

CHAPTER 8 : ABOUT SOUND

Instructions:

- ✓ Read the chapter in your book - quickly and thoroughly, preferably more than once.
- ✓ Watch the uploaded video class from school's website/YouTube channel. For becoming more clear about the basics, watch more than once, if needed.

(Questions given in this worksheet are important for all exams)

Cognitive Questions (Mark 1)

1. What is sound?

Ans.: Sound is a kind of energy which produces sensation of hearing in our ear.

2. What is audible sound?

Ans.: The sound that human can hear is called audible sound. The range of vibration of audible sound is 20Hz-20000Hz.

3. What is inaudible sound?

Ans.: The sound that human cannot hear is called inaudible sound. The vibration of inaudible sound is less than 20Hz and more than 20000Hz.

4. What is infrasonic sound?

Ans.: If the frequency of any source of sound is less than 20Hz then it is called infrasonic sound or pre-sound. Elephants communicate with each other using infrasonic sound.

5. What is ultrasonic sound?

Ans.: If the frequency of the sound is more than 20000Hz then it is called ultrasonic sound or post-sound. Some animals like bat, dog, bee can produce this sound.

6. What is frequency?

Ans.: The number of complete vibrations in one second of a wave transmitting particle is known as its frequency. The unit of frequency is hertz (Hz).

7. What is echo?

Ans.: When a sound becomes separated from its original sound and is repeated due to reflection then this reflected sound is called echo.

8. What is the persistence period of hearing?

Ans.: The persistence period of hearing is 0.1 second.

9. What is the limit of our audibility?

Ans.: The limit of our audibility is 20Hz-20000Hz which is called audible sound.

10. What is sound pollution?

Ans.: Sound pollution refers to an audibility limit exceeding 20000Hz that causes different health hazards to the listeners.

Analytical Question (Mark-2)**1. Can we hear the sound of all vibrations?**

Ans.: We know that a sound is produced due to vibration of an object. But the fact is that we cannot hear all sounds produced due to vibration of objects. We can hear audible sounds only. Here, we must know that the sounds produced due to vibrations of the range of 20Hz to 20000Hz are audible to us. So it can be said that we cannot hear the sounds of all vibrations.

2. How does a bat fly at night?

Ans.: Bat flies using the echo of sound as it cannot see. Bat can produce and hear ultrasonic sound and spread it forward which reflects back to the bat from a

reflector. Bat can understand from the reflected sound if there is any object before it. If the sound doesn't reflect back then it understand that there is open space and it flies on that way.

3. Write the characteristics of sound.

Ans.: The characteristics of sound are -

- i) Sound is a kind of energy.
- ii) Sound is produced from vibrating body.
- iii) Sound wave is a mechanical wave.
- iv) An elastic material medium is needed for propagation of sound.
- v. The velocity of sound wave depends on the nature of the medium. The velocity of sound in gaseous medium is less, high in liquid and higher in solid.

4. Velocity of sound in water is more than that in air - Explain.

Ans. Velocity of sound in any medium depends on the elasticity of the medium. The medium whose elasticity is more, the velocity is more in that medium. The elasticity of water is more than that of air, thus the velocity of sound is more in water than in air.

5. What are the differences between audible and inaudible sound?

Ans.: The differences between audible and inaudible sound are given below:

Audible sound	Inaudible sound
i. The sound that we can hear is known as audible sound.	i. The sound that we cannot hear is known as inaudible sound.
ii. The range of vibration of audible sound is 20Hz-20000Hz.	ii. The range of vibration of inaudible sound is less than 20Hz and more than 20000Hz.

6. Explain the causes of sound pollution.

Ans.: The causes of sound pollution are -

- i. Excessive use of mikes.
- ii. The sound of drums.
- iii. The sound of explosion of bombs.

- iv. The sound from industries.
- v. The horn of vehicles.
- vi. Loud sound from tape recorders and television.
- vii. The sound from the engine of old car.
- viii. The sound of aero plane and fighter plane
- ix. Machines being used in different works.

There are other reasons of sound pollution as well.

7. What is the difference between noise and pleasing sound?

Ans.: Audible sounds are of two types - pleasing sound and unpleasing sound. An unpleasant sound is called noise. The difference between pleasing sound and noise are given below:

Pleasing sound	Noise
i. The sound which are pleasing to ear and comfortable are called pleasing sound.	i. The sound which are unpleasant to hear are called noise.
ii. It is produced due to unit form vibration of an object.	ii. It is produced due to non-uniform vibration of an object.
iii. Tune of songs, tune of flutes, the sound of harmonium, play on guitar, etc are few examples of pleasing sounds.	iii. The sound of pushing nail, sound of construction works, sound of chalk while writing on board, etc are few examples of noise.

8. Write down the effect of sound pollution on public health.

Ans.: The effects of sound pollution on public health are as follows-

- i. Sound pollution can create complex diseases of heart and brain.
- ii. Sudden loud sound can damage our hearing.
- iii. Sound pollution increases mental stress and makes the temper rough.
- iv. It causes vomiting tendency.
- v. It also causes lack of appetite.
- vi. High blood pressure is also caused by this.
- vii. Sickness from lack of sleep, tiredness, lack of memory etc are caused by sound pollution.
- viii. Sound pollution causes terrible headache.

9. How can we prevent contamination of sound?

Ans.: Few steps can be taken to reduce contamination of sound -

- i. We should keep out all the things which creates noise.
- ii. We should not establish any factory which creates noise in residential area.
- iii. Less use of horns of vehicle.
- iv. We should not use radio, TV and other musical instruments with loud voice.
- v. We should plant trees around the houses, by the side of roads so that they can prevent sound contamination.
- vi. Besides, in order to prevent contamination of sound, silencer should be used with the engines of aero planes, vehicles and machineries of factories.

10. How does sound circulate?

Ans.: Sound is produced due to vibration of an object. Again, the vibrating body vibrates the molecules of air around it. Then vibration passes to next molecules of air. Such movement created by vibrating molecules of a medium is wave. So sound propagate from one place to another place in the form of wave through a medium.

11. How can we hear sound?

Ans.: We know, vibrating objects produce sound and that is circulated all the directions through medium.

The outer shape of our ear looks mostly like a funnel. When sound enters into it, then sound goes through a hole where there is a stretched thin layer at the end, which is called Tympanum.

This layer plays an important role. The role is that the vibration of sound vibrates the Tympanum, vibration reaches to the brain from this. Thus we can hear sound.

12. Why do you hear the sound of railway movement from a distance if you put the ear on the rail?

Ans.: The movement of sound from one place to another is called the circulation of sound. Circulation of sound needs a medium. The medium may be solid, liquid or gaseous. Sound circulates very fast through solid medium than liquid and gaseous medium. That is why we can hear the sound of railway movement from a distance if we put the ear on the rail because sound travels very fast in solid medium of rail.

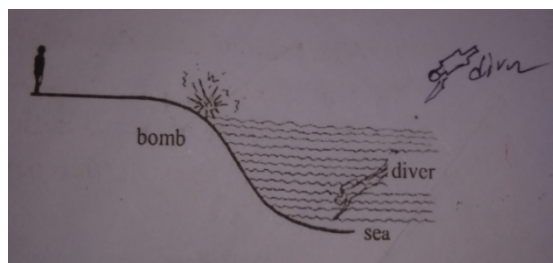
13. What change will come to the flute if the length of the tube of the flute is lesser?

Ans.: Sound is created by the inside vibrating air of the flute. Air is pushed inside the flute pipe by blowing. The intensity of sound depends upon the length and number of holes of the flute. If the length of the flute is lesser the intensity of sound will increase.

Creative Questions

(Solve yourself)

- 1.** The velocity of sound is 330m/sec in air and 1500m/sec in sea water. The man standing on the seashore and the diver are 3300 metres away from the place of the bomb explosion.



- a) After how much time will the man standing on the shore hear the sound from the place of the bomb explosion?
- b) Will the diver hear the sound of the explosion of the bomb at the same time as well? Give reason in favor of your answer.

- 2.** The sound of school bell was not heard for a long from Tapan's house. Recently the shape of the bell has been changed keeping the weight as before. As a result, now he can hear the sound of the school bell from his residence.
- a) Describe the techniques of reaching sound to Tapan's ear from the school bell.
- b) What kind of change has been made to the bell for which Tapan can hear the sound from his residence? Analyze this with appropriate causes.
- 3.** Araf is taking his half yearly examination of class seven. His science exam is on the next. There is a marriage ceremony to their neighboring house. Music was played loudly there till 1am at night. This loud music hampers his study very much. His father is a patient of high blood pressure. It is also a problem for him.
- a) What troubles may Araf's father face and write down the effect of sound pollution on public health.
- b) What measures can be taken to prevent the sound pollution?
- 4.** Some animals can hear the sounds of more than 20000Hz. The dog has this ability. Police uses high frequency whistles which the dog can hear but man cannot.
- a) How can animal hear sound?
- b) Discuss the circulation of sounds.

MCOs

(Solve yourself)

- | | |
|---|--|
| <p>1. Which medium circulates the highest velocity of sound?</p> <p>a) vacuum medium</p> <p>b) solid medium</p> <p>c) gaseous medium</p> <p>d) liquid medium</p> | <p>3. What is the cause of production of sound by a body?</p> <p>a) vibration</p> <p>b) expansion</p> <p>c) contraction</p> <p>d) propagation</p> |
| <p>2. Sound is a form of -</p> <p>a) energy</p> <p>b) substance</p> <p>c) motion</p> <p>d) none of the above</p> | <p>4. What is called the repetition of sound due to reflection?</p> <p>a) frequency</p> <p>b) echo</p> <p>c) sound wave</p> <p>d) refraction</p> |

- 5.** Which object is more suitable to produce echo?
- cotton cloth
 - rubber foam
 - paper
 - steel
- 6.** What is called the sensation of hearing?
- velocity
 - work
 - echo
 - sound
- 7.** What is produced by reflection of sound?
- frequency
 - echo
 - compression
 - refraction
- 8.** In which medium the velocity of sound is highest?
- air
 - solid
 - liquid
 - vacuum
- 9.** In which medium the velocity of sound is least?
- gas
 - liquid
 - solid
 - vacuum
- 10.** What is essential for propagation of sound?
- energy
 - medium
 - sunlight
 - music
- 11.** Which one of the following is a cause of sound pollution?
- tune of flute
 - low sound of TV
 - Sound from guitar
 - sound of air cooler
- 12.** What is the range of vibration per second of source of sound for our audibility?
- 10Hz-10000Hz
 - 15Hz-10000Hz
 - 20Hz-15000Hz
 - 20Hz-20000Hz
- 13.** Which of the following animal can hear the sound of more than 20000Hz?
- cat
 - dog
 - cow
 - goat
- 14.** What is called the sound of frequency lesser than 20Hz?
- ultrasonic
 - audible
 - infrasonic
 - none of the above
- 15.** Through which medium sound can travel?
- air
 - water
 - iron
 - vacuum
- 16.** Why do the astronauts cannot hear each other in the moon?
- there is no air in the moon
 - there is no light in the moon
 - there is no heat in the moon
 - all the above

- 17.** What types of sound can be produced by bats?
- a) ultrasonic sound
 - b) infrasonic sound
 - c) audible sound
 - d) none of the above
- 18.** Which one is the natural example of reflection?
- a) echo
 - b) velocity of sound
 - c) sound of watch
 - d) all of the above
- 19.** Which one is used to determine the depth of sea?
- a) echo
 - b) sharp sound
 - c) sound wave
 - d) ultrasonic sound
- 20.** Why does the voice of female is shrill?
- a) for higher frequency
 - b) for lower frequency
 - c) vocal cord is flat
 - d) none of the above
- 21.** Which one is the uses of sound?
- a) to determine the depth of sea
 - b) stethoscope
 - c) musical instrument
 - d) all of the above
- 22.** Which one is the better reflector of sound?
- a) soft surface
 - b) hard and solid surface
 - c) air surface
 - d) liquid surface