



CHAPTER-13 SOUND

NOTES:

Sound is Produced by a Vibrating Body

- Sound plays an important role in our life. It helps us to communicate with one another.
- Sound is produced by vibrating objects.
- **Vibration**: The to and fro or back and forth motion of an object is called vibration or oscillatory motion.

Sound produced by Humans

- In human, the sound is produced by the voice box or the larynx which is located at the upper end of the windpipe.
- Two vocal cords stretch across the voice box leaving a narrow slit between them for the passage of air. When the lungs force air through the slit, the vocal cords vibrate, producing sound.

Sound needs a Medium for Propagation

- Sound needs a medium to travel.
- Vibrating objects produce sound and it is carried in all directions in a medium.
- The medium could be a gas, a liquid or a solid.
- Sound cannot travel through a vacuum.

We hear sound through our Ears

- When the sound enters our ears, it travels down a canal up to the eardrum. Sound vibrations make the eardrum vibrate and send vibrations to the inner ear. From there, the signal goes to the brain. This process is called hearing.

Amplitude, Time period and Frequency of a vibration

- **Time period**: The time taken to complete one oscillation is called the time period.
- The number of oscillations or vibrations per second is called frequency of Oscillation. It is expressed in Hertz (Hz).
- **Amplitude**: The maximum distance to which a vibrating body moves on either side of its mean position is called the amplitude of vibration.
- Amplitude and frequency are two important properties of any sound.
- **Loudness of sound**: Larger the amplitude of vibration, louder is the sound.
- **Pitch of the sound**: Higher the frequency of vibration, the higher is the pitch or shrill is the sound.

Audible and Inaudible Sounds

- The sounds of frequencies less than about 20 vibration per second (20Hz) or higher than about 20,000 vibrations per second (20 KHz) cannot be detected by the human ear. Such sounds are called inaudible.
- **Audible frequencies**: For human ear, the range of audible frequencies is roughly from 20 to 20,000Hz.

Noise and Music

- **Noise**: Unpleasant sounds are called noise.
- **Musical sound**: Musical sound is one which produces a pleasing sensation.

Noise pollution

- **Noise pollution**: The presence of excessive or unwanted sounds in the environment is called noise pollution.
- Major causes of noise pollution are sounds of vehicles, explosions including bursting of crackers, machines, loud speakers, etc.

What are the Harms of Noise Pollution?

- Presence of excessive noise in the surroundings may cause many health related problems. e.g.- lack of sleep, hypertension, anxiety, etc.
- Person exposed to a loud sound continuously may get temporary or even permanent impairment of hearing.

Measures to limit Noise Pollution

- To control the sources of noise, silencing devices must be installed in air craft engines, transport vehicles, industrial machines and home appliances.
- Noise producing industries should be set up away from any residential area.
- Plantation on the roadside and elsewhere can reduce the noise pollution.

