Chapter 9. **Sound**

Very Short Q&A:

Q1: Define sound.

Ans: Sound is a sequence of waves of pressure that propagates through compressible media such as air or water. Sound is produced by vibrating objects

Q2: Sound can travel through

a. **Solid and gas**
b. **Gas and liquid**
c. **All of the above**
d. **None of these**

Ans: All of the above

Q3: Sound can travel in vacuum. True/ False.

Ans: False

Q4: Sound is produced by _____ objects

Ans: Vibrating.

Q5: Define noise.

Ans: Unpleasant or unwanted sounds are called noise.

Q6: Define frequency

Ans: The number of oscillation per second is called as frequency of oscillation.

Q7: What is the unit of frequency?

Ans: Hertz

Q8: Excessive or unwanted sound leads to_____.

Ans: Noise pollution.

Q9: What is the symbol of unit of frequency?

Ans: Hz.

Q10: What are the two important properties of sound?

Ans: Amplitude and frequency.

Q11: Define oscillatory motion.

Ans: The to and fro motion of an object is known as oscillatory motion.

Q12: The frequency determines _____ of sound

a. **Vibration**
b. **Amplitude**
c. **Shrillness**
d. **Oscillation**

Ans: shrillness

Q13: Name the factor on which the loudness of the sound depends upon.

Ans: Amplitude of sound

Q14: What do you mean by audible sound?

Ans: Range of sound between frequencies 20 to 20,000 Hz is called audible sound as sound between these frequencies is easily audible to human beings.

Q15: What do you mean by non-audible sound?

Ans: Range of sound less than 20 Hz and more than 20,000 Hz is called in audible sound as sound below 20 Hz and more than 20,000 Hz is not audible to human beings.

Q16: Why noise pollution is harmful for us?

Ans: It may cause health related problems like hypertension, lack of sleep, anxiety etc.

Q17: Voice of which of the following will have low frequency?

a. **Baby boy**
b. **Baby girl**
c. **A Woman**
d. **A man**

Ans: A baby boy

Q18: The lower the frequency of vibration the higher the pitch. True/False

Ans: False

Q19: Shrillness of a sound is determined by_____ of vibration.

Ans: Frequency

Q20: Unwanted or unpleasant sound is termed as music.True/False

Ans: False

Q21: Identify whether the following is a music or noise:

a. **Sound of table**
b. **Sound of vehicle**
c. **Sound of a loud speaker**

Ans:

a. Sound of tabla : Music
b. Sound of vehicle: Noise
c. Sound of a loud speaker: Noise

Q22: What is range of audible sound?

Ans: Range of sound between frequencies 20 to 20,000 Hz is called audible sound as sound between these frequencies is easily audible to human beings.

Q23: What is range of in audible sound?

Ans: Range of sound less than 20 Hz and more than 20,000 Hz is called in audible sound as sound below 20 Hz and more than 20,000 Hz is not audible to human beings.

Q25: How can we minimise noise made by transport vehicles?

Ans: By installing silencing device in transport vehicles, also use of automobiles horns should be minimised for this purpose.'

Q26: How can we minimise noise made by industrial machines?

Ans: By installing silencing device in industrial machines.

Q27: Name some health disorder caused by noise pollution.

Ans: Hypertension, lack of sleep, anxiety etc.

Q28: What do you mean by hearing impairment?

Ans: A hearing impairment is a hearing loss that prevents a person from totally receiving sounds through the ear. If the loss is mild, the person has difficulty in hearing.

Q29: Name some sources available at home that may lead to noise pollution.

Ans: Television, transistor radio at high volume, airconditioner, coolers, some kitchen appliances like pressure cooker etc.

Q30: In human beings sound vibration make the _____ vibrate.

Ans: Eardrum

Q31: Why we should never put a sharp, pointed or hard thing into our ear?

Ans: We should never put a sharp, pointed or hard thing into our ear because it may damage our eardrum which may lead to impair hearing

Q32: Define vacuum.

Ans: Vacuum is the space that is totally empty of matter.

Q33: What is vibration?

Ans: The rapid linear motion or to and fro motion of a particle or object is called vibration.

Q34: Name some musical instruments.

Ans: Tabla, sitar, harmonium, flute etc.

Q35: What is the importance of sound in our life?

Ans: Sound helps us to communicate with one another.

Short Q&A:

Q1: Discuss the importance of sound in our life.

Ans: Sound plays an important role in our life; Sound helps us to communicate with one another.Sound is so important because animals are able to hear events all around them, no matter where their attention is focused or not.

Q2: How is sound produced?

Ans: Sound is produced by the vibrations of a body and is transmitted through material media in pressure waves made up of alternate condensations (forcing of the molecules of the medium together) and rarefactions (pulling of the molecules of the medium away from one another).

Q3: How does sound travel from one place to another?

Ans: Sound travels through a medium solid, liquid and gas. It cannot travel through vacuum.

Q4: Why some sounds are louder than others?

Ans: The loudness of sound depends upon its amplitude. , larger the amplitude of vibration the louder is the sound and vice versa.

Q5: Explain with an activity that vibrating object produces sound.

Ans: Take metal dish pour water into it, strike its edge with a spoon, you will hear a sound, now again strike the edge of dish and look at the surface of water inside it, you will observe that vibrating dish producing sound along with wave in water. This shows that there is vibration in dish which is producing sound.

Q6: Vibrating objects produces sound; can we see the vibrations all the time?

Ans: No, we cannot see the vibrations all the time as their amplitude is so small that we cannot see them rather we can feel them.

Q7: What are vibrating parts of Veena and Tabla?

Ans: Vibrating part of Veena that produces sound is stretched string and Vibrating part of Tabla that produces sound is stretched membrane.

Q8: What are vibrating parts of Flute?

Ans: Vibrating part of Flute that produces sound is air column.

Q9: Name some musical instrument which are simply beaten or struck to produce melodious music.

Ans: Manjira, ghatam, not and kartal are some of the instruments that which are simply beaten or struck to produce melodious music.

Q10: How sound is produced from a guitar?

Ans: The string of the sitar is plucked it vibrate to produce sound, along with string other parts infact the whole instrument is forced to vibrate, and it is the sound of the vibration of the instrument that we hear.

Q11: Does any part of human body vibrate while speaking or singing a song?

Ans: Yes, while speaking or singing our voice box or larynx which is located at the upper end of the wind pipe vibrates.

Q12: Why the larynx in human body does vibrate while speaking or singing a song?

Ans: There are two vocal cords which are stretched across the voice box or larynx in such a way that it leaves a narrow slit between them for the passage of air, when the lungs force air through the slit, the vocal cords vibrate producing sound.

Q13: Explain via an activity that sound travels in liquids.

Ans: Fill a bucket with water and shake a bell under the water with one hand make sure that the bell should not touch the body of the bucket. Now place your ear gently on the water surface, you will hear the sound of the ringing bell, thus we can say that sound can travel through water.

Q14: Explain via an activity that sound travels in solids.

Ans: Take a metal rod and hold its one end to your ear, ask your friend to tap at the other end of metal rod you will hear the sound of tapping, thus this proves that sound can travels through solid.

Q15: How water animals communicate in water?

Ans: Sound can travels through liquid.Fill a bucket with water and shake a bell under the water with one hand make sure that the bell should not touch the body of the bucket. Now place your ear gently on the water surface, you will hear the sound of the ringing bell, thus we can say that sound can travel through water.

Q16: Explain the function of eardrum in human beings.

Ans: The eardrum, or tympanic membrane, is a thin, cone-shaped membrane that separates the external ear from the middle ear in humans, it is like a stretched rubber sheet, sound vibrations make the eardrum vibrate. The ear drum sends vibration to the inner ear and from there signal is send to the brain and in this way we are able to hear the sounds around us.

Q17: What is eardrum?

Ans: The eardrum, or tympanic membrane, is a thin, cone-shaped membrane that separates the external ear from the middle ear in humans, it is like a stretched rubber sheet, sound vibrations make the eardrum vibrate. The ear drum sends vibration to the inner ear and from there signal is send to the brain and in this way we are able to hear the sounds around us.

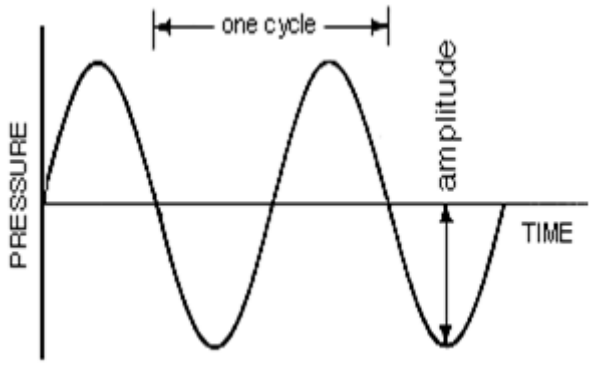
Q18: Explain the functioning of human ear.

Ans: The eardrum, or tympanic membrane, is a thin, cone-shaped membrane that separates the external ear from the middle ear in humans, it is like a stretched rubber sheet, sound vibrations make the

eardrum vibrate. The ear drum sends vibration to the inner ear and from there signal is send to the brain and in this way we are able to hear the sounds around us.

Q19: Define with a diagram, the amplitude of a vibration.

Ans: The amplitude of a sound wave is the maximum amount by which the instantaneous sound pressure differs from the ambient pressure.



Two cycles of a sine wave showing the amplitude of the pressure variation.The variation of (maximum) amplitude over time is called the envelope of the sound.

Q20: Why are sound waves called mechanical waves?

Ans: Sound waves force the medium particles to vibrate, because of the interaction of the particles present in that medium.

Q21: Why there is difference in sound of a baby and an adult?

Ans: The loudness of sound depends upon the amplitude of vibration, when the amplitude of vibration is large sound produced is large and when amplitude of vibration, is low sound produced is feeble. A baby has low amplitude of vibration in their ear drum thus sound produced by baby is low in compare to adults.

Q22: Name the factor which determines shrillness or pitch of a sound?

Ans: If the frequency of vibration is higher the sound has high pitch and if the frequency of vibration is lower the sound has low pitch.

Q23: Which of the two a drum or a whistle will produce sound with higher pitch and why?

Ans: Whistle will produce sound with higher pitch.If the frequency of vibration is higher the sound has high pitch and if the frequency of vibration is lower the sound has low pitch.

Q24: Which of the two a man or a woman will produce sound with higher pitch and why?

Ans: Woman will produce sound with higher pitch.If the frequency of vibration is higher the sound has high pitch and if the frequency of vibration is lower the sound has low pitch.

Q25: Differentiate between audible and in audible sounds.

Ans: Range of sound between frequencies 20 to 20,000 Hz is called audible sound as sound between these frequencies is easily audible to human beings. But range of sound less than 20 Hz and more than 20,000 Hz is called in audible sound as sound below 20 Hz and more than 20,000 Hz is not audible to human beings.

Q26: Is there any animal that can hear sound of frequencies higher than 20000 Hz?

Ans: Yes, dog can hear sounds of frequencies higher than 20000Hz, because of this ability of dog it is being used by police for investigation purposes.

Q27: Name some equipment that works at frequencies higher than 20000 Hz.

Ans: The ultra sound equipment used for tracking and investigating many medical problems works at frequencies higher than 20000 Hz.

Q28: Define noise along with examples.

Ans: Unpleasant and undesirable sounds are called noise. Example sound produced by horns of vehicles, sound coming from construction sites, sound produced by factories machineries etc.

Q29: Explain noise pollution and its causes.

Ans: Presence of excessive or unwanted sounds in the environment is called noise pollution, the main causes of noise pollution is the sound made by horns of vehicles, sound coming from construction sites, sound produced by factories machineries etc. in our home sound produced by television, transistor radio at high volume, airconditioner, coolers, some kitchen appliances like pressure cooker etc. contributes to noise pollution.

Q30: Draw the diagram of larynx and explain its function.

Ans:

In humans, the sound is produced by the voice box or the larynx. It is the part of throat. It moves when we swallow something.

Q31: Your friend's parents are going to buy a house; they have been offered one nearby a factory and another 50 km away from the factory in a less crowdie place. Which house you would suggest your friend's parents should buy, and why?

Ans: The house that is 50 km away from the factory in a less crowdie place , because house near by the factory will have to face noise pollution because of the industrial machines and also there will be problem of air pollution there.

Q32: How noise pollution is harmful to human beings?

Ans: Noise pollution can lead to number of health related problems like

- Hearing loss
- Loss of sleep
- Hypertension
- Severe headache
- stress

Q33: What is the difference between noise and music, can music become noise sometimes?

Ans: The sound that is pleasing to the ear is called music like sound produced by guitar, piano etc.The sound that is unpleasing to the ear is called noise like sound produced by factories machineries, transport vehicles etc. Yes music can become noise if it is played at high volumes.

Q34: Define:

a. **Reverberation of sound**
b. **Echo**

Ans: The persistence of sound due to repeated reflection and its gradual fading away is known as reverberation of sound.

Echo: Echo is defined as a repetition of sound due to the reflection of original sound by a large and hard obstacle.

Q35: What is the intensity of sound?

Ans: The amount of sound energy passing each second through unit area is called the intensity of sound.

Long Q&A:

Q1: Explain the mechanism of hearing in human body.

Ans: Sound plays an important role in our life; Sound helps us to communicate with one another.Sound is so important because animals are able to hear events all around them, no matter where their attention is focused or not. The eardrum, or tympanic membrane, is a thin, cone-shaped membrane that separates the external ear from the middle ear in humans, it is like a stretched rubber sheet, sound vibrations make the eardrum vibrate. The ear drum sends vibration to the inner ear and from there signal is send to the brain and in this way we are able to hear the sounds around us.

Q2: "Sound travels through a medium, it cannot travel in vacuum". Justify the statement.

Ans: Sound travels through a medium solid, liquid and gas. It cannot travel through vacuum.Fill a bucket with water and shake a bell under the water with one hand make sure that the bell should not touch the body of the bucket. Now place your ear gently on the water surface, you will hear the sound of the ringing bell, thus we can say that sound can travel through water.Take a metal rod and hold its one end to your ear, ask your friend to tap at the other end of metal rod you will hear the sound of tapping, thus this proves that sound can travels through solid.

Q3: A pendulum oscillates 50 times in 6 seconds. Find its time period and frequency.

Ans: Frequency of oscillation is defined as the number of oscillation of a vibrating body per second. it is given by

Frequency = no of oscillation/ time period = 50/6 = 8.33 Hz
Time period =1/frequency of oscillation = 1/ 8.33 = 0.12 seconds.

Q4: The sound from a butterfly is produced when it vibrates its wings at an average rate of 400 vibrations per second. What is the time period of vibration?

Ans: Time period =1/frequency of oscillation = 1/ 400 0.0025 seconds