

Q.1 What are the two conditions required for total internal reflection?

Ans1. The two conditions are:-

i) angle of incidence should be greater than critical angle.

ii) The light ray should travel from denser to rarer medium.

Q.2 A fish in the pond of water appears at a depth of 6cm. What is the ~~real~~ actual depth of the fish if the refractive index of ^{air} w.r.t. water is $\frac{3}{4}$?

Ans2. Let ~~water~~ water be medium 2 and air be medium 1.

$$\text{ATQ, } \mu_{12} = \frac{3}{4}$$

$$\Rightarrow \frac{1}{\mu_{21}} = \frac{3}{4}$$

$$\Rightarrow \mu_{21} = \frac{4}{3}$$

$$\text{As } \mu_{21} = \frac{\text{Real depth}}{\text{apparent depth}}$$

$$\Rightarrow \frac{4}{3} = \frac{\text{Real depth}}{6}$$

$$\Rightarrow \text{Real depth} = 8 \text{ cm}$$

The actual depth of fish is 8 cm.

Q.3 A ~~regular~~ rectangular glass slab of thickness 8 cm 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 be raised?

Ans 3. Let air be med 1
And glass be med 2.

$$\text{ATQ } \mu_{21} = 1.6$$

$$\begin{aligned} \text{So, the distance by which the} \\ \text{fig. is raised} &= \text{Real depth} \left(1 - \frac{1}{\mu_{21}}\right) \\ &= 8 \left(1 - \frac{1}{1.6}\right) \\ &= 8 \times \frac{0.6}{1.6} = \underline{3 \text{ cm}} \end{aligned}$$