



PHYSICS

BOOKS - MTG IIT JEE FOUNDATION

SOUND

Illustrations

1. The sound from an insect is produced when it vibrates its wings at an average rate of 200

vibrations per second. What is the time period ?



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2. Find the frequency of a wave whose time period is 0.002 second.



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3. Which of the following statements are false?

Give reason.

(i) Sound is produced by vibrations.

(ii) Sound requires a medium for propagation.

(iii) Light and sound both require a medium for propagation.

(iv) Sound travels slower than light.



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4. A child hears an echo from a cliff 4 seconds after the sound from a powerful cracker is produced. How far away is the cliff from the

child? Velocity of sound in air at 20°C is 344ms^{-1} .



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Solved Examples

1. Fill in the blanks with appropriate words: If a violin string is plucked strongly, its amplitude of vibration _____ (increases/decreases) and the note heard is _____ (louder/softer).
If it is plucked lightly, its amplitude of

vibration _____(increases/decreases) and the note heard is _____(louder/softer).



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2. Give an example of object to be the best absorber of sound?



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3. What do you mean by loudness and pitch of sound?



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4. Give some measures to control noise pollution?



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5. Find the time period of a wave whose frequency is 400Hz .



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6. Differentiate between musical sound and noise?



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7. 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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8. The frequency of a source of sound is 200 Hz. How many times does it vibrate in a minute?



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9. How is ultrasound used for cleaning ?



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10. How can you make a building sound proof ?



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11. The sound of distant horses can be heard by applying the ear to the ground whereas it is inaudible if the ear is held a little distance above the ground. Explain.



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12. The sonic boom of an aircraft has a time periods of $0.00005s$. Calculate the frequency of

the sound produced.



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13. What are the three factors on which the speed of sound depend upon?



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14. Define persistence of hearing.



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15. We have a stringed musical instrument. The string is plucked in the middle first with a force of greater magnitude and then with a force of smaller magnitude. In which case would the instrument produce a louder sound?



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Ncert Section

1. Sound can travel through

A. gases only

B. solids only

C. liquids only

D. solids, liquids and gases.

Answer: d



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2. Which of the following voices is likely to have minimum frequency?

A. Baby Girl

B. Baby boy

C. A man

D. A woman

Answer: c



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3. A pendulum oscillates 40 times in 4 seconds. Find its time period and frequency.



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4. The sound from the mosquito is produced when it vibrates its wings at an average rate of 500 vibrations per second. What is the time period of the vibration ?



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5. Identify the part which vibrates to produce sound in the following instrument Dholak



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6. Identify the part which vibrates to produce sound in the following instrument Sitar



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7. Identify the part which vibrates to produce sound in the following instrument Flute



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8. What is the difference between noise and music? Can music become noise sometimes?



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9. List sources of noise pollution in your surroundings.



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10. Explain in what way noise pollution is harmful to humans.



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11. Your parents are going to buy a house. They have been offered one on the roadside and another three lanes away from the roadside. Which house would you suggest your parents should buy? Explain your answer.



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12. Sketch larynx and explain its function in your own words.



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13. Lightning and thunder take place in the sky at the same time and at the same distance from us. Lightning is seen earlier and thunder is heard latter. Can you explain why?



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Ncert Section True And False

1. Sound cannot travel in vacuum.

A. True

B. False

C.

D.

Answer:



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2. In the statement, tick 'T' against those which are true, and 'F' against those which are false.

The number of oscillations per second of a vibrating object is called its time period. (T/F)



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3. In the statement, tick 'T' against those which are true, and 'F' against those which are false.

If the amplitude of vibration is large, sound is feeble. (T/F)



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4. In the statement, tick 'T' against those which are true, and 'F' against those which are false.

For human ears, the audible range is 20 Hz to 20,000 Hz. (T/F)



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5. In the statement, tick 'T' against those which are true, and 'F' against those which are false.

The lower the frequency of vibration, the higher is the pitch. (T/F)





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6. In the statement, tick 'T' against those which are true, and 'F' against those which are false.

(T/F) Unwanted or unpleasant sound is termed as music. (T/F)



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Ncert Section Fill In The Blanks

1. Fill in the blanks with suitable word

Time taken by an object to complete one oscillation is called _____



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2. Fill in the blanks with suitable word

Loudness is determined by the _____ of vibration.



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3. Unit of frequency is _____



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4. Unwanted sound is called _____



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5. Fill in the blanks with suitable word

Shrillness of a sound is determined by the _____ of vibration.





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Exercise Multiple Choice Questions Level 1

1. The sound in human is produced by

A. heart

B. mouth

C. larynx

D. hair

Answer: C



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2. Frequency of sound is lowest for

A. man

B. woman

C. young boy

D. young girl

Answer: A



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3. In which medium sound travel fastest

A. solid

B. liquid

C. gas

D. vacuum

Answer: A



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4. Unit of frequency is

A. decibel (dB)

B. hertz (Hz)

C. meter

D. second

Answer: B



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5. Inverse of frequency is called

A. amplitude

B. frequency

C. loudness

D. time period

Answer: D



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6. The hearing range of human ear is

- A. 20 Hz to 20,000 Hz
- B. less than 20 Hz
- C. more than 20,000 Hz
- D. 20,00 Hz to 25,000 Hz

Answer: A



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7. The length of the vocal cords is maximum for

A. man

B. woman

C. boy

D. girl

Answer: A



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8. Shrill sound is of

A. higher frequency

B. lower frequency

C. higher amplitude

D. lower amplitude

Answer: A



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9. Frequency of sound produced by a body is 10 Hz, then range is

- A. ultrasonic
- B. infrasonic
- C. audible
- D. none of these

Answer: B



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10. Unit of loudness

A. hertz (Hz)

B. meter

C. second

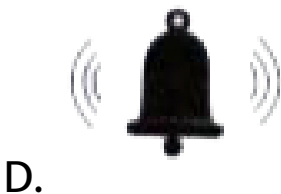
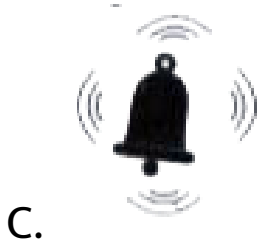
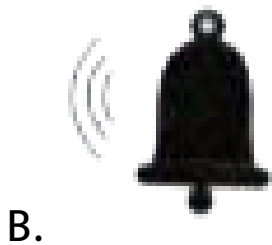
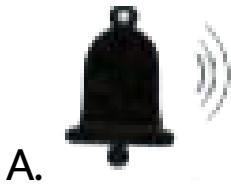
D. decibel (dB)

Answer: D



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11. Which of these pictures correctly show the way sound vibrations travel ?



Answer: C



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12. The speed of sound in air is

A. 330km s^{-1}

B. 330km h^{-1}

C. 330m s^{-1}

D. 300m s^{-1}

Answer: C



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13. Regular vibration produces

A. noise

B. music

C. both (a) and (b)

D. none of these

Answer: B



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14. A person, pressing his ear on the railway tracks can hear an approaching train. This is possible because of

A. vibration of railway tracks

B. vibration of air

C. speed of sound is more in solid medium

D. hearing ability of the man

Answer: C



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15. A person can be identified by the quality of sound produced by him. The characteristic of a sound can be determined by

A. amplitude

B. frequency

C. loudness

D. all of these

Answer: D



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16. The voices of men, women and children are different due to difference in length of

A. larynx

B. lungs

C. vocal cords

D. wind pipe

Answer: C



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17. An object moving at a speed greater than that of sound is said to be moving at

- A. ultrasonic speed
- B. sonic speed
- C. infrasonic speed
- D. supersonic speed

Answer: D



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18. The velocity of sound in vacuum is

A. $332ms^{-1}$

B. $330ms^{-1}$

C. $288ms^{-1}$

D. 0

Answer: D



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19. An object oscillates 50 times in one second.

What should be its frequency ?

A. 0.2 Hz

B. 0.02 Hz

C. 0.002 Hz

D. 50 Hz

Answer: D



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20. The time period of a simple pendulum is 0.2 s. What is its frequency of oscillation?

A. 0.5 Hz

B. 5 Hz

C. 50 Hz

D. 1 Hz

Answer: B



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21. Hertz stands for

A. second

B. second

C. meter

D. meter

Answer: B



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22. An aeroplane travelling at the speed of sound will have a velocity of

A. 100kmh^{-1}

B. 1188kmh^{-1}

C. 1540kmh^{-1}

D. 1620kmh^{-1}

Answer: B



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23. Sound is produced in a bamboo flute because

- A. air starts vibrating
- B. bamboo starts vibrating
- C. air hits the bamboo
- D. direction of air is changed.

Answer: A



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24. The difference between a musical sound and noise is

A. amplitude

B. loudness

C. vibration

D. all of these

Answer: C



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25. Noise pollution can cause

A. insomnia

B. hypertension

C. hearing impairment

D. all of these

Answer: D



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26. If you go on increasing the stretching force on a wire in a guitar, its frequency

A. increases

B. decreases

C. remains unchanged

D. none of the above

Answer: A



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27. A vibrating body

A. will always produce sound

B. may or may not produce sound if the
amplitude of vibration is low

C. will produce sound which depends upon
frequency

D. none of these

Answer: A



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28. The instrument used in the laboratory to produce sound of a fixed frequency is

- A. simple pendulum
- B. tuning fork
- C. thermometer
- D. meter tuning fork

Answer: B



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29. Higher the frequency of a musical sound, is its pitch.

A. lower

B. higher

C. remains same

D. none of these

Answer: B



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30. Quality of sound is used to distinguish between

A. Noise and music

B. Two different vibrating bodies

C. Two notes produced by same vibrating
body

D. All of the above

Answer: B



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Exercise Multiple Choice Questions Level 2

1. For an oscillating pendulum of fixed length, which of the following is true ?

A. Frequency depends on amplitude of oscillation

B. Frequency and time period are not related.

C. Time period depends on amplitude of oscillation.

D. Frequency and time period are related and do not depend on amplitude of oscillation.

Answer: D



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2. Which one of the following material will reflect sound better?

A. Thermocole

B. Curtain made from cloth

C. Steel

D. Paper

Answer: C



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3. An object vibrated with a frequency of 15 Hz.

Which of the following is true ?

A. It produces sound which we can hear.

B. It does not produce sound.

C. It produces sound which we cannot hear.

D. It produces sound which we can hear if we strain our ears.

Answer: C



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4. Time taken for 10 oscillation of a body is 20 second, then time period of the body is

A. 1 second

B. 2 second

C. 3 second

D. 4 second

Answer: B



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5. Large amplitude of sound vibrations will produce

- A. loud sound
- B. weak sound
- C. slow sound
- D. none of these

Answer: A



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6. The pitch of sound depends on

A. frequency

B. amplitude

C. both of these

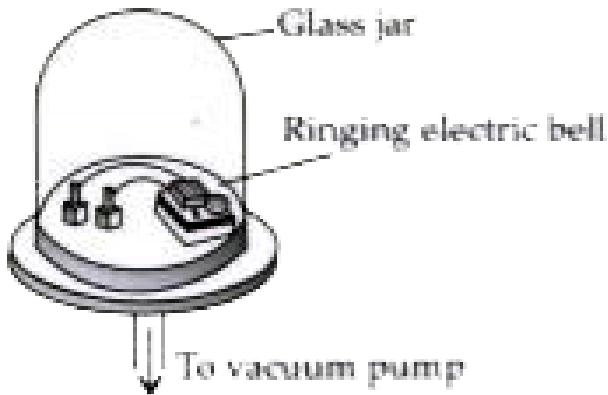
D. none of these

Answer: A



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7. A scientist performed an experiment as shown in the picture below.



What do you think happened as air was pumped out of the jar and he rang the bell?

A. The sound became louder

B. The sound became fainter first and louder once all the air was pumped out.

C. The sound could not be heard anymore

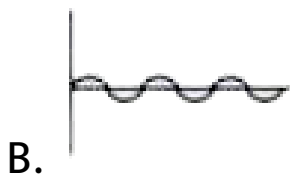
D. The sound was the same as before.

Answer: C

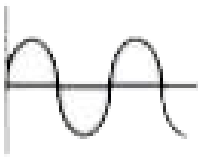


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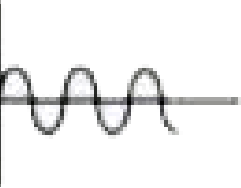
8. Which of them has highest amplitude ?



C.



D.



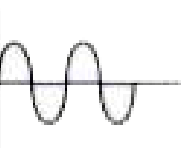
Answer: C



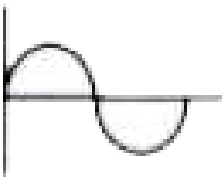
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9. Which of them has highest frequency?

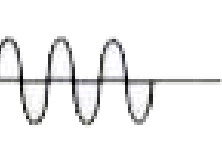
A.



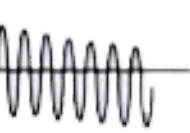
B.



C.



D.



Answer: D



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10. The speed of sound in solid, liquid and gas can be correctly compared as

A. solid gt liquid gt gas

B. liquid gt gas gt solid

C. liquid gt solid gt gas

D. gas gt liquid gt gas

Answer: A



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11. Flash and thunder are produced simultaneously. But thunder is heard a few seconds after the flash is seen. This is because

A. speed of sound is greater than speed of light

B. speed of sound is equal to the speed of light

C. speed of light is much greater than the speed of sound

D. none of these.

Answer: C



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12. Which of the following is NOT correct?

A. More oscillation per second, higher time period

B. Greater amplitude greater loudness

C. Higher pitch, higher frequency of vibration

D. More the value of decibel, higher is the noise

Answer: A





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13. The buzzing sound produced by a mosquito is produced by

A. its mouth

B. vibration of surrounding air

C. vibration of wings

D. none of these

Answer: C



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14. The membrane of a drum vibrates to produce sound. Similarly the strings of a sitar vibrates to produce sound. Based on these two examples answer the following question. Which part of a whistle vibrates to produce sound ?

- A. body of whistle
- B. air
- C. mouth of the person

D. all of the above

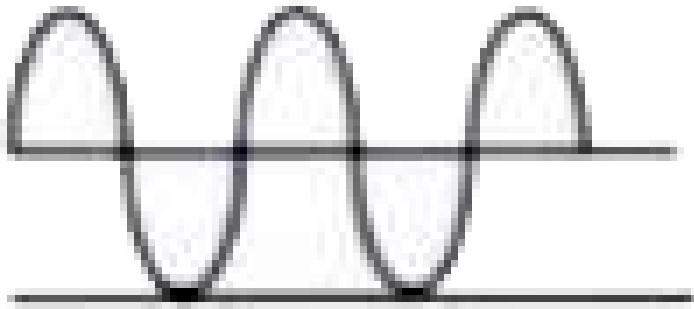
Answer: B



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15. When a tuning fork was struck and brought near a bucket of water, a wave as shown in figure was formed on its surface. If the fork is struck much harder and brought near the

surface, what will increase ?



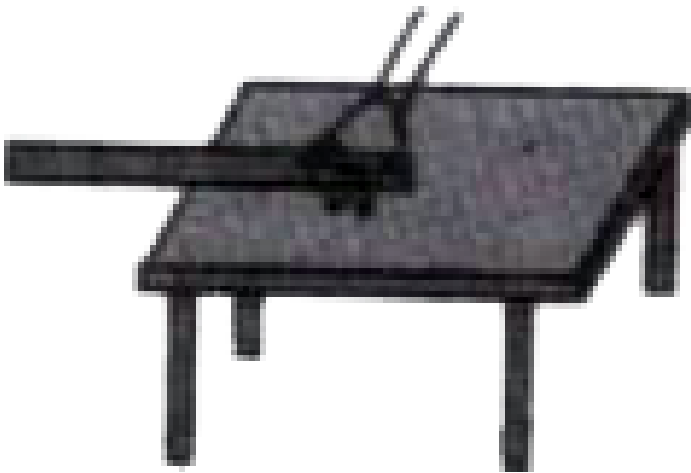
- A. Frequency
- B. Wavelength
- C. Velocity
- D. Amplitude

Answer: D



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16. By changing length of the scale protruding out of table and vibrating it we can produce sounds of different frequencies. This is possible due to



A. change in frequency

B. hange in velocity

C. change in amplitude

D. all of the above

Answer: A



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17. A bomb explodes on the moon. How long will the sound take to reach the earth ?

A. 10 seconds

B. 1000 seconds

C. 1 day

D. none of these

Answer: D



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18. The frequency of a source is 20 kHz. The frequencies of sound wave produced by it in water and air will be

A. same as that of source 20 kHz

B. gt 20 kHz

C. lt 20 kHz

D. depends upon velocity

Answer: A



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19. Which of the following statement is true?

- A. Sound and light both require medium for propagation.
- B. Sound travel through vacuum, but light can not
- C. Sound needs medium, but light doesn't need medium for its propagation.
- D. Sound and light both can not travel in a medium.

Answer: C



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20. Loudness of sound is directly proportional to the

- A. amplitude of the wave
- B. distance from the source and sound
- C. frequency of the wave
- D. wavelength of the wave

Answer: A



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Exercise Match The Following

List-I

(P) String vibration

(Q) Membrane
vibration

(R) Vibration of air

(S) Vibration of plate

(a) P-3, Q-1, R-4, S-2

(b) P-4, Q-3, R-2, S-1

(c) P-1, Q-4, R-2, S-3

(d) P-2, Q-3, R-1, S-4

List-II

1. Tabla

2. Bicycle bell

3. Gitar

4. Flute

1.



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List-I

- (P) Audible range
(Q) Infrasonic range
(R) Ultrasonic range
(S) Dog's hearing range

List-II

1. Above 20000 Hz
2. 50 Hz to 45000 Hz
3. Below 20 Hz
4. 20 Hz to 20 kHz

- (a) P-2, Q-1, R-3, S-4
(b) P-4, Q-3, R-1, S-2
(c) P-1, Q-3, R-2, S-4
(d) P-3, Q-2, R-4, S-1

2.



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List-I

- (P) Flatter voice
- (Q) Shriller voice
- (R) Pitch
- (S) Loudness

List-II

- 1. Frequency
- 2. Amplitude
- 3. Man
- 4. Woman

- (a) P-1, Q-3, R-2, S-4
- (b) P-4, Q-3, R-1, S-2
- (c) P-2, Q-4, R-3, S-1
- (d) P-3, Q-4, R-1, S-2

3.



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List-I

(P) Sound cannot propagate through

(Q) Unit of frequency

(R) Unit of loudness

(S) Trees act as

(a) P-2, Q-3, R-4, S-1

(b) P-4, Q-3, R-2, S-1

(c) P-3, Q-4, R-1, S-2

(d) P-1, Q-2, R-4, S-3

List-II

1. Decibel

2. Noise buffers

3. Vacuum

4. Hertz

4.



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- | List-I | List-II |
|----------------------------------|---------------------|
| (P) Regular vibration produces | 1. Solid |
| (Q) Speed of sound is maximum in | 2. Noise |
| (R) Humans cannot hear | 3. Music |
| (S) Irregular vibration produces | 4. Infrasonic sound |
- (a) P-3, Q-1, R-4, S-2
(b) P-1, Q-4, R-3, S-2
(c) P-4, Q-3, R-1, S-2
(d) P-2, Q-4, R-3, S-1

5.

Class 11 Physics



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Exercise Assertion Reason Type

1. Assertion : Two person on the surface of the moon cannot talk to each other.

Reason : There is no atmosphere on moon.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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2. Assertion : On a rainy day sound travel slower than on a dry day.

Reason : When moisture is present in air the density of air increases.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: D



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3. Assertion : The sound produced by a flute is shriller than the sound produced by a tabla.

Reason : Frequency produced by flute will be greater than the frequency produced by tabla.

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

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

assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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4. Why sound cannot travel through vacuum ?

A. If both assertion and reason are true

and reason is the correct explanation of

assertion.

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B



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5. Assertion : Every vibrating body is a source of sound.

Reason : All sounds are audible to us.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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6. Assertion : The sound which cannot be heard pleasantly is called noise.

Reason : The sound above 80 dB becomes painful.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: B



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7. Assertion : Humans cannot hear the sound of ultrasonic frequency.

Reason : Human ear can only hear sound of frequency range 20 Hz to 20000 Hz.

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

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

assertion.

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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8. Assertion : We cannot hear the sound produced by a vibrating pendulum.

Reason : The frequency of the pendulum is very less.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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9. Assertion : Trees should be planted along the roads to control noise pollution.

Reason : Trees act as noise buffers.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: A



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10. Assertion : Women have shriller sound than men.

Reason : Men produce higher frequency of sound than women.

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

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

C. If assertion is true but reason is false.

D. If assertion is false but reason is true.

Answer: C



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Exercise Comprehension Type

1. PASSAGE-I: Human ears can pick up sounds ranging in amplitude (loudness) from 10 dB to 180 dB. A sound is considered to be normal if it is between 50 dB to 60 dB. Sounds above 80 dB are painful and cause various health problems.

Which of the following sounds human can hear, comfortably?

A. 95 dB

B. 60 dB

C. 100 dB

D. 180 dB

Answer: B



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2. PASSAGE-I: Human ears can pick up sounds ranging in amplitude (loudness) from 10 dB to 180 dB. A sound is considered to be normal if

it is between 50 dB to 60 dB. Sounds above 80 dB are painful and cause various health problems.

The range of the normal sound is

- A. 0-10 dB
- B. 40 - 50 dB
- C. 50 - 60 dB
- D. 80 - 90 dB

Answer: C



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3. PASSAGE-I: Human ears can pick up sounds ranging in amplitude (loudness) from 10 dB to 180 dB. A sound is considered to be normal if it is between 50 dB to 60 dB. Sounds above 80 dB are painful and cause various health problems.

The sound becomes painful, if loudness is

- A. above 50 dB
- B. below 50 dB
- C. above 80 dB

D. below 80 dB

Answer: C



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4. PASSAGE-II: The number of oscillations or vibrations made by a vibrating body in one second is known as the frequency of the wave. The S.I. unit of frequency is hertz (Hz) which is named after the name of scientist Heinrich Hertz.

Time taken to complete one vibration by the vibrating body is known as time period. Time period and frequency are related as

$$\text{Time period} = \frac{1}{\text{frequency}}$$

The frequency of a source of sound is 20 Hz
find its time period.

A. 0.05 s

B. 0.5 s

C. 0.2 s

D. 0.02 s

Answer: A



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5. PASSAGE-II: The number of oscillations or vibrations made by a vibrating body in one second is known as the frequency of the wave.

The S.I. unit of frequency is hertz (Hz) which is named after the name of scientist Heinrich Hertz.

Time taken to complete one vibration by the vibrating body is known as time period. Time period and frequency are related as

$$\text{Time periode} = \frac{1}{\text{frequency}}$$

A vibrating body vibrates 200 times in 5 second, calculate its frequency?

A. 30 Hz

B. 40 Hz

C. 500 Hz

D. 1000 Hz

Answer: B



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6. PASSAGE-II: The number of oscillations or vibrations made by a vibrating body in one second is known as the frequency of the wave. The S.I. unit of frequency is hertz (Hz) which is named after the name of scientist Heinrich Hertz.

Time taken to complete one vibration by the vibrating body is known as time period. Time period and frequency are related as

$$\text{Time periode} = \frac{1}{\text{frequency}}$$

A boy heard a sound of frequency 100 Hz at a distance of 500 m from the source of sound.

What is the time period of oscillating particles of the medium?

A. 0.1 s.

B. 0.01 s

C. 0.2 s

D. 0.02 s

Answer: B



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7. PASSAGE-III : The human voice can produce sounds with a frequency between 60 Hz and 1300 Hz. It is interesting to note that a normal human ear can hear sound of frequency between 20 Hz to 20,000 Hz. The sound of frequency greater than 20000 Hz is called ultrasonic and the sound of frequency below 20 Hz is known as infrasonic.

A human can produce sound of frequency

A. 20 Hz

B. 200 Hz

C. 15 kHz

D. 20 kHz

Answer: B



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8. PASSAGE-III : The human voice can produce sounds with a frequency between 60 Hz and 1300 Hz. It is interesting to note that a normal human ear can hear sound of frequency between 20 Hz to 20,000 Hz. The sound of

frequency greater than 20000 Hz is called ultrasonic and the sound of frequency below 20 Hz is known as infrasonic.

Frequency of ultrasonic sound is

- A. below 20 Hz
- B. above 20 Hz
- C. below 20000 Hz
- D. above 20000 Hz

Answer: D



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9. PASSAGE-III : The human voice can produce sounds with a frequency between 60 Hz and 1300 Hz. It is interesting to note that a normal human ear can hear sound of frequency between 20 Hz to 20,000 Hz. The sound of frequency greater than 20000 Hz is called ultrasonic and the sound of frequency below 20 Hz is known as infrasonic.

Frequency of infrasonic sound is

A. below 20 Hz

B. above 20 Hz

C. below 20000 Hz

D. above 2000 Hz

Answer: A



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Exercise Subjective Problems Very Short Answer Type

1. What is sound?



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2. What is vibration?



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3. Name the sound producing organ in humans.



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4. Do the frequency of sound produced by men and women are same?



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5. What types of medium is required for sound to travel?



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6. Write the name of the organ through which human receives the sound.



[Watch Video Solution](#)

7. What is the unit of frequency ?



[Watch Video Solution](#)

8. What is the name of the sound produced by irregular vibrations?



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9. On which factor pitch of the sound depends?



[Watch Video Solution](#)

10. What is the range of frequency that a human can hear?



[Watch Video Solution](#)

11. What is the ultrasonic sound?



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12. What is the unit of loudness?



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13. What are sounds of frequencies below 20 Hz called?



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14. In which medium the speed of the sound is maximum?



[Watch Video Solution](#)

15. Can sound travel through vacuum?



[Watch Video Solution](#)

Exercise Subjective Problems Short Answer Type

1. What do you understand by "audible" and "inaudible" range of sound?



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2. Why do women have shriller voice than men?



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3. How is sound produced ?



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4. Explain the importance of sound in our daily life.



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5. Explain with the help of an activity that vibrating bodies produce sound.



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6. Name the organ in human that produces sound. How does it work?



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7. A pendulum oscillates with the frequency of 80 Hz. Find its time period?



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8. How does loudness of the sound depends upon amplitude?



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9. What do you understand by shriller sound?



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10. How is sound produced and how is it transmitted and heard by us?



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Exercise Subjective Problems Long Answer Type

1. With the help of an activity show that sound can travel through solids



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2. With the help of an activity show that sound cannot travel through vacuum.



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3. What are the major sources of noise pollution ? What are the harmful effect of noise pollution?



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4. Write the methods to control noise pollution.



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5. Write the applications of the ultrasound.



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6. How does loudness of sound is affected by amplitude?



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Exercise Integer Numerical Value Type

1. A person lives at a distance of 1.32 km from a factory. If the speed of sound in air be 330 m s^{-1} , how much time will the sound of factory siren takes to reach the worker?



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2. A boy stands 165 m in front of a high wall and then blows a whistle. Calculate the time interval when he hears an echo. (Speed of sound = 330 m s^{-1})





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3. The speed of sound is 330ms^{-1} and that of light is $3 \times 10^8\text{ms}^{-1}$. The ratio of speed of sound to that of light is $11 : 10^x$. Find the value of x .



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4. The distance of a reflecting surface from a source is 513 m, and speed of sound is

342ms^{-1} . Find the time in which the echo return.



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5. A sound wave has a frequency 1000 Hz and speed 330ms^{-1} . How long will it take to move through 1 km?



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1. Voice of which of the following creatures is likely to have maximum frequency?

A. Man

B. Cow

C. Bird

D. Dog

Answer: C



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2. The thunder of a lightening in the sky is heard 10 seconds after the flash of light. If the speed of sound is 330 m/s, the distance of lightening is

A. 3.3 m

B. 33 m

C. 330 m

D. 3300 m

Answer: D



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3. If one puts ones ears to the steel rail, the sound of a coming train can be heard even when the train cannot be seen. One can conclude from this observation that

(1) sound travels faster in steel than in air.

(2) amplitude of sound in the rail is much larger than in air.

(3) sound can travel larger distances in solids than in air.

(4) quality of sound in rail is better than in air.

The reasonable conclusions are

A. 1 and 3

B. 1 and 2

C. 2 and 3

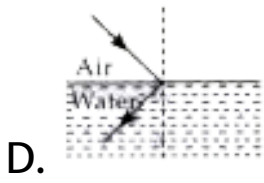
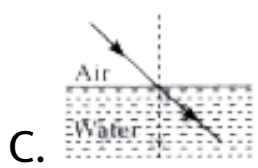
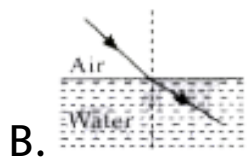
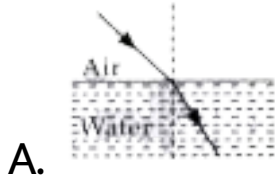
D. 2 and 4

Answer: A



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4. While travelling from air to water path of a sound beam is likely to be (see figure below):



Answer: B

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5. Loudness of sound is directly proportional to the of _____ the amplitude of vibration producing the sound.

A. square

B. cube

C. inverse square

D. inverse cube

Answer: A



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6. When we tighten the string on a guitar, its pitch

A. Increases

B. Decreases

C. Remains same

D. May increase or decrease

Answer: A



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7. In regular vibrations

A. Time period is always regular and constant

B. Frequencies of the vibrations are always same

C. Frequencies of sounds bear a definite relation with each other

D. Wavelength of sound does not change even when the loudness is increased

Answer: A



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8. Loudness of sound increases with

A. The amplitude of vibrating body

B. The increase in surface area of vibrating
body

C. The decrease in frequency of vibrating
body

D. The increase in distance from the source
of sound

Answer: A



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9. Match the following and select the correct answer from the codes given below.

(i) Pitch

(p) Wave form

(ii) Quality

(q) Frequency

(iii) Loudness

(r) Intensity

A. (i) - (q), (ii) - (p), (iii) - (r)

B. (i) - (p) , (ii) - (r) , (iii) - (q)

C. (i) - (r) , (ii) - (p) , (iii) - (q)

D. (i) - (q), (ii) - (r) , (iii) - (p)

Answer: A



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10. The ultrasonic waves take 4 seconds to travel from the ship to the bottom of the sea and back to the ship (in the form of an echo).

What is the depth of the sea? (Speed of sound in water = 1500 m/s.)

A. 3000 m

B. 2000 m

C. 1000 m

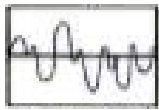
D. 500 m

Answer: A



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11. The oscilloscope traces for sound waves with different frequencies are shown here. The noises shown in the diagram in the increasing order of frequency are a



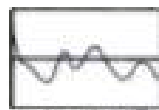
Car engine



Scream



Dentist's drill



Road drill

A. Car engine, Scream, Dentist's drill, Road drill

B. Road drill, Car engine, Dentist's drill, Scream

C. Scream, Car engine, Dentist's drill, Road drill

D. Dentist's drill, Road drill, Scream, Car engine

Answer: B



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12. A car approaches a hill with constant speed. When it is at a distance of 0.96 km from the hill, it blows horn whose echo is heard by

the driver 6 seconds later. If the speed of sound in air is 300 m/s, calculate the speed of the car.

A. 100 m/s

B. 20 m/s

C. 50 m/s

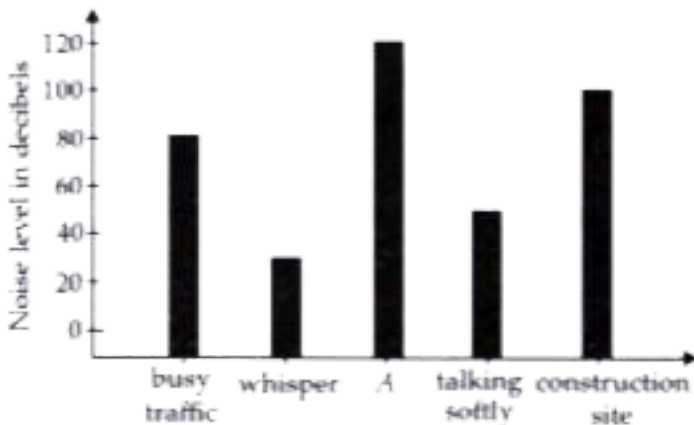
D. 70 m/s

Answer: B



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13. The graph shown here provides information about noise levels in different situations. Which of the following scenarios can create a noise level as indicated on the graph by the letter A?



A. A plane taking off

B. A few dogs barking

C. Some people talking loudly

D. Metro train moving on tracks

Answer: A



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14. The speed of sound in air, water and steel is different. If the speed of sound in air, water and steel is represented by V_a , V_w and V_s respectively, then which of the following

sequences is correct about the speed of sound
in ascending order?

A. V_a, V_w, V_s

B. V_s, V_w, V_a

C. V_w, V_s, V_a

D. V_a, V_s, V_w

Answer: A



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15. The intensity of sound wave gets reduced by 10% on passing through a slab. The total reduction in intensity on passing through three consecutive slabs is

A. 0.3

B. 0.7

C. 0.271

D. 0.729

Answer: C



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