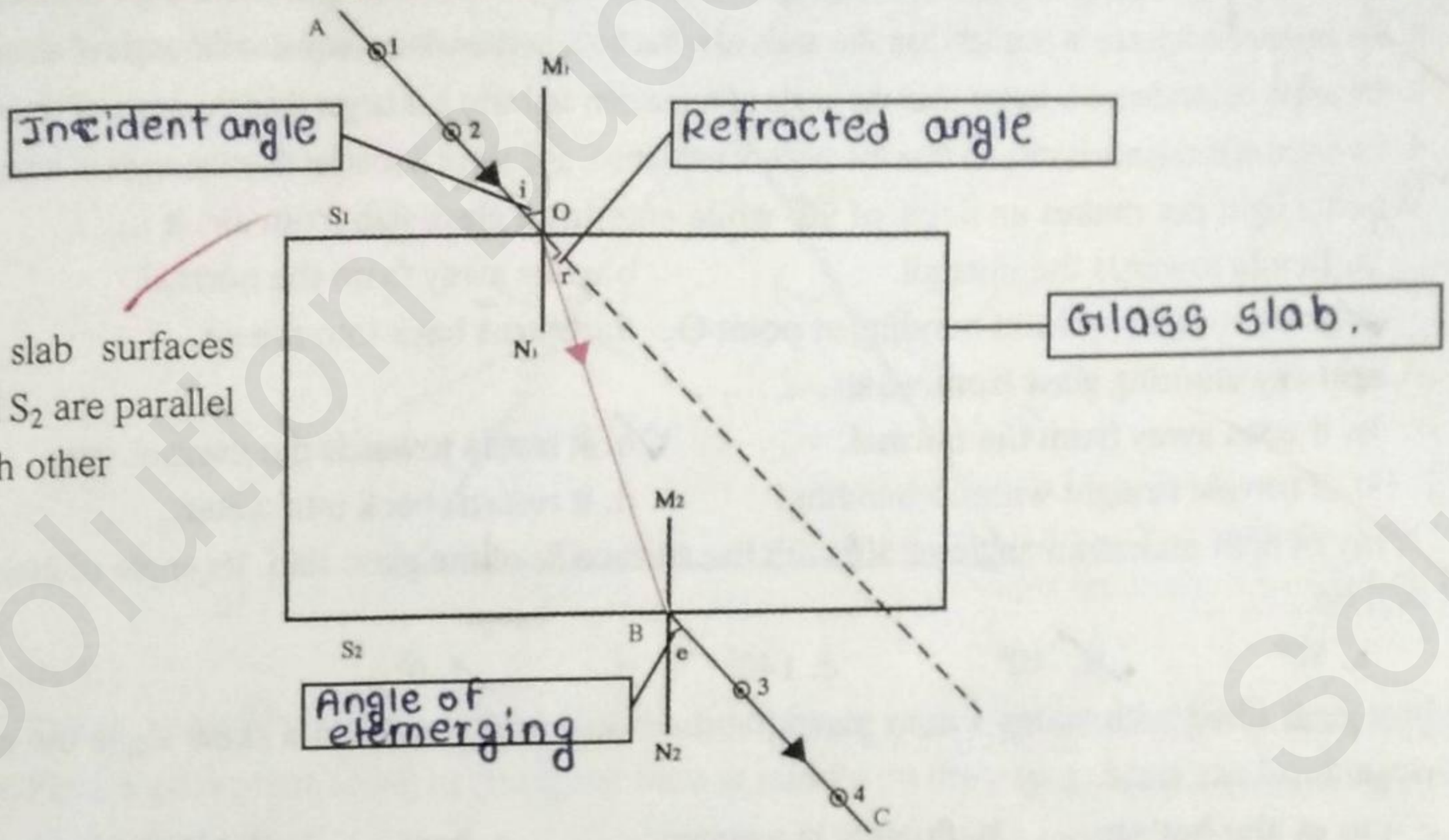
Practical No. 8

Aim : To verify the laws of refraction of light.

Apparatus : A glass slab, drawing board, drawing pins, paper pins, drawing sheet, etc.

Figure : (Label the following diagram.)



Glass slab surfaces S_1 and S_2 are parallel to each other

Procedure :

1. Take the drawing paper and fix it on the drawing board properly by using drawing pins.
2. Place the given glass slab at the center and draw its projections on the paper with a pencil.
3. Remove the slab and at point O, draw a normal M_1N_1 at the point O. Also, draw the ray AO at an angle of 30^0 with the normal.
4. Fix two paper pins 1 and 2 as the ray AO.
5. Now place the glass slab in its original place, look at the images of the paper pins 1 and 2 from the other side of the slab, and fix two more pins 3 and 4 in such a way that they are on the line joining the pins 1 and 2. The ray BC shows the emerging ray.
6. Remove the slab and join OB. Draw a normal M_2N_2 at the point B.
7. Measure the angle of incidence (i), the angle of refraction (r) and the angle of emergence (e).
8. Repeat the same procedure for 45^0 and 60^0.

Observation :

Sr.No.	Angle of incidence (i)	Angle of refraction (r)	Angle of emergence (e)
1	30^0	20.7	30^0
2	45^0	30^0	45^0
3	60^0	37.8^0	60^0

Inference / Conclusion :

1. When light undergoes refraction through a glass slab, the Incident ray and emergence ray are parallel to each other.
2. The angle of incidence and the angle of emergence are of ...same.... measures.

Multiple Choice Questions

1. One student is doing experiment to draw the path of light rays passing through a glass slab. For this, he measured the angle of refraction and angle of emergence for every angle of incidence. In all the cases he found that..... .

   a. The angle of incidence is larger than the angle of refraction, but is almost equal to the angle of emergence.
   b. the angle of incidence is smaller than the angle of refraction, but it is almost equal to the angle of emergence.
   c. the angle of incidence is larger than the angle of refraction and also it is larger than the angle of emergence.
   d. the angle of incidence is smaller than the angle of refraction, and also it is smaller than the angle of emergence.

2. When a light ray makes an angle of 90^0 while entering a glass slab from air, it .....

   a. bends towards the normal.
   b. goes away from the normal.
   c. goes straight without bending at point O.
   d. returns back into the air.

3. A light ray entering glass from water, ...

   a. it goes away from the normal.
   b. it bends towards the normal.
   c. it travels straight without bending.
   d. it returns back into water.

4. A ray of light makes an angle of 50^0 with the surface S_1 of the glass slab. Its angle of incidence will be .....

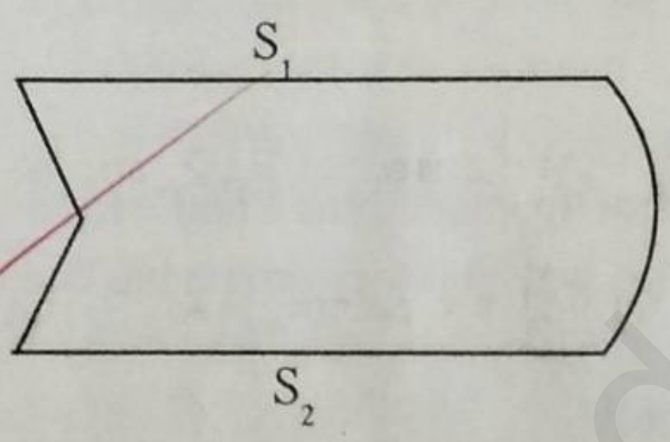
   a. 50^0 b. 40^0 c. 140^0 d. 0^0

5. In a glass filled with water a coin placed at the bottom, if viewed in a skew angle the coin is found .....

   a. at the bottom. b. floating in a water. c. bent. d. breaked.

: Exercise :

1. If the glass slab is of the following shape, and the experiment is performed as above, will the effects be the same? Here, S_1 and S_2 are slab surfaces parallel to each other.



In this experiment, light coming from air at point S_1, reflected toward normal and at the end of S_2 it will run in same direction (parrallel). So the experiment is as same as Previous experiment.

2. "During refraction of light through the glass slab, incident ray and emergent ray are parallel to each other." Explain.

During refraction of light, light bent toward normal in glass slab. Glass slab act as only one divider to chage its direction but when light cross this glass slab it go in its direc

3. What would be the path of refracting ray and emergent ray, if two glass slab kept attached to each other.

If two glass slab is kept attached to each other then they act as single slab therefore its refracting ray and emergent ray place at its own position.

Remark and Signature .....

PX1521