Sound

Very Short Answer Type Questions

Q.1. How is sound produced?

Answer: Sound is produced by vibrating objects.

Q.2. What should an object do to produce sound?

Answer: An object should vibrate in order to be table to produce sound.

Q.3. How does a sound making object differ from one that is silent?

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

Q.4. 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.

Q.5. 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.

Q.6. What is the length of vocal cords in a man?

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

Q.7. 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.

Q.8. 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.

Q.9. Name the sound producing organ in humans.

Answer: Vocal chords are the sound producing organ in humans.

Q.10. Which part of our body vibrates when we speak?

Answer: Vocal chords vibrates when we speak.

Q.11. 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.

Q.12. Name one solid, one liquid and one gas through which sound can travel.

Answer: Solid: Metal- Iron, Aluminium etc.

Liquid: Water

Gas: Air

Q.13. 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.

Q.14. 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.

Q.15. 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.

Q.16. 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.

Q.17. 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.

Q.18. 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.

Q.19. What is the speed of sound in air?

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

Q.20. 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.

Q.21. Name the organs of hearing in our body.
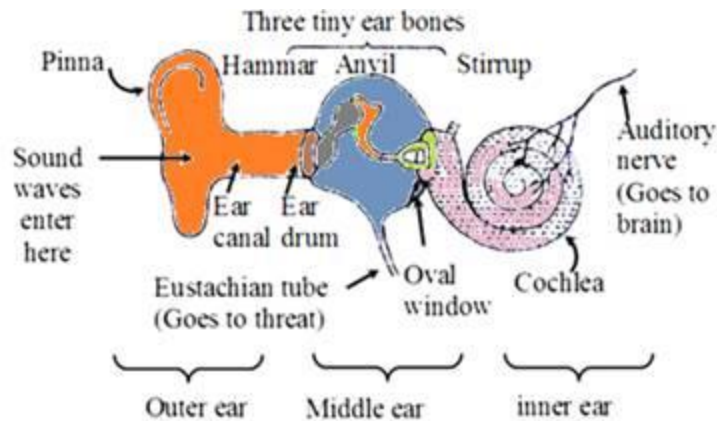
Answer: Our ears are the organs of hearing in our body.

Q.22. Name that part of ear which vibrates when outside sound falls on it.

Answer: Eardrum vibrates when outside sound falls on it.

Q.23. 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

**Q.24. What is the function of three tiny bones in the ear?**

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

Q.25. 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.

Q.26. 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.
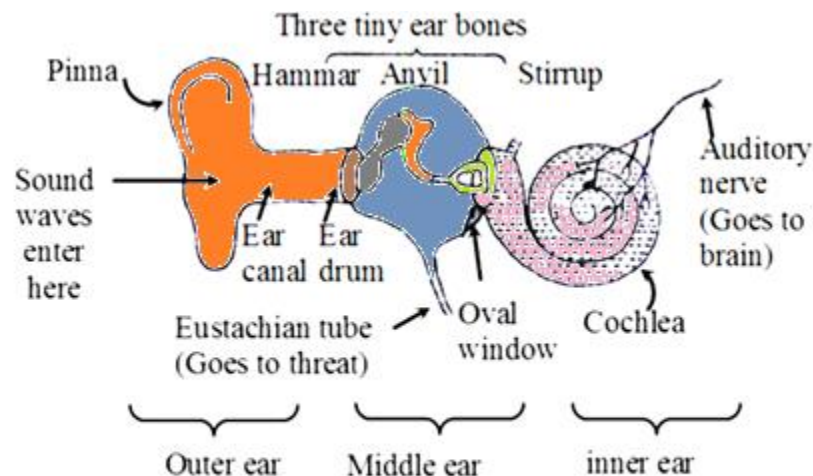
Structure of an ear

Q.27. Name the quantity whose unit is 'hertz'.

Answer: The unit of frequency is called "hertz".

Q.28. What is the relation between 'time-period' and 'frequency' of an oscillating body?

Answer: Time Period given by the inverse of the frequency.

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

Q.29. 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).

Q.30. What is the scientific name for the following?

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

Q.31. 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.

Q.32. If 125 oscillations are produced in 5 seconds, what is the frequency in hertz?

Answer:

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

Q.33. 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.

Q.34. 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.

Q.35. 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.

Q.36. What is the loudness of a normal conversation in decibels ?

Answer: The Normal conversation is at 60 dB.

Q.37. On what factor does the pitch of a sound depend?

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

Q.38. 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.

Q.39. 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.

Q.40. 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

Q.41. Which produces sound of a higher pitch: a drum or a whistle?

Answer: Drum produces higher pitch.

Q.42. 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.

Q.43. 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).

Q.44. Write the full form of dB.

Answer: Decibels is the full form of dB.

Q.45. 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.

Q.46. 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.

Q.47. 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.

Q.48. 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.

Q.49. 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

Q.50. 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 the ....of 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 hearing ....on 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

**Q.51 A. 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.

Q.51 B. What makes these strings vibrate?

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

Q.52. 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.

Sketch of the Larynx or Voice Box
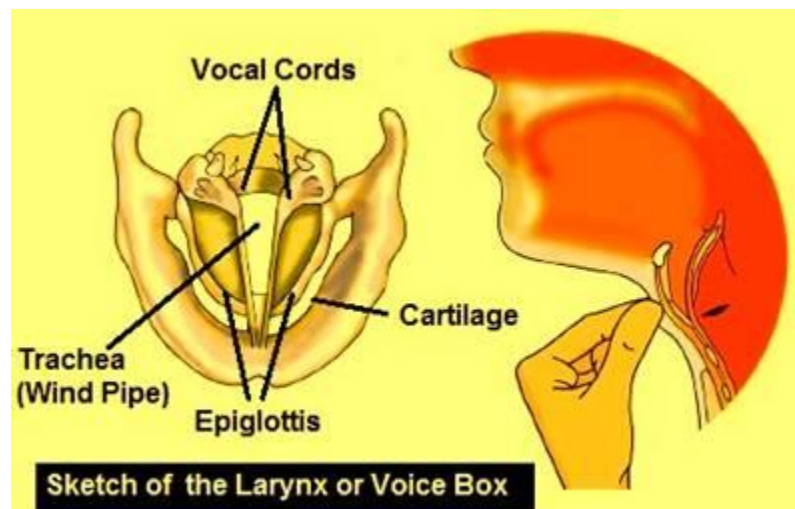
Q.53. What is the frequency of the sound produced when the vocal cords are:

(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.

Q.54. 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.

Q.55. 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.

Q.56. 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.

Q.57. 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.

Q.58. 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

Q.59. 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

Q.60. 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

Q.61. 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

Q.62 A. What is the upper limit of frequency of human hearing?

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

Q.62 B. What is the lower limit of frequency of human hearing?

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

Q.62 C. Name one animal which can produce ultrasonic sounds.

Answer: Bats can produce ultrasonic sounds.

Q.62 D. Name two animals which can hear ultrasonic sounds.

Answer: Dogs and cats.

Q.63 A. 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.

Q.63 B. 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.

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

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

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

Q.64 A. 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.

Q.64 B. 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.

**Q.65 A. Why a sound cannot be heard on the moon?**

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

Q.65 B. 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 its does not have any medium for sound to travel as sound does not travel in vacuum.

Q.66 A. 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.

Lower Pitch   Higher Pitch
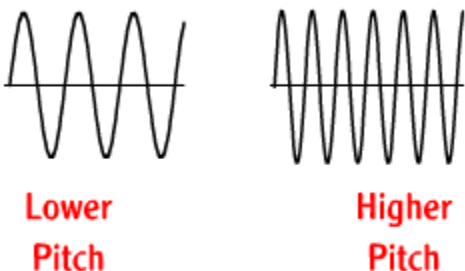
Q.66 B. What is ultrasound? State two uses of ultrasound.

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.

Q.67 A. 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.

Q.67 B. 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.

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

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

Q.68 A. 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.

Q.68 B. On what factor does the loudness of a sound depend?

Answer: The loudness of a sound depends Amplitude.

Q.69. 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.

Q.70. Why sound cannot travel through vacuum (or through outer space)?

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

Q.71 A. 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.

Q.71 B. Why should we not put a pin or pencil in our ears?

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

Q.72. 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

Q.73. 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.

Q.74. 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.
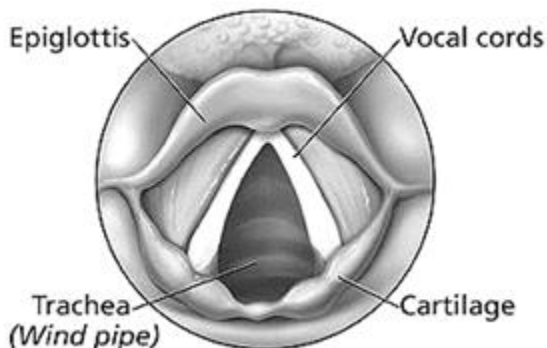
Q.75 A. Give two causes of noise pollution from the homes.

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.

**Q.75 B. 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

Q.76. 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.
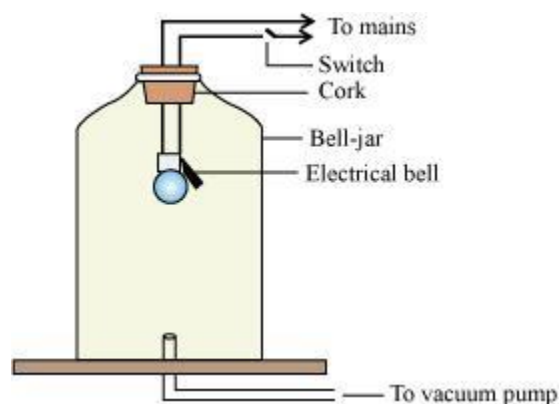
Now, we put an electrical bell in the bell jar. As the air is pumped, vacuum is being created inside the jar slowly and steadily and the sound from the bell jar fades. At a point when complete vacuum is maintained, no more sound is heard from the bell. Thus, the sound is not audible to our ears because of the vacuum inside the jar.

Q.77 A. What is meant by the 'time-period' of a vibrating object? State its unit.

Answer: Time Period given by the inverse of the frequency.

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

Its unit is seconds.

Q.77 B. 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)

Q.77 C. 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.

Q.78. 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.
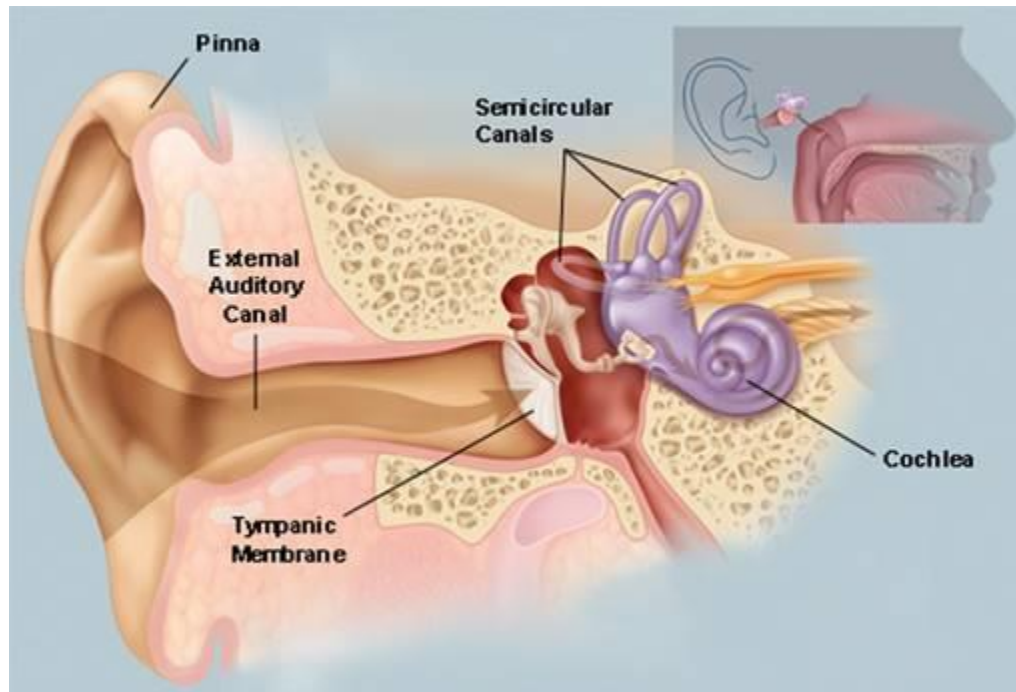
Q.79 A. What is noise? Give two examples of sounds which are considered noise.

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

Example- (1) Loud music

(2) The noise of machines.

Q.79 B. 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

Q.80 A. 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.

Q.80 B. 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.

Q.80 C. 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.

Q.80 D. 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)

Q.81. Voice of which of the following is likely to have the minimum frequency?

Answer: The voice of man has the least frequency.

Q.82. Sound can travel through:

Answer: Sound does not need any material medium to travel.

Q.83. Which of the following vibrates when a musical note is produced by the cymbals in an orchestra?

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

Q.84. 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:

Answer: This note must then be passing through vacuum.

Q.85. 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

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

Q.86. When we change a feeble sound to a loud sound, we increase its:

Answer: Amplitude.

Q.87. 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:

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

Q.88. A key of mechanical piano is first struck gently and then struck again but much harder this time. In the second case:

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

Q.89. One of the following can hear infrasound. This one is:

Answer: dog can hear both the infrasound as well as ultrasound.

Q.90. The speed of highly penetrating ultrasonic waves is:

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

Q.91. The ultrasound waves can penetrate into matter to a large extent because they have:

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

Q.92. The frequencies of four sound waves are given below. Which of these sound waves can be used to measure the depth of sea?

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

Q.93. 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?

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

Q.94. Which of the following are used to study the growth of fetus inside the mother's womb?

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

Q.95. We can distinguish between the musical sounds produced by different singers on the basis of the characteristic of sound called:

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

Q.96. The maximum speed of vibrations which produce audible sound will be in:

Answer: The sound travels faster in solids than liquids than gases.

Q.97. The sound waves travel fastest:

Answer: The sound travels faster in solids than liquids than gases.

Q.98. 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 ?

Answer: 1530

Q.99. 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?

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

Q.100. Which of the following modes is utilized in the production of sound by humans?

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

Questions Based on High Order Thinking Skills (HOTS)

Q.101. 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)

Q.102. 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.

Q.103. 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 1Hz = 1 vibration/second.

(c) We can hear this because it is in the range of 20Hz to 20,000Hz.

Q.104. 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.

Q.105. 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.