

13. Sound

1. Multiple choice questions (U/R)

a) A whistle is a good example of the production of sound by _____.

- | | |
|----------------|---------------|
| (i) rubbing | (ii) blowing |
| (iii) striking | (iv) plucking |

ans. (ii) blowing

b) _____ is a musical instrument in which sound is produced by the vibration of a string.

- | | |
|-------------|--------------|
| (i) Maracas | (ii) Timpani |
| (iii) Cello | (iv) Flute |

ans. (iii) Cello

c) The limits of human hearing are within the frequency range of:

- | | |
|----------------------|----------------------|
| (i) 2Hz to 20000Hz | (ii) 20Hz to 20000Hz |
| (iii) 20Hz to 2000Hz | (iv) 20Hz to 200Hz |

ans. (ii) 20Hz to 20000Hz

2. State whether the following statements are true or false (U)

a) The SI unit of amplitude is seconds.

False

b) One should use earplugs whenever exposed to high noise levels.

True

c) Any device or object with which one can make music is called a musical instrument.

True

d) A stethoscope is based on the principle of reflection of sound.

True

3. Name the following. (U)

a) The total number of vibrations produced by a vibrating body in one second.

Frequency

b) The maximum distance moved by a vibrating body from its mean position.

Amplitude

c) Unit of measurement of loudness of sound

Decibels

d) Form of energy produced by a vibrating body in a medium.

Sound

4. In the following questions, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Read the statements carefully and choose the correct alternative (A), (B), (C) and (D) as given below. (An)

- (A) Both A and R are true and R is the correct explanation of the assertion.
(B) Both A and R are true but R is not the correct explanation of the assertion.
(C) A is true but R is false.
(D) A is false but R is true.

a) **Assertion:** Infrasound is inaudible.

Reason : Frequency of infrasound is less than 20 Hz.

(A) Both A and R are true and R is the correct explanation of the assertion.

b) **Assertion:** Sound cannot travel through vacuum.

Reason: Sound generation and propagation does not require a medium.

(C) A is true but R is false.

5. Define the following (R)

a) Oscillatory motion

The back and forth movement of a body in air, which produces sound is called oscillatory motion.

b) Time period

The time required to complete one vibration or oscillation by a vibrating object is called its time period.

c) Echo

The echo occurs when a sound wave is reflected from the surface of an object. It is a repetition of the original sound due to reflection by some surface.

6. Answer the following in brief (An/U/R)

a) Differentiate between Noise and Music. (Any two points)

Noise	Music
<ul style="list-style-type: none">• Noise is unpleasant sound.• Noise has a low frequency and irregular pattern of change in frequency and amplitude.	<ul style="list-style-type: none">• Music is pleasant sound.• Music has a recognisable pattern of change in frequency and amplitude.

b) Explain the term ultrasound. State the uses of ultrasounds.

A sound with a frequency more than 20000 Hz which cannot be heard by human ears is called ultrasound.

Uses:

- **In the field of medical science, ultrasounds are used as a diagnosis tool to investigate the human body from inside.**
- **They are also used to measure the depth of the sea and to detect underwater objects.**

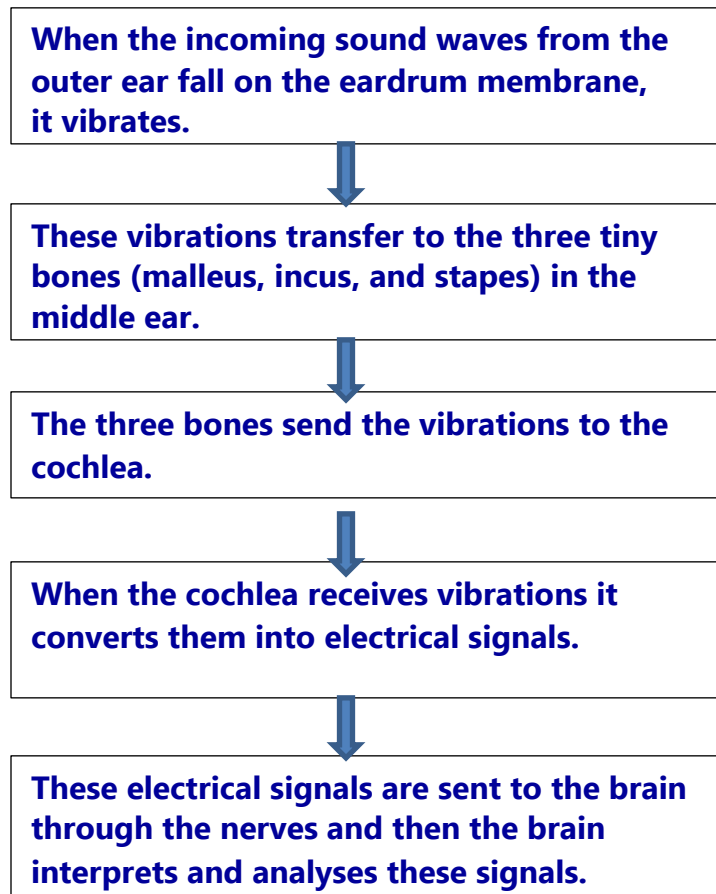
c) **What is reflection of sound? State two laws of reflection of sound.**

Sound waves bounce back from surfaces of objects. This bouncing back of sound waves from the surface of a solid or a liquid is called reflection of sound.

The following are two laws which govern reflection of sound:

- The direction of an incident sound wave and the reflected sound wave make equal angles with the perpendicular to the surface.**
- The incident sound wave, the normal and reflected sound wave, all three lie in the same plane.**

7. Draw a flow chart of the path of sound waves through the ear. (Ap)



8. Observe the given diagrams and answer the questions that follow: (An)

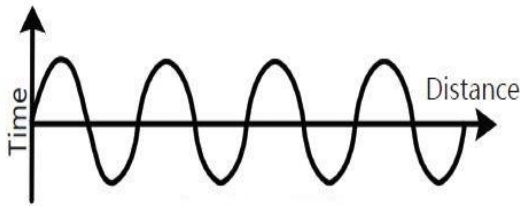


Fig A

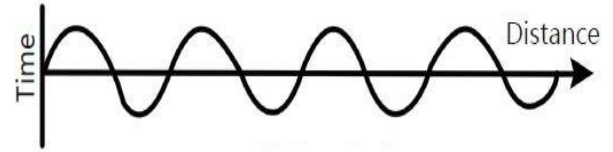


Fig B

a) What is loudness?

Loudness means, whether a sound seems loud or soft to a listener.

b) Identify the louder sound and the softer sound in the above diagrams.

Fig A – Louder sound

Fig B – Softer sound

c) On what factor does loudness depend?

The loudness depends on the amplitude of the vibration.

9. Students investigated the pitch of sound. They took two metal bowls of the same size. They filled half of one bowl and three-fourths of the second bowl with water. Using a wooden stick, they struck the edges of the bowls gently and sequentially. What is the difference in the pitch of the sound produced in both the bowls? Give reasons for your answer. (An)

The bowl with lesser water produced higher pitch sounds whereas the bowl with more water produced lower pitch sounds.

The frequency of the sound produced depends on the amount of water/the length of the air column in the bowl.

With lesser water more vibrations are produced and therefore the pitch is higher. With more water, lesser vibrations are produced and the pitch is lower.

10. Who am I? (An)

a) I am tiny as a dime.

I help to improve your hearing ability,

I direct sound waves into the ear canal for clarity.

Hearing aid

- (Answers may vary accept all correct answer)**

- ## Quality or timbre

The amplitude of sounds produced by bees will be lesser than the amplitude of the sounds produced by tigers.

[illegible]