

QB365 Question Bank Software Study Materials

Acoustics Important 2 Marks Questions With Answers (Book Back and Creative)

10th Standard

Science

Total Marks : 60

2 Marks

30 x 2 = 60

1) What is a longitudinal wave?

Answer : If the particles of the medium vibrate along the direction of propagation of the wave, then the waves are said to be longitudinal.

2) What is the audible range of frequency?

Answer : (i) The audible range of frequency is 20 Hz to 20,000 Hz.
(ii) These are generated by vibrating bodies such as vocal cords, stretched strings, etc.

3) What is the minimum distance needed for an echo?

Answer : The minimum distance required to hear an echo is $1/20^{\text{th}}$ part of the magnitude of the velocity of sound in air.
i.e $\frac{1}{20} \times 344 = 16.7m$

4) What will be the frequency sound having 0.20 m as its wavelength, when it travels with a speed of 331 m s^{-1} ?

Answer : Given: $V = 331 \text{ ms}^{-1}$, $\lambda = 0.20 \text{ m}$, $n = ?$

$$V = n \times \lambda$$

$$331 = n(0.20)$$

$$n = \frac{331}{0.20} = 1655 \text{ Hz}$$

5) Name three animals, which can hear ultrasonic vibrations.

Answer : Dolphins, dogs, bats can hear the ultrasonic vibrations.

6) Write the properties of sound wave?

Answer : Properties of Sound Wave

(i) Wavelength (A)

(ii) Amplitude (A)

(iii) Time period (T)

(iv) Frequency (n)

(v) Velocity (v)

7) What is time period of sound wave?

Answer : Time required to produce one complete vibration of particles of the medium or time in which a wave moves a distance equal to its wavelength is called time period of the sound wave. The SI unit of time period is second (s).

8) What is particle velocity?

Answer : The velocity with which the particles of the medium vibrate to transfer energy in the form of wave is called particle velocity.

9) Why does sound wave travel faster in solids?

Answer : The elasticity of a solid is higher than a liquid or a gas and so sound travels faster in solids than in liquids.

10) What is loudness? Write its unit.

Answer : The sensation produced in the ear which enables us to distinguish between a loud and a soft sound is called loudness. The unit of the intensity is decibel (dB).

11) State the Doppler effect.

Answer : Whenever there is a relative motion between a source and a listener, the frequency of sound heard by the listener is different from the original frequency of sound emitted by the source. This is known as "Doppler effect".

12) If the amplitude of a wave is doubled, what will be the loudness?

Answer : Loudness of sound depends upon the intensity (I) of sound. The intensity of sound, in turn depends on the amplitude of the sound wave.

13) How can we measure the depth of a sea by using "SONAR"?

Answer : In SONAR, by measuring the change in the frequency between the sent signal and received signal, the speed of marine animals and submarines can be determined.

14) Define particle velocity

Answer : The velocity with which the particles of the medium vibrate to transfer energy in the form of wave is called particle velocity.

15) What do you mean by acoustics?

Answer : Acoustics is a branch of physics that deals with production, transmission, reception, control, and effects of sound.

16) What is called compressions and rare factions?

Answer : As sound travels through a medium, the particles of the medium vibrate along the direction of propagation of the wave. This displacement involves the longitudinal displacements of the individual molecules from their mean positions. This results in a series of high and low pressure regions called compressions and rare factions.

17) Write a short note on Infrasonic waves

Answer : These are sound waves with a frequency below 20 Hz that cannot be heard by the human ear. e.g., waves produced during earth quake, ocean waves, sound produced by whales.

18) Write a short note on Ultrasonic waves.

Answer : These are sound waves with a frequency greater than 20 kHz, Human ear cannot detect these waves, but certain creatures like mosquito, dogs, bats, dolphins can detect these waves. e.g., waves produced by bats.

19) What is meant by rarer and denser medium?

Answer : The medium in which the velocity of sound increases compared to other medium is called rarer medium. (Water is rarer compared to air for sound). The medium in which the velocity of sound decreases compared to other medium is called denser medium. (Air is denser compared to water for sound)

20) Explain the parabolic forces.

Answer : Parabolic surfaces are used when it is required to focus the sound at a particular point. Hence, many halls are designed with parabolic reflecting surfaces.

21) Explain whispering gallery.

Answer : One of the famous whispering galleries is in St. Paul's cathedral church in London. It is built with elliptically shaped walls. When a person is talking at one focus, his voice can be heard distinctly at the other focus. It is due to the multiple reflections of sound waves from the curved walls.

22) Define Echo.

Answer : An echo is the sound reproduced due to the reflection of the original sound from various rigid surfaces such as walls, ceilings, surfaces of mountains, etc.

23) Write the possibilities of Doppler Effect.

Answer : i) The listener moves towards or away from a stationary source.

ii) The source moves towards or away from a stationary listener.

iii) Both source and listener move towards or away from one other.

iv) The medium moves when both source and listener are at rest.

24) What are sound waves?

Answer : The vibrating bodies produce energy in the form of waves, which are nothing but sound waves.

25) Suppose you and your friend are on the moon. Will you be able to hear any sound produced by your friend?

Answer : As the moon does not have air, I will not be able to hear any sound produced by my friend.

26) What are longitudinal waves?

Answer : i) The waves in which the particles of the medium vibrate along the direction of propagation of the waves are called longitudinal waves.

ii) Eg, Sound waves.

27) What are compressions and rarefactions?

Answer : i) Longitudinal waves are characterized by compression and rarefactions.

ii) A series of high-pressure regions are called compression and low-pressure regions are called rarefactions.

28) Define wave velocity.

Answer : The velocity with which the wave travels through the medium is called wave velocity.

29) Why is the speed of longitudinal wave greatest in steel?

Answer : i) The speed of a longitudinal wave is greatest in steel due to its elasticity.

ii) Hence speed is also greatest in steel.

30) What is meant by reflection of sound?

Answer : When sound waves travel in a given medium and strike the surface of another medium, they can be bounced back into the first medium. This phenomenon is known as reflection of sound.