

# Chapter 12

## SOUND

### Multiple Choice Questions

- Note is a sound
  - of mixture of several frequencies
  - of mixture of two frequencies only
  - of a single frequency
  - always unpleasant to listen
- A key of a mechanical piano struck gently and then struck again but much harder this time. In the second case
  - sound will be louder but pitch will not be different
  - sound will be louder and pitch will also be higher
  - sound will be louder but pitch will be lower
  - both loudness and pitch will remain unaffected
- In SONAR, we use
  - ultrasonic waves
  - infrasonic waves
  - radio waves
  - audible sound waves
- Sound travels in air if
  - particles of medium travel from one place to another
  - there is no moisture in the atmosphere
  - disturbance moves
  - both particles as well as disturbance travel from one place to another.
- When we change feeble sound to loud sound we increase its
  - frequency
  - amplitude
  - velocity
  - wavelength
- In the curve (Fig. 12.1) half the wavelength is
  - A B
  - B D
  - D E
  - A E

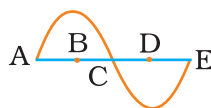
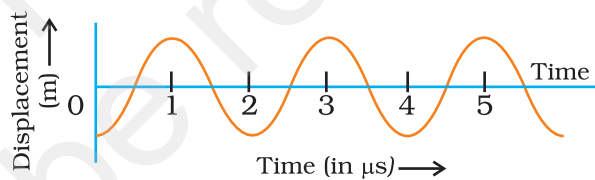


Fig. 12.1

7. Earthquake produces which kind of sound before the main shock wave begins
  - (a) ultrasound
  - (b) infrasound
  - (c) audible sound
  - (d) none of the above
8. Infrasound can be heard by
  - (a) dog
  - (b) bat
  - (c) rhinoceros
  - (d) human beings
9. Before playing the orchestra in a musical concert, a sitarist tries to adjust the tension and pluck the string suitably. By doing so, he is adjusting
  - (a) intensity of sound only
  - (b) amplitude of sound only
  - (c) frequency of the sitar string with the frequency of other musical instruments
  - (d) loudness of sound

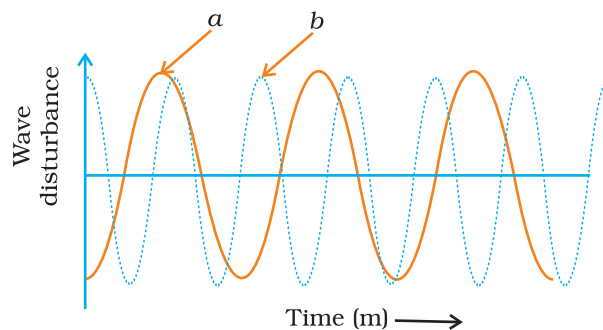
### Short Answer Question

10. The given graph (Fig.12.2) shows the displacement versus time relation for a disturbance travelling with velocity of  $1500 \text{ m s}^{-1}$ . Calculate the wavelength of the disturbance.



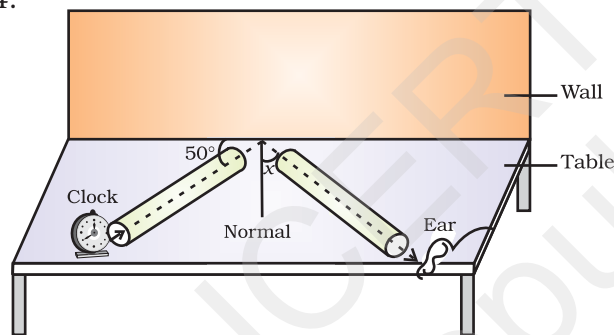
**Fig. 12.2**

11. Which of the above two graphs (a) and (b) (Fig.12.3) representing the human voice is likely to be the male voice? Give reason for your answer.



**Fig. 12.3**

- 12.** A girl is sitting in the middle of a park of dimension  $12\text{ m} \times 12\text{ m}$ . On the left side of it there is a building adjoining the park and on right side of the park, there is a road adjoining the park. A sound is produced on the road by a cracker. Is it possible for the girl to hear the echo of this sound? Explain your answer.
- 13.** Why do we hear the sound produced by the humming bees while the sound of vibrations of pendulum is not heard?
- 14.** If any explosion takes place at the bottom of a lake, what type of shock waves in water will take place?
- 15.** Sound produced by a thunderstorm is heard 10 s after the lightning is seen. Calculate the approximate distance of the thunder cloud. (Given speed of sound =  $340\text{ m s}^{-1}$ .)
- 16.** For hearing the loudest ticking sound heard by the ear, find the angle  $x$  in the Fig. 12.4.



**Fig. 12.4**

- 17.** Why is the ceiling and wall behind the stage of good conference halls or concert halls made curved?

## Long Answer Questions

- 18.** Represent graphically by two separate diagrams in each case
- Two sound waves having the same amplitude but different frequencies?
  - Two sound waves having the same frequency but different amplitudes.
  - Two sound waves having different amplitudes and also different wavelengths.
- 19.** Establish the relationship between speed of sound, its wavelength and frequency. If velocity of sound in air is  $340\text{ m s}^{-1}$ , calculate
- wavelength when frequency is 256 Hz.
  - frequency when wavelength is 0.85 m.
- 20.** Draw a curve showing density or pressure variations with respect to distance for a disturbance produced by sound. Mark the position of compression and rarefaction on this curve. Also define wavelengths and time period using this curve.