

Definition :- 1. A sequence  $\langle a_n \rangle$  of real numbers is called increasing sequence if  $a_n < a_{n+1} \forall n$

2. A sequence  $\langle a_n \rangle$  of real numbers is called decreasing sequence if  $a_n > a_{n+1} \forall n$ .

3. A sequence  $\langle a_n \rangle$  is called monotonic sequence if  $\langle a_n \rangle$  either increasing or decreasing sequence.

Example :-

1. The sequence  $\langle \frac{1}{n} \rangle$  is decreasing seq.

$$n+1 > n \Rightarrow \frac{1}{n+1} < \frac{1}{n}$$

$$\Rightarrow a_{n+1} < a_n \forall n.$$

2. The sequence  $\langle n^2 \rangle$  is increasing seq.

$$n^2 < (n+1)^2 \Rightarrow a_n < a_{n+1} \forall n.$$

$$\langle 1, 4, 9, 16, \dots \rangle$$

Example :-

Given an example to sequence which is not monotonic sequence (Exc).