|	INDIAN SCHOOL AL WADI AL KABIR	
Class IX	Department of Science 2020-2021 SUBJECT: Physics	DATE OF COMPLETION 12.05.2020
Work sheet No.: 01 Q & A	Chapter: Sound	Note: A4 File format
Name of the student:	Class & Section:	Roll No.

Objective type Questions (1 mark)

1. Name the sound waves used by bats to move about freely even in dark nights and search out prey.
2. Write the relation between speed of sound wave, wavelength of wave and frequency of wave.

Three marks Questions

3. (a) State what is the outer ear called? Explain its function.
   (b) How does the amplitude of loud sound differ from that of soft sound?
4. Define the term tone. A person is listening to a sound of 500 Hz sitting at a distance of 450 m from the source of the sound. What is the time interval between successive compressions reaching his ears from the source.
5. Study the figure shown below and answer the following questions.
   (i) Name the technique depicted in the figure.
   (ii) What is the principle of this technique
   (iii) List its two applications.
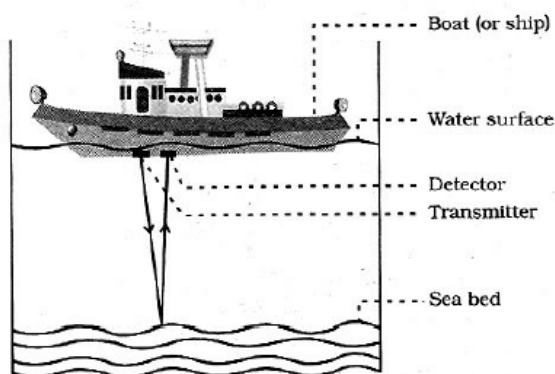
6. A sound wave with frequency higher than 20 kHz is not audible for human ear". Answer the following in respect of this statement.
   (i) What is the term used for such a sound?
   (ii) Name two organisms producing sound in this range.
   (iii)Write an application of such a wave.

7. What is an echo? State the conditions required to hear an echo.

<u>Five marks Questions</u>

8. (i) What is the audible range of the average human ear?
   (ii) Name two organisms producing sound in the infrasound range.

   (iii) Define reverberation and mention two methods by which it is reduced in halls.

9. (a) Differentiate between transverse and longitudinal waves. Give one example of each.

   (b) Briefly explain how sound travels in air

10. (a) Mention the audible range of frequencies for human beings. Differentiate

    between infrasonic and ultrasonic frequencies. Name any two animals

    which   produce infrasonic sounds and two animals which produce

    ultrasonic sounds.

    (b) Briefly explain any two practical applications of ultrasonic waves.

11. State laws of reflection of sound. Explain three applications based on these laws.

12. (i) Explain why are sound waves called mechanical waves?

    (ii) Derive this relationship between the wavelength of a sound wave and

    its   frequency with its speed.

    (iii) In which medium the speed of sound will be greater –air or water?

    Give reason for your answer.

13. (a) Define the following terms and give their SI unit.

    (i) Time Period

    (ii) Wavelength

    (b) A source of sound emits a wave of wavelength 2.9m. Find the frequency

    of wave emitted by the source. Velocity of sound wave is $340ms^{-1}$?

14. Describe an experiment with a neat diagram to show that "sound needs a medium

    to propagate. It cannot travel in vacuum".

Objective type Questions (1 mark)

4. Ultrasound waves
5. V=λxν

Three marks Questions

6. (a) Pinna. It helps in the collection of sound waves.
   (b) Amplitude of loud sound will be more than the soft sound.
4. The sound of a single frequency is called the tone.
      T= 1/ν= 1/500 = 0.002 s
10.
   (i) SONAR
   (ii) Finding the time taken for the ultra sound waves to reflect back from the reflecting surface and knowing the speed of the ultrasound through water, the distance between the source of sound and reflecting surface can be found as
    D = vxt/2
   (iii) 1. To find the depth of the sea
         2. To locate the underwater objects
11. A sound wave with frequency higher than 20 kHz is not audible for human ear". Answer the following in respect of this statement.
   (iv) Ultra sound waves
   (v) Bats and ultrasound waves
   (vi) SONAR. To determine the depth of the sea
12. The repeated reflection of sound is called an Echo. There should be a minimum distance of 17.2 m between the source of sound and reflecting surface to get clear echo.

Five marks Questions

13. (i) 20 Hz-20000 Hz
    (ii) Rhinoceros, Elephants

    (iii) Repeated reflection of sound which results in the persistence of sound is called the reverberation. To minimise reverberation the sound absorbent materials like fibre board and rough plaster can be used.

14. (a) Transverse wave- The wave in which the particles vibrate perpendicular to the direction of the wave.Eg. Light

    Longitudinal wave- The wave in which the particles vibrate perpendicular to the direction of the wave. E.g. Sound

    (b) The vibrations produced by the source is transferred to the particles in the medium. The vibrations are carried through the particles in the medium. During the propagation, the particles come closer to each other forming a high-pressure region called the compression. When there is more space between the particles, that results in the low-pressure region called the rarefaction. The compressions and rarefactions

thus formed are carried through the particles in the medium as a disturbance called the wave. The waves reach the listeners ear to hear the sound.

10. (a) 20 Hz-20000Hz.The sound of frequency below 20 Hz are called

Infrasonic sound. The sound of frequency above 20000 Hz are called

ultrasonic sound.

Two animals which produce infrasonic sounds- Rhinoceros and elephants

Two animals which produce ultrasonic sounds. – Bats and dolphins

(b) SONAR - . To determine the depth of the sea

Ultrasonography – To take the images of internal organs.

11. The angle of incidence = angle of reflection

The incident ray, normal and reflected ray all lie along the same plane.

Reflection of sound is used (1) in the working of Stethoscope

(2) in the working of megaphones

12. (i) During the propagation of sound as there is movement of particles, it is

called as mechanical wave.

(ii) **Speed = Distance/Time**

Speed of Sound = Distance travelled by a point on Wave/Time

Speed of Sound = Wave length/Time Period

Speed of Sound (v) = Wave length(λ) /Time Period (T)

$v = \lambda/T$

$= \lambda * 1/T$

$v = \lambda * \nu$

(vii)   The speed of sound is greater in water than that of air because the particles

are close to each other in water than in air.

13. (a) (I) Time taken for one complete wave is known as Time period. Its SI unit

is seconds

(ii) The distance between two consecutive compressions or rarefactions is

called the wavelength

(b) λ=2.9m.

v =340ms^{-1}

ν= v/λ= 340/2.9 = 117.2 Hz

14. Bell jar experiment.

An electric bell is fitted inside a bell jar. The bell jar is connected to a

vacuum pump. Once the switch is made on, the sound of the electric bell can

be heard. When the vacuum pump is made on, the air inside the bell jar

is evacuated. The sound of the ringing bell becomes feeble and feeble. Once the

full air is evacuated from the bell jar, even though the electric bell works, the

sound cannot be heard at all.

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