

India's Number 1 Education App

PHYSICS

NCERT - NCERT PHYSICS(HINGLISH)

SOUND

Solved Examples

1. A sound wave has a frequency of 2kHz and wavelength 35cm. How long will it take to travel 1.5km?



2. A person clapped his hands near a cliff and heard the echo after 2 s. what is the distance of the cliff from the person if the speed of the sound. v is taken as $346 m s^{-1}$?



3. A ship sends out ultrasound that returns form the seabed and is detected after 3.42s. If

the speed of the ultrasound through sea water is 1531m/s, what is the distance of the seabed from the ship ?

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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? Watch Video Solution 3. Why are sound waves called mechanical waves? Watch Video Solution

4. Suppose you and your friend are on the Moon. Will you be able to hear any sound produced by your friend ?



5. Which wave property determines

(a) loudness

(b) Pitch ?

6. Guess which has a higher pitch : a guitar or

a car horn ?



7. What are wavelength, frequency, time period

and amplitude of a sound wave ?

8. How are the wavelength and frequency of a

sound wave related to its speed ?

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9. Calculate the wavelength of a sound wave whose frequency is 220Hz and speed is 440m/s in a given medium.

10. A person is listening to a tone of 500Hz sitting at a distance of 450m from the source of the sound. What is the time interval between successive compressions from the source ?

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11. Distinguish between loudness and intensity

of sound.



12. In which of the three media : air, water or iron , does sound travel the fastest at a particular temperature ?



13. An echo is returned in 3s. What is the distance of the reflecting surface from the source, given that the speed of sound is 342m/s.

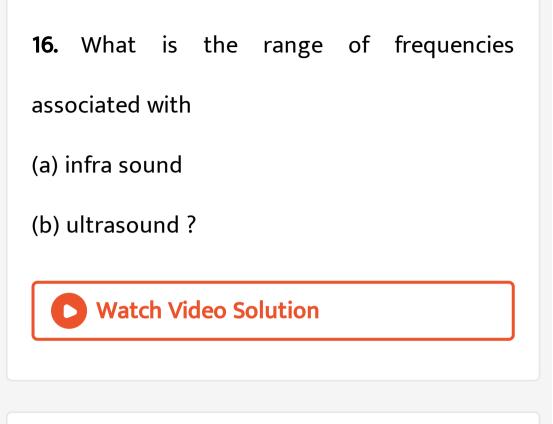
14. Why are the ceilings of concert halls curved

?



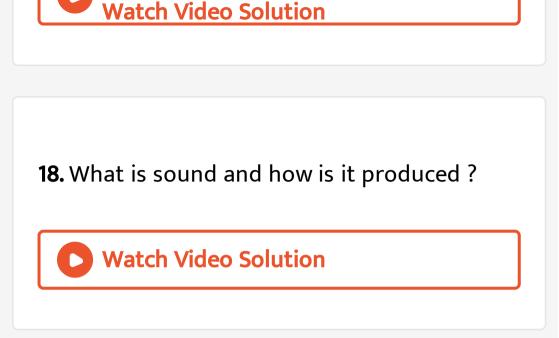
15. What is the audible range of the average

human ear ?



17. A submarine emits a sonar pulse, which returns from an underwater cliff in 1.02s. If the speed of sound in water is 1531m/s, how far away is the cliff ?



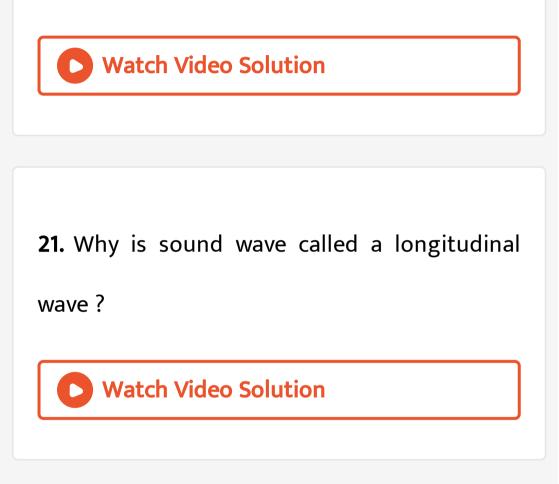


19. Describe with the help of a diagram, how compressions and rarefactions are produced

in air near a source of sound.

20. Cite an experiment to show that sound

needs a material for its propagation.



22. Which characteristic of the sound helps you to identify your friend by his voice while

sitting with others in a dark room ?



23. Flash and thunder are produced simultaneously. But thunder is heard a few seconds after the flash is seen, why ?

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24. A person has a hearing range from 20Hz to 20kHz. What are the typical wavelength of

sound waves in sir corresponding to these two

frequencies ? Take the speed of sound in air as

344m/s.

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25. Two children are at opposite ends of an aluminium rod. One strikes the end of the rod with a stone. Find the ratio of times taken by the sound wave in air and in aluminium to reach the second child.

26. The frequency of a source of sound is 100Hz. How many times does it vibrate in a minute ?

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27. Does sound follow the same laws of

reflection as light does ? Explain.

28. 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 remain the same. Do you hear echo sound on a hotter day ?

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29. Give two practical applications of reflection

of sound waves.

30. A stone is dropped from the top of a tower 500m high into a pond of water at the base of the tower. When is the splash heard at the top ? Given, $g = 10m/s^2$ and speed of sound = 340m/s.

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31. A sound wave travels at a speed of $339m\,/\,s$

. If its wavelength is 1.5cm, what is the

frequency of the wave ? Will it be audible ?





32. What is reverberation ? How can it be

reduced ?

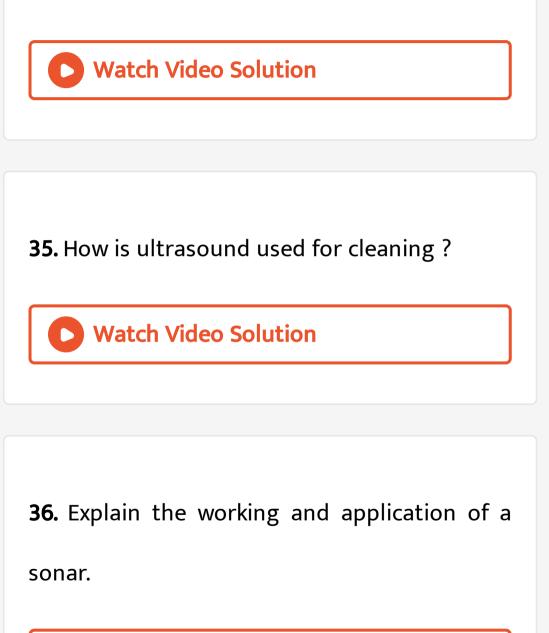


33. What is loudness of sound ? What factors

does it depend on ?

34. Explain how bats use ultrasound to catch a

prey.



37. A sonar device on a submarine sends out a signal and receives an echo 5s later. Calculate the speed of sound in water if the distance of the object from the submarine is 3625m,



38. Explain how defects in a metal block can be

detected using ultrasound.

39. Explain how the human ear works.

