



PHYSICS

BOOKS - FULL MARKS PHYSICS (TAMIL ENGLISH)

SOUND

Exercise Choose The Correct Answer

1. Which of the following vibrates when a musical note is produced by the cymbals in a orchestra?

- A. stretched strings
- B. stretched membranes
- C. air columns
- D. metal plates

Answer: A



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2. Sound travels in air:

- A. if there is no moisture in the atmosphere.
- B. if particles of medium travel from one place to another.
- C. if both particles as well as disturbance move from one place to another.
- D. if disturbance moves.

Answer: B



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3. A musical instrument is producing continuous note. This note cannot be heard by a person having a normal hearing range. This note must then be passing through

A. wax

B. vacuum

C. water

D. empty vessel

Answer: D



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4. The maximum speed of vibrations which produces audible sound will be in

A. seawater

B. round glass

C. dry air

D. Human blood

Answer: A

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5. Sound waves travel very fast in ____.

A. in liquids

B. in gases

C. in solids

D. in vacuum

Answer: C

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Exercise Fill In The Blanks

1. Sound is a Wave and needs a material medium to travel.

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2. ___ is the number of vibrations in the medium in one second.



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3. The velocity of sound in solid is than the velocity of sound in air.



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4. Vibration of object produces



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5. Loudness is proportional to the square of the



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6. is a medical instrument used for listening to sounds produced in the body.

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7. The repeated reflection that results in persistence of sound is called

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Exercise Match The Following

1.

Column - I

- (a) Tuning fork
- (b) Sound
- (c) Compressions
- (d) Amplitude
- (e) Ultrasonics

Column - II

- (i) The point where density of air is maximum
- (ii) Maximum displacement from the equilibrium position
- (iii) The sound whose frequency is greater than 20,000 Hz
- (iv) Longitudinal wave
- (v) Production of sound

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Exercise Answer In Brief

1. Through which medium sound travels faster, iron or water? Give reason.

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2. Name the physical quantity whose SI unit is 'hertz'. Define.

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3. What is meant by supersonic speed?

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4. How does the sound produced by a vibrating object in a medium reach your ears?



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



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Exercise Answer In Detail

1. Describe with diagram, how compressions and rarefactions are produced.



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2. An object of mass 100 kg is accelerated uniformly from a velocity of 5 m s⁻¹ to 8 m s⁻¹ in 6 s. Calculate the initial and final momentum of the object. Also, find the magnitude of the force exerted on the object.



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3. List the applications of sound.



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4. Explain how does SONAR work?



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Exercise Numerical Problem

1. The frequency of a source of sound is 600 Hz. How many times does it vibrate in a minute?



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2. A stone is dropped from the top of a tower 750 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 = 340ms^{-1}).



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In Text Problems

1. A sound wave has a frequency of 2 kHz and wavelength of 15 cm. How much time will it take to travel 1.5 km ?



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2. What is the wavelength of a sound wave in air at 20°C with a frequency of 22 Mhz?



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3. A man fires a gun and hears its echo after 5s. The man then moves 310 m towards the hill and fires his gun again. If he hears the echo after 3 s, calculate the speed of sound.

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4. A ship sends out ultrasound that returns from the seabed and is detected after 3.42 s. If the speed of ultrasound through sea water is 1531ms^{-1} , what is the distance of the seabed from the ship?

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Additional Questions Answer The Following Questions

1. "Sound needs a medium for propagation". Justify with an experiment.

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2. Name the characteristics that describe a sound.



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3. What does the intensity of sound heard at a place depend on?



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4. Why is sound wave called longitudinal wave?



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5. What is sound and how is it produced?



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6. How can two whales in the sea, hundreds of kilometers apart, communicate?

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7. What is a stethoscope? What is the principle on which it works?

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8. What is an ECG? How does it help in the field of medicine?

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