



SHIKSHA CLASSES

Sub. : Science

Answer Paper

Marks : 20

Std. : VIIIth - S.B.

15. Sound, 16. Reflection of Light

Q.1(A) : Choose the correct alternative

2

1) If the angle made by the incident ray with the surface of a plane mirror is 30° , the angle of reflection must be

Ans : c) 60°

2) In the experiment to show that a medium is necessary for propagation of sound, as the quantity of air inside the bell jar decreases, the level of ringing sound heard outside

Ans : b) decreases

Q.1(B) : Solve any one of the following question

1

1) Find the odd one out

a) Sitar, Violin, Guitar, Flute

Ans : Flute

b) Plane mirror, Plywood, Wood, Rough tile

Ans : Plane mirror

2) On which properties the working of kaleidoscope based?

Ans : The working of kaleidoscope based on reflection of light.

3) Write True or False.

Sound waves cannot travel through vacuum.

Ans : True

Q.2(A) : Give reason (Any One)

2

1) Astronauts on the moon cannot hear each other directly.

Ans : Sound requires medium to travel. The absence of atmosphere on the Moon makes it medium less. Thus, the astronauts on the Moon cannot hear each other directly because of absence of the medium.

2) Kaleidoscope and periscope both use the properties of reflection

Ans : Optical instruments like the periscope and kaleidoscope use the property of multiple reflections between plane mirrors in order to create the final image or images. In a periscope, two mirrors are placed at an angle of 45° with respect to the frame of the periscope such that the mirrors are parallel to each other.

Q.2(B): Solve any two of the following question.

4

1) How will you explain the statement 'We cannot see the objects in a dark room'?

Ans : In a room that is completely dark, no light falls on objects. Hence, no light enters our eyes. Hence, there is no sensation of vision, i.e., we cannot see the objects.

2) How is sound produced in a human larynx ?

Ans :

3) If the angle between the plane mirror and the incident ray is 40° , what are the angles of incidence and reflection?

Ans : The angle between the plane mirror and the incident ray is 40° . Therefore, the angle of incidence (i) = the angle made by the incident ray with the normal to the plane mirror = $90^\circ - 40^\circ = 50^\circ$. The angle of reflection, $r = i = 50^\circ$.

4) What is the relation between the frequency of vibration and the vibrating length (or height) of the air column?

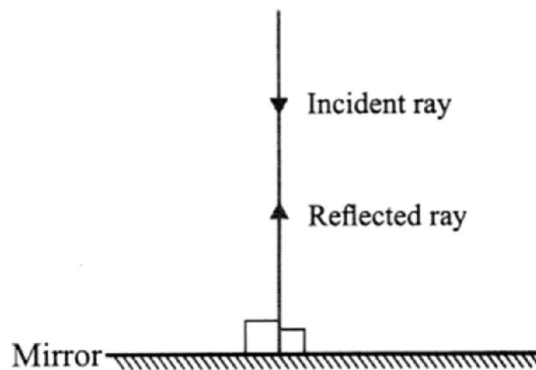
Ans : The greater the vibrating length (or height) of the air column, the less is the frequency of vibration of the column.

Q.3 : Solve any two of the following question.

6

1) State the laws of reflection of light & What will happen when a light ray is incident perpendicular to the mirror?

Ans : 1) The angle of reflection is equal to the angle of incidence.
2) The incident ray, the reflected ray and the normal lie in the same plane.
3) The incident ray and the reflected ray are on the opposite sides of the normal.



Here,

$$r = i = 90^\circ.$$

Hence the light ray, on reflection, will retrace the path.

2) How are different sound notes generated in musical instruments like guitar, which uses strings for sound generation, and flute, which uses blown air for sound generation ?

Ans : **In stringed instruments (like guitar):** Different notes are generated in these instruments when the frequency of vibration of string is changed. It can be changed by changing the **tension in string:** If the string of the instrument is under high tension, then the pitch of the note produced on plucking the string will be high i.e. the note will be shriller because frequency of vibration of the string will be high.

thickness of string: If the string of the instrument is thin, then the pitch of the note produced on plucking the string will be high as frequency of vibration of the string will be high.

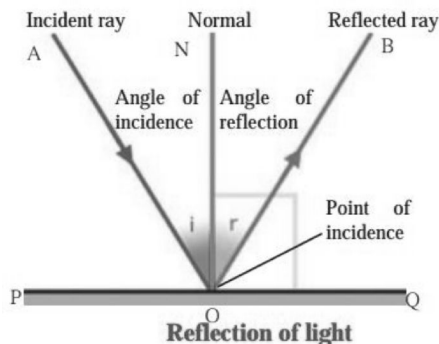
position of plucking of string: If a string stretched between two fixed ends is plucked closer to one of the fixed ends, then the pitch of the sound note produced will be high.

In wind instruments (like flute): Different notes are produced in these instruments by varying the length of the air column in them. The length of the air column can be increased or decreased by closing or opening the more number of holes present in these instruments.

3) Draw a figure showing the following

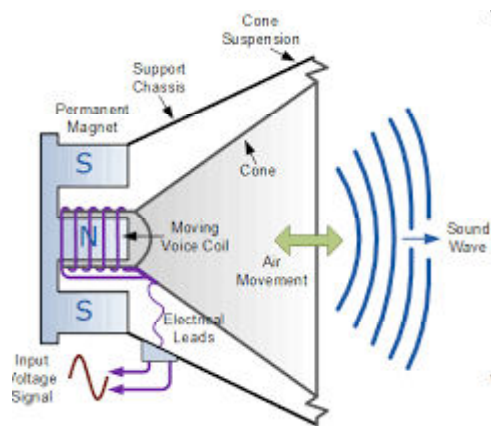
- a) Incident Ray b) Angle of incidence c) Angle of reflection
- d) Point of incidence e) Reflected ray f) Normal

Ans :



4) Draw the diagram of internal construction of a loudspeaker.

Ans :



Q.4 : Solve any One of the following question.

5

1) Explain the experiment, with a neat diagram, to prove the following:
'Sound needs a material medium for propagation.'

Ans :

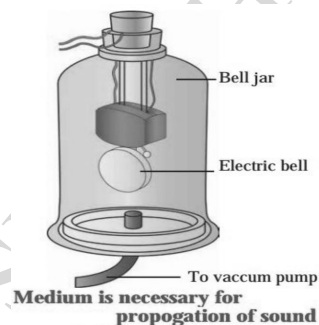


Figure shows part of the set up used in this experiment. What is not shown is the electric circuit in which the electric bell is connected. A vacuum tight bell jar contains an electric bell connected to a power supply through the lid of the jar. The jar is placed on a smooth horizontal surface such as that of glass.

Initially the vacuum pump is off and the jar contains air. The circuit containing the bell is completed using the key or the switch so that the bell starts ringing. This can be heard outside the jar.

Then the vacuum pump is switched on so that it starts removing the air from the jar. We find that the level of ringing sound heard goes on decreasing as the quantity of air in the jar becomes less and less.

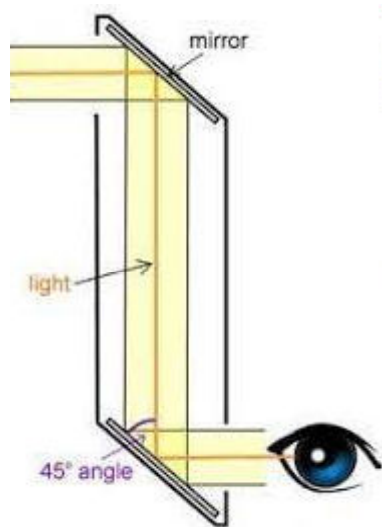
When the pump is operated for a sufficiently long time interval, the quantity of air in the jar becomes so less that the level of ringing sound becomes very low; sound is hardly audible. But we can see the striker in the bell hitting the gong. By extrapolation, we conclude that sound generation and propagation needs a medium.

2) Write a short note on periscope.

Ans : Activity:

Take a cardboard box. Make slits in the top and bottom sides of the box and place two mirrors so that they make an angle of 45° with the sides of the box and are parallel to each other. Fix them with a sticking tape.

Make two windows of 1 inch each near the two mirrors. Now see through the bottom window. Make note of what you see.



From the bottom window, one can see what is in front of the top window. This device is called a periscope. This is used in submarines to see objects above the surface of water. It is also used to observe and keep a watch on the objects or persons on the ground from an underground bunker. The kaleidoscope and periscope both use the properties of reflection of light.

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