PHYSICS

BOOKS - BEIITIANS

SOUND

Example

1. An object oscillates at the rate of 2 oscillations per second. What is its time period ?

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Formative Worksheet

1. A police officer, who is investigating a robbery in a locality, presses the door bell of house number 211.To alert people, a door bell emits

A. heat energy

B. light energy

C. sound energy

D. potential energy

Answer:

Watch Video Solution

2. Kevin touches four objects, I, II, III, and IV. He makes the following conclusions:

Object I is hot.

Object II is vibrating.

Object III is cold.

Object IV is sticky.

Among the given objects, the object producing sound is

A. I

B. II

C. III

D. IV

Answer:

Watch Video Solution

3. Which of the following musical instruments is not matched with its vibrating part?

A.

Musical instrument	Vibrating part
Guitar	Stretched string

B.

Musical instrument	Vibrating part
Jalterang	Water column

C.

Musical instrument	Vibrating part
Dhol	Stretched membrane

D.

Musical instrument	Vibrating part
Ghatam	Air column

Answer:

Watch Video Solution

4. The plucking of a stretched metal wire produces sound because

A. of change in atmospheric pressure around the wire

B. it is made up of a good conductor of electricity

C. of generation of heat

D. it starts vibrating

Answer:

Watch Video Solution

5. Which part of the human body vibrates to produce sounds?

A. Windpipe

B. Eardrum

C. Vocal cord

D. Nasal cavity

Answer:

Watch Video Solution

6. v_s=Speed of sound in solid medium

v_l= Speed of sound in liquid medium

v_g= Speed of sound in gaseous medium

When arranged in the descending order of their magnitudes, the speed of sound in the three different media is

A. $v_s > v_l > v_g$

B. $v_s > v_g > v_l$

C. $v_g > v_s > v_l$

D. $v_l > v_g > v_s$

Answer:

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7. The sound coming from an alarm clock cannot be heard if it is kept inside a box that is

A. filled with liquid only

B. filled with both solid and liquid

C. made up of iron with air inside it

D. devoid of any material medium inside

Answer:

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8. What should a hearing-impaired person wear in order to enhance his hearing power by amplifying sound?

A. Ear-horn

B. Stethoscope

C. Mobile headset

D. Jackhammer's headphone

Answer:

Watch Video Solution

9. Vibration can be defined as the

A. stretching of a membrane

B. roughness of a membrane

C. circular motion of a membrane

D. to and fro motion of a membrane

Answer:

Watch Video Solution

10. Ivan shakes one end of a rope attached to a wall. This produces a wave motion in the rope. He observes that the first peak of the wave reaches the wall in 5 seconds, and a total of 15 peaks are produced in the vibrating rope in 5

seconds. The length of the rope is 3 meters. What is the wavelength of the wave produced in the rope?

A. 10cm

B. 15cm

C. 20cm

D. 25cm

Answer:

Watch Video Solution

11. What is the time period of a pendulum if its bob oscillates 100 times in two seconds?

A. 0.01 s

B. 0.02 s

C. 0.1 s

D. 0.2 s

Answer:

Watch Video Solution

12. Eric throws a stone in a river. The stone travels a distance that is 100 m away from the river bank. He observes that the first wave comes to the bank 2 seconds after the stone touches the water surface. He counts that a total of 20 waves are created in 2 seconds. What is the distance between two consecutive waves?

A. 2m

B. 5m

C. 20m

D. 50 m

Answer:

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13. The maximum displacement of a sound wave on either side of the mean position of its vibration is the measure of its

A. amplitude

B. frequency

C. period

D. speed

Answer:

Watch Video Solution

14. The intensity of sound waves is measured in

A. hertz

B. joules

C. meters

D. decibel

Answer:

Watch Video Solution

15. The famous band of Beetles has used an ultrasonic whistle in one of their songs. The sound produced by the whistle cannot be heard by humans, but it can be heard by dogs. From the given information, it can be inferred

that the sound produced by the whistle may have a frequency, which

A. is less than 5 Hz

B. is less than 80 Hz

C. lies between 20 kHz to 25 kHz

D. lies between 20 Hz to 20 kHz

Answer:

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16. Humans cannot hear all the sounds produced in their surroundings. The sounds whose frequencies fall in the audible range can only be heard by humans. The lower limit of the audible range for human ears is 20 Hz and the upper limit is $a \times 10^b$ Hz. What are the respective values of a and b?

A. 1 and 2

B. 2 and 4

C. 3 and 2

D. 1 and 3

Answer:

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17. I. The amplitude determines the pitch of sound. III. Sound can travel through water. Among the given statements, only

A. I is correct

B. III is correct

C. I and II are correct

D. II and III are correct

Answer:

Watch Video Solution

18. Objects that produce sound:

I Fire crackers

II Siren

III Mouth organ

IV Fire alarm

V Factory machines

Which of the given objects does not produce sound that is harmful to the human ear?

A. I

B. II

C. III

D. V

Answer:

Watch Video Solution

19. Nowadays, government and local bodies are taking initiatives in roadside plantation. This helps in

A. reducing noise pollution

B. reducing traffic congestion

C. increasing the durability of roads

D. increasing the visibility of drivers

Answer:

 Watch Video Solution

Conceptive Worksheet

1. Sound is produced by

A. burning a candle

B. beating a drum

C. photosynthesis

D. a battery

Answer:

Watch Video Solution

2. When two people talk with each other, energy is transferred through

A. electric currents

B. the movement of mouth

C. sound waves

D. wind force

Answer:

Watch Video Solution

3. One end of a ruler is fixed on a table and the other end is struck

The vibration of the ruler produces

A. heat

B. light

C. sound

D. electrical

Answer:

 Watch Video Solution

4. Tom spreads some sand particles on a drum-head. He strikes the drum with a hammer. The striking of the drum will cause the sand particles to

A. cut through the drum-head

B. get stuck to the drum-head

C. move to and fro on the drum-head

D. move up and down on the drum-head

Answer:

Watch Video Solution

5. When a stretched membrane is beaten, it starts ....i..... This phenomenon is used to make a .....ii.....

The information in which alternative completes the given statements?

A.

i	*ii*
moving forward	*veena*

B.

i	*ii*
moving forward	drum

C.

i	*ii*
vibrating	*veena*

D.

i	*ii*
vibrating	drum

Answer:

Watch Video Solution

6. Justin and his friend Daniel stand at the two ends of a large empty hall. Justin makes a sound with a tuning fork by hitting the wall at his end. His friend Daniel puts his ear against the wall at the other end. He hears two sounds at an interval. Daniel hears two sounds because

A. Justin makes two sounds

B. a tuning fork has two vibrating arms

C. sound breaks into two perpendicular components

D. sound travels at different speeds through air and wall

Answer:

Watch Video Solution

7. Two fishing boats are at mid sea. One of the boats sends two sound signals (to the other boat) at the same time, one through air and the other through water. The second boat will receive

A. the sound signal sent through water first

B. the sound signal sent through air first

C. only the sound signal sent through air

D. both the sounds signals at same time

Answer:

Watch Video Solution

8. Longitudinal waves cannot travel through

A. wood

B. glass

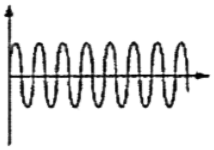
C. gasoline

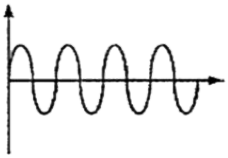
D. vacuum

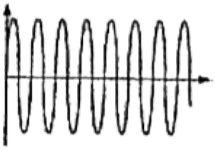
Answer:

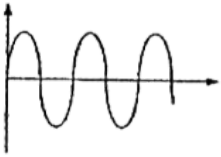
Watch Video Solution

9. Which of the following sound waves produces the loudest sound?

A. 

B. 

C. 

D. 

Answer:

Watch Video Solution

10. With reference to sound, the number of to and fro motions of a membrane in per unit time is expressed in the unit of

A. angstrom

B. second

C. meter

D. hertz

Answer:

Watch Video Solution

11. Julie hears the ringing of a bell at a nearby church. She hears the bell ring 24 times in one minute. The ringing frequency of the bell is

A. 0.2 Hz

B. 0.3 Hz

C. 0.4Hz

D. 0.5 Hz

Answer:

Watch Video Solution

12. A membrane is vibrating at a rate of 20 oscillations in two seconds. The sound produced by the membrane is

A. loud

B. shrill

C. of good quality

D. out of the audible range

Answer:

Watch Video Solution

13. The loudness of sound is determined by the

A. the amplitude of the vibrations of the sound

B. how fast the source is moving to and fro

C. the size of the source of the sound

D. how it is reflected from a surface

Answer:

Watch Video Solution

14. Cruz is standing in a pond. He throws a stone in the pond at some distance away from him. A wave is produced on the water surface. He observes that 30 peaks reach him in 5 seconds. What is the frequency of the produced wave?

A. 5 HZ

B. 6HZ

C. 30 HZ

D. 150 HZ

Answer:

Watch Video Solution

15. The bob of a simple pendulum is oscillating with a frequency of 25 Hz. How much time will the pendulum take to make 100 oscillations?

A. 1s

B. 2s

C. 4s

D. 6s

Answer:

Watch Video Solution

16. Which of the following frequencies of sound is not heard by humans?

A. 18Hz

B. 180Hz

C. 1800Hz

D. 18000Hz

Answer:

Watch Video Solution

17. High noise levels can injure the ear drum and cause deafness. Which of the following

devices can lead to the production of high noise?

A. Fan

B. Alarm clock

C. Refrigerator

D. Leaf-blowing machine

Answer:

Watch Video Solution

18. Which of the following effects is unlikely to occur because of noise pollution?

A. Loss of hearing

B. Breathing problem

C. Sleeping disorder

D. High blood pressure

Answer:

Watch Video Solution

Summative Worksheet Choose The Correct Answer

1. Sound can travel through

A. gases only

B. solids only

C. liquids only

D. solids, liquids and gases.

Answer:

Watch Video Solution

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:

Watch Video Solution

Summative Worksheet In The Following Statements Tick T Against Those Which Are True And F Against Those Which Are False

1. Sound cannot travel in vacuum

Watch Video Solution

2. The number of oscillations per second of a vibrating objects is called its time period

Watch Video Solution

3. If the amplitude of vibration is large, sound is feeble.

Watch Video Solution

4. For human ears, the audible range is 20 Hz to 20,000 Hz.

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5. The lower the frequency of vibration, the higher is the pitch.

Watch Video Solution

6. Unwanted or unpleasant sound is termed as music.

Watch Video Solution

7. Noise pollution may cause partial hearing impairment.

Watch Video Solution

Summative Worksheet Fill In The Blanks With Suitable Words

1. Time taken by an object to complete one oscillation is called.....

Watch Video Solution

2. Unwanted sound is called .....

Watch Video Solution

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

Watch Video Solution

4. 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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Summative Worksheet

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

Watch Video Solution

2. The sound from a 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?

Watch Video Solution

3. Identify the part which vibrates to produce sound in the instruments.

Dholak

Watch Video Solution

4. Identify the part which vibrates to produce sound in the instruments.

Sitar

Watch Video Solution

5. Identify the part which vibrates to produce sound in the instruments.

Flute

Watch Video Solution

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

Watch Video Solution

7. List sources of noise pollution in your surroundings.

Watch Video Solution

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

Watch Video Solution

9. 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.

Watch Video Solution

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

Watch Video Solution

Hots Worksheet

1. John places an alarm clock inside a box as shown in the given figure. He then creates a vacuum inside the box. When the alarm goes

on, John does not hear the alarm-sound.

John does not hear the alarm sound because

A. the walls of the box block the sound

B. sound cannot travel through vacuum

C. there is no medium between John and the box

D. the inside wall of the box reflects the sound back

Answer:

Watch Video Solution

2. Which part of a tabla vibrates to produce sound?

A. Wooden shell

B. Stretched membrane

C. Stretched side strings

D. Ring holding the strings

Answer:

Watch Video Solution

3. Which of the following effects cannot be produced by a force?

A. Striking a stretched metal cord

B. Beating a stretched membrane

C. Blowing into a narrow pipe

D. Heating a stretched string

Answer:

Watch Video Solution

4. Hearing impiarment is caused by either excessive noise or injury, disease, age, or by a combination of any of them. Many devices are used by the hearing impaired persons. Ear-horn is one of them. Ear-horn is a device that is used to

A. cure any infection in ear

B. cancel the noise pollution

C. protect ear from external agents

D. amplify and enhance the hearing power

Answer:

Watch Video Solution

5. Jackhammer is an electric device that is used to drill on hard surface. It produces unwanted sound that is very loud and irritating. The person who works with a Jackhammer generally wears a headphone known as Jackhammer's Headphone. What does the Jackhammer's Headphones do?

A. Prevents the worker from brain hemorrhage

B. Connects the worker with his manager

C. Absorbs and cancels the noise

D. Entertains the person

Answer:

Watch Video Solution

6. In medical sciences, doctors use ultrasound devices to investigate and track the affected internal parts of the body that are not visible directly. The technique is called sonography. These devices use sound to observe internal human parts and work at a frequency greater than 20 KHz.

The sound emitted by ultrasound equipments are

A. inaudible

B. audible

C. louder

D. feeble

Answer:

Watch Video Solution

7. Jackhammer is an electric device that is mainly used for drilling on a hard surface. In this process, a large sound is produced. The person who works With jachhammer generally wears a 'protection with jackhammers' to

avoid this. With reference to the given information, what does the 'protection with jackhammers' device do?

A. Protects ear from noise

B. Protects eye from dust

C. Protects from electric shock

D. Protects from wind and rain

Answer:

Watch Video Solution

8. Telephone operators answer the calls on telephones. A sound is easily transmitted and clearly heard over a telephone conversation if it is of high frequency

Mostly women are recruited as telephone operators because they can

A. do hard work

B. produce louder sound

C. produce high pitched sound

D. work continuously for many hours

Answer:

Watch Video Solution

9. Humans are able to hear because of the vibration of a stretched thin membrane. This membrane is called eardrum.

If elasticity of the eardrum is loosened, then

A. it will vibrate rapidly

B. it will not vibrate properly

C. inaudible sound can be heard

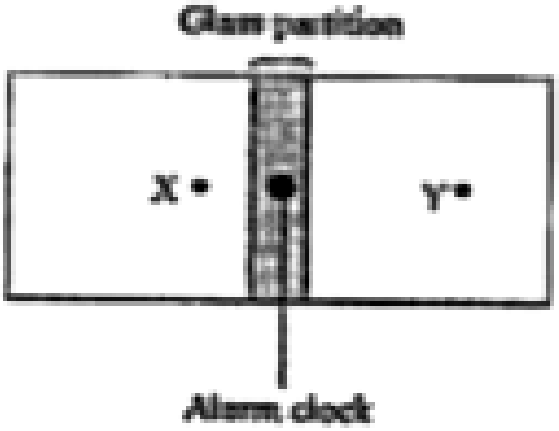
D. sound cannot be heard at all

Answer:

Watch Video Solution

10. There is a hollow glass partition in a room. It divides the room in two compartments. Two brothers X and Y are sitting in each compartment. An alarm clock, which is placed inside the glass partition, is producing sound, as shown in the given figure. Both brothers

are able to hear the sound. All the air from within the glass partition is removed with the help of a vacuum pump.



After evacuating the partition completely,

A. the alarm will produce a louder sound

B. both will be unable to listen to the sound

C. only X will be able to listen to the sound

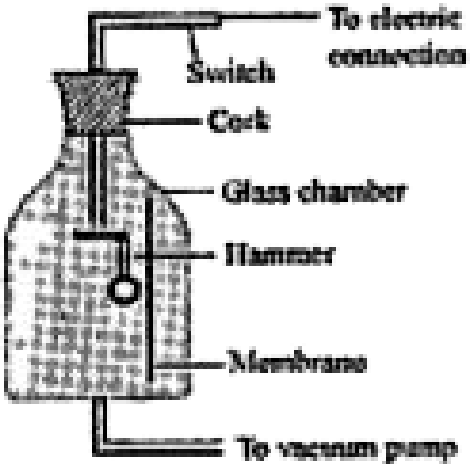
D. the alarm will produce a high pitch sound

Answer:

Watch Video Solution

11. An electric drum is enclosed inside a specially designed closed glass chamber, as shown in the given figure. On switching the current, the hammer repeatedly strikes the

membrane of the drum. Hence, the membrane vibrates and produces sound that can be heard at a distance. Now, the chamber is evacuated by closing the switch of the vacuum pump.



As the chamber is evacuated, the

A. frequency of hammering decreases

B. membrane stops vibrating

C. hammer stops striking

D. sound cannot be heard

Answer:

Watch Video Solution

12. Dolphins and whales communicate under water using sound. They can see each other with their eyes and also by producing sound.

Dolphins and whales are able to communicate in water because sound

A. can travel in water

B. travels fastest in water

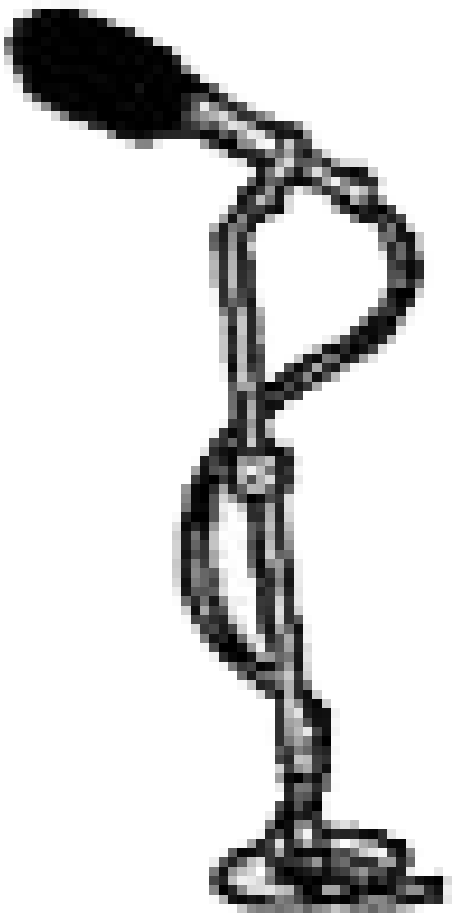
C. does not scatter in water

D. does not lose energy in water

Answer:

Watch Video Solution

13. Microphone is an electrical device that is used to amplify a human voice to be heard at a distance. It consists of a thin membrane called diaphragm that ....i... in response to ... ii.....



The information in which alternative completes the given statement?

A.

i	*ii*
rotates	electricity

B.

i	*ii*
rotates	sound

C.

i	*ii*
vibrates	electricity

D.

i	*ii*
vibrates	sound

Answer:

Watch Video Solution

14. Astronauts in deep space use radio devices to communicate with each other. The radio device converts the sound produced by the first astronaut into radio signals that reach to

the radio device of the second astronaut. There, this radio signal converts back into sound so that the second astronaut can hear the voice of the first. In outer space, astronauts use radio devices instead of direct sound to communicate because

A. sound cannot travel in vacuum

B. it is very difficult to speak in vacuum

C. radio devices are very cheap and easily available

D. vocal cords do not vibrate to produce sound in outer space.

Answer:

15. Underwater detection of objects is possible in navigation because

A. underwater objects can also produce sound

B. the speed of sound is the highest in water

C. the energy of sound increases in water

D. sound can travel through water

Answer:

Watch Video Solution

16. Astronauts use walkie-talkie to communicate to each other in deep space. Walkie-talkie radiates radio waves to connect

with the respective pair. Astronauts use walkie-talkie to communicate in deep space because

A. sound cannot travel through vacuum

B. range of the walkie-talkie is very large

C. walkie-talkie amplifies the sound produced by astronauts

D. radio waves cannot be transmitted without walkie-talkie

Answer:

Watch Video Solution

17. When stretched thread is plucked, it starts a vibrating. The given information is used to make a

A. flute

B. veena

C. manjira

D. jaltarang

Answer:

Watch Video Solution

18. The presence of excessive and the surroundings may cause

A. vision defects

B. mental problems

C. hearing impairment

D. breathing difficulty

Answer:

Watch Video Solution

19. Which of the following preventive measures cannot be attributed to roadside noise pollution?

A. Plantation on the roadside

B. Installing silencers in vehicles

C. Regular servicing of engines

D. Smoothening of roads

Answer:

 Watch Video Solution

Iit Jee Worksheet I Single Correct Answer Type

1. Every source of sound is

A. Vibrating Body

B. Stationary Body

C. Moving Body

D. None

Answer:

Watch Video Solution

2. Sound travels fastest in

A. Gases

B. Liquids

C. Solids

D. None

Answer:

Watch Video Solution

3. The frequency of ultrasonic vibrations is

A. $< 20Hz$

B. $20Hz - 20000Hz$

C. $> 20,000Hz$

D. none

Answer:

Watch Video Solution

4. Sound produced by irregular vibrations of a material is

A. Music

B. Noise

C. Loudness

D. None

Answer:

 Watch Video Solution

5. The conditions for hearing sound are

A. There must be a vibrating body to produce sound

B. There must be a material medium to propagate

C. There must be a receiver to receive the sound vibrations

D. All

Answer:

Watch Video Solution

6. Why the thunder is heard after the flash of lightning ?

A. Light travels very fast compared to sound

B. Sound travels very fast compared to light

C. Light and sound travel with same velocity

D. None

Answer:

Watch Video Solution

7. The Frequency of electric tuning fork is 8000 Hz. Will this sound be audible ?

A. The sound will be audible

B. The sound will not be audible

C. May or may not be audible

D. None

Answer:

Watch Video Solution

8. We differentiate between voices of two different persons without seeing them by ..... of sound produced ?

A. Pitch

B. Loudness

C. Quality

D. All

Answer:

Watch Video Solution

9. When a drum is hit softly, a soft sound is produced. Because, the vibration of .....

A. Amplitude is large

B. Amplitude is less

C. Frequency is less

D. Frequency is more

Answer:

Watch Video Solution

10. Mosquitos produce high pitch sound, because .....

A. Their frequency of vibration is high

B. Their frequency of vibration is low

C. Amplitude is low

D. Amplitude is high

Answer:

Watch Video Solution

Iit Jee Worksheet Ii Multiple Correct Answer Type

1. Which of the following produces sound?

A. Beating of drums

B. Heating an iron rod

C. Vibrating strings

D. Movement of charges

Answer:

Watch Video Solution

2. Through which of the following media, sound can propogate

A. Air

B. Water

C. Iron rod

D. Vaccum

Answer:

Watch Video Solution

3. Which of the following are the parts of a human ear?

A. Retina

B. Cochlea

C. Cornea

D. Pinna

Answer:

Watch Video Solution

4. Which of the following statements are correct?

A. The unit of frequency is Hertz

B. The unit of time period is second.

C. The unit of wave velocity is metere per second

D. Loudness of sound is expressed in decibels.

Answer:

Watch Video Solution

5. Which of the following sounds cause noise pollution?

A. The sound coming from factories.

B. The sound created by heavy vehicles.

C. Cry of a child.

D. Cutting of vegetables.

Answer:

Watch Video Solution

Iit Jee Worksheet Iii Paragraph Type

1. Velocity of sound is given by the expression,

$v = f \times \lambda$

Where, v= velocity of the wave,

f = frequency, λ = wavelength

Using the above information answer the following questions

The velocity of sound in air is $344 m / \sec$. What is the wavelength of a sound wave of frequency 32Hz?

A. 9.75m

B. 10.75m

C. 7.25m

D. 8.25m

Answer:

Watch Video Solution

2. Velocity of sound is given by the expression,

$v = f \times \lambda$

Where, v= velocity of the wave,

f = frequency, λ = wavelength

Using the above information answer the following questions

A wave travels at a speed of $330m/s$. If the wavelength is 2.2cm, what will be the frequency of the wave?

A. 15,000Hz

B. 14,500Hz

C. 15,500Hz

D. 14,000Hz

Answer:

Watch Video Solution

3. Velocity of sound is given by the expression,

$v = f \times \lambda$

Where, v= velocity of the wave,

f = frequency, λ = wavelength

Using the above information answer the following questions

Calculate the wavelength of radio waves of frequency 10^9 Hz. The speed of radio waves is $3 \times 10^8 m/s$

A. 20 cm

B. 35cm

C. 30 cm

D. 25 cm

Answer:

Watch Video Solution

4. Velocity of sound is given by the expression,

$v = f \times \lambda$

Where, v= velocity of the wave,

f = frequency, λ = wavelength

Using the above information answer the following questions

The wavelength of the wave generated by a tuning fork of frequency 256 Hz. velocity of sound in air at ordinary conditions is $340m/s$ is

A. 1.33 m

B. 2.3m

C. 0.1m

D. 0.3m

Answer:

Watch Video Solution

5. Velocity of sound is given by the expression,

$v = f \times \lambda$

Where, v= velocity of the wave,

f = frequency, λ = wavelength

Using the above information answer the following questions

A tuning fork produces 256 waves in 2 seconds. The frequency of the tuning fork is

A. 1.120 Hz

B. 125 Hz

C. 128Hz

D. 130Hz

Answer:

Watch Video Solution

Iit Jee Worksheet Iv Integer Type

1. The time period of oscillation is 1 second. Its frequency = ...Hz.

Watch Video Solution

2. The time period of oscillation of a body is 0.25 sec. Its frequency is .....Hz.

Watch Video Solution

3. The time period of a seconds pendulum is _____ s.

Watch Video Solution

Iit Jee Worksheet V Matrix Matching

1. Matrix Matching

(A) Audio vibrations of lower frequency	(p) Audio Vibration
(B) Audio vibrations of higher frequency	(q) Bass Effect
(C) Frequencies up to 40,000 Hz can heard by	(r) Shrill Effect
	(s) Dogs
	(t) Dolphins

Watch Video Solution

2. Matrix Matching

(A) Frequency	(t) Absorption of sound
(B) Amplitude	(p) Mechanical form
(C) Time period	(q) Reflected sound
(D) Sound waves	(r) Maximum displacement of vibrating body
	(s) Time taken to complete one vibration

Watch Video Solution

3. Matrix Matching

(A) Sounds which have pleasing effect on ears	(p) Amplitude & frequency of vibration don't change suddenly
(B) Sounds which do not have pleasing effect on ear	(q) Music
(C) In Musical sounds	(r) Irregular vibrations in a material
(D) Noise is produced due to	(s) Noise
	(t) Sound from construction site

Watch Video Solution

4. Matrix Matching

(A) Veena, Guitar	(p) Membrane instruments
(B) Mrudangam, Table	(q) Wind instruments
(C) Flute, shahnai	(r) Keyboard instrument
(D) Harmonium, Piano	(s) Stringed Instruments

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5. Matrix Matching

(A) Pitch	(p) Amplitude
(B) Loudness	(q) Frequency
(C) Two notes of same pitch and loudness are distinguished by	(r) Quality

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