(Q.) What is sound? (1 Mark)

(Ans) Sound is a form of energy producing sensation of hearing.

(Q.) How is sound produced? (1 Mark)

(Ans) Sound is produced by vibration of the objects.

(Q.) What is the necessary condition for sound propagation? (1 Mark)

(Ans) Sound needs a material medium for its propagation.

(Q.) Define amplitude of vibration. (1 Mark)

(Ans) The maximum distance through which a vibrating body is displaced from its mean position is called amplitude of vibration.

(Q.) What is the use of reflection of sound? (1 Mark)

(Ans) The phenomenon of reflection of sound is used in sonar technology.

(Q.) On what factor, does the loudness of sound depend? (1 Mark)

(Ans) Loudness of sound depends on the amplitude of vibration. It is directly proportional to the square of the amplitude of vibration producing sound.

(Q.) Define the term pitch. (1 Mark)

(Ans) Pitch is the property of sound which varies with the variation of frequency. If the frequency of vibration is high, then the sound produced is shrill and is of higher pitch whereas if the frequency of vibration is low, then the sound produced is dull and is of lower pitch.

(Q.) Define the term echo. (1 Mark)

(Ans) Echo is the reflected sound when the reflecting surface is approximately at the distance more than 17 m from the source producing this sound.

(Q.) What is the audible range of frequencies for human ear? (1 Mark)

(Ans) The audible range of frequencies for human ear is roughly from 20 Hz to 20,000 Hz.

(Q.) What is the full form of SONAR? (1 Mark)

(Ans) Full form of SONAR is Sound Navigation and Ranging.

(Q.) Name the section of throat in which human voice is produced. (1 Mark)

(Ans) The larynx or the voice box is the section of throat in which human voice is produced.

(Q.) What is an ultrasound? (1 Mark)

(Ans) Sound of frequencies greater than 20,000 Hz which is not audible to human ear is called an ultrasound.

(Q.) Name the two animals that use echolocation to guide themselves. (1 Mark)

(Ans) Batsanddolphins use the method of echolocation to guide themselves.

(Q.) Why humans cannot hear the sound of the whistle used for dog training? (2 Marks)

(Ans) Whistle used for training produce ultrasonic sounds of frequencies above 20,000 Hz. Audible range of dogs is nearly 40,000 Hz. But for humans, it is 20,000 Hz. So, human cannot hear the sound of the whistle used for dog training.

(Q.) Define the term 'quality of sound'? (2 Marks)

(Ans) It is a characteristic of sound through which the listener is able to distinguish between sounds of same pitch and same loudness produced by different musical instrument.

(Q.) Why does the walls, floor and ceilings are covered by sound absorbing materials in cinema hall and auditorium? (2 Marks)

(Ans) Sound absorbing materials are bad reflectors of sound. Therefore, there is negligible reflection of sound waves and audience can hear the sound clearly as no echo is produced.

(Q.) Write the following voices having different frequencies in the increasing order of their frequencies : (i) of a child, (ii) voice of an adult male, (iii) voice of an adult woman. (2 Marks)

(Ans) Voice in increasing order of their frequency:

Voice of an adult man < Voice of an adult woman < Voice of a child.

(Q.) A pendulum produces 20 oscillations in 5 seconds. Calculate its time period? (2 Marks)

(Ans) Frequency is the number of oscillations per second.
Number of oscillations completed by pendulum in 5 seconds = 20.
Therefore, number of oscillations completed by pendulum in 1 second = 20/5 = 4.
Therefore, frequency (f) of pendulum = 4 Hz.
Time Period = (1/f) = (1/4) second = 0.25 second.

(Q.) Give reason:
(i) During a thunderstorm, we see the lightning first and then hear the thunder.
(ii) We do not hear the supersonic jets when they approach us, but hear a sudden boom after it has passed away. (3 Marks)

(Ans) (i) Light travels faster than sound. Velocity of light is 3 x 108 m/s while of sound is 330 m/ s. So, light covers the distance fasterthan sound.
(ii) Supersonic jets fly faster than the speed of sound and hence, they cannot be heard when they approach us but a boom is heard after it passes away.

(Q.) Explain how sound is produced by each of the following types of musical instruments.
(i) Wind instruments.
(ii) Stringed instruments.
(iii) Percussion instruments. (3 Marks)

(Ans) (i) In wind instruments, sound is produced by vibrating a air column inside these instruments. Example: Flute, shehnai, etc.
(ii) In stringed instruments, sound is produced when taut strings vibrate to and fro on plucking. Example: Sitar, guitar, etc .

(iii) In percussion instruments, sound is produced when stretched skin vibrates. Example: tabla, drum, etc.

(Q.) How would you describe the sound produced when
1. the large number of vibrations are produced per second.
2. the amplitude is small.
3. the vibrations are produced at irregular intervals. **(3 Marks)**

(Ans) (1) When the large number of vibrations are produced in one second, its frequency will be high. So, high pitched or shrill sound will be produced.
(2) When the amplitude is small, the loudness of sound will be less. So, soft sound will be produced.
(3) When the vibrations are produced at irregular intervals, an unpleasant sound is produced due to these vibrations or the noise is produced.

(Q.) Sound produced by a mosquito is quite different from the roar of a lion. Explain. (3 Marks)

(Ans) The loudness of sound depends upon the amplitude of the sound wave. A mosquito produces sound by the vibration of its wings in open air while the lion roars by the vibration of its vocal cords. The amplitude of the vibration produced by mosquito will be less than that produced by a lion. The pitch and loudness of the two sounds is quite different, which makes the two sounds different and distinguishable.

(Q.) How is the human voice produced? Explain. (5 Marks)

(Ans) The human voice is the result of vibrations of the vocal cords. It is produced in larynx, a part of throat. Muscles of the vocal cords tighten the cords. Air from the lungs rushes past the tight stretched cords and causes the vocal cords to vibrate. These vibration transfer the energy to its surrounding. Surrounding air vibrates and we hear the sound. So, in this way, human produces the sound. Main cause of sound production is the vibration of vocal cords.

(Q.) What do you understand by the term noise pollution? Write some harmful effects of noise pollution. (5 Marks)

(Ans) Noise pollution: The disturbance produced in the environment by undesirable, loud and harsh sound from various sources is called noise pollution.
Harmful effects of noise pollution are :
1. Loss of hearing.
2. Headaches, irritation and nervous tension.
3. Anger, tension and interferences with the sleep pattern of individuals.
4. Reduction in concentration and results in the loss of work efficiency.

(Q.) What do you understand by the term noise pollution? Suggest some ways of minimising noise pollution. (5 Marks)

(Ans) Noise pollution: The disturbance produced in the environment by undesirable, loud and harsh sound from various sources is called noise pollution.
Prevention and control of noise: In the modern society, we cannot eliminate noise but we can lower down its level to bearable limits by taking following measures:
1. At homes, the television, the radio, the music system should be played at low volume.
2. The use of loudspeakers for various social or religious activities should be banned.
3. Transport vehicles, air craft engines, home appliances, etc. should be installed with modified and improved silencers.
4. The industries which produces noise should be set up far away from residential areas.