

**IIT-JEE · NEET · CBSE eBOOKS**

CLASS 11 & 12th



Learning Inquiry  
8929 803 804

CLASS 11th

# Waves

miso study



## 01. Wave Motion

- When a particle moves through space, it carries energy with itself.
- (Wave motion) to transport energy from one part to space to other without any bulk motion of material together with it.

### Examples of waves

Ripples on a pond (water waves), visible light, radio and TV signals

## 02. Classification of waves

### Based on medium necessity

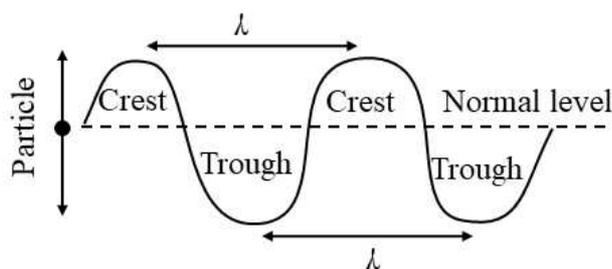
The waves which require medium for their propagation are called mechanical waves. In the propagation of mechanical waves elasticity and density of the medium is important therefore mechanical waves are known as **elastic waves**.

### Based on energy propagation

### Based on direction of propagation

### Based on the motion of particles of medium

Mechanical transverse waves produce in such type of medium which have shearing property



## 03. Speed of transverse wave on string

As a wave travels along the x-axis, the points on the string oscillate back and forth in the y-direction.

$$y(x,t) = A \sin(kx - \omega t + \phi_0)$$

$$v_y = \frac{dy}{dt} = -\omega A \cos(kx - \omega t + \phi_0)$$

The maximum velocity of a small segment of the string is  $v_{\max} = \omega A$ .

**NOTE**  Creating a wave of larger amplitude increases the speed of particles in the medium, but it does not change the speed of the wave through the medium.