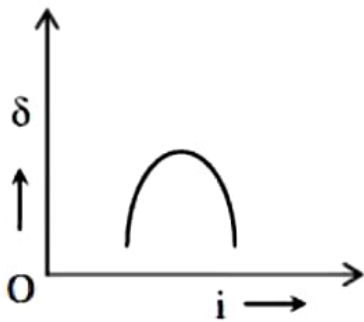


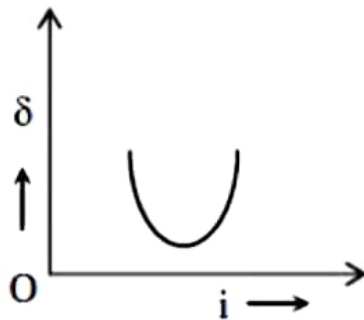
Question

The graph between angle of deviation (δ) and angle of incidence (i) for a triangular prism is represented by:

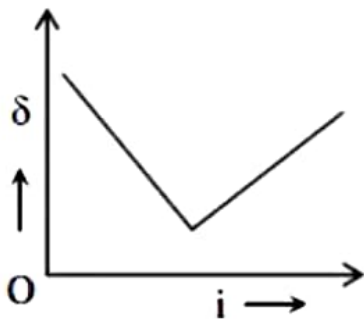
A



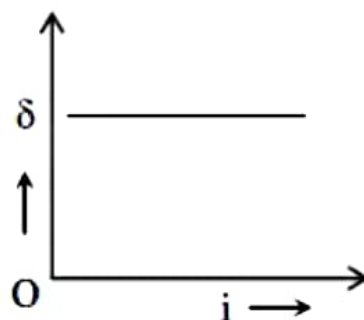
B



C



D



Solution

Correct
option is
B)

In the given figure,

$$\theta_4 = \sin^{-1} n \sin(\theta_3)$$

$$A + \delta = \theta_1 + \theta_4$$

$$A = \theta_2 + \theta_3$$

$$\delta = \theta_1 + \sin^{-1} n \sin(\theta_3) - A$$

$$\delta = \theta_1 + \sin^{-1} n \sin(A - \theta_2) - A$$

$$\delta = \theta_1 + \sin^{-1} n \sin\left(A - \sin^{-1} \frac{\sin(\theta_1)}{n}\right) - A$$

Plotting this on the graph, we get a graph like (b).

But deducing that just by looking at the equation is difficult.

To deduce it, we can first conclude that the curve will be nonlinear and continuous.

Secondly, minimum deviation occurs only at 1 value of angle incidence.

Hence answer is B

