

13. Sound

Very Short Answer Type Questions

1. Question

How is sound produced?

Answer

Sound is produced by vibrating objects.

2. Question

What should an object do to produce sound?

Answer

An object should vibrate in order to be able to produce sound.

3. Question

How does a sound making object differ from one that is silent?

Answer

A sound making object vibrates while a silent one does not. You can feel the vibrations by touching them.

4. Question

Name the part which vibrates to produce sound in the following:

(a) Drums

(b) Sitar

(c) Flute

Answer

(a) Its stretched membrane

(b) Its strings.

(c) Its long hollow pipe.

5. Question

What brings the sound of a ringing telephone bell to our ears?

Answer

The vibration of our eardrums brings us the sound of a ringing telephone bell.

6. Question

What is the length of vocal cords in a man?

Answer

The male vocal chords are between 17 mm and 25 mm in length.

7. Question

Out of a man and a woman:

- (a) who has shorter vocal cords?
- (b) who produces sound of higher pitch?

Answer

(a) Woman has short vocal chords. The male vocal chords are between 17 mm and 25 mm in length whereas of a woman are between 12.5 mm and 17.5 mm long.

(b) Woman produces sound of higher pitch.

8. Question

Give any four sources of sound in a market place.

Answer

The four sources of sound in a market place are:

1. Vendors selling eatables or other things.
2. Shopkeepers selling their things.
3. Vehicles in the market area, example, autorickshaw, car, etc.
4. Machines or generators noise.

9. Question

Name the sound producing organ in humans.

Answer

Vocal chords are the sound producing organ in humans.

10. Question

Which part of our body vibrates when we speak?

Answer

Vocal chords vibrates when we speak.

11. Question

What does the working of a toy telephone tell us about sound?

Answer

The working of a toy telephone tells us that vibrating objects produce sound and it is carried in all directions in a medium.

12. Question

Name one solid, one liquid and one gas through which sound can travel.

Answer

Solid: Metal- Iron, Aluminium etc.

Liquid: Water

Gas: Air

13. Question

Which of the following cannot transmit sound?

Water, Vacuum, Aluminium, Oxygen gas

Answer

Vacuum cannot transmit sound because sound needs a material medium to travel.

14. Question

Is the speed of sound more in water or in steel?

Answer

The speed of sound is faster in solid as compared to liquid. Thus, the speed of sound is more in steel.

15. Question

Where would sound travel faster-in wood or in water?

Answer

The speed of sound is faster in solid as compared to liquid. Thus, the speed of sound is more in wood.

16. Question

In which medium sound travels faster : air or iron?

Answer

The speed of sound is faster in solid as compared to gas. Thus, the speed of sound is more in iron.

17. Question

In which medium sound travels fastest : air, water or steel?

Answer

The speed of sound is faster in solid as compared to liquid, and then slowest in gases. Thus, the speed of sound is more in steel, then water and then air.

18. Question

Out of solids, liquids and gases :

(a) in which medium sound travels slowest?

(b) in which medium sound travels fastest?

Answer

(a) Sound travels slowest in gas medium

(b) Sound travels fastest in solid medium.

19. Question

What is the speed of sound in air?

Answer

The speed of sound in air is 343m/s.

20. Question

Which of the following is the speed of sound in water and which in steel?

(a) 5000 m/s

(b) 1500 m/s

(c) 340 m/s

Answer

The speed of sound is faster in solid as compared to liquid, and then slowest in gases. Thus, the speed of sound is more in steel, then water and then air.

(a) 5000 m/s - Speed of sound in steel.

(b) 1500 m/s - Speed of sound in water.

(c) 340 m/s - Speed of sound in air.

21. Question

Name the organs of hearing in our body.

Answer

Our ears are the organs of hearing in our body.

22. Question

Name that part of ear which vibrates when outside sound falls on it.

Answer

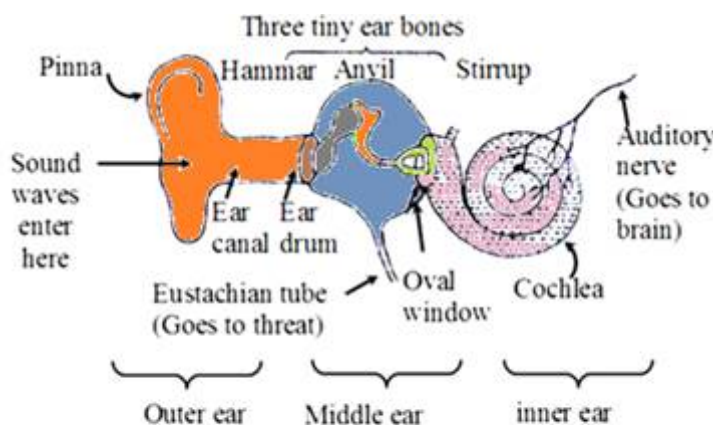
Eardrum vibrates when outside sound falls on it.

23. Question

Name the three tiny bones present in the middle part of ear.

Answer

The three tiny bones – the malleus, incus, and stapes – are found in the middle ear. Each bone is named in Latin for its shape.



Structure of an ear

24. Question

What is the function of three tiny bones in the ear?

Answer

The three bones help in transmitting the sound into the middle ear.

25. Question

Name the nerve which carries electrical impulses from the cochlea of ear to the brain.

Answer

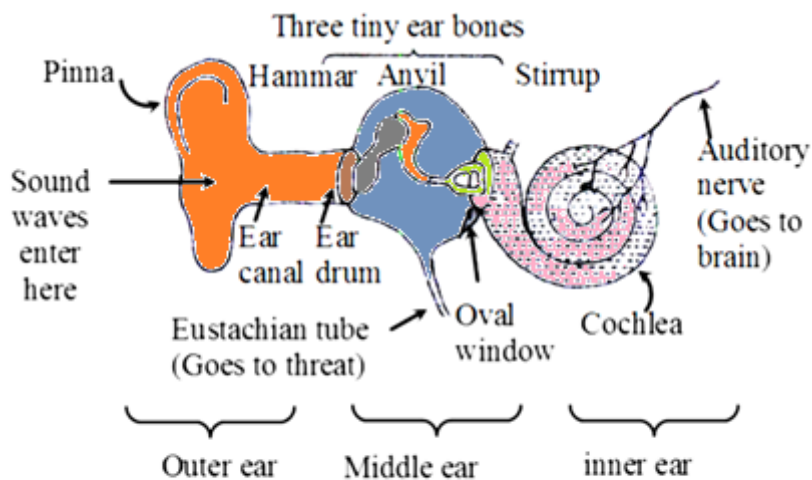
The auditory nerve carries electrical impulses from the cochlea of ear to the brain

26. Question

What is the name of passage in outer ear which carries sound waves to the eardrum?

Answer

As seen from the figure given below, the sound is carried through the Ear canal.



Structure of an ear

27. Question

Name the quantity whose unit is 'hertz'.

Answer

The unit of frequency is called "hertz".

28. Question

What is the relation between 'time-period' and 'frequency' of an oscillating body?

Answer

Time Period given by the inverse of the frequency.

$$\text{Time period} = \frac{1}{\text{frequency}}$$

29. Question

Name three characteristics which are used to describe oscillations (or vibrations).

Answer

Frequency, amplitude and Phase are the three characteristics which are used to describe oscillations (or vibrations).

30. Question

What is the scientific name for the following?

Answer

Frequency is the term used for number of vibrations made per second.

31. Question

What name is given to the maximum displacement of a vibrating body from its central position?

Answer

Amplitude is called as the maximum displacement of a vibrating body from its central position.

32. Question

If 125 oscillations are produced in 5 seconds, what is the frequency in hertz?

Answer

$$\text{Frequency is } f = \frac{\text{No of vibrations}}{\text{time}} = \frac{125}{5} = 25\text{Hz}$$

33. Question

How does loudness depend on the amplitude of vibrations?

Answer

Loudness is directly related to amplitude. If amplitude is high, then loudness is high. But if amplitude is low, then the loudness is low.

34. Question

By how much will the loudness of a sound change when the amplitude of vibrations is:

(a) doubled?

(b) halved?

Answer

(a) Loudness is also doubled.

(b) Loudness is halved.

35. Question

Name the unit used to measure the loudness of sound. Also write its symbol.

Answer

Decibel is the unit used to measure the loudness of sound. Its symbol is dB

36. Question

What is the loudness of a normal conversation in decibels ?

Answer

The Normal conversation is at 60 dB

37. Question

On what factor does the pitch of a sound depend?

Answer

The pitch of a sound depends on the frequency of the sound.

38. Question

How is pitch related to frequency?

Answer

The pitch of a sound you hear depends on the frequency of the sound wave. A high frequency sound wave has a high pitch, and a low frequency sound wave has a low pitch.

39. Question

Name the characteristic of sound which enables us to distinguish between a man's voice and a woman's voice even without seeing them.

Answer

The pitch of the sound enables us to distinguish between a man's voice and a woman's voice even without seeing them.

40. Question

Arrange the following sounds in the order of increasing frequencies (keeping the sound of lowest frequency first) :

(i) Baby's voice

(ii) Man's voice

(iii) Woman's voice

Answer

The following sounds in the order of increasing frequencies :

Man's voice

Woman's voice

Baby's voice

41. Question

Which produces sound of a higher pitch : a drum or a whistle?

Answer

Drum produces higher pitch.

42. Question

Name the characteristic of sound which depends on:

(a) amplitude

(b) frequency.

Answer

(a) Loudness of the sound depends on amplitude.

(b) Pitch of the sound depends on frequency.

43. Question

Name the characteristic of sound which can distinguish between the 'notes' (musical sounds) played on a flute and a sitar (both the notes having the same pitch and loudness).

Answer

The tone of the sound will distinguish between the 'notes' (musical sounds) played on a flute and a sitar (both the notes having the same pitch and loudness).

44. Question

Write the full form of dB.

Answer

Decibels is the full form of dB.

45. Question

What is the name of very high frequency sounds which cannot be heard by the human ear?

Answer

Ultrasonic waves is the name of very high frequency sounds which cannot be heard by the human ear.

46. Question

Why do we not hear the screams of a bat ?

Answer

We cannot hear the screams of a bat because its frequency is higher than 20,000Hz.

47. Question

Which of the following frequency of sound can be heard by a dog but not by a man?

(a) 50,000 hertz

(b) 15,000 hertz.

Answer

Option (a) is correct. 50,000Hz can be heard by dog but not human being.

48. Question

Name the substance which vibrates in a flute to produce sound.

Answer

The air particles vibrate in the air column in the flute, which produces sound.

49. Question

State whether the following statements are true or false:

- (a) Sound cannot travel in vacuum.
- (b) The number of oscillations per second of a vibrating object is called its time-period.
- (c) If the amplitude of vibrations is large, sound is feeble.
- (d) The lower the frequency of vibration, the higher is the pitch.
- (e) If the amplitude of vibrations is doubled, the loudness of sound also gets doubled.
- (f) When the amplitude of vibrations is halved, the loudness of sound becomes one-fourth.
- (g) Unwanted or unpleasant sound is termed as music.
- (h) Noise pollution may cause partial hearing impairment.

Answer

- (a) True
- (b) False
- (c) False
- (d) False
- (e) True
- (f) False
- (g) False
- (h) True

50. Question

Fill in the following blanks with suitable words :

- (a) Sounds are produced by objects.
- (b) The human voice box is called
- (c) Sound cannot travel in
- (d) A set of three tiny.....in the middle part of ear passes on sound vibrations from the eardrum to the liquid in cochlea.

- (e) The unit of frequency is
- (f) The time taken by an object to complete one oscillation is called.....
- (g) The shrillness of a sound is determined by theof vibration.
- (h) Unpleasant sound is called.....
- (i) Sound which is pleasing to the ear is called.....sound.
- (j) A person having partial hearing loss can hear properly by wearing a device called hearingon the ear.

Answer

- (a) Sounds are produced by **vibrating** objects.
- (b) The human voice box is called **larynx**
- (c) Sound cannot travel in **vacuum**
- (d) A set of three tiny **bones** in the middle part of ear passes on sound vibrations from the eardrum to the liquid in cochlea.
- (e) The unit of frequency is **Hertz (Hz)**
- (f) The time taken by an object to complete one oscillation is called **time-period**
- (g) The shrillness of a sound is determined by the **frequency** of vibration.
- (h) Unpleasant sound is called **noise**.
- (i) Sound which is pleasing to the ear is called **musical** sound.
- (j) A person having partial hearing loss can hear properly by wearing a device called hearing **machine** on the ear.

Short Answer Type Questions

51 A. Question

What is the name of the strings in the human voice box which vibrate to produce sound?

Answer

The vocal chords of the human voice box vibrate to produce sound.

51 B. Question

What makes these strings vibrate?

Answer

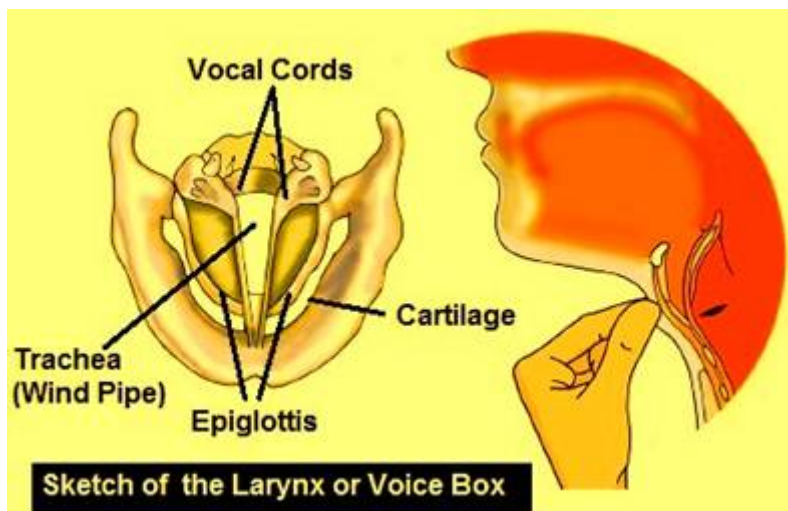
The vocal chords are stretched across the larynx and they vibrate to produce sound.

52. Question

Describe how sound is produced by the human voice box (or larynx).

Answer

In humans, the sound is produced by the box, which is called voice box or the larynx. Larynx is a part of the throat. It is responsible for production of sound. It has two vocal cord which are stretched across the voice box or larynx in such a way that it leaves a narrow slit between them for the air. When the lungs force the air through the slit, the vocal cords vibrate, producing sound.



53. Question

What is the frequency of the sound produced when the vocal cords are:

(a) tight and thin ? (b) loose and thick?

Answer

(a) The frequency produced by tight and thin vocal chords is quite high. i.e. its high pitch sound.

(b) The frequency produced by loose and thick vocal chords is quite low i.e. its low pitch sound.

54. Question

Why are the voices of men, women and children different ?

Answer

The length of vocal chords varies in all these three, which is the main reason for different voices. Men have the longest vocal chords, while female have little shorter vocal chords than men and children have the smallest vocal chords.

55. Question

If you want to hear a train approaching from far away, why is it more convenient to put the ear to the track?

Answer

It is more convenient to put the ear to the track, If you want to hear a train approaching from far away because we can hear the vibrations from the ground when we put our ear at the track.

56. Question

State one observation from everyday life which shows that sound travels much more slower than light.

Answer

In case of thunder, we see the lightening first and then the sound of thunder. This is because, the velocity of light in air is 3×10^8 m/s while the velocity of sound in air is 343 m/s.

57. Question

Explain why, the flash of lightning is seen first but the sound of thunder is heard a little later (though lightning and thunder take place in the sky at the same time and same distance from us).

Answer

The flash of lightning is seen first but the sound of thunder is heard a little later though lightning and thunder take place in the sky at the same time and same distance from us, because, the velocity of light in air is 3×10^8 m/s while the velocity of sound in air is 343 m/s. Thus, we can see light first and thunder sound later.

58. Question

Name the object (or part) which vibrates to produce sound in the following musical instruments :

(a) Sitar

(b) Dholak

(c) Flute

(d) Cymbals

(e) Veena

(f) Tabla

Answer

(a) Strings

(b) Diaphragm – Membrane

(c) Air column

(d) The metal plates

(e) Strings

(f) Diaphragm – Membrane

59. Question

Name one musical instrument each in which the sound is produced:

(a) by vibrating a stretched string.

(b) by vibrating air enclosed in a tube.

(c) by vibrating a stretched membrane

(d) by vibrating metal plates.

Answer

(a) Veena

(b) Flute

(c) Table

(d) Cymbals

60. Question

Give two examples of each of the following :

(a) stringed musical instruments.

(b) wind musical instruments.

(c) membrane musical instruments.

(d) plate type musical instruments.

Answer

- (a) Guitar, Veena
- (b) Flute, Trumpet
- (c) Tabla, Dholak
- (d) Cymbals, Matka

61. Question

Which of the sounds having the following frequencies can be heard by the human beings and which cannot?

- (a) 6 hertz
- (b) 5000 hertz
- (c) 10000 hertz
- (d) 35000 hertz
- (e) 18kHz

Answer

- (a) Cannot be heard because human being can hear within the range 20Hz to 20,000Hz
- (b) Can be heard because human being can hear within the range 20Hz to 20,000Hz
- (c) Can be heard because human being can hear within the range 20Hz to 20,000Hz
- (d) Cannot be heard because human being can hear within the range 20Hz to 20,000Hz
- (e) Can be heard because human being can hear within the range 20Hz to 20,000Hz

62 A. Question

What is the upper limit of frequency of human hearing?

Answer

20,000Hz is the upper limit of frequency of human hearing.

62 B. Question

What is the lower limit of frequency of human hearing?

Answer

20Hz is the lower limit of frequency of human hearing.

62 C. Question

Name one animal which can produce ultrasonic sounds.

Answer

Bats can produce ultrasonic sounds.

62 D. Question

Name two animals which can hear ultrasonic sounds.

Answer

Dogs and cats.

63 A. Question

What is a vibration (or an oscillation)? Define 'amplitude' of vibration of an object.

Answer

The to- and - fro motion of an object in a medium is called vibration.

Amplitude is the largest distance from the mean position of the object.

63 B. Question

What is the frequency of a vibrating body whose time-period is 0.05 second ?

Answer

Time Period given by the inverse of the frequency.

$$\text{Time period} = \frac{1}{\text{frequency}}$$

$$\text{or frequency} = \frac{1}{\text{Time period}}$$

$$\Rightarrow \text{frequency} = \frac{1}{0.05 \text{ sec}} = 20 \text{ Hz}$$

64 A. Question

State two methods of producing sound.

Answer

Two methods of producing sound are:

1. Beating the plate and spoon against each other.
2. Playing guitar.

64 B. Question

How does sound from a sound producing body travel through air to reach our ears?

Answer

The air particles near the sound producing body vibrate and exchange energy, which is received by our ears and we are able to hear the sounds.

65 A. Question

Why a sound cannot be heard on the moon?

Answer

Because moon does not have any atmosphere and sound it does not have any medium for sound to travel as sound does not travel in vacuum.

65 B. Question

How do astronauts talk to one another on the surface of moon and why?

Answer

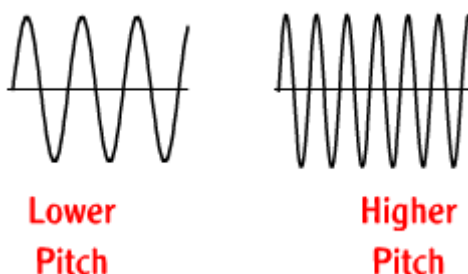
The astronauts have sound transmitting devices in the helmets they wear which help them exchange sound waves with one-another. This is because moon does not have any atmosphere and sound it does not have any medium for sound to travel as sound does not travel in vacuum.

66 A. Question

What is meant by the (a) 'pitch' of sound, and (b) 'quality' of sound?

Answer

The sensation of frequency is called "pitch" The high frequency indicates high pitch and vice-versa.



66 B. Question

What is ultrasound? State two uses of ultrasound.

Answer

Ultrasounds mean the sounds having frequency greater than 20,000Hz.

The uses of ultrasound are:

1. They are used in sonography.
2. They used in radars.

67 A. Question

What differences will you hear in a sound if there is an increase in

(i) amplitude, and (ii) frequency?

Answer

(i) The sound will become loud on increasing the amplitude.

(ii) The sound will become shrill on increasing the frequency.

67 B. Question

Calculate the time period of a pendulum which is vibrating with a frequency of 10 hertz.

Answer

Time Period given by the inverse of the frequency.

$$\text{Time period} = \frac{1}{\text{frequency}}$$

$$\Rightarrow \text{Time period} = \frac{1}{10 \text{ Hz}} = 0.1 \text{ sec}$$

68 A. Question

How can you show that a sounding tabla is vibrating?

Answer

We can feel the vibration of table membrane when we hit it to produce sound.

68 B. Question

On what factor does the loudness of a sound depend?

Answer

The loudness of a sound depends Amplitude.

69. Question

When we put our ear to a railway line, we can hear the sound of an approaching train even when the train is far off but its sound cannot be heard through the air. Why?

Answer

Because the track is made of metals and sounds travel faster in solids than air. Thus, we can hear the sound of an approaching train even when the train is far off but its sound cannot be heard through the air.

70. Question

Why sound cannot travel through vacuum (or through outer space)?

Answer

Because sound needs material medium to transfer energy from one particle to another particle. If there is vacuum, then no energy transfer takes place

71 A. Question

What type of pollution is caused by the working of mixer and grinder in the kitchen?

Answer

Noise pollution is caused by the working of mixer and grinder in the kitchen.

71 B. Question

Why should we not put a pin or pencil in our ears?

Answer

No, we must never put a pin or pencil in our ears, because it can tear our ear diaphragm.

72. Question

Name any two common musical instruments and identify their vibrating parts.

Answer

Dholak	Diaphragm (stretched membrane)
Sitar	Strings of the Sitar
Flute	Air column inside the flute

73. Question

What is the difference between noise and music? Can music become noise sometimes?

Answer

The Unwanted sound that is unpleasant to ear is called noise. A pleasant sound is called music.

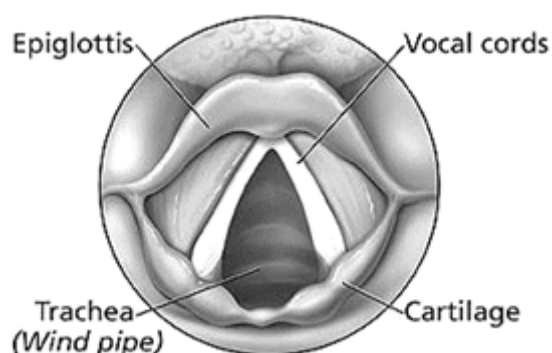
Music can become noise at many instances. Music is of many types and everybody may not like each type of music. When someone listens very loud music, it can be noise for someone else.

74. Question

Draw a labelled diagram of larynx and explain its functions.

Answer

In humans, the sound is produced by the box, which is called voice box or the larynx. Larynx is a part of the throat. It is responsible for production of sound. It has two vocal cord which are stretched across the voice box or larynx in such a way that it leaves a narrow slit between them for the air. When the lungs force the air through the slit, the vocal cords vibrate, producing sound.



75 A. Question

Give two causes of noise pollution from the homes.

Answer

The causes of noise pollution are as follows:

- 1) Televisions running at high volumes.
- 2) Use of Loudspeakers in religious or other functions.
- 3) Use of crackers.

75 B. Question

What are the usual causes of the partial hearing loss suffered by a person?

Answer

Loud noise and noise pollution are the usual causes of the partial hearing loss suffered by a person.

Long Answer Type Questions

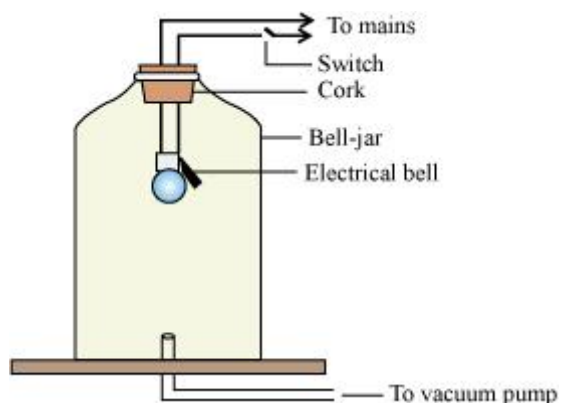
76. Question

How can you show that sound cannot travel through a vacuum? Draw a labelled diagram of the apparatus used.

Answer

The bell jar experiment is a common experiment to show that sound cannot travel through a vacuum

A bell jar's shape is similar to that of a bell. A bell jar is placed on a base and connected to a vacuum pump as shown in the picture below. The air in the jar is varied by pumping the air out of it.



Now, we put an electrical bell in the bell jar. As the air is pumped, vacuum is being created inside the jar slowly and steadily and the sound from the bell

jar fades. At a point when complete vacuum is maintained, no more sound is heard from the bell. Thus, the sound is not audible to our ears because of the vacuum inside the jar.

77 A. Question

What is meant by the 'time-period' of a vibrating object? State its unit.

Answer

Time Period given by the inverse of the frequency.

$$\text{Time period} = \frac{1}{\text{frequency}}$$

Its unit is seconds.

77 B. Question

Define 'frequency' of a vibrating object. Name the unit in which frequency is measured.

Answer

The frequency is described as the number of vibrations or oscillations per second. Its unit is Hertz (Hz)

77 C. Question

A pendulum oscillates 40 times in 4 seconds. Calculate its

(i) time-period, and

(ii) frequency.

Can we hear the sound produced by the oscillations of this pendulum? Give reason for your answer.

Answer

Frequency = 40 vibration/ 4 seconds = 10 Hz

Thus, time period = $1/f = 1/10 = 0.1$ seconds.

No, we cannot hear because the audible human range is from 20Hz to 20,000 Hz.

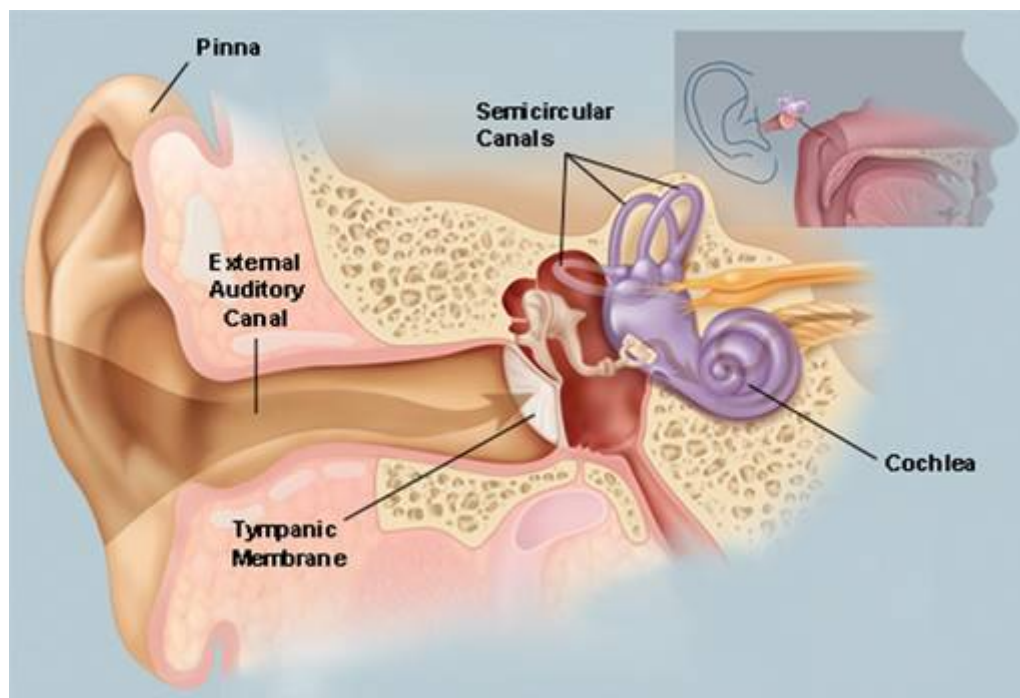
78. Question

Draw a neat and labelled diagram of the human ear. Explain its working.

Answer

The ear has three main parts:

- 1) External part – It is called the pinna and is made of ridged cartilage covered by skin.
- 2) Middle – This is the part through which sound travels inside the ear to the eardrum, through auditory canal. Sound causes the eardrum and its tiny attached bones in the middle portion of the ear to vibrate, and the vibrations are conducted to the nearby cochlea.
- 3) Inner part – The cochlea is part of the inner ear. Its main function is to transform sound into nerve impulses.



79 A. Question

What is noise? Give two examples of sounds which are considered noise.

Answer

The Unwanted sound that is unpleasant to ear is called noise.

Example- 1) Loud music

2) The noise of machines.

79 B. Question

What is a musical sound ? Give two examples of musical sounds.

Answer

A pleasant sound is called music. Its like a treat to the ears.

Example – 1) Beats

2) Tones

80 A. Question

What is meant by noise pollution? Mention some of the sources of noise pollution in your surroundings.

Answer

The harmful and annoying noise to the ears is called noise pollution. The sources of noise pollution are as follows:

- 1) Televisions running at high volumes.
- 2) Use of Loudspeakers in religious or other functions.
- 3) Use of crackers.
- 4) Horns of buses, cars and trucks

80 B. Question

Explain how, noise pollution (or excessive loud noise) is harmful to human beings.

Answer

Noise pollution has adverse effects physical as well as mental behavior. The constant exposure to noise pollution can create many health related problems like hypertension, insomnia, mental disorder and may even lead to loss of hearing.

80 C. Question

State the various measures which can be taken to control (or reduce) noise pollution in our surroundings.

Answer

The following measures which can be taken to control (or reduce) noise pollution in our surroundings:

- 1) Ban the use of loudspeakers after 9pm.
- 2) Ban the use of horns in the areas nearby hospital and school.

80 D. Question

What can be done along the roads to reduce noise pollution caused by traffic from reaching the residents of the area?

Answer

The following measures which can be taken to reduce noise pollution caused by traffic from reaching the residents of the area:

- 1) The residential area must be declared as no use of horns.
- 2) The colonies must be established at a distance than the roads.

Multiple Choice Questions (MCQs)

81. Question

Voice of which of the following is likely to have the minimum frequency?

- A. baby girl
- B. baby boy
- C. a man
- D. a woman

Answer

The voice of man has the least frequency.

82. Question

Sound can travel through:

- A. gases only
- B. solids only
- C. liquids only
- D. solids, liquids and gases

Answer

Sound does not need any material medium to travel.

83. Question

Which of the following vibrates when a musical note is produced by the cymbals in an orchestra?

- A. stretched strings
- B. stretched membranes
- C. metal plates
- D. air columns

Answer

Metal plates vibrates when a musical note is produced by the cymbals in an orchestra.

84. Question

A musical instrument is producing a continuous note. This note cannot be heard by a person having a normal hearing range. This note must then be passing through:

- A. water
- B. wax
- C. vacuum
- D. empty vessel

Answer

This note must then be passing through vacuum.

85. Question

Which of the following sound frequencies can be heard by a woman having a normal hearing range?

- A) 25000 Hz
 - B) 15kHz
 - C) 40000 Hz
 - D) 25Hz
- A. A and B
 - B. B and C
 - C. B and D
 - D. only D

Answer

25Hz because the human audible range is 20Hz to 20,000 Hz.

86. Question

When we change a feeble sound to a loud sound, we increase its:

- A. frequency

B. amplitude

C. speed

D. timbre

Answer

Amplitude.

87. Question

Before playing the orchestra in a musical concert, a *sitarist* tries to adjust the tension and pluck the strings suitably. By doing so he is adjusting:

A. intensity of sound only

B. amplitude of sound only

C. frequency of the sitar string, with the frequency of other musical instruments

D. loudness of sound

Answer

He is adjusting the frequency of the sitar string, with the frequency of other musical instruments.

88. Question

A key of mechanical piano is first struck gently and then struck again but much harder this time. In the second case:

A. sound will be louder but pitch will not be different

B. sound will be louder and the pitch will also be higher

C. sound will be louder but pitch will be lower

D. both loudness and pitch will remain unaffected

Answer

In the second case sound will be louder but pitch will not be different.

89. Question

One of the following can hear infrasound. This one is:

A. dog

B. bat

C. rhinoceros

D. humans

Answer

dog can hear both the infrasound as well as ultrasound.

90. Question

The speed of highly penetrating ultrasonic waves is:

A. lower than those of audible sound waves

B. higher than those of audible sound waves

C. much higher than those of audible sound waves

D. same as those of audible sound waves

Answer

The speed of sound waves is same in a particular medium.

91. Question

The ultrasound waves can penetrate into matter to a large extent because they have:

A. very high speed

B. very high frequency

C. very high quality

D. very high amplitude

Answer

The ultrasound waves can penetrate into matter to a large extent because they have very high frequency.

92. Question

The frequencies of four sound waves are given below. Which of these sound waves can be used to measure the depth of sea?

A. 15,000 Hz

B. 10 kHz

C. 50 kHz

D. 10,000 Hz

Answer

The ultrasound waves can be used to measure the depth of sea.

93. Question

Which of the following frequency of sound can be generated by a vibrating simple pendulum as well as by the vibrating vocal cords of a rhinoceros?

- A. 5 kHz
- B. 25 Hz
- C. 10 Hz
- D. 15,000 Hz

Answer

10Hz can be generated by a vibrating simple pendulum as well as by the vibrating vocal cords of a rhinoceros.

94. Question

Which of the following are used to study the growth of fetus inside the mother's womb?

- A. radio waves
- B. X-rays
- C. infrared waves
- D. sound waves

Answer

Infra-red Waves are used to study the growth of foetus inside the mother's womb

95. Question

We can distinguish between the musical sounds produced by different singers on the basis of the characteristic of sound called:

- A. frequency
- B. timbre
- C. pitch
- D. loudness

Answer

Timbre can distinguish between the musical sounds produced by different singers on the basis of the characteristic of sound.

96. Question

The maximum speed of vibrations which produce audible sound will be in:

- A. dry air
- B. sea water
- C. ground glass
- D. human blood

Answer

The sound travels faster in solids than liquids than gases.

97. Question

The sound waves travel fastest:

- A. in solids
- B. in liquids
- C. in gases
- D. in vacuum

Answer

The sound travels faster in solids than liquids than gases.

98. Question

The speeds of sound in four different media are given below. Which of the following is the most likely speed in m/s with which the two under water whales in a sea talk to each other when separated by a large distance ?

- A. 340
- B. 5170
- C. 1280
- D. 1530

Answer

1530

99. Question

The velocities of sound waves in four media P, Q, R and S are 18,000 km/h, 900 km/h, 0 km/h, and 1200 km/h respectively. Which medium could be a liquid substance?

- A. P
- B. Q
- C. R
- D. S

Answer

Because the speed of sound in liquids is more than gas but less than solids.

100. Question

Which of the following modes is utilized in the production of sound by humans?

- A. vibrating membranes
- B. vibrating plates
- C. vibrating strings
- D. vibrating air columns

Answer

The vibrating strings modes is utilized in the production of sound by humans.

Questions Based on High Order Thinking Skills (HOTS)

101. Question

Three different vibrating objects produce three types of sounds X, Y and Z. The sounds X and Y cannot be heard by a man having normal range of hearing but sound Z can be heard easily. The sound X can be heard by a bat whereas the sound Y can be heard by a rhinoceros. What type of sounds are X, Y and Z?

Answer

X : Ultrasonic sound waves (Greater than 20,000Hz)

Y : Infrasonic sound waves (0-20 Hz)

Z : Audible sounds (20Hz-20,000Hz)

102. Question

Your parents are going to buy a house. They have been offered one house on the roadside and another house three lanes away from the roadside. Which house would you suggest your parents should buy ? Explain your answer.

Answer

There will be more noise in the house which is along the roadside due to noise produced by transportation vehicles. But, the house which is three lanes away from the roadside would have comparatively less noise . Therefore, it is better to take the house that is three lanes away from the roadside.

103. Question

The sound from an insect is produced when it vibrates its wings at an average rate of 500 vibrations per second:

- (a) What is the time-period of the vibrations ?
- (b) What is the frequency of the vibrations in hertz ?
- (c) Can we hear this sound? Why or why not?

Answer

- (a) The time period = $1/f = 1/500 = 0.002$ secs.
- (b) The frequency of the vibrations in hertz is 500 Hz. Because $1\text{Hz} = 1$ vibration/second.
- (c) We can hear this because it is in the range of 20Hz to 20,000Hz.

104. Question

There are three small bones in the middle ear.

- (a) Name the three bones
- (b) Which of these bones is in touch with oval window ?
- (c) Which of these bones is in touch with the ear drum ?
- (d) Which bone is in touch with the other two bones?

Answer

- (a) Hammer, Anvil, Stirrup are the three ear bones.
- (b) Strirrup is in touch with oval window.
- (c) Hammer is in touch with the ear drum.
- (d) Anvil is in touch with the other two bones.

105. Question

Explain why, if we strike a steel tumbler with a metal spoon lightly, we hear a feeble sound but if we hit the tumbler hard, a loud sound is heard.

Answer

This is because the amplitude of vibrations is small when we beat the spoon lightly and so feeble sound is produced but when it is beaten with force then, amplitude of vibrations is large, so loud sound is produced.