

Science

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(Chapter – 12) (Sound)

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Question 1:

What are wavelength, frequency, time period and amplitude of a sound wave?

Answer 1:

Wavelength: The distances between two consecutive compressions or rarefaction of a wave. Its S.I unit is meter.

Frequency: One compression and one rarefaction constitutes one vibration. The number of vibration in a second is called frequency. Its unit is Hertz.

Amplitude: When waves are produced, the particles vibrate about their mean position. The maximum displacement from its mean position of a particle is called its amplitude. It is measured in meters.

Time period: The time taken by the wave to complete one oscillation i.e., the time between two consecutive compressions or rarefactions is called time period.

Question 2:

How are the wavelength and frequency of a sound wave related to its speed?

Answer 2:

Speed = Wavelength x frequency

$$V = \lambda \times \nu$$

Question 3:

Calculate the wavelength of a sound wave whose frequency is 220 Hz and speed is 440 m/s in a given medium.

Answer 3:

$$f = 220 \text{ Hz}, \quad V = 440 \text{ m/s}$$
$$\lambda = \frac{V}{f} = \frac{440}{220} = 2 \text{ m}$$

Question 4:

A person is listening to a tone of 500 Hz sitting at a distance of 450 m from the source of the sound. What is the time interval between successive compressions from the source?

Answer 4:

$$\nu = 500 \text{ Hz.}$$

$$\text{Therefore } T = \frac{1}{500} \text{ s} = 0.002 \text{ s}$$