CBSE Test Paper 04

Chapter 12 Sound

1. Wave motion is a periodic _____ produced by a vibrating body. **(1)**
   a. Energy
   b. Disturbance
   c. oscillations
   d. Momentum
2. Match the following with correct response. **(1)**

Column A	**Column B**
(1) Audible range	(A) Less than 20 Hz
(2) Infrasonic	(B) Speed greater than sound in air
(3) Ultrasonic	(C) More than 20,000 Hz
(4) Supersonic	(D) 20 Hz to 20,000 Hz

   a. 1-A, 2-C, 3-B, 4-D
   b. 1-D, 2-A, 3-C, 4-B
   c. 1-B, 2-D, 3-A, 4-C
   d. 1-C, 2-B, 3-D, 4-A

3. Sound waves are **(1)**

   a. transverse
   b. neither transverse nor longitudinal
   c. partly transverse and partly longitudinal
   d. longitudinal

4. _____ have frequencies more than 20,000 hertz. **(1)**

   a. Different
   b. Ultrasonics
   c. Sound
   d. Infrasonics

5. Calculate the wavelength of a sound wave whose frequency is 820 Hz and speed is 440 ms^{-1} in a given medium. **(1)**

    a. 0.53 m
    b. 0.55 m
    c. 0.57 m
    d. 0.50 m

6. The multiple reflection of sound in a hall is called **(1)**
    a. All of these
    b. Scanning
    c. Echo
    d. Reverberation

7. Which of the following does not require medium for propagation? **(1)**
    A. Sound waves
    B. Light waves
    C. Radio waves
    D. Water waves

    a. B and D
    b. All of these
    c. B and C
    d. A and C

8. Which characteristic of the sound helps you to identify your friend by his voice while sitting with others in a dark room? **(1)**

9. What is the range of frequencies associated with **(1)**

    a. Infrasound?
    b. Ultrasound?

10. In which of the three media, air, water or iron, does sound travel the fastest at a particular temperature? **(1)**

11. Bats have no eyes still they can ascertain distances, directions nature and size of the

objects. Explain why? **(3)**

12. Define :- **(3)**

    a. Time Period
    b. Amplitude of a wave

13. Explain how defects in a metal block can be detected using ultrasound. **(3)**

14. Explain how bats use ultrasound to catch their prey. **(3)**

15. How does the sound produced by a vibrating object in a medium reach your ear?

OR

Explain how sound is produced by your school bell. **(5)**

CBSE Test Paper 04

Chapter 12 Sound

Answers

1. b. Disturbance

   Explanation: Wave motion is a periodic disturbance in the medium produced by vibrating body. These disturbance moves into medium to produce sounds. Wave motion is also known as propagation of disturbances.

2. b. 1-D, 2-A, 3-C, 4-B

   Explanation: The sound whose frequency lies between 20 Hz and 20000 Hz which we are able to hear is called audible sound.

   Inaudible sounds having frequency less than 20 Hz are known as infrasonic sounds.

   Inaudible sounds having frequecy more than 20000 Hz are known as ultrasonic sounds.

   When a body is travelling at a speed greater than the speed of sound,we say that the body is travelling at a supersonic speed.

3. d. longitudinal

   Explanation: Sound Wave is longitudinal wave. Sound propagates because of oscillation of particles of medium parallel to the disturbance, thus sound wave is longitudinal wave.

4. b. Ultrasonics

   Explanation: The sound of frequency more than 20,000Hz are called ultrasonics. ultrasonic sounds have a frequency above the upper limit of human hearing.

5. a. 0.53 m

   Explanation: v= 440 ms^{-1}; frequency = 840 Hz

   Wavelength= $\frac{wave\ speed}{frequency} = \frac{440}{840}$ = 0.53 m.

6. d. Reverberation

   Explanation: When a number of echoes of the original sound are heard, each echo being fainter than the preceding one, such multiple echoes are called reverberations. In halls and auditorium reverberation is reduced by using sound absorbing substances. Sound absorbing panels are kept near the stage.

7. c. B and C

   Explanation: Light waves and Radio waves are electromagnetic waves and hence they do not require any medium of propagation.

8. Pitch of the sound wave.

9. Infrasound = less than 20 Hz
   Ultrasound = greater than 20 KHz

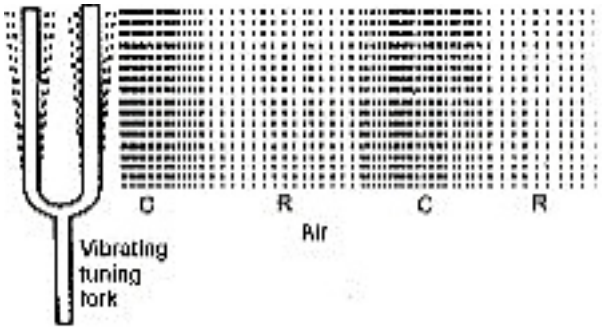
10. Sound will travel the fastest in iron at a particular temperature because the particles in solid are closely packed and the sound wave jumps off each particle fastly.

11. Bats, have special types of wings. When they fly they produce ultrasonic waves. These waves are received by the ears of bat after they have been reflected by the object. The ears of the bat are so sensitive and trained that they not only get information of distance of the obstacle but also that of the nature of the reflecting surface.

12. a. **Time Period of a wave(T):**- The time required by a wave to complete one vibration is called time Period.
    b. **Amplitude(A):-** The magnitude of the maximum disturbance in the medium on either side of mean value is called the amplitude of wave.

13. The ultrasound waves are allowed to pass through metal block to which detectors are fitted. If there is a small defect in the metal block like an air bubble or a crack, then the ultrasound waves are reflected from such spots. Metal block if defective is indicated by the reflected ultrasonic waves.

14. The bats produce high pitched ultrasonic waves which are not heard by human beings. The ultrasonic waves on striking the insect send back an echo, which is heard by the bat. As the echo is heard by the bat, it hovers on the insect and catches it.

15. 

Air is the commonest material through which sound propagates. When a vibrating object, like prongs of tuning fork, move forward, they push the molecules of the air in front of them. This is turn compresses the air, thus creating a region of high pressure and high density called compression. This compression in the air travels forward. When the prongs of the tuning fork move backward, they create a region of low pressure in the air, commonly called rarefaction. This region has low-pressure low density and more volume. As the tuning fork continues to vibrate, the regions of compression in the air alternate with the regions of rarefaction. These regions alternate at the same place. The energy of vibrating tuning fork travels outward. This energy which reaches the ears makes the eardrums to vibrate and thus we hear the sound.