PHYSICS

BOOKS - R G PUBLICATION

SOUND

Example

1. How does the sound produced by a vibrating object in a medium reach your ear?

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2. Explain how sound is prodeuced by your school bell.

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3. Why are sound waves called mechanical waves?

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4. 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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5. Which wave property determines (a) loudness (b) pitch?

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6. Guess which sound has a higher pitch guitar or car horn?

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7. What are wavelength, frequency, time period and amplitudes of a sound wave?

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8. How are the wavelength and frequency of a sound wave related to its speed?

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

10. A person is listening to a tone of 500Hz sitting at a distance of 450 m 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.

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

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13. An echo was heard after 3s. What is the distance of the reflecting surface from the source, given that the speed of sound is $342ms^{-1}$?

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14. Why are the ceiling of concert halls curved?

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15. What is the audible range of the average human ear?

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16. What is the range of frequencies associated with Infrasound?

17. What is the range of frequencies associated with Ultrasound?

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

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19. What is sound and how is it produced?

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20. Describe with the help of a diagram, how compressions and rarefactions are produced in air near a source of sound.

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21. Cite an experiment to show that sound needs a material medium for its propagation.

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22. Why is sound wave called a longitudinal wave?

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23. Which characteristic of the sound helps you to identify your friend by his voice while sitting with others in a dark room?

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

25. 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 $344ms^{-1}$.

26. 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.

27. The frequency of a source of sound is 100 Hz. How money times does it vibrate in a

minute?

28. Does sound follow the same laws of reflection as light does? Explain?

29. 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?

30. Give two practical applications of reflection of sound waves.

31. 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= $10ms^{-1}$ and speed of sound = $340ms^{-1}$.

32. A sound wave travels at a speed of $339ms^{-1}$. If its wavelength is 1.5 cm, what is the frequency of the wave? Will it be audible?

33. What is reverberation? How can it be reduced?

34. What is loudness of sound? What factors does it depend on?

35. Explain how bats use ultrasound to catch a prey.

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36. How is ultrasound used for cleaning?

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37. Explain how defects in a metal block can be detected using ultrasound.

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

39. Explain how defects in a metal block can be detected using ultrasound.

40. Explain how the human ear works.

41. A body vibrates 10 times per second. The time period of the body is

A. 100s

B. 10s

C. 1s

D. 0.1S

Answer:

42. Choose the wrong statement-

A. Mechanical waves need a medium for

transmission.

B. Mechanical waves carry energy

C. Mechanical waves carry momentum

D. The speed of mechanical wave depends on the nature of the source.

Answer:

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43. The frequencies and velocities of two waves are equal. If wavelengths of the two waves are λ_1 and λ_2 respectively, then.

A. $\lambda_1 < \lambda_2$

B. $\lambda_1 > \lambda_2$

C. $\lambda_1 = \lambda_2$

D. $\lambda_1 > \lambda_2$

Answer:

44. The distance between two consecutive compressions (c) or two consecutive rarefactions is

A. λ

B. $\lambda/2$

C. 2λ

D. $1/\lambda$

Answer:

45. At the place of compession

A. Density of the medium increases

B. Density of the medium decreases

C. There is no change in density

D. Density may increase of decrese.

Answer:

46. At the place of rarefraction

A. Density of the medium increases

B. Density of the medium decreases

C. There is no change in density

D. Density may increase of decrese.

Answer:

47. The relation between frequency (v) and time period (T) is

A. $v = T$

B. $v = 2T$

C. $v = T/2$

D. $v = \dfrac{1}{T}$

Answer:

48. The relation between speed of wave v, wavelength λ and time period T is

A. $v = \dfrac{\lambda}{T}$

B. $v = \lambda T$

C. $\lambda = v/T$

D. $T = v/\lambda$

Answer:

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49. Sound wave is

A. mechanical wave

B. electromagnetic wave

C. Pressre wave

D. none of these.

Answer:

50. Speed of sound wave is

A. higher than the speed of light wave

B. lesser than the speed of light wave

C. equal to the speed of light wave

D. none of these.

Answer:

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51. Speed of sound is maxium.

A. in steel

B. in water

C. in air

D. in O_2

Answer:

52. In any medium as temperature increases

    A. speed of sound increases

    B. speed of sound decreases

    C. speed of sound remains the same

    D. none of these.

Answer:

53. Speed of sound in air at $22°C$

A. 331 m/s

B. 344 m/s

C. 320 m/s

D. 324 m/s

Answer:

54. For hearing distinct echoes the minimum distance between obstacle and source is

A. 17.2

B. 16.5m

C. 100 m

D. 15 m

Answer:

55. Four sources emit sound waves of four different frequencies . Which one can not be heard?

A. 10Hz

B. 100 Hz

C. 1000 Hz

D. 10,000 Hz

Answer:

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56. The frequencies of infrasound.

      A. below 20 Hz

      B. above 20 Hz

      C. between 20 Hz and 20,000 Hz

      D. above 20 kz.

Answer:

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57. S.I. unit of frequency is

A. m

B. c.m.

C. Hz

D. km

Answer:

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58. Note is a sound

A. of mixture of several frequencies

B. of mixture of two frequencies only

C. of a single frequency

D. always unpleasant to listen

Answer:

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59. Infrasound can be heard by

A. dog

B. bat

C. rhnoceros

D. human beings

Answer:

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60. What is mechanical wave?

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61. What is a wave?

62. If the particles of the medium move in the direction of propagation of wave?

63. What is longitudinal waves?

64. What is transverse wave?

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65. Give one example of longtitudinal wave.

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66. Give one example of transverse wave.

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67. What are compressions?

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68. What are rarefactions?

▶ **Watch Video Solution**

69. What is time period?

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70. Write the relation between frequency (v) and time period (T)`

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71. What is rich quality sound?

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72. What is a tone?

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73. What is a note?

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74. What is the velocity of sound in air at $0°C$.

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75. What is the minimum time interval between the original sound and the reflected

sound to hear a distinct echo?

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76. What is infrasound?

▶ Watch Video Solution

77. What is ultra sound?

▶ Watch Video Solution

78. What is supersonioc speed?

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79. Name two object that move with supersonic speed.

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80. What is echocardiography?

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81. Establish the relation between time period and frequency.

82. Establish the relation $v = v\lambda$, where v $\rightarrow$ speed of wave $v \rightarrow$ frequency, $\lambda \rightarrow$ wavelength.

83. What is hearing aid? How does hearing aid work?

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84. Explain the process of 'Ultrasonography'.

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85. A sound wave has a frequancy 20 MHz. Find out the time period.

86. A radio signal has wave length 300 m and speed $3 \times 10^8 m/s$. Find out the frequency of the signal.

87. A man standing on the seashore has seen that the no of waves that hit the shore per

mnute is 60. If speed of wave is 10m/s, find out the wave length.

88. A source oscillates 50 times in 5 s. If the distance between compression and rarefaction of the medium is 10m, find out the frequency, wavelength and speed of the wave.

89. A persion clapped his hands in front of a wall and heard echo later 1s. If speed of sound m air is 330 m/s, find out the distance between the person and the wall.

90. A tuning fork oscillates 350 times in second. What is the distance travelled by the sound wave emitted by the tuning fork after

its 5 oscillation. The speed of sound in air is

350 m/s

91. A man'stationed between two hills fires a

gun. He hears the first echo after 1 s and the

second after 2 s. What is the distance between

the hills. The speed of sound in air is 330 m/s.