CLASS – 8 PHYSICS CHAPTER – 7 SOUND EXERCISE SOLUTIONS

Think and Answer

Which of the two will produce a high-pitched sound wave; a solid and rigid scale or an elastic flexible scale?
Answer : A solid and rigid scale.

Test Your Understanding [Page No. 121]

Question : Write T for Tgrue and F for false statements :
1. Sound is produced by a vibrating body.
Answer : True

2. All objects produce same type of sound.
Answer : False

3. Guitar is a muscial instrument.
Answer : True

4. The number of complete waves or cycles produced by a vibrating body in one second is called frequency.
Answer : True

5. The pitch of a sound is independent of the frequency of vibrations.
Answer : False

6. Flute is a stringed instrument.
Answer : False

7. The loudness of sound is a measure of the sound energy reaching the ear per second.
Answer : True

8. Loudness of a sound depends on the area of vibrating body only.
Answer : True

9. Hertz is the unit to measure the intensity of loudness.
Answer : False

10. Noise pollution can cause permanent hearing loss.
Answer : True

11. Quality of sound is different for different instruments.
Answer : True

12. Humans can hear sound from 20 dB to 180 dB.
Answer : False

EXERCISES

A. Choose the correct option :

1. Loudness of sound does not depend on :
Answer : (d) frequency of the sound wave

2. Which of the following is a source of sound?
Answer : (c) Stretched wire

3. The loudness of sound is measured in…….
Answer : (b) decibel

4. Which of the following is a string instrument?
Answer : (d) Guitar

5. Which one is a percussion instrument?
Answer : (a) Maracas

6. Pitch of a sound wave depends on :
Answer : (a) Frequency

7. What will be the frequency, If the string of guitar is tight?
Answer : (b) high

8. Which of the following is correct for monotone?
Answer : (d) All of these

9. ……is not an example of stretched skin (membrane).
Answer : (c) Trumpet

10. It is an example of air column or wind instrument.
Answer : (b) Flute

B. Fill in the blanks :

1. The sensation of a…….is usually known as a pitch of a sound.
Answer : frequency

2. ……..is a type of energy induced by vibrations.
Answer : Sound

3. The number of vibrations made by the vibrating body in one second is called……..
Answer : frequency

4. Amplitude is indicated by the height of the crest and the depth of the trough of the…….wave.
Answer : sound

5. …….denotes the shrillness or flatness of a sound.
Answer : Pitch

6. Violin is an example of……..instrument.
Answer : string

7. The sensation of……..is also known as pitch of the sound.
Answer : frequency

8. ……travels in the form of waves.
Answer : Sound energy

9. Wind instruments produce sound when……..is blown in them.
Answer : wind

C. Write T for True and F for False statements :

1. Sound doesn't travels in the form of waves.
Answer : False

2. The more the area of the vibrating body, the louder is the sound.
Answer : True

3. Pitch of a sound wave depends on frequency.
Answer : True

4. Frequency of a wave is measured in seconds.
Answer : False

5. A note is produced by a combination of frequencies.
Answer : True

6. Guitar is a wind instrument.
Answer : False

7. The loudness of a wave is highly dependent on energy.
Answer : True

8. A big drum produces a less sound than a small drum.
Answer : False

9. The pitch of the voices men is lower than women.
Answer : True

D. Match the columns.

1. Hertz	a. Unit to measure intensity of sound
2. A stringed instrument	b. An overtone and a fundamental tone at a fixed interval
3. Pitch	c. Loudest and lowest notes
4. Membrane instrument	d. Guitar
5. Monotone	e. SI unit of frequency
6. Decibel	f. Drums
7. Harmonics	g. Sensation of a frequency
8. Fundamentals	h. Sound with single tone

Answer : 1 – (e), 2 – (d), 3 – (g), 4 – (f), 5 – (h), 6 – (a), 7 – (b), 8 – (c)

E. Answer the following questions in short.

1. What is a sound?
Answer : A sound is a form of energy that produces the sensation of hearing in our ears. It is produced by a vibrating body.

2. What do you understand by the pitch of a sound?

Answer : Pitch is the characteristics of a sound wave which determine the sharpness or shrillness of a sound wave.

3. The sound wave produced by a muscial instrument is not a monotone. Why?
Answer : The sound produced by a musical instrument is not a monotone because here sound is produced by the vibration of particles. As the particles vibrate the surrounding particles in the medium also vibrate. As the particles move they move from high pressure area to low pressure area.

4. What do you mean by frequency of a sound wave.
Answer : Frequency is defined as the number of vibrations produced by a vibrating body in one second.

5. Name the groups in which musical instruments are categorized.
Answer : Muscial instruments are mainly categorized in four classes :
(i) Stringed muscial instruments
(ii) Wind musical instruments
(iii) Membrane musical instruments
(iv) Plate type musical instruments

6. Write a short note on loudness.
Answer : Sounds are produced by vibrating objects. If more energy is supplied to an object by plucking it or hitting it more strongly, then the object will vibrate with a greater amplitude and produce a louder sound. Thus, the loudness of sound depends on the amplitude of vibrations of the vibrating object. Greater the amplitude of vibrations, louder the sound will be.
Loudness of sound is measured in decibels (dB).

7. Define pitch.
Answer : Pitch is that characteristic of sound by which we can distinguish between different sounds of the same loudness.

8. What do you mean by monotone?
Answer : Monotone is defined as a continuous sound, especially someone's voice, that doesn't rise and fall in pitch.

9. What is noise pollution?
Answer : The disturbance produced by undesirable, loud and unpleasant sounds.

10. Define harmonics.
Answer : Those frequencies that are integer multiples of the fundamental pitch's frequency are called harmonics.

F. Answer the following questions in detail.

1. Explain the relationship between pitch and frequency with the help of metallic ruler.
Answer : A longer ruler vibrates more slowly, so has a lower frequency. A shorter ruler vibrates more quickly so has a higher frequency. Lower frequency waves have a lower pitch. When the ruler is shorter it vibrates more quickly, so makes higher frequency pressure waves, which have a higher pitch.

2. What are the factors on which loudness of a sound depends? Explain.
Answer : Loudness of a sound depends on the amplitude of the vibration producing that sound. Greater is the amplitude of vibration, louder is the sound produced by it. The amplitude of the sound depends upon the force with which an object is made to vibrate. Actually, the loudness of sound is directly proportional to the square of amplitude of vibrations (of sound producing object). This means that :
(i) If the amplitude of vibrations is doubled (made 2 times), then the loudness will become four times [because $(2^2) = 4$]
(ii) And if the amplitude of vibrations is halved (made ½), then the loudness will become one-fourth [because $(1/2)^2 = ¼$].

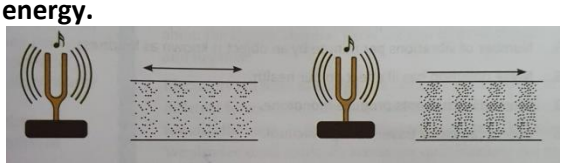
3. What are the factors on which pitch of a sound depends? Explain.
Answer : The pitch of a sound depends on the frequency of vibration (of the sound producing object). In fact, the pitch of a sound is directly proportional to its frequency. If the frequency of vibration is low, the sound produced has a low pitch. On the other hand, if the frequency of vibration is high, the sound produced has a high pitch. A man's voice has a low frequency, so it has a high pitch. The

voice of a small baby has a higher frequency than the voice of even a woman, so the pitch of a baby's voice is higher than that of a woman. Thus, the sound of low frequency are said to have a low pitch while the sounds of high frequency are said to have a high pitch.

4. What is noise pollution? Write a note on the ill effects of noise pollution.
Answer : Noise pollution : The disturbance produced by undesirable, loud and unpleasant sounds.
For example : Running of mixer and grinder in the kitchen produces noise; blowing of horns of motor vehicles (like cars, buses and trucks, etc.) causes noise; brusting of crackers produces noise, etc.
Noise pollution impacts millions of people on a daily basis. The most common health problem it causes is Noise Induced Hearing Loss (NIHL). Exposure to loud noise can also cause high blood pressure, heart disease, sleep disturbances, and stress.
These health problems can affect all age groups, especially children.

Picture-based Questions

Look at the picture carefully and then write which sound producing body has more energy.



Answer : Figure 2 has more energy because it is vibrating strongly.

Application-Based Questions

1. Why is the sound of siren in an ambulance or a Fire tender different from the horns used by other vehicles?
Answer : To alert peoples, to provides or leave the way in case of emergency.

2. During a thunder, we see the lightning before we hear the thunder. Why?
Answer : If **we** are watching the sky, **we see the lightning before we hear the thunder**. That is because light travels much faster than sound waves. **It** takes approximately 5 seconds for the sound to travel 1 mile. If the **thunder** follows the **lightning** almost instantly, **you** know the **lightning** is too close for comfort!

3. Why are floors and ceilings of the auditorium and theaters covered with sound proof tiles?
Answer : The roof and walls of the **auditorium** or **cinema hall** are generally **covered with sound** absorbent materials like draperies or compressed fibreboard to reduce reverberation. These materials reduce the formation of echoes by **absorbing sound** waves.

WORKSHEET [Page No. 126]

A. Circle the odd one out.
1. Tabla, Drums, Mridhangam, Guitar
Answer : Guitar

2. Flute, Saxophone, Sitar, Shehnai
Answer : Sitar

3. Vacuum, Amplitude, Frequency, Loudness
Answer : Vacuum

4. Veena, Drum, Sitar, Violin
Answer : Drum

5. Sound of birds, Sound of a fan, Sound of a baby, Sound of a cracker
Answer : Sound of a cracker

6. Drums, Shehnai, Speaker, Guitar
Answer : Speaker

7. Hertz, Decibel, Frequency, Watt
Answer : Watt

8. Temperature, Amplitude of Vibrations, Area off Vibrating body, Distnace from listner
Answer : Temperature

B. State whether True or False.
1. The voice of a woman has a lower pitch than that of a man.
Answer : False

2. Loudness depends on frequency.
Answer : False

3. Tabla is a stringed instrument.
Answer : False

4. Harmonium is a wind instrument.
Answer : True

5. Number of vibrations per minute by an object is known as loudness.
Answer : False

6. Noise pollution has ill effect on our health.
Answer : True

7. Musical instruments produce monotone.
Answer : False

8. Sound can easily travel through vacuum.
Answer : False