The following questions are about polarization and polarized light.

1. Describe what is meant by polarized light.

2. Describe polarization by reflection.

3. Unpolarized light in air is reflected from a liquid surface in such a way that it is completely polarized. The angle of incidence is 43°. What is the angle of refraction in the liquid?

Two disks of Polaroid are aligned so that they polarize light in the same plane.

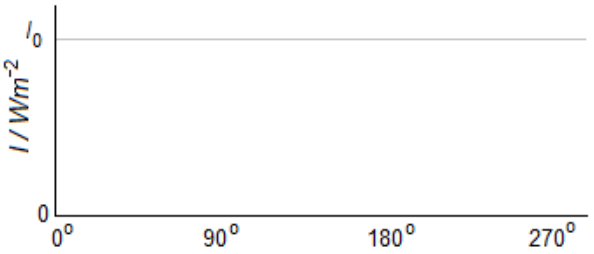
4. Calculate the angle through which one sheet needs to be turned in order to reduce the amplitude of the observed E-field to one-fifth of its original value.

5. If the initial intensity was I_0, what will the new intensity be (at the angle you just calculated)?

6. If we want the intensity to be one-fifth of its original value, what must be the angle through which one of the sheets is turned.

Polarized light of intensity I_0 is incident on an analyzer. The transmission axis of the analyzer makes an angle θ with the direction of the electric field of the light waves entering it.

7. Explain the terms polarizer and analyzer.



8. Sketch a graph to show the variation of the intensity of the light transmitted through the analyzer as θ changes from 0° to 270°.

9. A ray of plane-polarized light of intensity 25 Wm^{-2} is normally incident on a polarizing filter. The intensity of the transmitted light is 20 Wm^{-2}. Calculate the angle between the plane of the polarized light and the preferred plane of the filter.