Lec-04

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Sequence

and limit point = {1, 2} (∵ it has two limit pt)

⇒ The sequence is not cgt also it is not divergent

The sequence is oscillating finitely...

(4) ⇒ every bdd sequence is either cgt or oscillating finitely

(5) Every nbdd sequence never be cgt.

ex:- {1, 0, 2, 0, 3, 0, 4, ...} is nbdd

∴ sequence is or never be cgt

(6) Let $\langle a_n \rangle$ be a sequence and if

(1) $\langle a_n \rangle$ is bdd

(2) $\langle a_n \rangle$ has unique limit pt

} ⇒ $\langle a_n \rangle$ is cgt

(7) Let $\langle a_n \rangle$ be a sequence and if

(1) $\langle a_n \rangle$ is bdd

(2) $\langle a_n \rangle$ is not convergent

⇒ $\langle a_n \rangle$ has atleast two limit point

(8) Bolzano Weistrass Property :- Every bounded sequence has atleast one limit point.

→ (1) bdd sequence is cgt ⇒ one limit pt

bdd sequence is not cgt ⇒ two or more limit

(10) Let S be a Compact set and $\{a_n\}$ be a sequence in S then $\exists$ a limit point of the sequence $\langle a_n \rangle$ in S.

(11) Let $\{a_n\}$ be bdd sequence then the collection of limit point of bdd sequence is also bdd.

(12) Let A' = set of all limit point
$\Rightarrow A'$ is closed.

(13) Set of all limit point of a bdd sequence is Compact.

(14) If $\langle a_n \rangle$ be a convbdd sequence then its set of limit point may be bdd or may be unbdd.

Ex:- $\{1+\frac{1}{2}, 2+\frac{2}{2}, 1+\frac{1}{3}, 2+\frac{1}{3}, 3+\frac{1}{3}, 1+\frac{1}{4}, 2+\frac{1}{3}, \ldots\}$

is convbdd sequence.

Set of limit point $= \{1, 2, 3, \ldots\}$ which is close convbdd.

L-22 Sum & product of a Sequence

(1) If $\langle a_n \rangle$ is Cgt & $\langle b_n \rangle$ diverge to $+\infty$ then $\langle a_n + b_n \rangle$ is divergent to $+\infty$.