

# Short answer questions for Sound

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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**

Frequency (f) =  $1/\text{Time period}$   
=  $1/0.025$   
= 40Hz

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**

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Given

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

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

Distance = Speed  $\times$  Time =  $342 \times 6 = 2052 \text{ m}$

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

So,

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

### 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  $v$ , wavelength  $\lambda$  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 ( $\lambda$ )  $\times$  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 =  $12000/60$

= 200 Hz

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

(b) Wavelength of the wave produced

Given,

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

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

$v = f \lambda$

$$\text{or } \lambda = v/f \\ = 360 / 200 = 1.8\text{m}$$

**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 =  $1/\lambda$ .

**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 20Hz 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.