CH: Wave Motion

- Define and understand progressive wave
- ***Write progressive wave in mathematical form***
- Discuss the condition under which stationary waves can be formed
- Write stationary wave in mathematical form
- Calculate frequency, amplitude, velocity, time period, etc. of progressive wave
- ***Find expression for stationary wave using two progressive waves***

Waves:

Waves are the disturbances that transport energy from on point to another without the actual transportation of the matter.

As a wave travel (propagate) from one point to another in a medium, the particles (atoms or molecules) within the medium move simple harmonically (to- and- fro) about their mean position (*without actual transfer of particles*).

Types of waves:

1) **Non- mechanical wave (*Electromagnetic wave*):**

   The wave which needs no material medium for propagation is called as non- mechanical wave (*they can travel through the vacuum of space).*

   The electromagnetic wave is the only non- mechanical wave.

   They transmit energy as electric and magnetic field vectors (*i.e., in the form of electric and magnetic energy*).

   Examples: light waves, heat radiation etc.

   All non- mechanical waves are transverse in nature.

2) **Mechanical waves (*Elastic wave*):**

   The wave which needs material medium for propagation is called as mechanical wave.

   They also transmit energy and momentum in the medium (*but not in the form of electric and magnetic fields vector*).

   Examples: sound waves, water waves, string wave etc.

   Mechanical waves can be either longitudinal or transverse in nature.