

For the same value of angle of incidence, the angles of refraction in three media A, B and C are  $15^\circ$ ,  $25^\circ$  and  $35^\circ$  respectively. In which medium would the velocity of light be minimum?

Sol-

Let the refractive index of the medium be  $n$  and speed of light in air is  $c$ .

Using Snell's law of refraction :  $n_{\text{air}} \times \sin i = n_{\text{medium}} \times \sin r$  where

$$n_{\text{air}} = 1$$

$$\therefore 1 \times \sin i = n \times \sin r \quad \Rightarrow \quad n = \frac{\sin i}{\sin r}$$

$$\text{Velocity of light in a medium} \quad v = \frac{c}{n} = \frac{c \times \sin r}{\sin i} \quad \Rightarrow \quad v \propto \sin r$$

Thus velocity of light is minimum in medium A.