PHYSICS

NCERT - NCERT PHYSICS(TAMIL ENGLISH)

SOUND

Example

1. Find the time period of the wave whose frequency is 500Hz?

Watch Video Solution

2. In a certain gas, a source produces 40,000 compression and 40,000 rarefaction pulses in 1 sec. When the second compression pulse is produced, the first is 1cm away from the source. Calculate the wave speed.

Watch Video Solution

3. An echo is heard after 0.8s, when a boy fires a cracker, 132m away from a tall building. Calculate the speed of sound?

Watch Video Solution

4. A research team sends a sonar signal to confirm the depth of a sea. They heard an echo after 6s.Find the depth of the sea. an echo after 6s.Find the depth of the sea m/s?

Watch Video Solution

5. Find the time period of the wave whose frequency is 500Hz?

Watch Video Solution

6. In a certain gas, a source produces 40,000 compression and 40,000 rarefaction pulses in 1 sec. When the second compression pulse is produced, the first is 1cm away from the source. Calculate the wave speed.

Watch Video Solution

7. An echo is heard after 0.8s, when a boy fires a cracker, 132m away from a tall building. Calculate the speed of sound?

Watch Video Solution

8. A research team sends a sonar signal to confirm the depth of a sea. They heard an echo after 6s.Find the depth of the sea. an echo after 6s.Find the depth of the sea m/s?

Watch Video Solution

Think And Discuss

1. Do compressions and rarefactions in sound wave travel in same directions or in opposite directions ? Explain.

Watch Video Solution

2. What will be the frequency sound having 0.20 m as its wavelength, when it travels with

a speed of $331ms^{-1}$?

Watch Video Solution

3. The frequency of source of sound is 10Hz. How many times does it vibrate in one minute?

Watch Video Solution

4. Gently strike a hanging bell (temple bell) and try to listen to the sound produced by it

with a stethoscope keeping it both at bottom portion and top portion of the bell. Is the pitch and loudness of the sound same at the two portions ? Why ?

Watch Video Solution

5. During a thunderstorm if you notice a 3 second delay between the flash of lightning and sound of thunder. What is the approximate distance of thunderstorm from you.

Watch Video Solution

6. Two girls are playing on identical stringed instruments. The strings of the both instruments are adjusted to give notes of same pitch. Will the quality of two notes be same? Justify your answer.

Watch Video Solution

7. What change would you expect in the characteristic of a musical sound when we

increase its frequency at one instance and amplitude at another instance?

Watch Video Solution

8. What could be the reason for better reflection of sound by rough surfaces than polished surfaces?

Watch Video Solution

9. Why is an echo weaker than the original sound ?

Watch Video Solution

10. In a closed box if you say hello, the sound heard will be Hellooooo..... What does it mean?

Watch Video Solution

11. What is the advantage of having conical openings in Horns, megaphones etc. ?

Watch Video Solution

12. Why do we put cushions on the chairs, carpet on the floor, straw materials on the walls in cinema halls?

Watch Video Solution

13. What is the benefit of using ultrasound over light waves in the above applications?

Watch Video Solution

14. Do compressions and rarefactions in sound wave travel in same directions or in opposite directions ? Explain.

Watch Video Solution

15. Does the frequency of sound waves depend on the medium in which it travels? How?

Watch Video Solution

16. The frequency of source of sound is 10Hz. How many times does it vibrate in one minute?

Watch Video Solution

17. Gently strike a hanging bell (temple bell) and try to listen to the sound produced by it with a stethoscope keeping it both at bottom portion and top portion of the bell. Is the pitch and loudness of the sound same at the two portions ? Why ?

Watch Video Solution

18. During a thunderstorm if you notice a 3 second delay between the flash of lightning

and sound of thunder. What is the approximate distance of thunderstorm from you.

Watch Video Solution

19. Two girls are playing on identical stringed instruments. The strings of the both instruments are adjusted to give notes of same pitch. Will the quality of two notes be same? Justify your answer.

Watch Video Solution

20. What change would you expect in the characteristic of a musical sound when we increase its frequency at one instance and amplitude at another instance?

Watch Video Solution

21. What could be the reason for better reflection of sound by rough surfaces than polished surfaces?

Watch Video Solution

22. Why is an echo weaker than the original sound ?

Watch Video Solution

23. In a closed box if you say hello, the sound heard will be Hellooooo..... What does it mean?

Watch Video Solution

24. What is the advantage of having conical openings in Horns, megaphones etc. ?

Watch Video Solution

25. Why do we put cushions on the chairs, carpet on the floor, straw materials on the walls in cinema halls?

Watch Video Solution

26. What is the benefit of using ultrasound over light waves in the above applications?

Watch Video Solution

Let Us Improve Our Learning Reflections On Concepts

1. Explain the following terms :

(a) amplitude (b) wavelength (c) frequency (AS_1)

Watch Video Solution

2. Write the relation between wavelength, frequency and speed of sound (AS_1)

Watch Video Solution

3. Which has larger frequency – infrasonic sound or ultrasonic sound? (AS_2)

Watch Video Solution

4. What do you understand by a sound wave? (AS_1)

Watch Video Solution

5. Why is soft furnishing avoided in concert halls? (AS_7)

Watch Video Solution

6. Define the wavelength of a sound wave. How is it related to the frequency and the wave speed? (AS_1)

Watch Video Solution

7. Explain the following terms :

(a) amplitude (b) wavelength (c) frequency (AS_1)

Watch Video Solution

8. Write the relation between wavelength, frequency and speed of sound (AS_1)

Watch Video Solution

9. Which has larger frequency – infrasonic sound or ultrasonic sound? (AS_2)

Watch Video Solution

10. What do you understand by a sound wave? (AS_1)

Watch Video Solution

11. Why is soft furnishing avoided in concert halls? (AS_7)

Watch Video Solution

12. Define the wavelength of a sound wave. How is it related to the frequency and the wave speed? (AS_1)

Watch Video Solution

Let Us Improve Our Learning Application Of Concepts

1. State the laws of reflection.

Watch Video Solution

2. Two sources A and B vibrate with the same amplitude. They produce sounds of frequencies 1kHz and 30kHz respectively. Which of the two waves will have larger power? (AS_1)

Watch Video Solution

3. You might have observed that sometimes your pet dog starts barking though no one is seen near in its surroundings or no

disturbance heard nearby. Does this observation raise any doubts in your mind about the peculiar behavior of dog after your understanding about 'range of hearing the sound'. If yes, write them. (AS_2)

Watch Video Solution

4. How are multiple reflections of sound helpful to doctors and engineers? (AS_7)

Watch Video Solution

5. Does the sound follow same laws of reflection as light does? (AS_1)

Watch Video Solution

6. Two sources A and B vibrate with the same amplitude. They produce sounds of frequencies 1kHz and 30kHz respectively. Which of the two waves will have larger power? (AS_1)

Watch Video Solution

7. You might have observed that sometimes your pet dog starts barking though no one is seen near in its surroundings or no disturbance heard nearby. Does this observation raise any doubts in your mind about the peculiar behavior of dog after your understanding about 'range of hearing the sound'. If yes, write them. (AS_2)

Watch Video Solution

8. How are multiple reflections of sound helpful to doctors and engineers? (AS_7)

Watch Video Solution

Let Us Improve Our Learning Higher Order Thinking Questions

1. Explain the working and applications of SONAR.

Watch Video Solution

2. How do you appreciate efforts of a musician to produce melodious sound using a musical instrument by simultaneously controlling frequency and amplitude of the sounds produced by it. (AS_6)

Watch Video Solution

3. How do echoes in a normal room affect the quality of the sounds that we hear? (AS_7)

Watch Video Solution

4. Explain the working and applications of SONAR.

Watch Video Solution

5. How do you appreciate efforts of a musician to produce melodious sound using a musical instrument by simultaneously controlling frequency and amplitude of the sounds produced by it. (AS_6)

Watch Video Solution

6. How do echoes in a normal room affect the quality of the sounds that we hear? (AS_7)

Watch Video Solution

Let Us Improve Our Learning Multiple Choice Questions

1. When can you say that the sound is propagating through a medium

A. If the medium is travelling

B. The particles of a medium are travelling

C. When the source of sound is travelling

D. When the disturbance is travelling.

Answer:

 Watch Video Solution

2. The unit for the number of waves produced in a second are

A. hertz

B. joule

C. meter

D. pascal

Answer:

Watch Video Solution

3. The sounds of frequency less than 20 Hz are known as

A. Ultra sounds

B. Soft sounds

C. Louder sounds

D. Infrasonics

Answer:

Watch Video Solution

4. The sound limit between the frequency of 20Hz – 20000Hz is called as

A. Audible range

B. Ultra sound range

C. Low sound range

D. Sonic boom

Answer:

Watch Video Solution

5. The characteristic feature of sound which conveys the sensation of sound to our brain is

A. Pitch

B. Loudness

C. Quality

D. amplitude

Answer:

Watch Video Solution

6. When can you say that the sound is propagating through a medium

A. If the medium is travelling

B. The particles of a medium are travelling

C. When the source of sound is travelling

D. When the disturbance is travelling.

Answer:

Watch Video Solution

7. The unit for the number of waves produced in a second are

A. hertz

B. joule

C. meter

D. pascal

Answer:

Watch Video Solution

8. The sounds of frequency less than 20 Hz are known as

A. Ultra sounds

B. Soft sounds

C. Louder sounds

D. Infrasonics

Answer:

Watch Video Solution

9. The sound limit between the frequency of 20Hz – 20000Hz is called as

A. Audible range

B. Ultra sound range

C. Low sound range

D. Sonic boom

Answer:

Watch Video Solution

10. The characteristic feature of sound which conveys the sensation of sound to our brain is

A. Pitch

B. Loudness

C. Quality

D. amplitude

Answer:

Watch Video Solution

Let Us Improve Our Learning Suggested Projects

1. Collect the information about the animals which communicate through Infrasonics or ultrasonics. Collect their pictures and write a report on their communication technique.

Watch Video Solution

2. We know that the sound is a form of energy. So, the large amount of energy produced due to the sound pollution in cosmopolitan cities can be used to our day to day needs of energy.

It also helps us to protect biodiversity in urban areas". Do you agree with this statement? Collect information on this and write a report.

Watch Video Solution

3. Collect the information about the animals which communicate through Infrasonics or ultrasonics. Collect their pictures and write a report on their communication technique.

Watch Video Solution

4. We know that the sound is a form of energy. So, the large amount of energy produced due to the sound pollution in cosmopolitan cities can be used to our day to day needs of energy. It also helps us to protect biodiversity in urban areas". Do you agree with this statement? Collect information on this and write a report.

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?

View Text Solution

2. What is the wavelength of a sound wave in air at $20^{\circ} C$ with a frequency of 22 MHz?

View Text Solution

3. A man fires a gun and hears its echo after 5 s. 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.

View Text Solution

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 $1531 \ \mathrm{m\,s^{-1}}$, what is the distance of the seabed from the ship?

View Text Solution