

UNIT-2 Part-I (waves & oscillations)

wave:- A wave motion is a disturbance of some kind which moves from one place to another by means of a medium.

oscillation:- oscillation is an effect expressible as a quantity that repeatedly & regularly fluctuate above and below some mean position.

1) Transverse wave:- wave motion in which particle of medium vibrate about their mean position at right angle to the direction of propagation.

Eg - Light waves.

2) Longitudinal waves:- wave motion in which wave vibrate about their mean position along the same line as propagation of wave.

Eg. Sound waves.

Simple Harmonic Motion:- If the acceleration of a particle in a periodic motion is always directly proportional to its displacement from its equilibrium position.

Types of SHM:-

1) Linear Harmonic Simple Harmonic Motion:-

If the displacement of a particle executing SHM is linear is said to be linear simple harmonic motion.

Example - Simple Pendulum.

Angular Simple Harmonic Motion:-

If the Displacement of a Particle Executing SHM is angular. Example - Compound Pendulum.

Essential Conditions for SHM:-

1) If f be the linear acceleration and x be the displacement from Equilibrium Position.

The essential condition is -

$$\boxed{f \propto -x}$$

2) If α be the angular momentum & θ be the angular displacement then essential condition is -

$$\boxed{\alpha = -\theta}$$

Time Period:- The smallest time interval during which oscillation repeat itself is called Time Period, denoted by T . Its Unit is seconds.

Frequency:- Number of oscillation that a body complete in one second is called frequency of Periodic motion.

It is reciprocal of Time Period T and is given by -

$$\boxed{n = \frac{1}{T}}$$

Unit - Hertz represented by Hz.

Amplitude:- Maximum displacement of a body from its Mean position.