Lakhmir Singh Solutions For Class 8 Science Chapter 13 Sound

1. How is the sound produced?

Solution:

Sound is produced by vibrating objects.

2. What should an object do to produce sound?

Solution:

An object should vibrate to the table to produce sound.

3. How does a sound-making object differ from one that is silent?

Solution:

A sound-making object vibrates when a silent does not. You can feel the vibrations by touching them.

4. Name the part which vibrates to produce sound in the following:

(a) Drums

(b) Sitar

(c) Flute

Solutions:

(a) Its stretched membrane

(b) Its strings.

(c) Its long hollow pipe.

5. What brings the sound of a ringing telephone bell to our ears?

Solution:

The vibrations of eardrums bring us the sound of a ringing telephone bell.

6. What is the length of vocal cords in a man?

Solution:

The male vocal cords are between 17mm and 25mm in length.

7. Out of a man and a woman:

(a) who has shorter vocal cords?

(b) who produces a sound of a higher pitch?

Solution:

(a) A woman has short vocal chords because the length of male vocal chords is between 17mm and 25mm in length and that of woman are between 12.5mm and 17.5mm long

(b) Woman produces a sound of a higher pitch.

8. Give any four sources of sound in a market place.

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Solutions:

The four sources of sound in a market place are:

1. Vendors selling eatables or other things.

2. Shopkeepers selling their things.

3. Vehicles in the market area, for example, auto rickshaw, car, etc.

4. Machines or generators noise.

9. Name the sound-producing organ in humans.

Solutions:

Vocal chords are the sound-producing organ in human beings.

10. Which part of our body vibrates when we speak?

Solutions:

Vocal chord vibrates when u speak.

11. What does the working of a toy telephone tell us about sound?

Solutions:

The working of a toy telephone tells us that vibrating objects produce sound and it is carried in all directions in a medium.

12. Name one solid, one liquid and one gas through which sound can travel.

Solution:

Solid: Metal- Iron, Aluminium etc.

Liquid: Water

Gas: Air

13. Which of the following cannot transmit sound?

Water, Vacuum, Aluminium, Oxygen and gas.

Solution:

A vacuum cannot transmit sound because sound needs a material medium to travel.

14. Is the speed of sound more in water or steel?

Solution:

The speed of sound is faster in solid as compared to liquid. Thus, the speed of sound is more in steel.

15. Where would sound travel faster-in wood or in the water?

Solution:

The speed of sound is faster in solid as compared to liquid. Thus, the speed of sound is more in wood.

16. In which medium sound travels faster: air or iron?

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Solution:

The speed of sound is faster in solid as compared to gas. Thus, the speed of sound is more in iron.

17. In which medium sound travels fastest: air, water or steel?

Solution:

The speed of sound is faster in solid as compared to liquid, and then slowest in gases. Thus, the speed of sound is more in steel, then water and then air.

18. Out of solids, liquids and gases:

(a) in which medium sound travels slowest?

(b) in which medium sound travels fastest?

Solution:

(a) Sound travels slowest in gas medium

(b) Sound travels fastest in solid medium.

19. What is the speed of sound in air?

Solution:

The speed of sound in air is 343m/s.

20. Which of the following is the speed of sound in water and which in steel?

(a) 5000 m/s

(b) 1500 m/s

(c) 340 m/s

Solution:

Solid has a high speed of sound when compared to liquid and gases. The speed of sound is more in steel, then water and then air.

(a) 5000 m/s – Speed of sound in steel.

(b) 1500 m/s – Speed of sound in water.

(c) 340 m/s – Speed of sound in air.

21. Name the organs of hearing in our body.

Solution:

Our ears are the hearing organ of our body.

22. Name that part of the ear which vibrates when outside sound falls on it.

Solution:

The eardrum vibrates when outside sound falls on it.

23. Name the three tiny bones present in the middle part of the ear.

Solution:

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The three tiny bones – the malleus, incus, and stapes – are found in the middle ear. Each one is named in Latin for its shape.

24. What is the function of three tiny bones in the ear?

Solution:

The three tiny bones help in transmitting the sound into the middle ear.

25. Name the nerve which carries electrical impulses from the cochlea of the ear to the brain.

Solution:

The auditory nerve carries electrical impulses from the cochlea of the ear to the brain.

26. What is the name of passage in the outer ear which carries sound waves to the eardrum?

Solution:

Sound waves are carried through the ear canal to the eardrum.

27. Name the quantity whose unit is 'hertz'.

Solution:

The unit of frequency is called "hertz".

28. What is the relation between 'time-period' and 'frequency' of an oscillating body?

Solution:

The time period is the reciprocal of the frequency.

Time period = 1/frequency.

29. Name three characteristics which are used to describe oscillations (or vibrations).

Solutions:

Frequency, amplitude and Phase are the three characteristics which are used to describe oscillations (or vibrations).

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30. What is the scientific name for the following?

The number of vibrations made per second

Solution:

Frequency is the term used for the number of vibrations made per second.

31. What name is given to the maximum displacement of a vibrating body from its central position?

Solution:

Amplitude is called as the maximum displacement of a vibrating body from its central position.

32. If 125 oscillations are produced in 5 seconds, what is the frequency in hertz?

Solution:

Frequency f = No: of vibrations/time

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= 125/5 = 25Hz

33. How does loudness depend on the amplitude of vibrations?

Solution:

Amplitude and loudness are directly proportional. When loudness is high then the amplitude is high and vice versa.

34. By how much will the loudness of a sound change when the amplitude of vibrations is:

(a) doubled?

(b) halved?

Solution:

(a) Loudness is also doubled.

(b) Loudness is halved.

35. Name the unit used to measure the loudness of sound. Also, write its symbol.

Solution:

Decibel is the unit used to measure the loudness of sound. Its symbol is dB

36. What is the loudness of a normal conversation in decibels?

Solution:

The loudness of normal conversation is 60dB.

37. On what factor does the pitch of a sound depend?

Solution:

The frequency is an important factor which maintains the pitch of the sound.

38. How is pitch related to frequency?

Solution:

Pitch and frequency are correlated in the means of the sound wave. The pitch of a sound is nothing but the frequency of the sound wave and if the pitch is high, the frequency will be high and vice versa.

39. Name the characteristic of sound which enables us to distinguish between a man's voice and a woman's voice even without seeing them.

Solution:

The pitch of the sound enables us to distinguish between a man's voice and a woman's voice even without seeing them.

40. Arrange the following sounds in the order of increasing frequencies (keeping the sound of lowest frequency first) :

(i) Baby's voice

(ii) Man's voice

(iii) Woman's voice

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Solution:

Man's voice > Woman's voice > Baby's Voice

41. Which produces the sound of a higher pitch: a drum or a whistle?

Solution:

Drums produce a higher pitch.

42. Name the characteristic of sound which depends on:

(a) Amplitude

(b) Frequency.

Solution:

(a) The loudness of the sound depends on amplitude.

(b) Pitch of the sound depends on frequency.

43. Name the characteristic of sound which can distinguish between the 'notes' (musical sounds) played on a flute and a sitar (both the notes having the same pitch and loudness).

Solution:

The tone will distinguish the notes (musical sounds) played on a flute and a sitar (both the notes having the same pitch and loudness).

44. Write the full form of dB.

Solution:

Decibels is the full form of dB which is the unit of sound.

45. What is the name of very high-frequency sounds which cannot be heard by the human ear?

Solution:

The ultrasonic wave is the name of very high-frequency sounds which cannot be heard by the human ear.

46. Why do we not hear the screams of a bat?

Solution:

The frequency of bat scream is 20,000Hz. That is why we cannot hear the scream of a bat.

47. Which of the following frequency of sound can be heard by a dog but not by a man?

(a) 50,000 hertz

(b)15,000 hertz.

Solution:

Option (a) is correct. 50,000Hz can be heard by a dog but not by a man.

48. Name the substance which vibrates in a flute to produce sound.

Solution:

The air particles vibrate in the air column in the flute which further produces sound.

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49. State whether the following statements are true or false:

(a) Sound cannot travel in a vacuum.

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

(c) If the amplitude of vibrations is large, the sound is feeble.

(d) The lower the frequency of vibration, the higher is the pitch.

(e) If the amplitude of vibrations is doubled, the loudness of sound also gets doubled.

(f) When the amplitude of vibrations is halved, the loudness of sound becomes one-fourth.

(g) Unwanted or unpleasant sound is termed as music.

(h) Noise pollution may cause partial hearing impairment.

Solution:

(a) True

(b) False

(c) False

(d) False

(e) True

(f) False

(g) False

(h) True

50. Fill in the following blanks with suitable words :

(a) Sounds are produced by ……..objects.

(b) The human voice box is called ……..

(c) Sound cannot travel in ……..

(d) A set of three tiny……in the middle part of ear passes on sound vibrations from the eardrum to the liquid in the cochlea.

(e) The unit of frequency is ……..

(f) The time taken by an object to complete one oscillation is called……

(g) The shrillness of a sound is determined by the ……..of vibration.

(h) Unpleasant sound is called…….

(i) Sound which is pleasing to the ear is called…….sound.

(j) A person having partial hearing loss can hear properly by wearing a device called hearing ……on the ear.

Solution:

(a) Sounds are produced by vibrating objects.

(b) The human voice box is called larynx

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(c) Sound cannot travel in a vacuum

(d) A set of three tiny bones in the middle part of ear passes on sound vibrations from the eardrum to the liquid in the cochlea.

(e) The unit of frequency is Hertz (Hz)

(f) The time taken by an object to complete one oscillation is called time-period

(g) The shrillness of a sound is determined by the frequency of vibration.

(h) Unpleasant sound is called noise.

(i) Sound which is pleasing to the ear is called musical sound.

(j) A person having partial hearing loss can hear properly by wearing a device called a hearing machine on the ear.

Short Answer Type Questions

51. (a) What is the name of the strings in the human voice box which vibrate to produce sound?

(b) What makes these strings vibrate?

Solution:

(a) The vocal chords of the human voice box vibrate to produce sound.

(b) The vocal chords are stretched across the larynx and they vibrate to produce sound.

52. Describe how sound is produced by the human voice box (or larynx).

Solution:

Voicebox or larynx is a part of the throat which produces sound in humans. It has two vocal chords which are stretched across the larynx that it leaves a narrow slit between them for the air. When the lungs force the air through the slit, the vocal chord vibrates and produce sound

53. What is the frequency of the sound produced when the vocal cords are:

(a) tight and thin? (b) loose and thick?

Solution:

(a) The frequency produced by tight and thin vocal chords is quite high. i.e. its high pitch sound.

(b) The frequency produced by loose and thick vocal chords is quite low i.e. its low pitch sound.

54. Why are the voices of men, women and children different?

Solution:

The main reason for the difference in voices is the length of vocal chords. The longest vocal chord present in men and the shorter vocal chord is for women. Children have the smallest vocal chord.

55. If you want to hear a train approaching from far away, why is it more convenient to put the ear to the track?

Solution:

We hear the vibrations from the ground when we put our ear at the track so that we can hear a train approaching from far away.

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56. State one observation from everyday life which shows that sound travels much slower than light.

Solution:

We see lightning first then the sound of thunder, because the velocity of light in air 3× 108 m/s while the velocity of sound in air is 343m/s.

57. Explain why the flash of lightning is seen first but the sound of thunder is heard a little later (though lightning and thunder take place in the sky at the same time and the same distance from us).

Solution:

The flash of lightning is seen first but the sound of thunder is heard a little later (though lightning and thunder take place in the sky at the same time and the same distance from us) because the velocity of light in air 3× 108 m/s while the velocity of sound in air is 343m/s.

58. Name the object (or part) which vibrates to produce sound in the following musical instruments :

(a) Sitar

(b) Dholak

(c) Flute

(d)Cymbals

(e) Veena

(f) Tabla

Solution:

(a) Strings

(b) Diaphragm – Membrane

(c) Air column

(d) The metal plates

(e) Strings

(f) Diaphragm – Membrane

59. Name one musical instrument each in which the sound is produced:

(a) By vibrating a stretched string.

(b) By vibrating air enclosed in a tube.

(c) By vibrating a stretched membrane

(d) By vibrating metal plates.

Solution:

(a) Veena

(b) Flute

(c) Table

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(d) Cymbals

60. Give two examples of each of the following :

(a) Stringed musical instruments.

(b) Wind musical instruments.

(c) Membrane musical instruments.

(d) Plate type of musical instruments.

Solutions:

(a) Guitar, Veena

(b) Flute, Trumpet

(c) Tabla, Dholak

(d) Cymbals, Matka

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