Important Terms Regarding Wave Motion.

- (1) Wavelength:
- (i) It is the length of one wave.

(ii) Wavelength is equal to the distance travelled by the wave during the time in which any one particle of the medium completes one vibration about its mean position.

(iii) Wavelength is the distance between any two nearest particles of the medium, vibrating in the same phase.

(iv) Distance travelled by the wave in one time period is known as wavelength.

(v) In transverse wave motion:

- λ = Distance between the centers of two consecutive crests.
- λ = Distance between the centers of two consecutive troughs.
- λ = Distance in which one trough and one crest are contained.
- (vi) In longitudinal wave motion:
- λ = Distance between the centers of two consecutive compression.



 λ = Distance between the centers of two consecutive rarefaction.

 λ = Distance in which one compression and one rarefaction contained.

(2) Frequency: (i) Frequency of vibration of a particle is defined as the number of vibrations completed by particle in one second.

(ii) It is the number of complete wavelengths traversed by the wave in one second.

(iii) Units of frequency are hertz (Hz) and per second.

(3) Time period: (i) Time period of vibration of particle is defined as the time taken by the particle to complete one vibration about its mean position.

(ii) It is the time taken by the wave to travel a distance equal to one wavelength.

(4) Relation between frequency and time period: Time period = $1/Frequency \cdot T = 1/n$

(5) Relation between velocity, frequency and wavelength: $v = n\lambda$

Velocity (v) of the wave in a given medium depends on the elastic and inertial property of the medium.

Frequency (n) is characterized by the source which produces disturbance. Different sources may produce vibration of different frequencies. Wavelength (λ) will differ to keep n $\lambda = v = \text{constant}$