House Assignment Questions

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

ans. 1st Condition :- the light must be travelling from a more dense medium into a less dense medium. (for e.g- glass to air)

2nd condition :- the angle of incidence must be greater than the critical angle.

(2) A fish 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 with respect to water is 3/4?

Sol. Actual depth = ref. index × apparent depth

$= 6 \times \frac{3}{4} = \frac{18}{4} = 4.5$

(3) A 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

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equal distance for figure will appear to be raised?

Ans. Apparent depth = $\frac{\text{real depth}}{\text{refractive index}}$

$= \frac{8}{1.6} \times \frac{10}{10} = \frac{80}{16} = 5$ cm

Apparent depth = 5 cm

normal shift = real depth - apparent depth

$= 8 - 5 = 3$ cm

Hence, at a distance of 3 cm, the figure will appear to be raised.