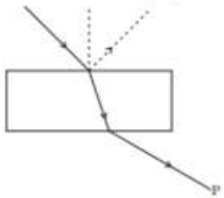


**04.** Consider a light beam incident from air to a glass slab at Brewster's angle as shown in Figure. A polaroid is placed in the path of the emergent ray at point P and rotated about an axis passing through the centre and perpendicular to the plane of the polaroid.



- 1) For a particular orientation there shall be darkness as observed through the polaroid
- 2) The intensity of light as seen through the Polaroid shall go through a minimum but not zero for two orientations of the polaroid
- 3) The intensity of light as seen through the polaroid shall go through a minimum for four orientations of the polaroid
- 4) The intensity of light as seen through the polaroid shall be independent of the rotation

**Sol. 2)**

The intensity of light as seen through the Polaroid shall go through a minimum but not zero for two orientations of the polaroid

Brewster's law: Brewster discovered that when a beam of unpolarized light is reflected from a transparent medium (refractive index =  $\mu$ ), the reflected light is completely plane polarized at a certain angle of incidence. When ray ABCD of light passes through a prism in such a way that angle between reflected ray BE and refracted ray BC is  $90^\circ$  then only reflected ray is plane-polarized. So Polaroid rotated in the way of CD the intensity will never be zero but varies in one complete rotation.

