15. Sound

Practice Questions

Q 1) Answer in brief-

1. Sound and Music

Ans: If the frequency of sound wave is changed, different sound is produced. Sound waves of different frequencies produce different sound notes. In the field of music, various musical instruments are used for creation of sound notes. This includes instruments like sitar, violin, guitar which use strings for production of sound and instruments like flute, shehnai which use air blown into pipes for the production of sound.

2. Tuning Fork

Ans: A tuning fork is made up of metal. It has two prongs and a stem. The frequency of a tuning fork depends upon the material used in making the fork. A periodic motion of the prongs creates compression and rarefaction in the air and these are propagated away from the prongs.

3. Sound intensity

Ans: The frequency of vibrations of sound sources is called as intensity. The ability of the brain to understand frequency of sound from sound source is called as sound intensity. More the number of vibrations, more will be the frequency and intensity. High intensity sound means the number of compressions and rarefactions going through a particular point in a unit time. The intensity is more when the frequency of vibrations is more and then the sound is harsh while when the intensity is low then the sound is clear. The sound intensity is measured in decibel (dB)

4. SONAR technology (Sound Navigation And Ranging)

Ans: Due to SONAR technology, the distance, direction and speed of objects under the surface of the water are measured from ship in seas using ultrasound waves. Using SONAR technique, the depth of the sea can be measured. The transducers and detectors are installed in it. Transducers create ultrasound and vibrations and transmits them to sea depth and those waves bounce back and reflects back. The sound waves are converted into electric waves with the help of detectors.

5. Jaltarang instrument

Ans: Take 6-7 glass cups. Arrange them in a line and fill them with water gradually increasing water level from one to other. Take a pencil and strike the

cups sequentially. When a cup is struck, waves are set up in the air column above the water level in the cup. The frequency of the generated wave depends on the height of the air column inside the glass cup. Since the water level in each glass is different, the height of the air column in each glass is also different. Therefore, the frequency of sound generated by each glass cup will also be different. So, the sound generated is different.

6. Stringed instrument and Blown instrument

Ans: The guitar, sitar, mandolin and santoor are the stringed instruments. In this sound is created due to vibrations of stretched strings. If the strain of strings is increased then frequency of sound increases and while increasing the length of the vibrating portion is increased then frequency decreases. Similarly, flute, bugle, shehnai and saxophone are blown instruments. The sound frequency can be changed by changing the length of vibrating air column in them. The sound frequency increases by decreasing the length air column, while it frequency decreases by increasing the length.

Q 2Answer the following questions-

1. Which problems are created due to sound pollution?

Ans: 1. Due to continuous hearing of loud sound, it can result in permanent deafness. 2. Insomnia, dysfunction of mental balance, person feels uneasy. 3. May suffer from physical and mental disorders, increase in heartbeat, possibly high blood pressure.4. Sound causes diseases of brain and liver.5. Disorders like intense headache, belly ache, etc.

2. Why the voice of male, female and children are different?

Ans: In the humans, sound is produced in the larynx. There are two vocal cords in larynx. The sound is produced when the vocal cords vibrate. Vocal cords are 20cm in length in male, about 15cm in female and even smaller in children. Therefore, the voice of male, female and children are different.

3. Why there must be limit on the loudspeaker?

Ans: Very loud sound can be produced by using a loudspeaker. Therefore, loudspeakers are used in public places. However, if sound level is around 100 decibels, the sound can be harmful to us. Therefore, though the loudspeaker can generate very loud sound, there must be limit on its loudness.

4. Explain the work of human larynx with the help of experiment.

Ans: Take two rubber strips out of an unused bicycle tube. Place these two pieces one above the other and stretch them towards both the ends tightly. Now blow air

through the gap between them. As the air blows through the gap between the rubber strips, a sound is produced. Human larynx works in a similar way.

Q 3) Identify the correlation.

1. Frequency of the sound wave: Hertz: : _____: Decibel

Ans: Sound

2. Flute: _____: : Guitar: Instrument which uses strings

Ans: Instrument which uses blown air

Q 4) Write whether the following statements are true or false.

1. The propagation of sound occurs through the muscles.

Ans: True

2. The region in which air is at high pressure and high density is called rarefaction.

Ans: False (The region in which air is at high pressure and high density is called compression)

3. In flute, different notes can be generated by changing the way of blowing air.

Ans: True

4. Muscles attached to the vocal cords can make the cords loose only.

Ans: False (Muscles attached to the vocal cords can make the cords tight or loose)

Q 5) Explain the difference.

1. Flute and Guitar (One point each)

Flute	Guitar
1. Flute is instrument which uses blown air.	1. Guitar is instrument which uses strings.

Q 6) Write the answers in one sentence.

1. What is the length of vocal cords in females?

Ans: The length of vocal cords in females is about 15cm.

2. What is rarefaction?

Ans: The region in which air is at low pressure and low density is called rarefaction.

3. What is compression?

Ans: The region in which air is at high pressure and high density is called compression.

4. The frequency of sound wave is measured in which unit?

Ans: The frequency of sound wave is measured in Hertz.

5. What is the SI unit of wavelength?

Ans: The SI unit of wavelength is Metre (m)

6. Wave

Ans: The propagation/ travel pattern of sound through a medium is called a wave.

7. Frequency

Ans: Number of cycles that are produced in the air or medium per second is called as frequency.

8. Wavelength

Ans: The distance between two compressions or two rarefactions is called as wavelength.

9. What is the SI unit of wavelength?

Ans: The SI unit of wavelength is metres (m)

10. What is the limit for human hearing?

Ans: The limit for human hearing is approximately 20 hertz to 20,000 hertz (20Hz to 20 KHz)

11. Which animals uses inaudible/ infra sound?

Ans: The animals like rhinoceros, elephant and whale uses inaudible sound.

12. What is ultrasound?

Ans: The frequency greater than 20,000 hertz (20 KHz) is called as ultrasound.

13. Which animals can create ultrasounds?

Ans: The animals like dolphin, bat, the mammals like porpoise, rat can create ultrasounds.

Q 7) Name the following:

1. Note

Ans: Sa, Re, Ga, Ma, Pa, Dha, Ni

2. The string instrument

Ans: Sitar, Guitar

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