WORKSHEET 1

CHAPTER 11 – SOUND

A. Tick (✓) the correct option.

1. Bats detect the obstacles in their path by receiving the reflected
   a. infrasonic waves. b. ultrasonic waves. c. radio waves. d. electromagnetic waves.
2. Propagation of wave transfers
   a. energy. b. matter.
   c. both energy and matter. d. none of these.
3. The number of oscillations completed in one second is called
   a. time period. b. velocity. c. frequency. d. wavelength.
4. Time period of a vibrating body of frequency 100 Hz is
   a. 100 s. b. 10 s. c. 0.1 s. d. 0.01 s.
5. The point of maximum positive displacement of a transverse wave is called
   a. crest. b. trough. c. pitch. d. none of these.

B. Fill in the blanks.

1. A _____ pitch sound is called a shrill sound.
2. The distance travelled by a wave in one second is called the _____ of the wave.
3. The points on a wave which are in the same state of vibration are said to be in the same _____
4. The SI unit of wavelength is _____
5. The loudness of a sound is measured in _____

C. State whether the following statements are true or false.

1. Sound cannot be produced if the body is not vibrating.
2. Sound waves do not need a material medium for their propagation.
3. Light waves travel faster than sound waves in air.
4. In a compression of a longitudinal wave, the density of particles is high.
5. The distance between a crest and an adjacent trough is equal to half the wavelength.

D. Match the following.

1. Audible sound	0.1 s
2. Ultrasonic sound	< 20 Hz
3. Persistence of hearing	17.2 km
4. Minimum distance to hear an echo	20 Hz – 20,000 Hz
5. Infrasonic sound	> 20,000 Hz

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Class: IX Date: .....

E. Answer the following questions.

Very short answer questions

1. Define longitudinal wave.
2. Give the relation between time period and frequency.

Short answer questions

1. Name four factors affecting loudness of sound.
2. How is loudness of sound measured?

Long answer questions

1. If a thunder is heard 2 s after the lightning is seen, how far is the lightning from the man? (speed of sound in air = 330 m/s)
2. What are differences between compression and rarefaction?

ANSWERS

WORKSHEET 1

A. Tick (✓) the correct option.

1. b 2. a 3. c 4. d 5. a

B. Fill in the blanks.

1. high
2. velocity
3. phase
4. metre
5. decibels

C. State whether the following statements are true or false.

1. T 2. F 3. T 4. T 5. T

D. Match the following.

1. Audible sound	20 Hz – 20,000 Hz
2. Ultrasonic sound	> 20,000 Hz
3. Persistence of hearing	0.1 second
4. Minimum distance to hear an echo	17.2 km
5. Infrasonic sound	< 20 Hz

E. Answer the following questions.

Very short answer questions

1. A wave in which the particles of the medium oscillate (vibrate) to and fro in the same direction in which the wave is moving is called a longitudinal wave.
2. Frequency (f) = $\frac{1}{\text{Time period } (T)}$

Short answer questions

1. Four factors affecting the loudness of sound are amplitude of vibration, motion of the medium, distance from the vibrating body and presence of resonant body.
2. The loudness of sound is measured in decibels (dB).

Long answer questions

1. Speed (v) of sound = 330 m/s

   Time taken (t) = 2 s

   We know

   Distance = Speed × Time

   = 330 m/s × 2 s

   = 660 m

   Thus, the lightning is at a distance of 660 m from the man.

2. Differences between compression and rarefaction.

Parameter	Compression	Rarefaction
1. Distance between particles	It is that part of a longitudinal wave in which the particles of the medium are closer to one another than in their normal state.	It is that part of a longitudinal wave in which the particles of the medium are farther apart than in their normal state.
2. Volume of the medium	There is a momentary decrease in the volume of the medium.	There is a momentary increase in the volume of the medium.
3. Density of the particles	The density of the particles of the medium is higher than the normal density.	The density of the particles of the medium is lesser than the normal density.