H·W
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HOME ASSIGNMENT

Q1. Can a beam of white light when passed through a hollow prism give spectrum? Explain.

Ans- Spectrum is produced by the deviation of different colour by the means of refraction. When the white light travels from air into the hollow prism, there is no change of medium, as prism has air inside. Thus a beam of light doesnot give spectrum on passing through a hollow prism.

Q2. Why do different components of white light deviate by a different amounts when passed through a prism?

Ans- The rays of different colours have different speed in certain medium. So the refractive index of the prism is different from light of different colours. Thus the white light gets dispersed into different colours.

Q3. The angle of prism is 60 degrees. What is the angle of incidence for minimum deviation for the prism with refractive index. $\sqrt{2}$.

Given,

Ans- The refractive index $= \sqrt{2}$

Angle of prism $= 60°$

$$\mu = \frac{\sin\left[\frac{A+Sm}{2}\right]}{\sin\left[\frac{A}{2}\right]} \quad \text{---------} (1)$$

$i = e$

$\Rightarrow i + e = A + Sm$

$$i = \left[\frac{A+Sm}{2}\right] \quad \text{---------} (2)$$

By (1) & (2)

$$\mu = \frac{\sin(i)}{\sin\left(\frac{A}{2}\right)}$$

$$\sin(i) = \mu \times \sin\left[\frac{A}{2}\right]$$

$$= \sqrt{2} \times \sin\left[\frac{60}{2}\right]$$

$$= \sqrt{2} \times \sin 30°$$

$$\sin(i) = \sin^{-1}\left[\frac{1}{\sqrt{2}}\right]^{-1}$$

$$i = 45°.$$