

Exercise Question

1 → a → $3 \times 10^8 \text{ m s}^{-1}$

b → $2.25 \times 10^8 \text{ m s}^{-1}$

c → $2 \times 10^8 \text{ m s}^{-1}$

2 → Light travels in a straight line path in a medium. Thus, a medium is said to be denser if the speed of light in it decreases, while it is said to be rarer if the speed of light in it increases.

3 → When light travels through water its speed gets reduced. Hence it is an optically denser medium. The speed of light in air is more than the speed of light in water, which means water is optically denser than air.

4) → A medium is rarer when the speed of light increases when light travels through that medium. Speed of light in air is more than speed of light in glass, which means air is optically rarer than speed of light in air is more than speed of light in glass, which means air is optically rarer than glass.

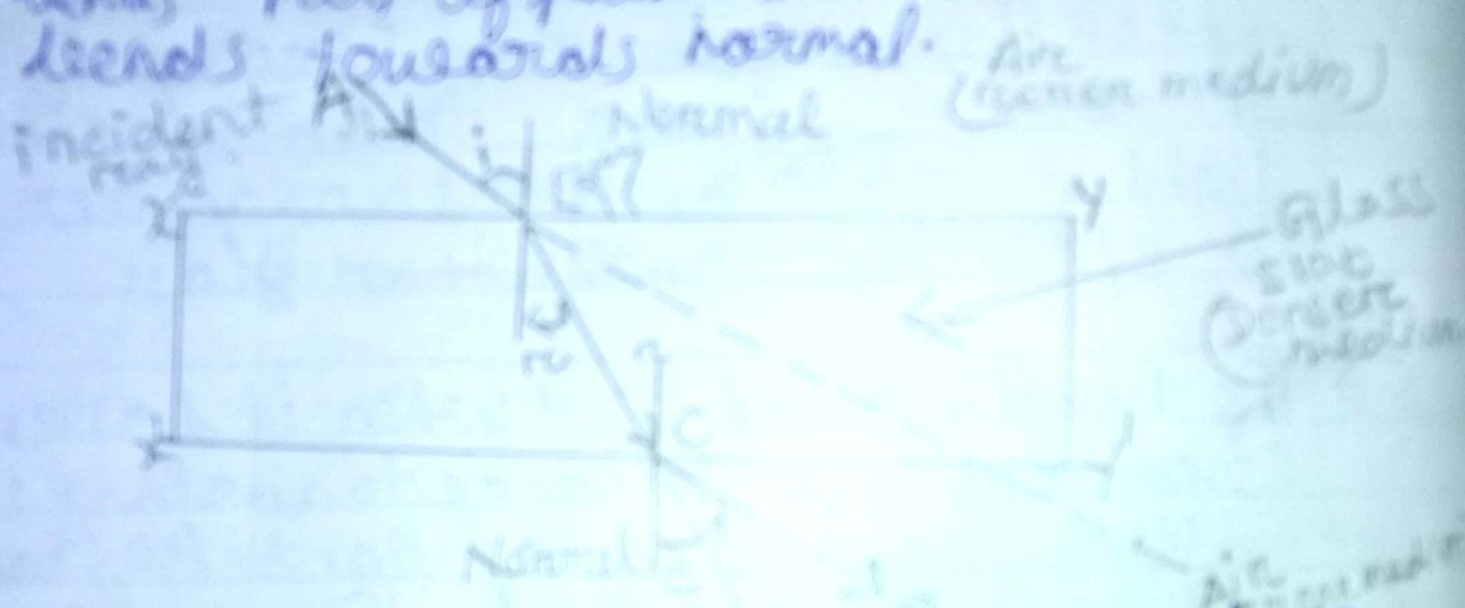
5) → The Bending of light when it passes from one substance to another is called refraction of light. Refraction of light is caused by the differences in density between the substances.

6) → To show - A light ray bends when it passes from one transparent medium into another transparent medium.

Experiment → Spread and fix a sheet of white paper on the drawing board. At the center of the paper, place a glass slab $XYX'Y'$

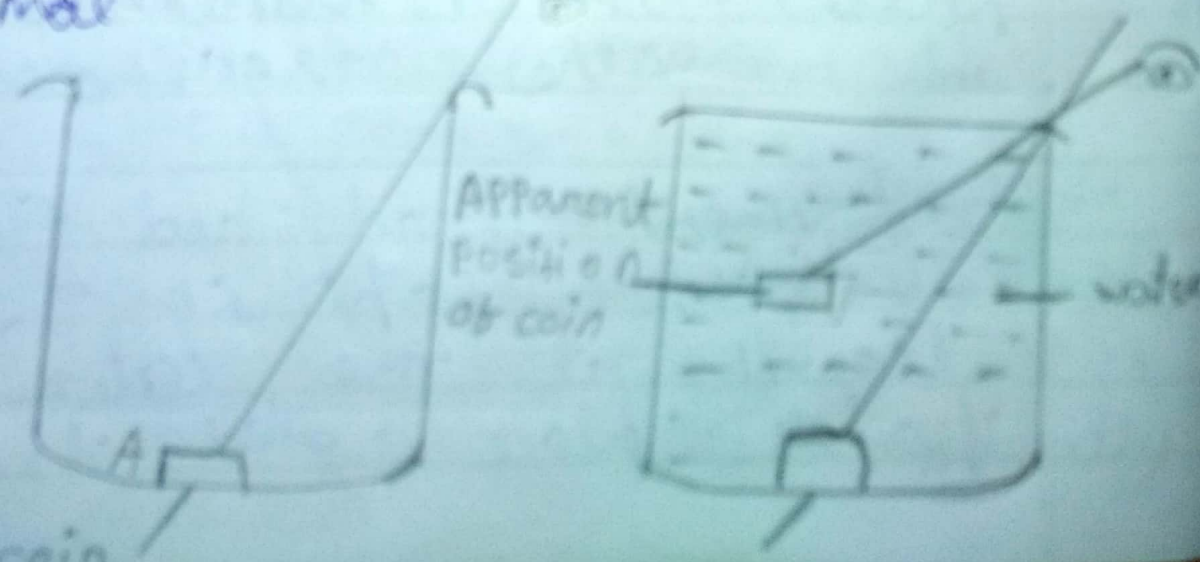
and draw its boundary.

A ray of light AB travelling from air (rarer medium) to glass slab (denser medium) bends towards normal. Part of path BC in denser medium bends towards normal.



Observation - Part of Path BC in denser medium bends towards normal. This shows that when light travels from rarer to denser medium, it bends towards normal.

7 -> ~~water~~



When there is no water in the vessel the coin appears at A. When water is added in the vessel, the coin appears to be at B rather than actually the coin is at A. Hence, the coin appears to be raised up in water. Its height appears to be less than actually it is.

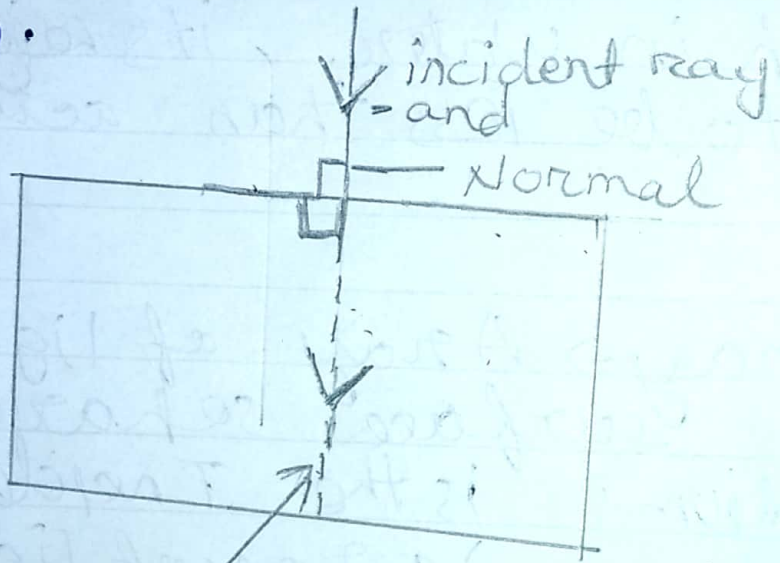
8) Incident ray \rightarrow A ray of light falling on the surface separating two mediums is the Incident ray.
 Refracted ray \rightarrow A ray of light travelling through another medium with change in direction is the refracted ray.

Angle of Incidence \rightarrow The angle which the incident ray makes with the normal is called angle of incidence.

Angle of Refraction \rightarrow The angle which the refracted ray makes

with the normal is called angle of refraction

1) → when a ray of light falls on a glass slab normally, the angle between normal and incident ray is zero.



10) →

when a ray of light travels from a rarer medium to denser medium it bends towards the normal

