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SOUND

TEXTBOOK QUESTIONS AND THEIR ANSWERS

Q.1. Choose the correct answer :

1. Sound can travel through

(a) Gases only **(b) Solids only**

(c) Liquids only **(d) Solids, Liquids and Gases**

Ans. (d)

Q.2. Which of the following voices is likely to have minimum frequency?

(a) Baby girl **(b) Baby boy**

(c) A man **(d) A woman**

Ans. (a)

Q.3. In the following statements, tick T against those which are true, and F against those which are false :

(a) Sound cannot travel in vacuum. (T/F)

(b) The number of oscillations per second of a vibrating object is called its time period. (T/F)

(c) If the amplitude of vibration is large, sound is feeble. (T/F)

(d) For human ears, the audible range is 20 Hz to 20, 000 Hz. (T/F)

(e) The lower the frequency of vibration, the higher is the pitch. (T/F)

(f) Unwanted or unpleasant sound is termed as music. (T/F)

(g) Noise pollution may cause partial hearing impairment. (T/F)

Ans. (a) T, (b) F, (c) F, (d) T, (e) F, (f) F, (g) T.

Q.4. Fill in the blanks with suitable words.

(a) Time taken by an object to complete one oscillation is called …….

(b) Loudness is determined by the …… of vibration.

(c) The unit of frequency is …….

(d) Unwanted sound is called …….

(e) Shrillness of a sound is determined by the ……. of vibration.

Ans. (a) Time-period, (b) Amplitude, (c) Hertz, (d) Noise, (e) Frequency.

Q.5. A pendulum oscillates 40 times in 4 seconds. Find its time period and frequency.

Ans. Number of oscillations = 40

Time taken = 4 seconds

$$\text{Time period} = \frac{\text{Number of oscillations}}{\text{Time taken}}$$

$$= \frac{40}{4} = 10 \text{ seconds.}$$

Pendulum makes 40 vibrations in 4 seconds.

Therefore, in one second, vibrations made are

$$= \frac{40}{4} = 10 \text{ vibrations.}$$

Therefore, frequency of pendulum = 10 Hz.

Q.6. The sound from a mosquito is produced when it vibrates its wings at an average rate of 500 vibrations per second. What is the time period of the vibration?

Ans. Time taken to complete 500 vibrations = 1 second

Time taken to complete 1 vibration = $\frac{1}{500}$

= 0.002 sec.

Time period of the vibration = 0.002 second.

Q.7. Identify the part which vibrates to produce sound in the following instruments :

(a) Dholak – In this, vibrating the stretched membrane produces the sound.

(b) Sitar – In this, vibrating the stretched string produces the sound.

(c) Flute – In this, vibrations in the air column produces sound.

Q.8. What is the difference between noise and music? Can music become noise sometimes?

Ans. Music : Pleasant sound produced by regular vibration is called music.

Noise : Unpleasant sound produced by irregular vibrations is called noise.

Music played very loud or music on loudspeakers can become noise sometimes.

Q.9. List the sources of noise pollution in your surroundings.

Ans. The sources of noise pollution in our surroundings are as under :

(1) With the increasing automobiles on road and decreasing greenery, the noise of road traffic has become one of the most important source of noise pollution.

(2) Noise pollution is also caused by sound of aeroplanes and trains.

(3) Barking of dogs, car horns, loud music, televisions, loudspeakers, building construction and household noise are other reasons of noise pollution.

(4) Sounds of machines and siren from the industries also caused noise pollution.

Q.10. Explain in what way noise pollution is harmful to humans.

Ans. The harmful effects of noise pollutions on humans are as follows :

(a) High noise levels can lead to increase in heart beat and blood pressure.

(b) Constant noise can lead to stress disorders.

(c) Exposure to noise with a volume more than to decibels can lead to permanent hearing damage.

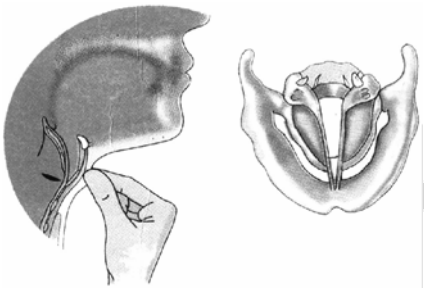
(d) High noise levels can also contribute to mental illness.

(e) Noise can also lead to sleeping disorders.

Q.11. Your parents are going to buy a house. They have been offered one on the roadside and another three lanes away from the roadside. Which house would you suggest your parents should buy? Explain your answer.

Ans. My parents are going to buy a house. If they are offered a house, one by the roadside and the other, three lanes away from the roadside, then I will suggest them to buy the house which is three lanes away from the roadside because of less noise pollution caused due to road traffic.

Q.12. Sketch larynx and explain its function in your own words.



Ans. Larynx is the organ which helps us to speak. It lies between the pharynx and the trachea. When exhaled air passes through the larynx, two folds of tissue called vocal codes, within it vibrate, producing sound. When the vocal cords become taut and thin, the opening of the larynx becomes narrow, the frequency of the sound produced increases.

Q.13. Lightning and thunder take place in the sky at the same time and at the same distance from us. Lightning is seen earlier and thunder is heard later. Can you explain?

Ans. Lightning and thunder takes places in the sky at the same time and at the same distance from us. Lightning is seen earlier and thunder is heard later because light travels very fast at the rate of 300, 000 km/s, whereas sound travels much slower at the rate of 340 km/s in air.

Q.14. How is sound produced?

Ans. Sound is produced by vibrating objects.

Q.15. How does it travel from one place to another?

Ans. Sound travels from one place to another through molecules of material mediums.

Q.16. How do we hear sound?

Ans. When a body produces sound, it creates a vibration in the molecules of the medium and this disturbance progressively reaches our ear and we are able to hear sound through the ear.

Q.17. Why are some sounds louder than the others?

Ans. Some sounds are louder than the others because the amplitude of their vibrations are more than the others.

Q.18. Touch the school bell not in use. What do you feel?

Ans. The school bell is still when not in use. No vibrations are felt.

Q.19. Again touch the school bell when producing sound. Can you feel it vibrating?

Ans. Yes, we can feel the school bell vibrating when producing sound.

Q.20. Does sound travel in liquids?

Ans. Yes, sound travel in liquids.

Q.21. Make a toy telephone as shown in figure. Can you say that sound can travel through strings?

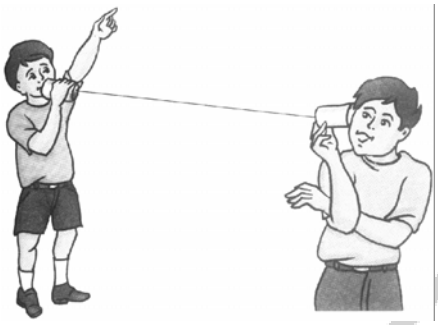


Fig. : *A toy telephone*

Ans. Yes, we can say that sound can travel through strings.

Q.22. Can you recognise many familiar sounds without seeing the objects producing them?

Ans. Yes.

Q.23. How is it possible?

Ans. This is possible because of factors like amplitude and frequency of sound.

Q.24. What are the factors that make the different sounds different?

Ans. The two important properties of sound – frequency and amplitude helps us to distinguish one sound from the others.

Q.25. Can we differentiate sounds on the basis of their amplitudes and frequencies?

Ans. Yes.

Q.26. If an object oscillates 20 times in one second. What would be its frequency?

Ans. Its frequency is 20 Hz.

Q.27. Compare the sound of a baby with that of an adult. Is there any difference?

Ans. Yes, there is a difference in the sound of a baby with that of an adult because of the difference in their frequencies of sound and amplitude of sound.

Q.28. Can you say that the frequency of the voice of a child is higher than that of an adult?

Ans. Yes.

Q.29. Is the sound always pleasing?

Ans. No.

Q.30. Are the sound coming from construction site pleasing?

Ans. No.

Q.31. Do you enjoy the sounds produced by horns of bushes and trucks?

Ans. No.

Q.32. If all the students in the class speak together, what would be sound produced called?

Ans. Such a sound would be noise.