28/10/2024 & 29/10/2024

> ***A set D in X is said to be dense in X if for every open set U subset of X we have U intersection D is ≠phi***

▼ Different types of Points in set S

Adherent point	Accumulation point	Isolated point	Interior Point	Boundary Point
let X* is said to be an Adherent point of Set S if and only if for **every neighborhood** of X* there exits a point in that neighborhood	let X* is said to be an accumulation point of Set S if and only if for **every deleted neighborhood of X*** there exits a point in that neighborhood	There Exists a **Deleted neighborhood of a point** that doesn’t intersect with S, Then that point is called Isolated point.	If for a point there Exists a Neighborhood such that the neighborhood is subset of the Set, the the point is called Interior point.	Every **Neighborhood** of this point contains at least one point from the Set and At least one point not from the Set.
Can be outside the set	Can be outside the set	Can’t be outside the set	Can’t be outside the set	Can be outside the set

Every Accumulation Point is also Adherent point but Converse is not always true.

Every Adherent Point is either Accumulation Point or Isolated Point.

Every point is an Adherent Point.

Every Boundary Point is either Accumulation Point or Isolated Point

Open Sets:

End point is an interior point

Closed set

Complement of the open set. It contains all its accumulation point.

▼ Q) Let the set is {0} U [1,2].

{0}

It is Adherent , Isolated and Boundary but its not Accumulation point.

{1} or {2}

Boundary , Adherent and Accumulation.

{1.5}

Accumulation , Adherent and Interior Point .

▼ The following are equivalent for Dense Set

- A set D is a subset X is dense in X
- For every non-empty open set U is a subset X, we have U intersection D ≠ Empty.
- Closure of D = X
- Every point x belongs to X is an adherent point of D.