

Q) What are the two conditions required for total internal reflection?

The two conditions required for total internal reflection are

- 1) Angle of incidence should be greater than the critical angle.
- 2) Ray should travel from denser medium to rarer medium.

Q) A fish in the pond of water appears at a depth of 6cm. What is the actual depth of fish refractive index of air w.r.t. water is $\frac{3}{4}$?

$$\frac{\text{Actual depth}}{\text{Apparent depth}} = \text{Refractive index}$$

Let the actual path be x .

A/Q

$$\frac{x}{6} = \frac{3}{4}$$

$$4x = 18$$

$$x = 4.5 \text{ cm}$$

∴ the actual depth is 4.5cm.

Q3) A rectangular glass slab of thickness 8cm is placed on a figure. The eye is kept exactly above this slab. If the refractive index of glass is 1.6, then by what distance the figure will appear to rise?

$$\text{Apparent depth} = \frac{\text{Actual depth}}{\text{Refractive index}}$$

$$\begin{aligned} \text{Apparent depth} &= \frac{8}{1.6} \\ &= \frac{80}{16} = 5\text{cm} \end{aligned}$$

$$\begin{aligned} \text{Normal shift} &= \text{Actual depth} - \text{Apparent depth} \\ &= 8 - 5 \end{aligned}$$

$$= 3\text{cm}$$

$$\frac{3}{N} = \frac{x}{8}$$

$$3 \times 8 = 8N$$

$$24 = 8N$$

$$N = \frac{24}{8} = 3$$