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Solution 17

Eustachian tube

Solution 18

Auditory nerve

Solution 19

Ear canal

Solution 20

We should not put a pin or pencil or any other sharp pointed objects in our ears because they can damage the ear-drum and damaging of ear drum can make us deaf.

Solution 21

Ultrasound scans are used to monitor the growth of developing baby in the uterus of the mother.

Solution 22

An ultrasound scan for fetus is better than X-rays because X-rays can damage the delicate body cells of the fetus.

Solution 23

SONAR is used to find the depth of sea by using ultrasonic sound waves.

Solution 24

SO und Navigation And Ranging

Solution 25

Soundboard works on the principle of reflection of sound.

Solution 26

A megaphone is used to address a small gathering of people.

Solution 27

A stethoscope, based on the principle of reflection of sound, is used by doctors to listen to our heartbeats.

Solution 28

Soundboard is a concave board which is kept behind the speaker on the stage of a big hall.

Solution 29

Curtains and carpets can make our big room less echoey.

Solution 30

No we cannot hear infrasonic waves and ultrasonic waves. That's because the frequencies of both these waves fall beyond the human audible range of frequencies.

Solution 31

Infrasonic sound

Solution 32

Ultrasonic sounds

Solution 33

Infrasonic sound waves

Solution 34

As the frequency increases the pitch of the sound also increases.

Solution 35

The loudness decreases with the decrease in the amplitude of sound.

Solution 36

Ultrasonic sound waves

Solution 37

a) reflected

b) frequency

c) amplitude

- d) waveform
- e) reflection

Solution 38

An echo is heard sooner on a hot day because the speed of sound in air increases with temperature. So the speed of sound in air is more on a hot day, and an echo is heard sooner.

Solution 39

An echo is heard sooner in water because the speed of sound in water is higher than the speed of sound in air.

Solution 40

The persistence of sound in a big hall due to repeated reflections from the walls, ceiling and floor of the hall is called reverberation. If the reverberation time in a big hall is too long, then the sound becomes blurred, distorted and confusing due to overlapping.

Solution 41

Reverberations in a big hall or auditorium can be reduced by the following methods :

- i) Panels made of sound absorbing materials are put on the walls and ceilings of hall and auditorium.
- ii) Carpets are put on the floor to absorb sound and reduce reverberations
- iii) Heavy curtains are put on doors and windows to absorb sound and reduce reverberations
- iv) The seats in the hall are made from materials having sound absorbing properties

Solution 42

We hear more clearly in a room with curtains than in a room without curtains because curtains are bad reflectors of sound. They absorb most of the sound falling on them, and hence do not produce echoes. On the other hand, in rooms without curtains, there is a greater reflection of sound due to which some echoes are produced.

These echoes cause a hindrance to hearing.

Solution 43

A megaphone is a large, cone-shaped (or funnel-shaped) device for amplifying and directing the voice of a person who speaks into it. A megaphone works on the principle of multiple reflections of sound.

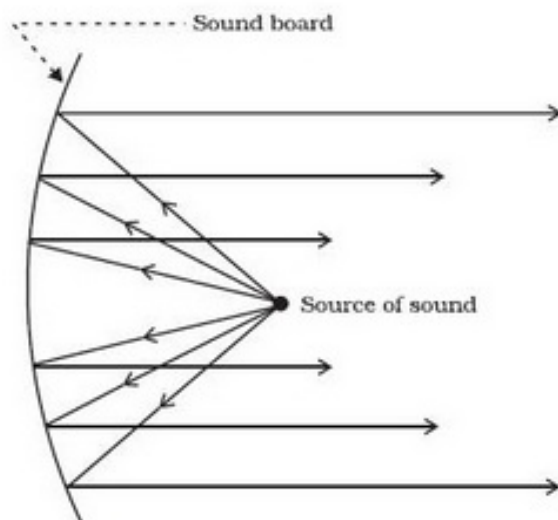
Solution 44

A bulb horn is a cone shaped wind instrument which is used for signaling in bicycles, cars, buses, trucks and boats, etc. A bulb horn works on the principle of multiple reflections of sound.

Solution 45

Stethoscope is a medical instrument used by the doctors for listening to the sounds produced within the human body, mainly in the heart and lungs. It works on the principle of multiple reflections of sound.

Solution 46



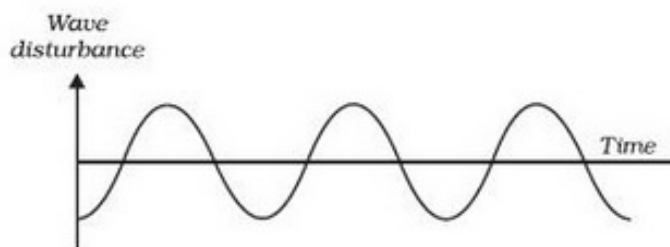
Sound board used in a big hall.

The soundboard is a concave board (curved board) which is placed behind the speaker in large halls or auditoriums so that his speech can be easily heard even by the persons sitting at a considerable distance. The sound board works as follows: the speaker is made to stand at the focus of the concave soundboard. The concave surface of the soundboard reflects the sound waves of the speaker towards the audience (and hence prevents the spreading of sound in various directions). Due to this, sound is distributed uniformly throughout the hall and even the persons sitting at the back of the hall can hear the speech easily.

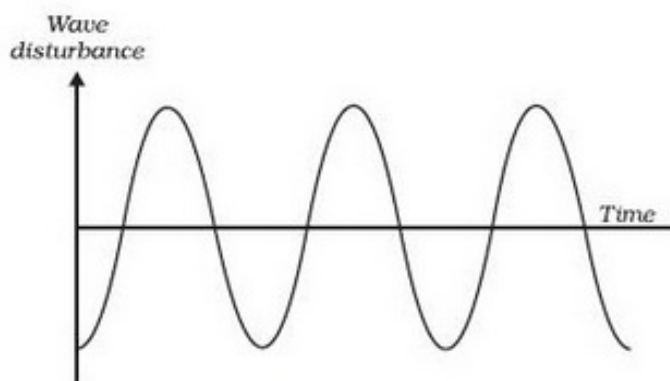
Solution 47

a) The loudness of sound is a measure of the sound energy reaching the ear per second. It depends on the amplitude of the sound waves.

b)



Soft sound

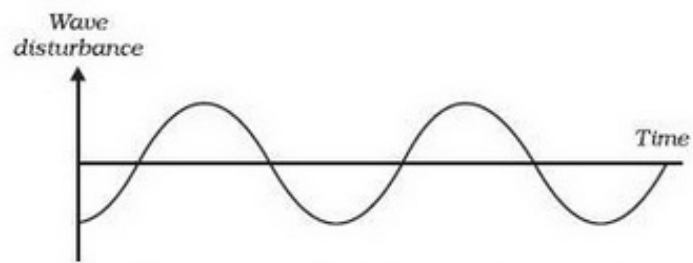


Louder sound

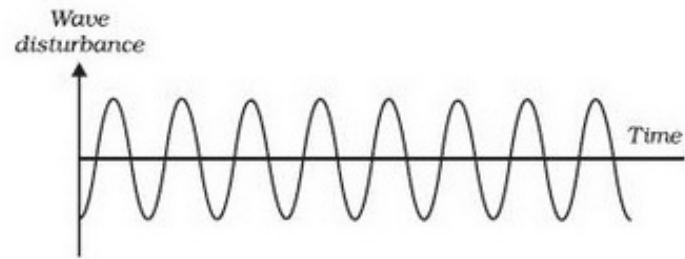
Solution 48

(a) Pitch is that characteristic of the sound by which we can distinguish between different sounds of same loudness. It depends on the frequency of the sound waves

(b)



Wave shape for a low pitched sound.



Wave shape for a high pitched sound.

***** END *****