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NCERT Class 9 Physics Short Answer Questions for Sound Board Sample Problems

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Question 1

Name two animals which can produce infrasonic waves.

Answer

Hippopotamus and whale

Question 2

What is reverberation?

Answer

Reverberation is defined as persistence of sound after the source has stopped emitting sound.

This is due to multiple reflections of sound waves.

Question 3

What is echo?

Answer

The sound waves produced bounce back or gets reflected from the mountain or buildings and come to our ears, this reflected sound is known as Echo. To hear echo, the barrier reflecting the sound should be least at a distance of 17 meters.

Question 4

What is infrasonic? Give an example.

Answer

Sound having frequency less than 20Hz is known as infrasonic sound or infrasonic.

Waves produced during earthquake are infrasonic.

Question 5

Give examples of organisms which can hear infrasonic?

Answer

Whales and elephants can produce and hear infrasonic sound.

Question 6

What are infrasonic and ultrasonic sounds?

Answer

Infrasonic sound has frequency less than 20 Hz and ultrasonic sound has frequency higher than 20 kHz.

Question 7

What is the audible range of human ear?

Answer

The audible range of human ear is 20 Hz to 20 kHz.

Question 8

Why do we hear sound of an approaching truck before the truck reaches us?

Answer

This is because velocity of sound is much greater than the velocity of truck

Question 9

What is the frequency of wave with time period 0.025 s?

Answer

$$\begin{aligned}\text{Frequency (f)} &= \frac{1}{\text{Time period}} \\ &= \frac{1}{0.025} \\ &= 40\text{ Hz}\end{aligned}$$

Therefore, frequency of the wave = 40 Hz.

Question 10

A baby recognizes her mother by her voice. Name the characteristic of sound involved

Answer

The characteristic of sound involved in uniqueness of the sound is quality of sound or timber.

Question 11

What is SONAR? For what it is used?

Answer

SONAR is Sound Navigation and Ranging. It is a technique used to measure the depth of the sea, locate the sunken ships or icebergs and submarines.

Question 12

An echo is returned in 6 seconds. What is the distance of reflecting surface from source? [Given that speed of sound is 342 m/s.]

Answer

Given

Time in which echo returned, $t = 6 \text{ s}$,

Speed of sound, $y = 342 \text{ m/s}$

Distance = Speed \times Time = $342 \times 6 = 2052m$

As this distance is twice the distance of reflecting surface from source.

So,

The distance of reflecting surface from source = $\frac{2052}{2} = 1026m$.

Question 13

Why Ceiling of good conference halls and concert halls are curved?

Answer

Ceiling of good conference halls and concert halls are curved so that the sound waves after reflecting from these walls reaches every part of the hall and can be easily heard by the listeners.

Question 14

(i) Define the time period of a wave.

(ii) Give the relation among speed of sound y , wavelength λ and its frequency f .

Answer

(i) Time period (T)

It is defined as the time required to complete one wave.

(ii) Speed of sound (v) = Wavelength (λ) \times Frequency (f)

Question 15

A body is vibrating 12000 times in one minute. If the velocity of sound in air is 360 m/s, find:

(a) Frequency of vibration in hertz,

(b) Wavelength of the wave produced.

Answer

(a) Frequency of vibration in hertz

Given,

Number of vibration in one minute = 12000

Number of vibrations in one sec = $\frac{12000}{60}$

= $200Hz$

Therefore, Frequency, $f = 200 \text{ Hz}$

(b) Wavelength of the wave produced

Given,

Velocity of speed in air, $v = 360 \text{ m/s}$

Frequency, $f = 200 \text{ Hz}$

$$v = f\lambda$$

or $\lambda = \frac{v}{f}$

$$= \frac{360}{200} = 1.8 \text{ m}$$

Question 16

Why sometimes we hear echo of sound.

Answer

We sometimes hear the echo of a sound produced because the distance between the source of the sound and the obstacle is at least 17.2

Question 17

What is a wave number?

Answer

The number of wavelengths present per unit length is called wave number. i.e.. it is the reciprocal of wavelength $= \frac{1}{\lambda}$.

Question 18

Are Sound waves mechanical waves?

Answer

Sound waves are mechanical waves as they need material medium for propagation which is the characteristic of the mechanical waves.

Question 19

A vibrating body produces sound. However, no sound is heard when a simple pendulum oscillates in air why?

Answer

Sound is produced only when the frequency of the wave is greater than 20 Hz . As a simple pendulum produces waves less than 20 Hz they cannot be heard.

Question 20

What type of waves can travel in vacuum? Give example (s) .

Answer

Electromagnetic waves can travel in vacuum. Sun light, X-rays are examples of electromagnetic waves.