EXERCISE-1

A. Very Short Answer Type Questions

Q.1 Define vibration.

Q.2 How is sound produced ?

Q.3 Can sound travel in vacuum ?

Q.4 What is meant by oscillatory motion ?

Q.5 Define frequency.

Q.6 Define 1 hertz.

Q.7 Define amplitude.

Q.8 What is audible range of sound ?

Q.9 Name the equipment which works at frequencies greater than 20,000 Hz.

Q.10 What is noise ?

Q.11 In which unit loudness is expressed ?

Q.12 Name the SI units of (i) time period (ii) frequency.

Q.13 In which state of matter does sound travel the (i) slowest (ii) faster ?

Q.14 What happens to sound when it strikes a surface ?

B. Short Answer Type Question

Q.15 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 ?

Q.16 How can we control the sources of noise pollution ?

Q.17 What is relation between loudness of sound and amplitude ?

Q.18 The frequency of a given sound is 1.5 KHz. How many vibrations is it completing in one second ?

Q.19 Which characteristic of a vibrating body determines (a) loudness (b) pitch of the sound produced by it.

Q.20 Why do we hear the thunder a little after we see the flash of lightning ?

Q.21 Why do we not hear echoes in our ordinary surroundings ?

Q.22 What are vocal cords ? What is their function?

Q.23 How is that you can hear a friend talking in another room without seeing him ?

Q.24 List sources of noise pollution in your surroundings.

Q.25 What are the effects of noise pollution ?

Q.26 A pendulum oscillates 40 times in 4 seconds. Find its time period and frequency.

Q.27 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.

Q.28 How can the noise pollution be controlled in residential area ?

Q.29 Can you hear the sound on the moon? Explain.

C. Long Answer Type Questions

Q.30 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 why ?

Q.31 (a) What is SONAR ?

(b) What is the basic principle of its working?

(c) Explain its use.

Q.32 What is the use of ultrasound in medicine and industry ?

Q.33 (a) Name the properties of sound which is

(i) similar to the property of light.

(ii) different from that of light

(b) Why do some people have hearing impairment ? How do they communicate with others ?

EXERCISE-2

Single Correct Answer Type Questions

Q.1 Sound cannot travel through
(A) air (B) water
(C) iron (D) vacuum

Q.2 The audible range of frequency is
(A) 200-2000 Hz (B) 20-20000 Hz
(C) 20-23000 Hz (D) 220-20000 Hz

Q.3 A tightened string of instrument produces sound of ..... frequency, a
(A) lower (B) higher
(C) same (D) none of these

Q.4 An object produces a sound of 15 Hz. Which of the following is correct ?
(A) this sound can be heard by us
(B) this sound cannot be heard by us
(C) it does not produce sound
(D) this sound can be heard only through solids

Q.5 A mosquito produces sound by vibrating its...
(A) wings (B) vocal cords
(C) legs (D) body

Q.6 Violin is a musical instrument with .....
(A) stretched bow
(B) stretched string
(C) stretched membrane
(D) none of these

Q.7 Loudness is the measure of ..... of a sound.
(A) shrillness (B) heaviness
(C) Length (D) Pitch

Q.8 The level of normal conversation is about..... dB.
(A) 40-60 (B) 100-200
(C) below 60 (D) 60-100

Q.9 Late Ustad Bismillah Khan was a famous.... player.
(A) Flute (B) Table
(C) Guitar (D) Shehnai

Q.10 The frequency of a sound wave is
(A) Directly proportional to time period
(B) Inversely proportional to time period
(C) Equal to the time period
(D) Has no relation with time period

Q.11 The maximum distance of a vibrating body from its mean position is called its –
(A) Frequency (B) Quality
(C) Amplitude (D) Pitch

Q.12 The loudness of a sound depends upon its–
(A) Amplitude (B) Frequency
(C) Pitch (D) None of these

Q.13 The pitch of a sound depends upon its –
(A) Amplitude (B) Frequency
(C) Quality (D) None of these

Q.14 Two wires A and B of equal length differ only in their thickness. A is thinner than B. If both are plucked with same force, then–
(A) A will produce sound of higher pitch than B
(B) A will produce sound of lower pitch tha B
(C) Both will produce sounds of equal pitch
(D) None of these

Q.15 Which of the following are used in dishwasher or to wash the machines ?
(A) Infra-sonic waves
(B) Ultra-sonic waves
(C) Both (A) and (B)
(D) Neither (A) nor (B)

Q.16 Which of the following sounds has the greatest frequency ?
(A) man's voice
(B) woman's voice
(C) boy's voice
(D) all have the same frequency

Q.17 The sound waves travel the slowest in –
(A) Dry air (B) Moist air
(C) Liquid water (D) Ice

Q.18 For an echo to be distinguishable from sound, the minimum time difference is –
(A) 1 sec (B) 0.1 sec
(C) 0.01 sec (D) 10 sec

Q.19 Which of the following is the correct group of wind instruments –
(A) Violin, drum, nadaswaram
(B) Shehnai, flute, nadaswaram
(C) Shehnai, flute, cymbals
(D) Gongs, jaltarang, shehnai

Q.20 Sound cannot be associated with
(A) hearing (B) frequency
(C) wave (D) sunlight

Q.21 Sound is caused due to
(A) propagation of light
(B) vibrations
(C) change in physical state
(D) clouds

Q.22 The minimum distance required to produce a distinct echo is
(A) 10 m (B) 11 m
(C) 15 m (D) 17 m

Q.23 Which of the following is not a stringed instrument ?
(A) Sitar (B) Tabla
(C) Violin (D) Guitar

Q.24 Sound travels in air at 0ºC with a velocity of about
(A) 300 m/s (B) 330 m/s
(C) 360 m/s (D) 380 m/s

Q.25 Velocity of sound in water is about
(A) 340 m/s (B) 420 m/s
(C) 1000 m/s (D) 1500 m/s

Q.26 If a pendulum has a time period of 3 second, then its frequency is
(A) 3 Hz (B) 0.5 Hz
(C) 3 s (D) 0.33 Hz

ANSWERS

EXERCISE-1

A. Single Correct Answer Type Questions

Sol.1 Vibration is the to and fro or back and forth motion of an object.

Sol.2 Sound is produced by a vibrating body.

Sol.3 No, sound cannot travel in vacuum.

Sol.4 The to and fro motion of an object is known as oscillatory motion.

Sol.5 The number of oscillations per second is called the frequency of oscillation.

Sol.6 A frequency of 1 hertz means one oscillation per sound.

Sol.7 The maximum distance to which a vibrating body moves on either side of its mean position is called the amplitude of vibration.

Sol.8 The range of the sound which can be heard by human ear is known as audible sound.

Sol.9 Ultrasound equipment.

Sol.10 Unpleasant sounds are called noise

Sol.11 Loudness is expressed in a unit called decibel (dB).

Sol.12 (i) Second
(ii) Hertz

Sol.13 (i) Air
(ii) Solids

Sol.14 Sound gets reflected on striking a surface.

B. Short Answer Type Question

Sol.15 Time taken for 500 vibrations = 1 second
Time taken for 1 vibrations = 1/500 second.
Time period = 1/500 second.

Sol.16 We can control noise pollution by designing and installing silencing devices in machines.

Sol.17 Loudness of sound is proportional to the square of the amplitude of vibrations producing the sound.

Sol.18 Frequency =
No. of vibrations = Frequency × time
= 1.5 × 1000 × 1
= 1500 vibrations

Sol.19 (a) Amplitude
(b) Frequency.

Sol.20 We hear the thunder a little after we see the flash of lightning because the speed of sound is less than the speed of light.

Sol.21 We do not hear echoes in our ordinary surroundings because the distance to hear echo should be more than 17 m.

Sol.22 The larynx has a pair of membranes known as vocal cords stretched across their length. The vocal cords vibrate and produce sound.

Sol.23 Sound can travel in all directions and around corners. Light cannot travel around corners. Therefore, we can hear a friend talking in another room but cannot see him.

Sol.24 The major sources of noise pollution are sounds of vehicles, explosions, machines, loudspeakers.

Sol.25 Due to noise pollution a person may suffer from lack of sleep, hypertension and anxiety. If a person is exposed to noise continuously he may get temporary or permanent deafness.

Sol.26 40 vibrations in 4 seconds.
10 vibrations in 1 seconds.
$\therefore$ Frequency = 10 vibrations/sec. or 10 Hz.
$\therefore$ Time period = 1/10 sec.

Sol.27 I would advise my parents to buy the house three lanes away from the roadside because there the noise from automobiles would be much less.

Sol.28 (a) The noisy operations must be conducted away from residential areas.
(b) Noise producing industries should be set away from such areas.
(c) Use of automobile horns be minimized.

(d) TV and music systems should be run at lower volumes.

Sol.29 We cannot hear the sound on the moon because sound requires a material medium to travel. On the moon there is no atmosphere and sound cannot travel in vacuum.

C. Long Answer Type Question

Sol.30 The speed of light is more that the speed of sound. Therefore, even though thunder and lightning take place simultaneously, we see the lightning earlier.

Sol.31 (a) SONAR refers to Sound Navigation and Ranging.

(b) The principle of reflection of sound is used in SONAR.

(c) SONAR is used to measure the depth of the ocean. Ultrasonic waves are sent from the ship down into the sea. They are received back after reflection from the sea bed. The depth is calculated by noting the time period.

Sol.32 **Use of ultrasound in medicine :**

(a) for scanning and imaging the body for stones, tumour and foetus.

(b) for relieving pain in muscles and joints.

Use of ultrasound in industry :

(a) for detecting finer faults in metal sheets.

(b) in dish washing machines where water and detergent are vibrate with ultrasonic vibrators.

(c) for homogenising milk in milk plants.

Sol.33 (a) (i) The property of sound similar to light is that in both reflection takes place.

(ii) Sound can travel around corners but light cannot.

(b) Some people suffer from hearing impairment because their ear drum is damaged or absent. This can be from birth or may occur later on. Such people communicate with "sign language". They can also use "hearing aids".

ANSWER KEY

EXERCISE-2

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	D	B	B	B	A	B	C	A	D	B	C	A	B	A	B
Ques.	16	17	18	19	20	21	22	23	24	25	26				
Ans.	B	A	B	B	D	B	D	B	B	D	D				