PHYSICS

BOOKS - SURA PHYSICS (TAMIL ENGLISH)

ACOUSTICS

Textbook Evatuation Choose The Correct Answer

1. When a sound wave travels through air, the air particles _____ .

A. vibrate along the direction of the wave

motion

B. vibrate but not in any fixed direction

C. vibrate perpendicular to the direction of

the wave motion

D. do not vibrate

Answer: A

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2. Velocity of sound in a gaseous medium is $330ms^{-1}$. If the pressure is increased by 4 times without causing a change in the temperature, the velocity of sound in the gas is ....

A. $330ms^{-1}$

B. $660ms^{-1}$

C. $156ms^{-1}$

D. $990ms^{-1}$

Answer: A

3. The frequency, which is audible to the human ear is

    A. 50 kHz

    B. 20 kHz

    C. 15000 kHz

    D. 10000 kHz

Answer: B

▶

4. The velocity of sound in air at a particular temperature is $330ms^{-1}$. What will be its value when temperature is doubled and the pressure is halved?

A. $330ms^{-1}$

B. $165ms^{-1}$

C. $330 \times \sqrt{2}ms^{-1}$

D. $320 \times \sqrt{2}ms^{-1}$

Answer: C

5. If a sound wave travels with a frequency of $1.25 \times 10^4 Hz$ at $344 ms^{-1}$, the wave length will be _____ .

   A. 27.52 m

   B. 275.2 m

   C. 0.02752 m

   D. 2.752 m

Answer: C

6. The sound waves are reflected from an obstacle into the same medium from which , they were incident. Which of the following changes?

    A. speed

    B. frequency

    C. wavelength

D. none of these

Answer: D

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7. velocity of sound in the atmosphere of a planet is 500ms^-(1). The minimum distance between the sources of sound and the obstacle to hear the echo, should be

A. 17m

B. 20m

C. 25 m

D. 50 m

Answer: C

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Textbook Evatuation Fill In The Blanks

1. Rapid back and forth motion of a particle about its mean position is called _____.

2. If the energy in a longitudinal wave travels from south to north, the particles of the medium would be vibrating in _____

3. A whistle giving out a sound of frequency $450 Hz$, approaches a stationary observer at a

speed of $33ms_1$. The frequency heard by the observer is (speed of sound $= 330ms_1$____.

4. A source of sound is travelling with a velocity 40 km/h towards an observer and emits a sound of frequency 2000 Hz. If the velocity of sound is 1220 km/h, then the apparent frequency heard by the observer is.

....

Textbook Evatuation True Or False If False Give The Reason

1. Sound can travel through solids, gases, liquids and even vacuum.

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2. Waves created by Earth Quake are infrasonic.

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3. Is the velocity of sound independent of temperature?.

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4. True or False. The velocity of sound is high in gases than liquids.

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1. Match the following

1.	Infrasonic	-	(a)	Compressions
2.	Echo	-	(b)	22 kHz
3.	Ultrasonic	-	(c)	10 Hz
4.	High pressure region	-	(d)	Ultrasonography

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1. Assertion: The change in air pressure affects the speed of sound.

Reason: The speed of sound in a gas is proportional to the square of the pressure

    A. If both the assertion and the reason are true and the reason is the correct explanation of the assertion.

    B. If both the assertion and the reason are true but the reason is not the correct explanation of the assertion.

C. Assertion is true, but the reason is false.

D. Assertion is false, but the reason is true.

Answer: C

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2. Assertion: Sound travels faster in solids than in gases.

Reason : Solid posses a greater density than that of gases.

A. If both the assertion and the reason are true and the reason is the correct explanation of the assertion.

B. If both the assertion and the reason are true but the reason is not the correct explanation of the assertion.

C. Assertion is true, but the reason is false.

D. Assertion is false, but the reason is true.

Answer: B

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1. What are longitudinal waves? Give one example.

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2. What is the audible range of frequency?

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3. What is the minimum distance needed for an echo?

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4. What will be the frequency of sound having 0.20 m as its wavelength, when it travels with a speed of $331 ms^{-1}$?

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5. Name three animals, which can hear ultrasonic vibrations.

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Textbook Evatuation Answer Briefly

1. Why does sound travel faster on a rainy day than on a dry day?

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2. Why does an empty vessel produce more sound than a filled one?

3. Air temperature in the Rajasthan deserrt can reach $46°C$. What is the velocity of sound in air at that temperature ? $\left(V_0 = 331ms^{-1}\right)$.

4. Explain why, the ceilings of concert halls are curved.

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5. Mention two cases in which there is no Doppler effect in sound?

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Textbook Evatuation Problem Corner

1. A sound wave has a frequency of 200 Hz and a speed of $400ms^{-1}$ in a medium. Find the wavelength of the sound wave. ?

Give : Frequency of a wave, n = 200 Hz

Speed of sound, V = $400ms^{-1}$

To find : Wavelength, $\lambda = ?$

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2. The thunder of cloud is heard 9.8 seconds later than the flash of lightning. If the speed of sound in air is $330ms^{-1}$, what will be the

height of the cloud?

Give : Time, t = 9.8 s

Speed of sound, $V = 330ms^{-1}$

To find : Height of the cloud, d = ?

3. A person who is sitting at a distance of 400 m from a source of sound is listening to a sound of 600 Hz. Find the time period between successive compressions from the source?

Given : Frequency of sound, n = 600 Hz

To find : Time period between successive compressions, T = ?

4. An ultrasonic wave is sent from a ship towards the bottom of the sea. It is found that the time interval between the .transmission and reception of the wave is 1.6 seconds. What is the depth of the sea, if the velocity of sound in the seawater is $1400ms^{-1}$?

Time interval between sending and receiving of the wave, t = 1.6 s

Velocity of sound in sea wave, $V = 1400ms^{-1}$

To find : Depth of the sea, d = ?

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5. A man is standing between two vertical walls 680 m apart. He claps his hands and hears two distinct echoes after 0.9 se,conds and 1.1 second respectively. What is the speed of sound in the air?

Given : Time of first echo, $t_i = 0.9s$

Time of second echo, $t_2 = 1.1s$

Distance between man and wall, d = 680 m

To find : Speed of sound in air, V = ?

6. Two observers are stationed in two boats 4.5 km apart. A sound signal sent by one,under water, reaches the other after 3 seconds. What is the speed of sound in the water?

Distance between two observers, d = 4 .54 km

To find : speed of sound, $V = \dfrac{d}{t} = $?

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7. A strong sound signal is sent from a ship towards the bottom of the sea. It is received back after 1s. What is the depth of sea given that the speed of sound in water $1450ms^{-1}$?

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1. What are the factors that affect the speed of sound in gases?

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2. What is mean by rellection of sound? Explain.

(a) Reflection at the boundary of a rarer medium

(b) Reflection at the boundary of a denser

(c) Reflection at sound in curved surfaces

3. (a) What do you understand by the term 'ultrasonic vibration'?

(b) State three uses of ultrasonic vibrations.

(c) Name three animals which can hear ultrasonic vibrations.

4. State three uses of ultrasonic vibrations.

5. Name three animals, which can hear ultrasonic vibrations.

6. What is an echo?

State two conditions necessary for hearing an

echo.

7.

What are the medical applications of echo?

8. (a) What are the medical applications of echo?

(b) How can you calculate the speed of sound using echo?

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Textbook Evatuation Hot Questions

1. Suppose that a sound wave and a light wave have the same frequency, then which one has a longer wavelength?

A. Sound

B. Light

C. both (a) and (b)

D. data not sufficient

Answer: B

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2. When sound is reflected from a distant object, an echo is produced. Let the distance between the reflecting surface and the source of sound remain the same. Do you hear an

echo sound on a hotter day? Justify your answer.

Government Exam Questions Answers

1. A source of sound is moving with a velocity of $50 ms^{-1}$ towards a stationary listener. The listener measures the frequency of the source as 1000Hz. What will be the apparent frequency of the source when it is moving

away from the listener after crossing him? (velocity of sound in the medium is $330 ms^{-1}$).

Additional Questions Answers Choose The Correct Answer

1. Which statement is true?

A. Sound-waves can propagate as

longitudinal or transverse depending on

the transmitting medium.

B. Sound waves are transverse and they propagate perpendicular to the transmitting medium.

C. Sound waves are longitudinal waves and they propagate parallel to the transmitting medium.

D. Sound waves can propagate as longitudinal or transverse depending on the temperature.

Answer: C

2. The velocity of sound in gases is affected by

_____ .

    A. temperature

    B. density

    C. relative humidity

    D. all the above

Answer: D

3. A sound wave passes through gold rod and comes into the surrounding air. What is the relation between original wavelength λ and new wavelength λ' ?

A. $\lambda = \lambda'$

B. $\lambda > \lambda'$

C. $\lambda < \lambda'$

D. none of these

Answer: B

4. At what velocity should a source of sound move towards a listener so that apparent frequency is twice the actual frequency?

A. 165 mis

B. 330 mis

C. 660 mis

D. 110 mis

Answer: A

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5. The region of a sound wave having low pressure is _____ .

A. interference

B. refraction

C. rarefaction

D. compression

Answer: C

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6. A car playing music at a frequency of 250 Hz moves at 20 m/s . towards an observer. What frequency the observer can hear when (i) it approaches and (ii) when it passes by?

A. approaching : $250 \times \left(\dfrac{v + 20}{v} \right)$,

leaving : $250 \times \left(\dfrac{v - 20}{v} \right)$

B. approaching , $250 \times \left(\dfrac{v}{v + 20} \right)$,

leaving : $250 \times \left(\dfrac{v}{v - 20} \right)$

C. approaching : $250 \times \left(\dfrac{v - 20}{v} \right)$,

leaving : $250 \times \left(\dfrac{v + 20}{v} \right)$

D. approaching : $250 \times \left(\dfrac{v}{v - 20} \right)$,

leaving : $250 \times \left(\dfrac{v}{v + 20} \right)$

Answer: D

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7. Ultrasound waves compared to audible sound waves have _____ .

   A. Lower frequency and Shorter wavelength

   B. Lower frequency and longer wavelength

   C. higher frequency and longer wavelength

   D. higher frequency and shorter wavelength.

Answer: D

8. The speed of sound in air is 340 m/s and wavelength 1.7m.calculate the frequency and period

9. Distance between two consecutive compressions is _____ .

A. λ

B. $\lambda/2$

C. $\lambda/4$

D. 2λ

Answer: B

10. Earthquake produces _____ .

A. Ultrasound

B. Infrasound

C. audible sound

D. none

Answer: C

11. Infrasound can be heard or produced by

_____ .

A. dog

B. bat

C. rhinoceros

D. human beings

Answer: C

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12. Before playing guitar, guitarist adjust the tension and pluck the string. By doing so, he is adjusting _____ .

A. intensity of sound only

B. amplitude

C. frequency

D. loudness of sound

Answer: A

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13. The pitch of sound depends on _____ .

A. frequency

B. amplitude

C. both

D. none

Answer: B

▶ **Watch Video Solution**

14. Sound waves in air are _____ .

A. Transverse

B. longitudinal

C. both a & b

D. none

Answer: B

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15. Sound can travel in _____ .

A. air

B. any material medium

C. vacuum

D. none

Answer: C

16. The region of increased pressure in a sound wave is called _____ .

    A. crest

    B. through

    C. compression

    D. particle

Answer: C

17. Which voice is likely to have minimum frequency?

A. baby girl

B. boy

C. A man

D. Awoman

Answer: A

18. What is the frequency range of audible sound?

    A. 20 Hz to 20 kHz

    B. 1.5 Hz to 20 kHz

    C. 10 Hz to 15 kHz

    D. 20 Hz to 25 kHz

Answer: A

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19. How long sound persists in our ears?

A. $\dfrac{1}{10}$ of a second

B. $\dfrac{1}{9}s$

C. $\dfrac{1}{8}s$

D. $\dfrac{1}{7}s$

Answer: A

20. Sound travels with a speed of 330 ms^{-1}. What is the wavelength of sound whose frequency is 550 Hz?

    A. 0.6 m

    B. 0.7 m

    C. 0.4 m

    D. 0.2.m

Answer: A

21. Sound travels with a velocity of _____ in dry air

    A. $332ms^{-1}$

    B. $330ms^{-1}$

    C. $331ms^{-1}$

    D. $336ms^{-1}$

Answer: A

22. Dogs can receive sound upto _____ kHz.

A. 20

B. 25

C. 45

D. 15

Answer: B

23. Sound propagates maximum in . . . .

    A. gas

    B. liquid

    C. solid

    D. all

Answer: C

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24. Loudness of sound varies directly with vibrating body's _____ .

A. intensity

B. amplitude

C. pitch

D. quality

Answer: B

▶ Watch Video Solution

25. Sound energy passing per second through a unit area held perpendicular is called _____ .

A. intensity

B. frequency

C. amplitude

D. quality

Answer: A

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26. Bats detect obstacles in their path by receiving the reflected _____ waves.

A. radio

B. ultrasonic

C. electromagnetic

D. infrasonic

Answer: B

▶ **Watch Video Solution**

27. When sound travels through air, the air particles _____ .

A. do not vibrate

B. vibrate but not in any fixed direction

C. vibrate perpendicular to the direction of wave propagation

D. vibrate along the direction of wave propagation

Answer: D

28. Sound waves do not travel through

_____ .

A. vacuum

B. solid

C. liquid

D. gases

Answer: A

29. The speed of sound in a medium depends upon _____ .

A. frequency

B. amplitude

C. wavelength

D. properties of the medium

Answer: D

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30. A source emits a frequency of 1 kHz is moving toward a rest listener with a speed of 0.9 V, where V is the speed of sound wave. The frequency heard by the listener is _____ .

    A. 10 Hz

    B. 0.1 Hz

    C. 100 Hz

    D. 10 kHz

Answer: D

31. Doppler effect in sound is due to _____ .

A. motion of source

B. motion of the observer

C. relative motion of source· and observer

D. none of these

Answer: C

1. A wave motion is a transfer of _____ .

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2. For propagation of mechanical wave, the medium must possess _____ .

    A. a) inertia

    B. b) conductivity

C. c) plasticity

D. d) elasticity

Answer:

▶ **Watch Video Solution**

3. Speed of sound in gas is _____ than liquid.

▶ **Watch Video Solution**

4. In a region of compression there is _____ in volume.

5. Velocity of sound in air _____ by _____ for every _____ .

6. Dolphins and bats hear _____ .

7. To hear a distinct echo, each time interval between the original sound and the reflected sound must be _____ .

8. Speed of sound depends upon _____ of the medium.

9. Loud sound can travel a larger distance due to _____ .

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10. The frequency of sound wave whose time period is 0.02 second is _____ .

> ▶ Watch Video Solution

11. Sound is a form of _____ and produced by _____ .

12. High and low pressure regions of longitudinal wave is called _____ and _____ .

13. Energy of the sound wave is proportional to _____ .

▶ Watch Video Solution

14. Distance between two consecutive compressions is _____ .

▶ Watch Video Solution

15. Number of vibrations produced in one second is _____ of the wave.

16. SI unit of frequency is _____ .

17. Velocity of sound is _____ in solids.

18. Sound waves are _____ .

▶ **Watch Video Solution**

19. For louder sound _____ will be greater.

▶ **Watch Video Solution**

20. To differentiate two sounds is called _____ .

21. The speed of sound is inversely proportional to _____ .

22. When humidity increases, the speed of sound _____ .

23. Reflection of sound is called _____ .

▶ Watch Video Solution

24. The pitch of sound depends on _____ .

▶ Watch Video Solution

25. _____ surfaces are used to focus the

sound at particular point.

▶ Watch Video Solution

26. Elliptical surfaces are used in designing

_____ .

27. The minimum distance required to hear an

echo is _____

28. To determine the velocity of sound in any medium _____ is used.

29. When source and listener move towards each other the apparent frequency is _____ than actual frequency.

30. When distance between source and listener decreases apparent frequency become _____ than the actual frequency.

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31. The average speed of sound wave in sea water is _____ .

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32. The loudness of normal human voice is

_____ .

33. The minimum distance required to hear an echo is I/20th part of the magnitude of velocity of sound in air, if the velocity of sound is _____ then the minimum distance required to hear an echo is 17 .2 m.

34. The velocity of sound increases when the

_____ of the material increases.

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35. The speed of sound is inversely

proportional to _____ .

▶ **Watch Video Solution**

36. The _____ of sound in a gas increases with the increase in temperature.

▶ Watch Video Solution

37. The velocity of sound changes by _____ when the temperature changes by $1°C$.

▶ Watch Video Solution

38. The angle of incidence is equal to the angle of _____ .

39. The _____ and refraction of sound is similar to the reflection of light.

40. Sound waves that travel towards the reflecting surface are called the _____ waves.

41. The point of incidence and the point of reflection is the _____ on the reflection surface.

42. A perpendicular line drawn at the point of incidence is called the_____ .

43. In ear trumpet, the sound enters into the _____ with more intensity.

44. The apparent change in frequency first observed and explained by_____ .

45. An _____ is emitted by a source attached to a police car.

46. Full form of RADAR_____ .

47. Expansion of SONAR_____ .

48. _____ is the frequency of the sound as

heard by the listener.

49. The product of the time period of a wave and its frequency is _____ .

50. In ordinary talk, amplitude of vibration is approximately_____ .

51. If the time period of a wave increases then its frequency will _____ .

52. In a whispering hall, the speech of a person standing in one focus can be heard clearly by a _____ standing at the other focus.

53. The angle which the incident sound wave makes with the normal is called the _____ .

54. The angle formed between the reflected ray and the normal is ------.

55. A compression travelling towards the rigid wall is reflected back as a _____

56. Rarefaction travels from _____ to _____

.

57. _____ waves are sound waves with frequency below 20 Hz.

58. Waves produced during an earthquake and ocean waves are called _____ waves.

59. _____ waves with frequency greater than 20 kHz.

60. Human ear cannot detect _____ waves.

61. Bats can detect _____ waves.

62. Sound waves requires a _____ for propagation.

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63. Light waves are _____ .

▶ Watch Video Solution

64. The wavelength of sound waves ranges

from _____ .

▶ **Watch Video Solution**

65. The wavelength of light waves ranges from

_____ .

▶ **Watch Video Solution**

66. Two types of velocity are _____ velocity and _____ velocity.

67. SI unit of velocity is_____ .

68. The velocity with which the particles of a medium vibrate in order to transfer the

energy in the form of a wave is called_____ .

69. The velocity with which the wave travels through a medium is called _____ .

70. The distance travelled by a sound wave in _____ is called the velocity of the sound wave.

71. The speed of sound is directly proportional

to the square root of the _____ .

72. Velocity of sound in solids decreases as the

_____ increases.

73. When sound is reflected from a convex surface, the· reflected waves are _____ out and the intensity is decreased.

74. When sound is reflected from a concave surface, the reflected waves are _____ and focused at a point.

75. Many halls are designed with _____ reflecting surfaces to required to focus the sound at a particular point.

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76. In _____ surfaces, sound from one focus will always be reflected to the other focus, no matter where it strikes the wall.

▶ **Watch Video Solution**

77. What is persistences of hearing?

78. The minimum time interval between the two sound is _____ .

79. The minimum distance required to hear an echo is _____ part of the magnitude of the

velocity of sound in air.

80. The principle of echo is used in ____ ultrasonography.

81. Echo is used to determine the _____ of sound waves in any medium.

82. _____ are basically curved surfaces which are used in auditoria and halls to improve the quality of sound.

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83. _____ is a hearing aid used by people, who have difficulty in hearing.

▶ Watch Video Solution

84. A _____ is a horn-shaped device used to address a small gathering of people.

▶ **Watch Video Solution**

85. The frequency of radio waves emitted by a satellite decreases as the satellite passes away from the _____ .

▶ **Watch Video Solution**

86. From the frequency change, the speed and location of the aeroplanes and aircrafts are tracked by _____ .

▶ Watch Video Solution

87. The speed of marine animals and submarines can be determined by using _____ .

▶ Watch Video Solution

88. _____ is a branch of physics that deals with production, transmission, reception, control and effects of sound.

89. The vibrating bodies produce energy in the form of waves are _____ .

90. Sound is produced by _____.

91. Sound can propagate through _____ medium.

92. Sound that cannot be heard by the human ear is_____ .

93. The distance travelled by one wave is taken as _____.

94. The velocity of sound is _____ in gaseous medium.

95. As the density increases, the velocity of sound_____ .

▶ **Watch Video Solution**

96. Velocity of sound in solids decreases as the _____ increases.

▶ **Watch Video Solution**

97. When humidity increases, the speed of sound _____ .

Watch Video Solution

98. The velocity of sound changes by _____ when the temperature changes by $1°C$.

Watch Video Solution

99. The bouncing of sound waves from the interface between two media is termed as _____ .

100. The waves that strike the interface are termed as_____ .

1. Sound can propagate through gaseous medium only.

▶ View Text Solution

2. The maximum displacement of a vibrating particle in a medium is called wavelength.

▶ View Text Solution

3. Time in which a wave moves a distance equal to wavelength is frequency of sound wave.

⏵ View Text Solution

4. Sound travels faster in air than solid.

⏵ View Text Solution

5. Medium is not required for the propagation of sound.

▶ **View Text Solution**

6. Sound from long distance cannot he heard clearly during rainy reasons.

▶ **View Text Solution**

7. The particles of the medium move from one part to another part during propagation.

▶ View Text Solution

8. Compressions are region of lowest pressure.

▶ View Text Solution

9. SI unit of wavelength is cm

▶ View Text Solution

10. The sound of less than 20 Hz is called ultrasound.

▶ View Text Solution

11. The range of hearing in humans is from 20 Hz to 2000 Hz.

▶ View Text Solution

12. The sensation of sound persists in all brains for about 1 second.

▶ View Text Solution

13. Infrasonic sound is used to defect o bjects in ocean.

▶ View Text Solution

14. The higher the frequency of sound, the lower is its pitch.

▶ View Text Solution

15. To hear a distinct echo, the minute distance below source of rigid surface should be 27 m.

▶ View Text Solution

16. The speed of sound in air increases with decrease in temperature.

▶ **View Text Solution**

1. Assertion: Sound wave propagate fastest in solids.

Reason: Sound wave can propagate slightly in vacuum.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: C

▶ **View Text Solution**

2. Assertion: Ocean waves hitting a beach are transverse waves.

Reason: Ocean waves hitting a beach are assumed to be plane wave.

    A. Both assertion and reason are true and reason is the correct explanation of assertion.

    B. Both assertion and reason are true but reason is not the correct explanation of

assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: A

▶ **View Text Solution**

3. Assertion: Velocity of sound is maximum in solids than liquid and gases.

Reason: Gases are least elastic in nature.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: A

▶ View Text Solution

4. Assertion: Human ear can defect infrasonic waves.

Reason: Infrasonic waves have frequency greater than 20 Hz.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of

assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: D

▶ **View Text Solution**

5. Assertion: Pitch distinguishes a sharp from dull sound.

Reason: A female voice is shrill and male voice is grave.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: B

▶ View Text Solution

6. Assertion: Distinguishing the loud sound from faint sound is called loudness.

Reason: Loudness of normal human voice is 100 dB.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of

assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: C

▶ **View Text Solution**

7. Assertion: Sensation received by the ear

called quality.

Reason: Quality depends on the shape of wave

form.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: B

▶ View Text Solution

8. Assertion: During rainy season sound from long distances can be heard clearly.

Reason : Humidity increases speed of sound increases.

    A. Both assertion and reason are true and reason is the correct explanation of assertion.

    B. Both assertion and reason are true but reason is not the correct explanation of

assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: A

▶ **View Text Solution**

9. Assertion: Intensity of sound waves reflected

from plane surface islarge.

Reason : According to laws of reflection

intensity varies.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: D

▶ View Text Solution

10. Assertion: Intensity of soupd wave does not change when the listener moves towards or away from the stationary source.

Reason: The motion of listener causes the apparent change in wavelength.

   A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but

reason is not the correct explanation of

assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: D

▶ View Text Solution

11. Assertion: Two astronauts can talk to each other on moon through microphone.

Reason: Microphone convert sound waves into transverse waves, it can travel even in vacuum.

A. Both assertion and reason are true and reason is the correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true but reason is false.

D. Assertion is false but reason is true.

Answer: A

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Additional Questions Answers Use The Analogy To Fill In The Blank

1. Sound waves: longitudinal:: _____ : transverse

2. Speed of sound : $340ms^{-1}$ :: Speed of light :

_____

3. Earthquake : _____ :: Dolphins :

Ultrasonic waves

4. Effect of density : $V\alpha\sqrt{\dfrac{1}{d}}$ :: Effect of temperature : _____

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5. Iron: $5950ms^{-1}$ :: Water : _____ _

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6. Velodty of solid: maximum:: Velocity of gas : _____

7. Density of gas increases : speed of sound decreases :: Humidity increases : _____

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Additional Questions Answers Arrange The Following In Correct Sequence

1. Arrange the velocity of sound descending order.

Velocity of sound in liquid, Velocity of sound in vacuum, Velocity of sound in gas, Velocity of sound in solid.

2. Arrange the mediums according to the speed of sound, in an ascending order.

Aluminium, Water, Air (at $0°C$), Iron

3. Arrange the categories of sound waves according to the frequency ranges.

Ultrasonic waves, Ultra sound waves, Infrasonic waves, Audible waves

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Additional Questions Answers Very Short Answers

1. Why are sound waves called mechanical waves?

2. Which wave property determines loudness and pitch?

3. Which sound has a higher pitch, guitar or bus horn?

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

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

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6. Why do we hear sound of an approaching bus, before the bus reaches us?
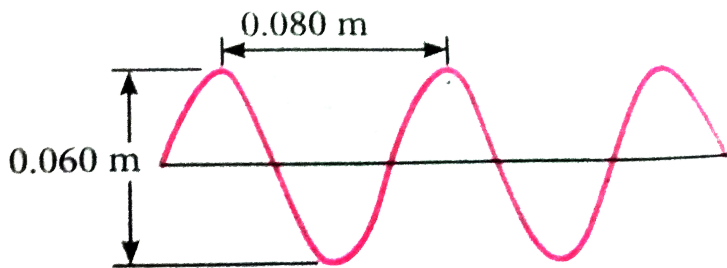
7. Why ceiling of good conference halls is curved?

8. Which characteristics of the sound helps you to identify, your friend by his voice while

sitting with others in a dark room?

9. What is the amplitude of the wave in the diagram below?

1. What is the work of architectural acoustician

?

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2. Write the properties of sound wave ?

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3. Define wavelength.

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4. Define amplitude.

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5. What is time period of sound wave ?

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6. Define frequency of a sound wave.

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7. What is particle velocity ?

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8. Define wave velocity. Find the relation between frequency wavelength and velocity.

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9. Why does sound wave travel faster in solids ?

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10. What is pitch?

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11. What is meant by quality?

12. How does the elastic modulus of the medium affect the velocity of sound?

13. Wirte the laws of reflection.

14. What is the principle used in whispering gallery ?

15. State the Doppler effect.

16. If the amplitude of a wave is doubled, what will be the loudness ?

Additional Questions Answers Long Questions

1. Write the applications of echo.

2. When you place your ear on rails, it allows you to hear the approach of a train long

before you can hear the sound of train in the air. How?

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3. What are the categories of sound waves based on th~ir frequencies?

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4. How will you determine the velocity of sound by echo method?

5. Write the difference between the sound and light waves.

6. Write any two applications for reflection of sound?

7. Explain the working and use of SONAR?

8. Calculate the apparent frequency when source and listener moving towards each other.

9. Write the applications of Doppler effect.

1. An observe approaches a stationary sound source 1000 Hz at twice the speed of sound.

What frequency does the observer hear ?

Given

Frequency of the source, n = 1000 Hz

Speed of observer, $v_L = 2v$

To find : Observer approaches the source apparent frequency n' = ?

2. What is the frequency heard by a stationary observer when a train approaches with a speed of $30ms^{-1}$. The frequency of the train is 600 Hz and the speed of sound is 340 m/s ?

Given

Speed of the train, $v_s = 30ms^{-1}$

Frequency of the train, $n = 600Hz$

Speed of sound, $v = 340 ms^{-1}$

To find : Apparent frequency n = ?

3. A boy hears two different sounds when a race car is moving toward and moving away. If the speed of sound ina ir si $340 ms^{-1}$. The frequency emitted by the car is 800 Hz and the car velocity is $120 ms^{-1}$. Find the frequency heard by the boy ? (when the car moving forward).

Given

Frequency g car's distance, $n = 800Hz$

Velocity of source, $v_s = 120ms^{-1}$

Velocity of sound, $v = 340ms^{-1}$

To find : Frequency emitted by the car, n' = ?

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4. Find the speed of sound in air at $23°C$.

Consider the speed of sound in air at $0°C$ is

$331.3ms^{-1}$

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5. At $10°C$ how for away is a reflecting surface if you hear an echo in 0.274s ?(Speed of sound in air at $0°C$ is $331.3ms^{-1}$)

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Additional Questions Answers Higher Order Thinking Skills Hots

1. Frequency is the most fundamental property of waves. Why?

2. Why longitudinal waves are called pressure waves?

3. What does cause the rolling sound of thunder?

4. Two astronauts at the surface of the moon cannot talk to each other. Why?

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5. Why does sound travel faster in solids than in gases ?

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6. Explain why sound travels faster in warm air than cool air?

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Additional Questions Answers Value B Ased Question

1. How to analyse the planets areirregular shaped?

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2. What is the method used to find it?

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