

Board – ICSE

Class – 10<sup>th</sup>

Topic – Sound

- Give one example each of natural vibration, forced vibration & resonance.
  - Mention one practical use of echo.
- State three characteristics of musical sound.
    - How does the musical sound differ from noise?
  - How does a stretched string on being set into vibration, produce an audible sound?
    - Will this sound be audible if the string is set into vibration on the surface of moon?  
Give reason for your answer .
  - Radio waves of speed  $3 \times 10^8 \text{m/s}$  are reflected off the moon and received back on earth. The time elapsed between the sending and receiving it back at the earth station is 2.5sec. What is the distance of moon from the earth?
- An observer stands at a distance of 850m from a cliff and fires a gun. After what time gap will he hear the echo, if speed of sound in air is 350m/s?
- A vibrating tuning fork is placed over the mouth of a burette filled with water. The tap is opened and the water level gradually falls. It is observed that the sound becomes the loudest for a particular length of air column.
  - Name the phenomenon
  - Why does the sound become the loudest?
  - What is the name of the phenomenon taking place for another length of air column and is not the loudest?
- What change, if any, would you expect in the characteristics of a musical sound when we increase – i) its frequency. ii) its amplitude.
- A pendulum has a frequency of 5 vibrations per second. An observer starts the pendulum and fires a gun simultaneously. He hears the echo from the cliff after 8 vibrations of the pendulum. If the velocity of sound in air is 340m/s, what is the distance between the cliff and the observer?
- Sound made in front of a tall building 18m away, is repeated. Name the phenomenon and briefly explain it.
- Differentiate between resonance & forced vibration.
  - The wavelength of waves produced on the surface of water is 20cm. If the wave

velocity is 24m/s, calculate 1. The number of waves produced in one second. 2. The time required to produce one wave.

9. Why soldiers are asked to break their rhythmic steps while crossing a bridge.
10. A sound has a frequency of 150Hz and wavelength of 2m. Calculate its velocity.
11. State two ways by which the frequency of a transverse vibrations of a stretched string can be decreased.
12. A radar is able to detect the reflected waves from an enemy aeroplane, after a time interval of 0.02milliseconds. If the velocity of the waves is  $3 \times 10^8$  m/s, calculate the distance of the plane from the radar.