Experiment No. 5
Refraction through a glass slab

Aim: To trace the path of light passing through the rectangular glass slab and measure the angle of incidence and the angle of emergence and interpret the result.
Materials required: Drawing board, white paper, glass slab, geometry box and pins.
Theory:

- When a ray of light passes from one transparent medium to another medium, it changes the direction of its path or it bends. This phenomenon is known as refraction of light.
- When a ray of light travels from a rarer medium to a denser medium, it bends towards the normal. When a ray travels from denser medium to rarer medium, it bends away from normal.
- The angle between the incident ray and normal at point of incidence is ∠i, the angle between the refracted ray and the normal at the point of incidence is ∠r. The angle that the emergent ray makes with the normal is the angle of emergence ∠e.

Laws of refraction of light:

- The incident ray, the refracted ray and the normal to the refracting surface at the point of incidence , all lie on the same plane.
- The ratio of sine of angle of incidence to the sine of angle of refraction is constant for a given pair of media.

Procedure:

- Take a sheet of paper and fix it on the drawing board.
- Place the rectangular glass slab symmetrically in the middle of the paper.
- Draw its outline ABCD. After drawing the outline, remove the glass slab from its position. On one of the longer side AB, draw a normal N_1N_2 at O, situated near the middle of the line AB.
- Draw the incident ray inclined to the normal on AB.
- Keep the glass slab and see the refracted image of the pins through the glass slab. Fix two more pins on the emergent ray. Produce the incident ray till the emergent ray.
- Find ∠e drawing a normal on CD.

Result:

- Light is refracted towards the normal when it passes from rarer medium to denser medium
- Light is refracted away from the normal, when it passes from denser to rarer medium.
- Li = Le
- Lateral displacement = ————— cm