

1. How does the sound produced by a vibrating object in a medium reach your ear?
2. Explain how sound is produced by your school bell ?
3. Suppose you and your friend are on the Moon. Will you be able to hear any sound produced by your friend ?
4. Guess which has a higher pitch : a guitar or a car horn ?
5. How are the wavelength and frequency of a sound wave related to its speed ?
6. Calculate the wavelength of a sound wave whose frequency is 220 Hz and speed is 440 m/s in a given medium.
7. In which of the three media : air, water or iron ; does sound travel the fastest at a particular temperature ?
8. Why are sound waves called mechanical waves ?
9. Which wave property determines (a) loudness (b) pitch ?
10. A person is listening to a tone of 500 Hz sitting at a distance of 450 m from the source of the sound. What is the time interval between successive compressions from the source ?
11. Which characteristic of the sound helps you to identify your friend by his voice while sitting with others in a dark room ?
12. Flash and thunder are produced simultaneously. But thunder is heard a few seconds after the flash is seen, why ?
13. A person has a hearing range from 20 Hz to 20 kHz. What are the typical wavelengths of sound waves in air corresponding to these two frequencies? Take the speed of sound in air as  $344 \text{ ms}^{-1}$ .
14. A sound wave travels at a speed of  $339 \text{ ms}^{-1}$ . If its wavelength is 1.5 cm, what is the frequency of the wave ? Will it be audible ?
15. Distinguish between loudness and intensity of sound.
16. A stone is dropped from the top of a tower 500 m high into a pond of water at the base of the tower. When is the splash heard at the top? Given,  $g = 10 \text{ ms}^{-2}$  and speed of sound =  $340 \text{ ms}^{-1}$ .
17. What are wavelength, frequency, time period and amplitude of a sound wave?
18. Why are the ceilings of concert halls curved?
19. What is the audible range of the average human ear?
20. What is the range of frequencies associated with?  
(a) infrasound                      (b) ultrasound ?
21. Explain how bats use ultrasound to catch a prey.
22. How is ultrasound used for cleaning?
23. A sonar device on a submarine sends out a signal and receives an echo 5 s later. Calculate the speed of sound in water if the distance of the object from the submarine is 3625 m.
24. An echo is returned in 3 s. What is the distance of the reflecting surface from the source, given that the speed of sound is 342 m/s.
25. When a sound is reflected from a distant object, an echo is produced. Let the distance between the reflecting surface and the source of sound production remains the same. Do you hear echo sound on a hotter day?
26. A submarine emits a sonar pulse, which returns from an underwater cliff in 1.02 s. If the speed of sound in water is 1531 m/s, how far away is the cliff ?
27. Give two practical applications of reflection of sound waves.
28. What is reverberation ? How can it be reduced ?
29. Explain how the human ear works.