of ∪)

(iv) A ∪ A = A (Idempotent law)

(v) U ∪ A = U (Law of U)

-The intersection of sets A and B is the set of all elements which are common to both A and B. The symbol ‘∩’ is used to denote the intersection.

-Some Properties of Operation of Intersection

(i) A ∩ B = B ∩ A (Commutative law).

(ii) (A ∩ B) ∩ C = A ∩ (B ∩ C) (Associative law).

(iii) Φ ∩ A = φ, U ∩ A = A (Law of φ and U).

(iv) A ∩ A = A (Idempotent law)

(v) A ∩ (B ∪ C) = (A ∩ B) ∪ (A ∩ C) (Distributive law)

-The difference of the sets A and B in this order is the set

of elements which belong to A but not to B. Symbolically, we write A – B and read as

“A minus B”

-Let U be the universal set and A a subset of U. Then the complement of A is the set of all elements of U which are not the elements of A.

-Some Properties of Complement Sets

1. Complement laws: (i) A ∪ A′ = U (ii) A ∩ A′ = φ

2. De Morgan’s law: (i) (A ∪ B) ´ = A′ ∩ B′ (ii) (A ∩ B) ′ = A′ ∪ B′

3. Law of double complementation: (A′) ′ = A

4. Laws of empty set and universal set φ′ = U and U′ = φ