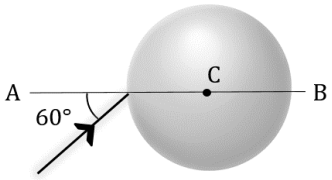
Q.1 A ray of light falls on a transparent sphere with its centre at C, as shown in the figure. The ray emerges from the sphere parallel to the line AB. Then, the refractive index of the sphere is

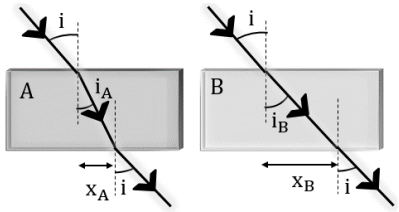


(A) $\sqrt{2}$ **(B)** $\sqrt{3}$ **(C)** $\frac{3}{2}$ **(D)** $\frac{1}{2}$

Q.2 A mark at the bottom of a liquid appears to rise by 0.1 m when viewed from above. The depth of the liquid is 1 m. Then, the refractive index of the liquid is

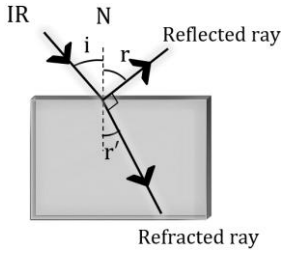
(A) 1.33 **(B)** $\frac{9}{10}$ **(C)** $\frac{10}{9}$ **(D)** 1.5

Q.3 Two rectangular slabs A and B through which light ray passes as shown in figure. If both slabs are identical, made by different materials and $x_A < x_B$, then(μ_A and μ_B are the refractive indices of slab A and slab B)



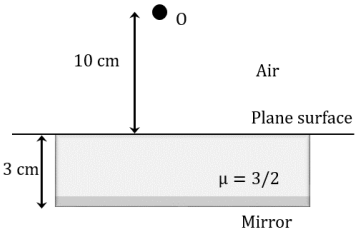
(A) $\mu_A > \mu_B$ **(B)** $\mu_A < \mu_B$ **(C)** $\mu_A = \mu_B$ **(D)** cannot say

Q.4 A ray of light is incident on a glass plate at an angle 600. If the reflected ray and refracted rays are perpendicular to each other, the refraction index of glass is.



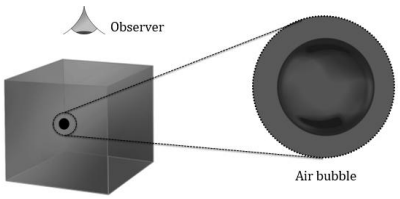
(A) $\sqrt{3}$ **(B)** $\sqrt{\frac{3}{2}}$ **(C)** $\frac{3}{2}$ **(D)** $\frac{1}{2}$

Q.5 Position of the final image of an object O (as shown in the figure) with respect to the plane surface will be



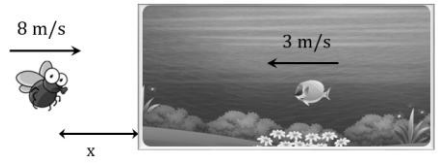
(A) 14 cm below **(B)** 14cm above **(C)** 21cm below **(D)** 21cm above

Q.6 A small air bubble is inside a transparent cube of side length 24 cm and of refractive index 4/3. If the apparent distance of air bubble when viewed from top of one of the faces is 9 cm, then its apparent distance when viewed from opposite face will be.



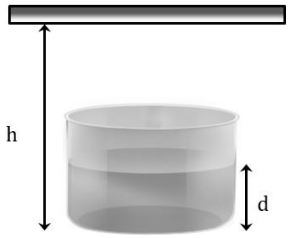
(A)6 cm **(B)**8cm **(C)**9cm **(D)**7cm

Q.7 A fish in an aquarium approaches the left wall at a rate of 3 ms^{-1}& observes a fly approaching it at 8 ms^{-1}. If the refractive index of water is 4/3, find the actual velocity of the fly.



(A)2.75 ms^{-1} **(B)**1.25 ms^{-1} **(C)**3.75 ms^{-1} **(D)**8 ms^{-1}

Q.8 Consider the situation shown in figure. A plane mirror is fixed at a height h above the bottom of a beaker containing water (μ) up to a height d. The position of the image of the bottom of the beaker formed by the mirror will be:



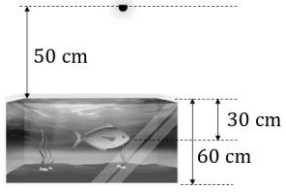
(A) $\left(d+\frac{d}{\mu}\right)$ behind the mirror **(B)** $\left(d+\frac{d}{\mu}\right)$ in front of the mirror

(C) $\left(h-d+\frac{d}{\mu}\right)$ in front of the mirror **(D)** $(h-d+\frac{d}{\mu})$ behind the mirror

Q.9 How much water ($\mu = 4/3$) should be filled in a container of height 21 cm, so that it appears half filled to the observer when viewed from the top of the container.

(A)11 cm **(B)**12cm **(C)**13cm **(D)**14cm

Q.10 A fish in an aquarium, 30 cm deep in water ($\mu = 4/3$) can see a light bulb kept 50 cm above the surface of water. The fish can also see the image of this bulb in the reflecting bottom surface of the aquarium. Total depth of water is 60 cm. Then, the apparent distance between the two images seen by the fish is



(A) $\frac{730}{3}$ cm **(B)** $\frac{760}{3}$ cm **(C)** $\frac{710}{3}$ cm **(D)** $\frac{770}{3}$ cm

ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(B)	(C)	(A)	(A)	(A)	(C)	(C)	(D)	(D)	(B)