

Sound: Production of Sound

EXERCISE, EXCERS [PAGE 125]

Exercise | Q 1.1 | Page 125

Fill in the blank:

Sound is generated by the rhythmic _____ of an object.

Solution: Sound is generated by the rhythmic vibration of an object

Exercise | Q 1.2 | Page 125

Fill in the blank:

The frequency of sound is measured in _____.

Solution: The frequency of sound is measured in Hertz (Hz).

Exercise | Q 1.3 | Page 125

Fill in the blank:

If _____ of sound is decreased, its loudness also decreases.

Solution: If amplitude of sound is decreased, its loudness also decreases.

Exercise | Q 1.4 | Page 125

Fill in the blank:

A medium is necessary for _____ of sound.

Solution: A medium is necessary for propagation of sound.

Excers | Q 2 | Page 125

Match the pairs

Group 'A'	Group 'B'
(a) Flute	(1) Frequency less than 20 Hz
(b) Frequency	(2) Frequency more than 20000 Hz
(c) Sound level	(3) Vibrations in the air
(d) Ultrasonic sound	(4) Measured in Hz
(e) Infrasonic sound	(5) Decibel

Solution:

Group 'A'	Group 'B'
(a) Flute	(3) Vibrations in the air
(b) Frequency	(4) Measured in Hz
(c) Sound level	(5) Decibel
(d) Ultrasonic sound	(2) Frequency more than 20000 Hz
(e) Infrasonic sound	(1) Frequency less than 20 Hz

Exercise | Q 3.1 | Page 125

Give scientific reason.

In earlier times, people used to listen for the arrival of a distant train by putting their ear to the rail.

Solution: In earlier times, people used to listen for the arrival of a distant train by putting their ear to the rail because they knew that sound travels faster through solids than gases. Thus, by putting their ear to the rails used to give them the idea of the arrival time of a train in advance.

Exercise | Q 3.2 | Page 125

Give scientific reason.

The sounds generated by a tabla and a sitar are different.

Solution: Due to difference in the pitch and timbre, the sound produced by a tabla and a sitar are different.

Exercise | Q 3.3 | Page 125

Give scientific reason.

If you were both on the moon, your friend will not be able to hear you call.

Solution: We know that sound cannot travel through vacuum. Since there is no atmosphere on the moon, so we cannot hear sound on the Moon.

Exercise | Q 3.4 | Page 125

Give scientific reason.

We can hear the movement of a mosquito's wings but we cannot hear the movement of our hands.

Solution: The frequency of the sound produced by the movement of mosquito's wings



is in the audible range of humans whereas that produced by the movement of our hands falls in the inaudible range. Due to this reason, we can hear the movement of a mosquito's wings but cannot hear the movement of our hands.

Exercise | Q 4.1 | Page 125

Write answers to the following questions.

How is the sound produced?

Solution: The back and forth movement of an object produce sound. An object moving back and forth is said to be in vibration. Hence, the sound is produced by vibrating objects.

Exercise | Q 4.2 | Page 125

Write answers to the following questions.

What does the intensity of sound depend upon?

Solution: The intensity of sound depends on the amplitude of vibration of the sound. It is proportional to the square of the amplitude of the vibration of the sound.

Exercise | Q 4.3 | Page 125

Write answers to the following questions.

Explain how the frequency of oscillation is related to the length of a pendulum and the amplitude of its oscillation.

Solution: The frequency of oscillation of a pendulum decreases with an increase in the length of the pendulum and vice-versa. It is independent of the amplitude of the oscillation of pendulum provided the amplitude is small.

Exercise | Q 4.4 | Page 125

Write answers to the following questions.

Explain the two ways by which the pitch of the sound generated by a stretched string can be changed.

Solution: Frequency or pitch of vibration of a stretched string can be changed by varying the

- **tension in the string:** If the string of the instrument is under high tension, then the pitch of the note produced on plucking the string will be high i.e. the note will be shriller because the frequency of vibration of the string will be high.



- **the thickness of the string:** If the string of the instrument is thin, then the pitch of the note produced on plucking the string will be high as the frequency of vibration of the string will be high.