EXPERIMENT- 1

OBJECT: To measure angle of incidence

(i) angle of emergence 'e', angle of deviation 'δ' and angle of prism 'A' and To verify, i + e = A + δ

APPARATUS: Drawing board, white sheet of paper, prism, drawing pins, pins and protractor.

THEORY:- The figure shows the principal section ABC of a prism. The angle of the prism is ∠BAC = ∠A. A ray of light OP strikes the face AB of the prism at an angle of incidence 'i'. It suffers refraction from air (rarer medium) to glass (denser) medium at the face AB, so it bends towards the normal PN making an angle of refraction equal to r, and travels along PQ inside the room prism. Thus PQ is the refracted ray. The refracted ray PQ strikes the face AC

of the prism at an angle of incidence r_2. It suffers refraction from glass (denser medium) to air (rarer medium) at the face AC, so it bends away from the normal NQ and emerges out of the prism as QR at an angle of emergence 'e'. Thus QR is the emergent ray.

By geometry $i + e = A + \delta$

METHOD:

1. Fix the white sheet of papers on the drawing board with the help of drawing pins.

2. Mark one angle on the prism as A with a piece of gummed label. Place prism on the paper and mark its boundary ABC with the point of a pencil. Remove the prism.
Measure and record the $\angle A = \angle ABC$.

3. Take a point Q on the line AB, nearby in its middle and draw a line PQ at an $\angle x = 20°$ with the line AB as shown in figure (i.e $\angle x = \angle PQB$).
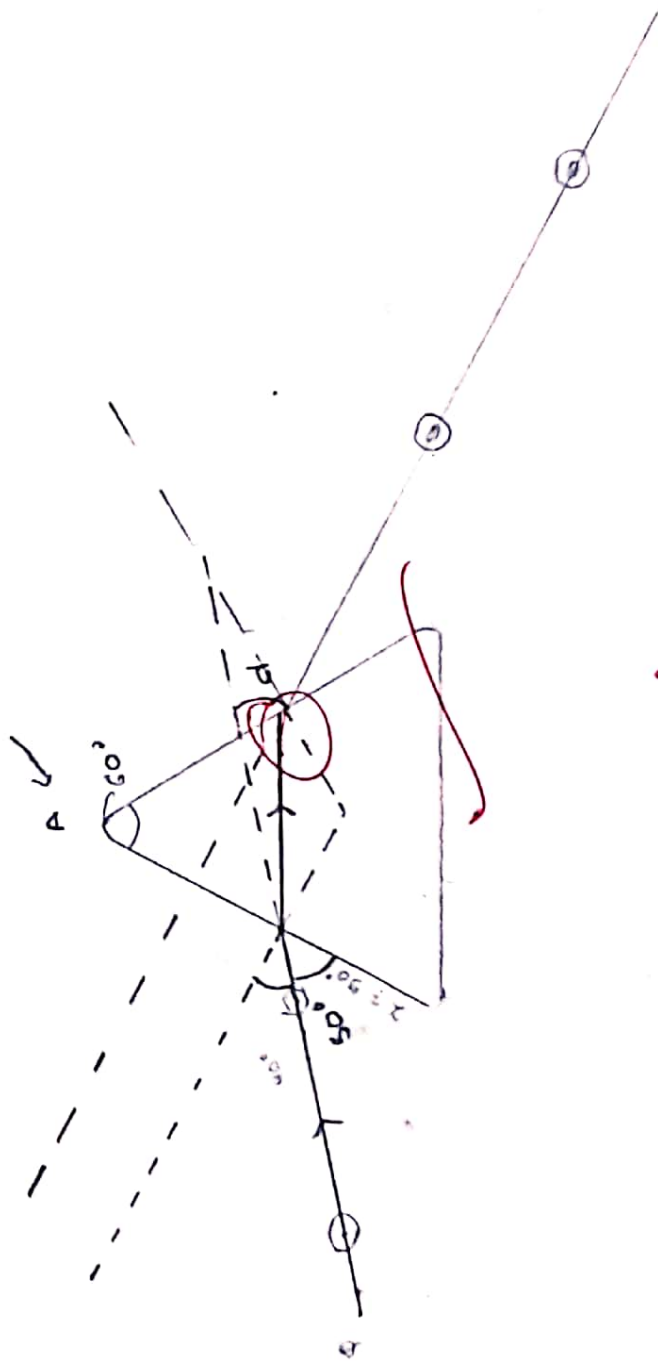
Record angle of incidence $i = 90° - x$.

4. Fix Two pins X and Y on the line PQ. Replace the prism and looking through the prism from the side AC, fix two pins R and S on the other side so that they appear in line with the pins X and Y. Remove the pins, mark the position of pins. Remove the prism.

5. Join the position of pins R and S and produce it to meet the prism boundary AC at T measure the angle y between the line TD and the line AC (i.e., $\angle y = \angle DTC$). Record the angle of emergence $e = 90° - y$.

6. Produce PQ and TD backwards and measure the angle δ between the Two produced lines at shown in figure. Record the angle of deviation δ.

OBSERVATIONS:

No of observations	Angle x (in digree)	Angle of Incidence $J = 90° - x$ (in digree)	Angle y (in digree)	Angle of emergence $e = 90° - y$ (in digree)	Angle of deviation δ (in digree)
1.	1	50°	40°	60°	40°	40°

i = 40°
A = 60°
e = 46°
δ = 40°

pl. omit

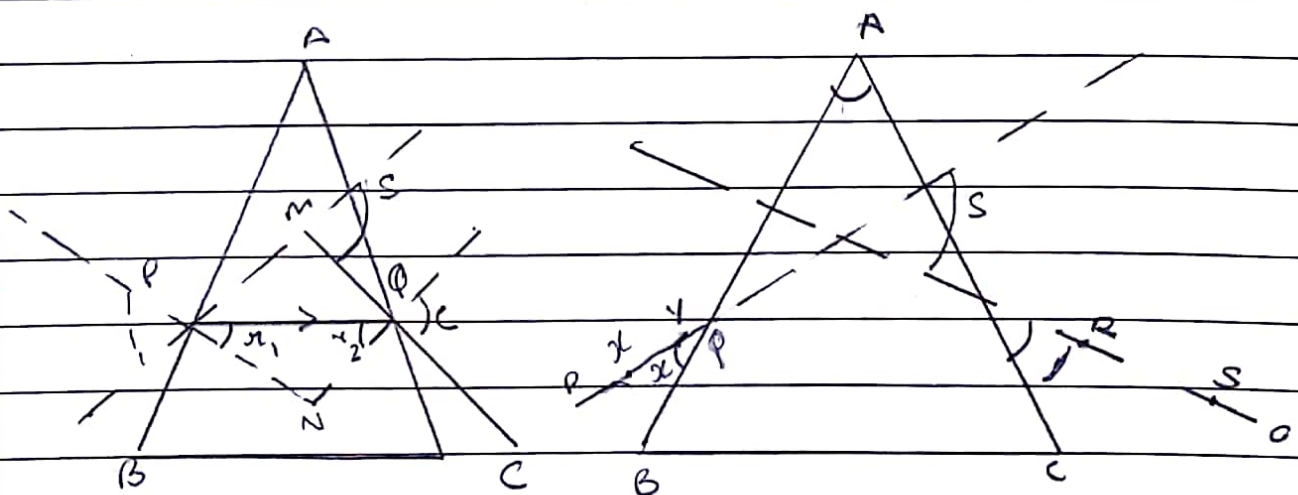|	2						
2	2						
3	3						
4	4						

RESULT:

From the observation Table, we notice that

$$i + e = A + \bar{O}$$

PRECAUTIONS:

1. The pin X and Y should be at least 5cm apart.
2. All the pins should stand vertical