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

The two conditions required for total internal reflection are:

(i) The light ray must travel from a denser to a rarer medium

(ii) The angle of incidence in the denser medium must be greater than the critical angle for that pair of media

Q2) A fish in the pond of water appears at a depth of 6cm. What is the actual depth of the fish if the refractive index w.r.t. water is 3/4?

Let the Real depth be x.

∵ Apparent depth = Refractive index.
Real depth

∴ $\frac{6cm}{x} = \frac{4}{3}$

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

$\Rightarrow 4.5cm = x$

So, the actual depth of the fish in the water is 4.5cm

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

Let the apparent depth be x.

$\because$ $\frac{\text{Real depth}}{\text{apparent depth}}$ = refractive index.

$\therefore$ $\frac{8\text{cm}}{x} = 1.6$

$\Rightarrow$ $\frac{8\text{cm}}{1.6} = x$

$\Rightarrow$ $5\text{cm} = x$.

$\therefore$ Distance by which the image is raised = actual depth - apparent depth

$= 8\text{cm} - 5\text{cm}$

$= 3\text{cm}$.

So, the image is raised by 3cm.