

Wave -

A wave is a disturbance that propagates in space, transport energy and momentum from one point to another without the transport of matter.

Characteristic of wave motion-

- (i) When a wave passes through a medium, particles of the medium vibrate simple harmonically about their mean position. They do not leave their position and move with the disturbance.
- (ii) In wave motion the phase of the particles during their vibration is different at different positions.
- (iii) The velocity of the particles during their vibration is different at different positions.
- (iv) The velocity of wave motion through a particular medium is constant. It depends only on the nature of medium not on the frequency, wavelength or intensity.
- (v) Energy is propagated along with the wave motion without any net transport of the matter.
- (vi) For the propagation of wave, a medium should have following properties:
 - (a) Elasticity
 - (b) Inertia
 - (c) Minimum friction amongst the particles of the medium
 - (d) Uniform density of the medium.

Types of Waves-

1.] On the basis of necessity of medium-

(i) Mechanical Waves-

They require medium for their propagation.
Eg. Waves on string, waves on water surface, sound waves etc.

(ii) Non-Mechanical Waves-

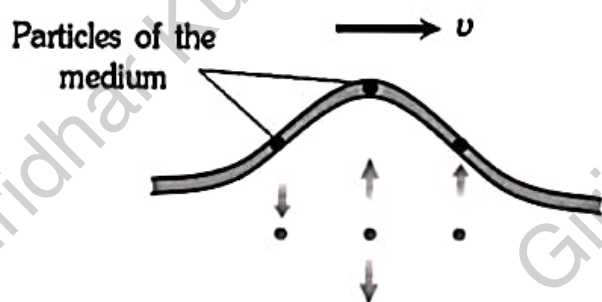
They do not require medium for their propagation.
Eg. Light, heat (Infrared), radio waves, X-rays etc.

2.] On the basis of vibration of particles-

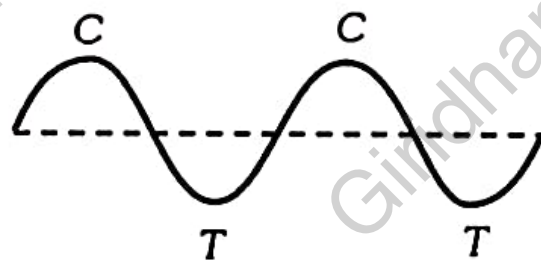
(i) Transverse waves-

In the transverse waves the particles of the medium vibrate in a direction perpendicular to the direction of propagation of wave.

It travels in the form of crests (C) and troughs (T).



Transverse wave on a string



Eg. Light, waves on water surface etc.

(ii) Longitudinal Waves-

In the longitudinal waves the particles of the medium vibrate in the direction of wave motion.

It travels in the form of compressions (C) and rarefactions (R).