

How  
9/11/21

B) Short / Long answer questions

① state the speed of light in

a) air =  $3 \times 10^8$  m/s

b) Water =  $2.25 \times 10^8$  m/s

c) glass =  $2 \times 10^8$  m/s

② How does the speed of light determine the optical density of a medium?

ans → If the speed of light is less than the speed of light in air, means the medium is denser than air.

→ If the speed of light is more than the speed of light in Air, means the medium is less denser than air.

③ Which is optically denser = air or water? give reason.

ans → Water is optically denser as the speed of light is less in water than air.

④ Out of air and glass, which is optically rarer? give reason.

ans → Air is rarer as the speed of light in air is more than the speed of light in glass.

⑤ What do you understand by refraction of light?

ans → Refraction is the bending of light as it passes from one substance to another.

→ The bending is caused by the differences in density between the two substances.

⑥ Describe an experiment to show that a light ray bends when it passes from one transparent medium to another transparent medium.

ans → AIM → To show that a light ray bends when it passes from one transparent medium to other.

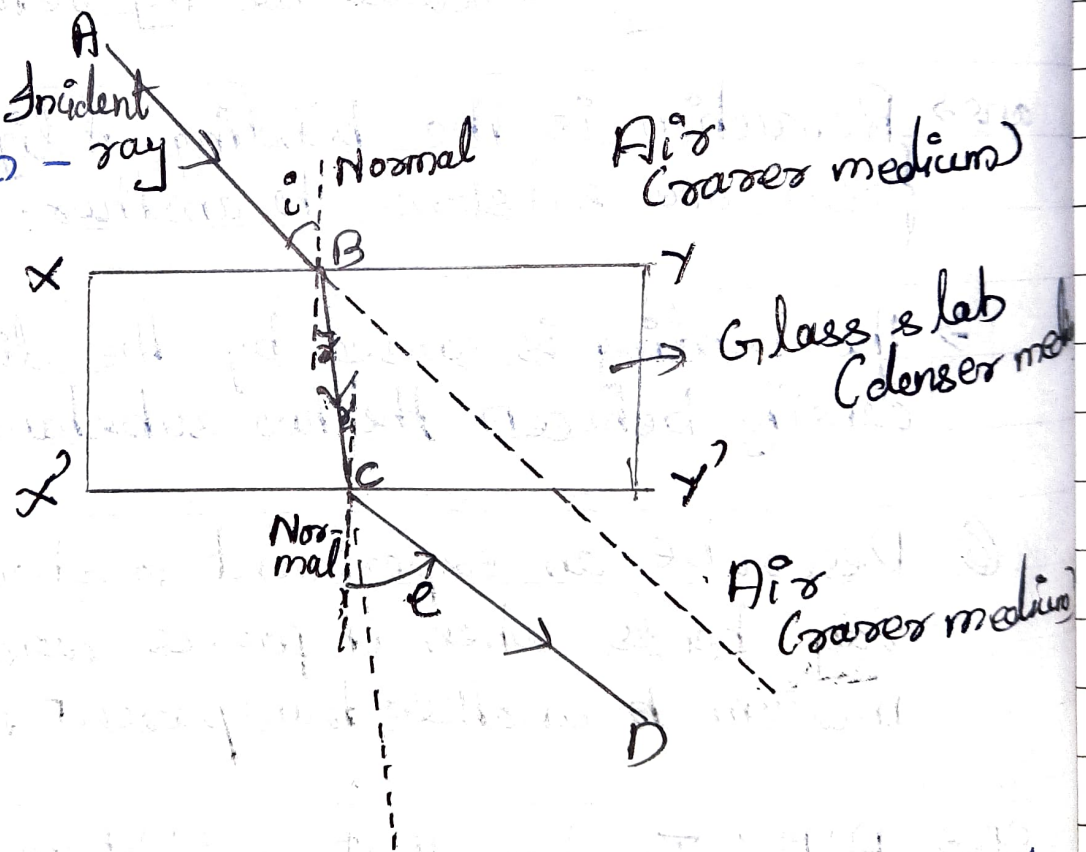
Materials req. → A sheet of white paper, a board, a glass slab, source of light (torch).



## Procedure -

- \* We have to spread and fix the sheet of white paper on the board.
- \* At the center of the paper, we will place the glass slab  $[xyx'y']$  and draw its boundary.
- \* Then we will put the torch light on the glass slab.

## Observation



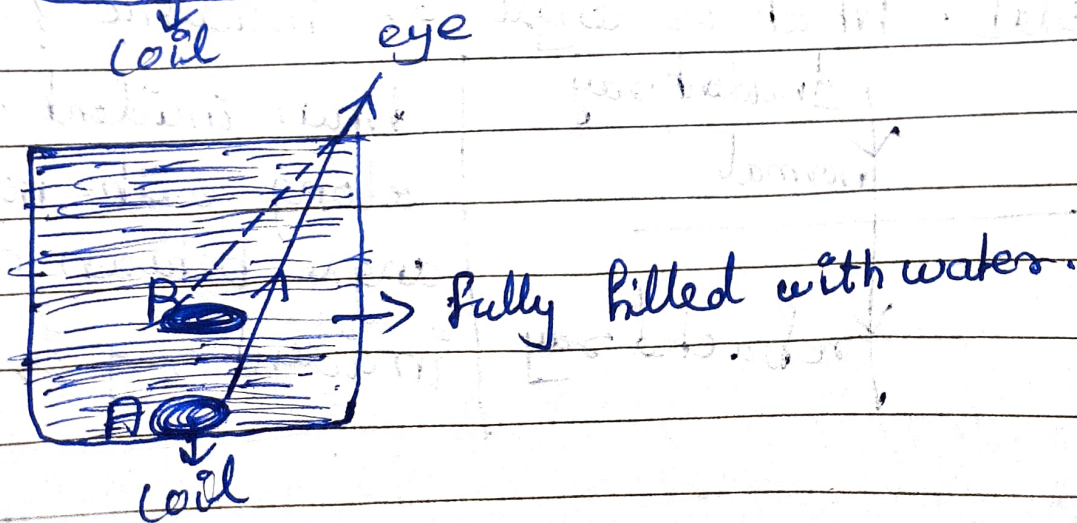
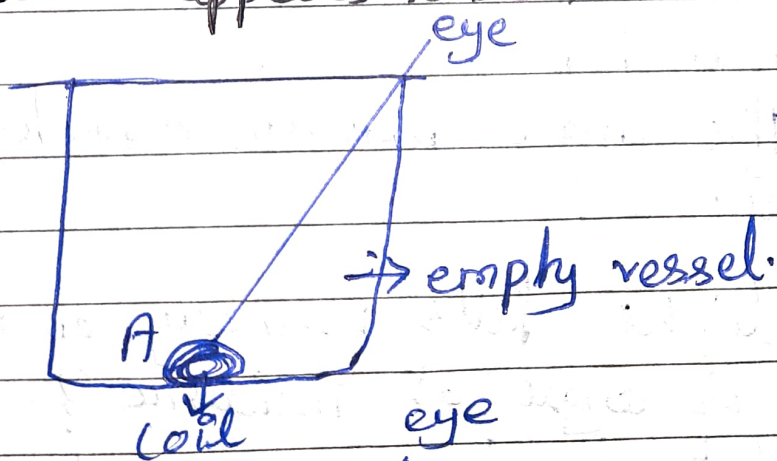
- \* Here, a ray of light 'AB' traveling from air to glass slab.
- \* Part of path BC in denser medium bends towards the normal.

\*  $\angle r$  &  $\angle i$  shows that when light when travels from rarer to denser medium bends towards normal.

\* Ray BC travels from denser to rarer medium also Ray CD bend away from normal through  $\angle e$ .

Conclusion - This shows the refraction of light.

(7) Draw a ray diagram to show that the depth of a vessel containing water when seen from above appears to be less than real depth.





⑧ Define the following terms.

Incident ray -

The ray of light falling on the surface separating two media.

Refracted ray -

The ray of light traveling in other medium in the changed direction.

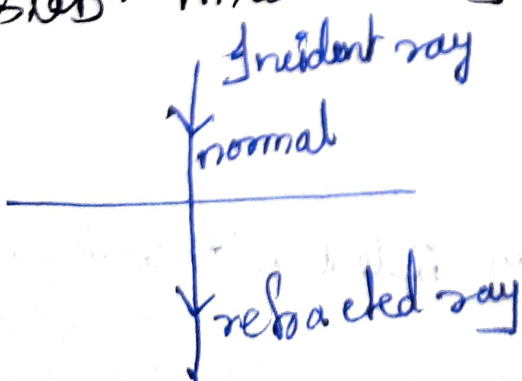
Angle of incidence -

The angle between incident ray and normal.

Angle of refraction -

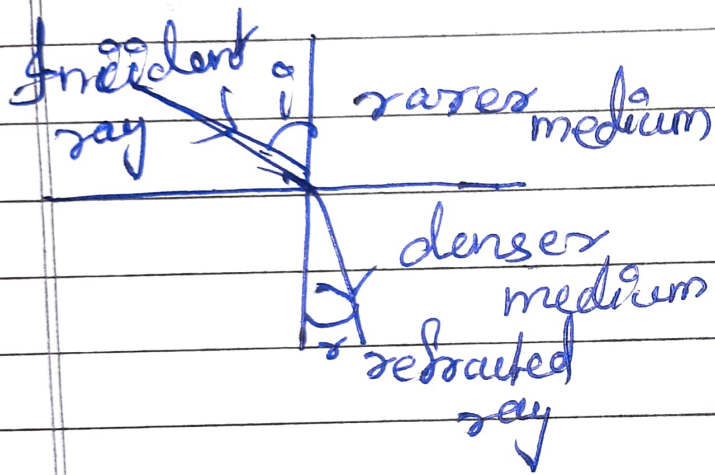
The angle between refracted ray and normal.

⑨ A ray of light falls normally on a glass slab. What is angle of incidence?



When incident ray <sup>passes</sup> along with normal, then angle between normal and incident ray is  $0^\circ$ .

⑩ A ray of light travels from a rarer medium to a denser medium. How will it bend?



When a ray of light, travels from rarer to denser medium, it bends towards the normal.