



PHYSICS

BOOKS - BAL BHARTI

STUDY OF SOUND

Examples

1. How long will it take for a sound wave of 25 cm wavelength and 1.5 kHz frequency, to travel a distance of 1.5 km?



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2. Ultrasonic waves are transmitted downwards into the sea with the help of a SONAR. The reflected sound is received after 4 s. What is the depth of the sea at that place?

(Velocity of sound in seawater = $1550\text{m} / \text{s}$)



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3. Sound waves of wavelength 1cm have a velocity of 340 m/s in air. What is their frequency? Can this sound be heard by the human ear?



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Exercises

1. Sound will not travel through



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2. Fill in the blanks and explain:

The velocity of sound in steel is.....than the velocity of sound in water.



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3. Fill in the blanks and explain:

The incidence of.....in daily life shows that the velocity of sound is less than the velocity of light.



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4. Fill in the blanks and explain:

To discover a sunken ship or objects deep inside the sea,.....technology is used.



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5. The roof of a movie theatre and a conference hall is curved.



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6. The intensity of reverberation is higher in a closed and empty house.



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7. We cannot hear the echo produced in a classroom.



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8. What is an echo? What factors are important to get a distinct echo?



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9. Answer the following questions:

Study the construction of the Golghumat at Vijapur and discuss the reasons for the multiple echoes produced there.



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10. Answer the following questions:

What should be the dimensions and the shape of classrooms so that no echo can be produced there?



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11. Where and why are sound absorbing materials used?



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12. The speed of sound in air at 0° C is 332 m/s, If it increases at the rate of 0.6 m/s per degree, what will be the temperature when the velocity has increased to 344 m/s?



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13. Nita heard the sound of lightning after 4 seconds of seeing it. What was the distance of the lightning from her?

(The velocity of sound in air is $340\text{m} / \text{s}$)



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14. Sunil is standing between two walls. The wall closest to him is at a distance of 660 m. If he shouts, he hear the first echo after 4 s and another after another 2 seconds.

What is the velocity of sound in air?



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15. Hydrogen gas is filled in two identical bottles, A and B, at the same temperature. The mass of hydrogen in the two bottles is 12 gm

and 48 gm respectively. In which bottle will sound travel faster? How many times as fast as the other?



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16. Helium gas is filled in two identical bottles A and B. The mass of the gas in the two bottles is 10 gm and 40 gm respectively. If the speed of sound is the same in both bottles, what conclusions will you draw?



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17. The transverse sound waves are produced in



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Can You Recall

1. How does the velocity of sound depend on its frequency?



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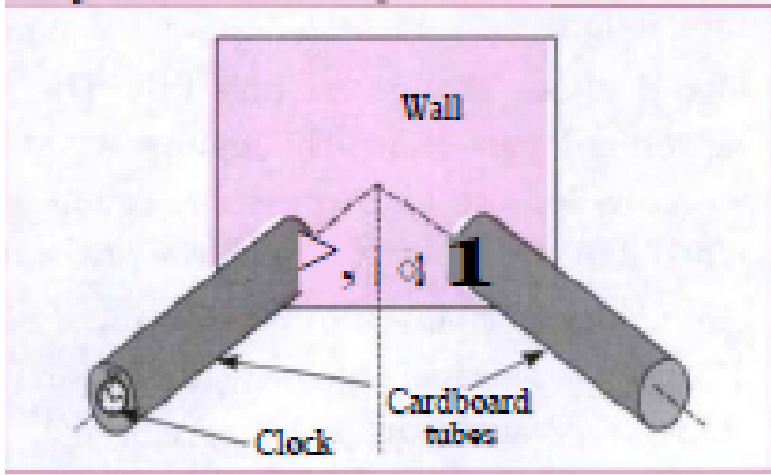
2. How is the direction of the oscillation of the particles of the medium related to the direction of propagation of the sound wave?



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Use Your Brain Power

1. In the above activity, what will happen if you lift one of the tubes to some height?



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2. To hear the echo distinctly, will the distance from the source of sound to the reflecting surface be same at all temperatures? Explain your answer.



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3. When is the reflection of sound harmful?



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4. Answer the following questions:

How will you reduce reverberation in public halls or buildings?



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