

Q1) What are the total conditions required for total internal reflection?

→ The two conditions for the total internal reflection are -

- The light should travel from an optical denser to optical rarer medium.
- The incident should always be greater than the critical angle for both the mediums.

Q2) A fish appears in the pond at the depth of 6cm. What is the actual depth of the fish if the refractive index of air & water is $\frac{3}{4}$

→ Apparent depth = 6cm

refractive index air & water = $\frac{3}{4}$

Let real depth be x cm

$$\text{So } \frac{x \text{ cm}}{6 \text{ cm}} = \frac{3}{4} \Rightarrow x = \frac{3 \times 6}{4} = 4.5$$

So real depth is 4.5 cm.

Q3) A rectangular glass slab of 2 cm thick is placed on a figure. The eye is kept exactly above it, if the refractive index is 1.6 then by what distance the figure will appear to raised?

→ Actual depth = 8cm

Refractive index, air to glass = 1.6 = $\frac{8}{5}$

Let apparent depth be x cm

$$\text{So } \frac{8 \text{ cm}}{x \text{ cm}} = \frac{8}{5} \Rightarrow x = \frac{5}{8} \times 8 = 5$$

So the apparent depth is 5cm.