→ $\langle 1, 2, 1, 2, 1, 2, 1, 2, 1, 2, \ldots \rangle$

infinite many duppey रहते हैं

limit point $= \{1, 2\}$

∴ limit $= \{$does not exist$\}$

→ $\langle \frac{1}{n} \rangle = \{1, \frac{1}{2}, \frac{1}{3}, \ldots \rangle$

limit point $= \{0\}$

limit $= \{0\}$

1.2 **Divergent sequence:**

Let $\{a_n\}$ be a real sequence and if $\lim_{n \to \infty} a_n = \infty$ or $-\infty$

then the sequence $\{a_n\}$ is called divergent sequence.

OR,

let K (however large) and if $\lim_{n \to \infty} a_n > K$ ∀ n then $\{a_n\}$ is called divergent sequence.

Ex(1) $\langle n \rangle = \langle 1, 2, 3, 4, 5, 6, 7, \ldots \rangle$

1 पर केवल देखने के बाद कितना बढ़ रहा है

इसका मतलब है $\langle n \rangle$ divergent है

* Oscillating sequence:

suppose $\langle(-1)^n 5\rangle = \{-5, 5, -5, 5, -5, \dots\}$

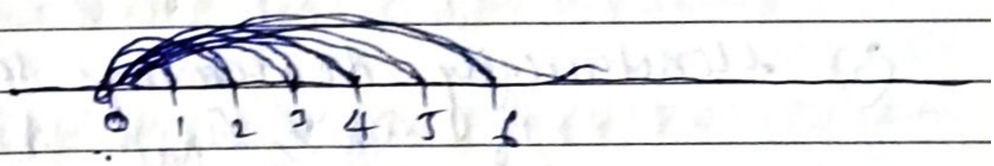
limit point = $\{-5, 5\}$ set के अन्दर दो या दो से ज्यादा limit point है तो ये sequence convergent नहीं होगा इसलिए ये sequence oscillating है

कोई भी sequence के तीन behave होते है

(1) Convergent (2) Divergent (3) oscillate.

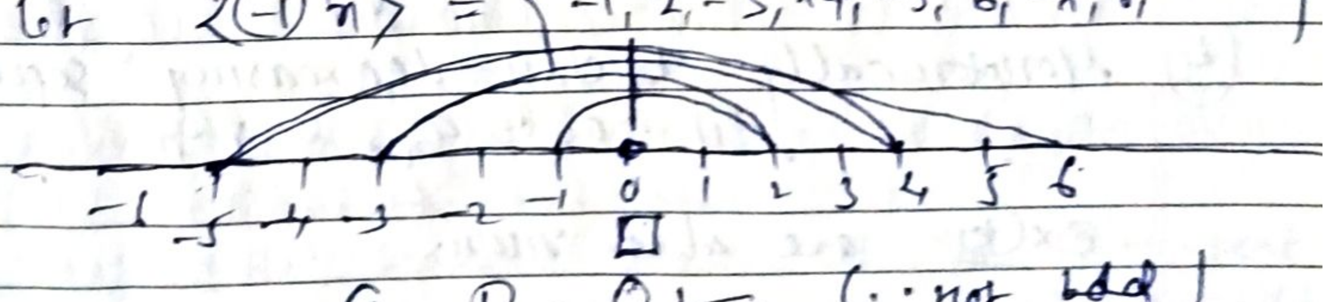
Note that ये sequence $\langle(-1)^n 5\rangle$ has no. of element infinite but ये oscillate कर रहे है between two finite number के बीच एवं bdd. इसलिए ये finitely oscillating sequence है।

* Let $\{0, 1, 0, 2, 0, 3, 0, 4, 0, 5, 0, 6, \dots\}$ be sequence



then this sequence is oscillating.
limit point = $\{0\}$ but not bdd sequence ⇒ this is infinite oscillating seq^n

* Let $\langle(-1)^n n\rangle = \{-1, 2, -3, +4, -5, 6, -7, 8, \dots\}$



C, D, O infinitely ($\because$ not bdd)
X X