

# HOME ASSIGNMENT

1. What are the 2 conditions required for total internal reflection?

Ans

The 2 conditions for TIR :-

(i)

The light must propagate from optically denser to optically rarer medium.

(ii)

The angle of incidence in the denser medium must be greater than the critical angle for the media.

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

Ans:

$$\mu_{a/w} = \frac{3}{4}$$

$$\text{So, } \mu_{w/a} = \frac{1}{\mu_{a/w}} = \frac{4}{3}$$

$$\text{So, } \mu_{w/a} = \frac{\text{Real Depth}}{\text{App. Depth}}$$

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

$$\Rightarrow \boxed{x = 8 \text{ cm}}$$

→ The actual depth of fish is 8 cm below water surface.

3. A ~~water~~ 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 fig will appear to be raised.

Ans. 
$$\mu_g = \frac{\text{Real Depth}}{\text{App depth}}$$

So, 
$$1.6 = \frac{8 \text{ cm}}{\text{App depth}} \quad \Rightarrow \text{App depth} = \frac{8}{1.6} = \underline{\underline{5 \text{ cm}}}$$

Shift = R.D - A.P  

$$= 8 - 5 = \underline{\underline{3 \text{ cm}}}$$
 Ans.