Physicsaholics

DPP – 5

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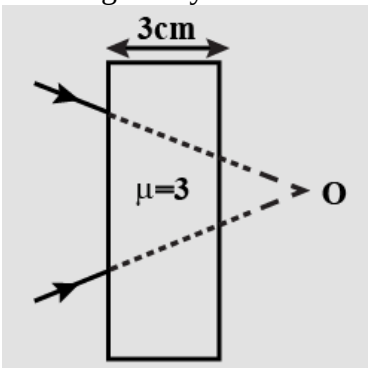
Q 1. The perpendicular distance between the original path of the incident ray and the convergent ray of light coming out of a glass slab is called:
(a) Refraction (b) Norma shift
(c) Lateral displacement (d) None of these

Q 2. A stone placed at the bottom of a fully filled water tank appears raised by 80 cm . If the refractive index of water is 4/3, find the actual depth of water in the tank.
(a) 120 cm (b) 320 m
(c) 320 cm (d) 120 m

Q 3. A postage stamp kept below a rectangular glass block of refractive index 1.5 when viewed from vertically above it, appears to be raised by 7.0mm.Calculate the thickness of the glass block?
(a) 1.2 cm (b) 2.1 cm
(c) 2.5 cm (d) 1 cm

Q 4. A glass slab of thickness 18 cm and refractive index $\frac{3}{2}$ is placed on a printed matter. The normal shift of the printed matter is:
(a) 12 cm (b) 9 c m
(c) 6 cm (d) 3 cm

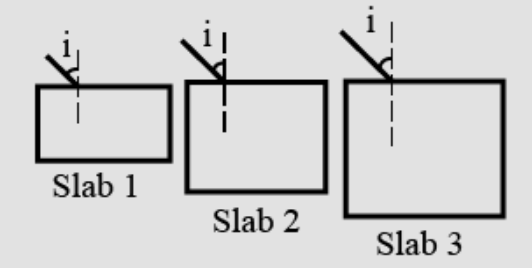
Q 5. The point of intersection of emergent rays is :



(a) 2 cm left of 'O' (b) 2 cm right of 'O'
(c) 1 cm left of 'O' (d) 1 cm right of 'O'

Q 6. A ray of light falls on three glass slabs of the same material at the same angle of incidence. In which case, is the lateral displacement of the emergent ray of light

(a) maximum
(b) minimum



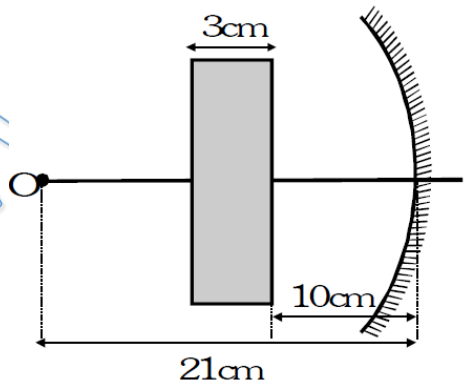
(a) slab-3, slab-1 (b) slab-2, slab-1
(c) slab-3, slab-2 (d) slab-1, slab-3

Q 7. A ray of light is incident on a surface of glass slab at an angle 45^0. If the lateral shift produced per unit thickness is $\frac{1}{\sqrt{3}}$, then the angle of refraction produced is?

(a) $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$ (b) $\tan^{-1}(\sqrt{3})$
(c) $\tan^{-1}\left(1-\sqrt{\frac{2}{3}}\right)$ (d) $\sin^{-1}\left(1-\sqrt{\frac{2}{3}}\right)$

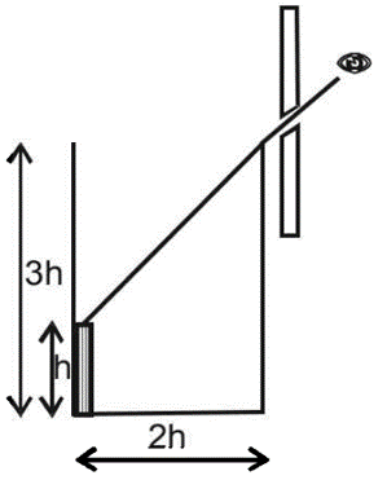
Q 8. A light ray is incident at an angle of 45^o with the normal to a $\sqrt{2}cm$ thick plate ($\mu = \sqrt{2}$). Find the shift in the path of the light as it emerges out from the plate?
(a) 0.42 cm (b) 0.52 cm (c) 0.62 cm (d) 0.67 cm

Q 9. An object is placed 21 cm in front of a concave mirror of radius of curvature 20 cm. A glass slab of thickness 3 cm and refractive index 1.5 is placed closed to the mirror in space between the object and the mirror. Find the position of final image formed if distance of nearer surface of the slab from the mirror is 10 cm?



(a) 21cm in front of mirror
(b) 11cm in front of mirror
(c) 21cm behind the mirror
(d) 11cm behind the mirror

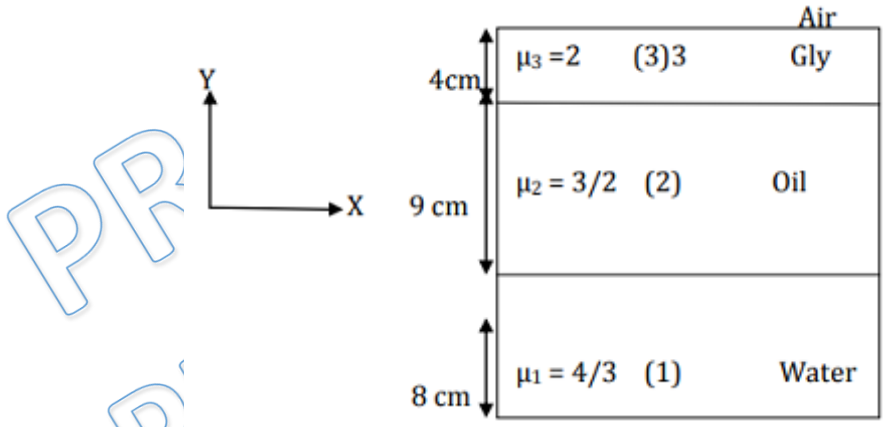
Q 10. An observer can see through a pin hole the top end of a thin rod of height h, placed as shown in the figure. The beaker height is 3h and its radius h. when the beaker is filled with a liquid up to a height 2h, he can see the lower end of the rod. Then the refractive index of the liquid is:



(a) $\frac{5}{2}$ (b) $\sqrt{\frac{5}{2}}$

(c) $\sqrt{\frac{3}{2}}$ (d) $\frac{3}{2}$

Q 11. A tank contains three layers of immiscible liquids. The first layer is of water with refractive index 4/3 and thickness 8cm. The second layer is an oil with refractive index 3/2 and thickness 9cm. While the third layer is of glycerin with refractive index 2 and thickness 4cm. find the apparent depth of the bottom of the container.



(a) 14 cm below the glycerine air interface
(b) 7 cm below the glycerine air interface
(c) 14 cm below the glycerine oil interface
(d) 7 cm below the glycerine oil interface

Q 12. A bird is flying at a height of 3.6m above the surface of water and a fish is in the water at a depth of 1.2m. The apparent height of bird with respect to fish is $\left(\mu_{water} = \frac{4}{3}\right)$

(a) 3.9 m (b) 4.8 m

(c) 5.2 m (d) 6.0 m

Q 13. 'n' transparent slabs of refractive index 1.5, each having thickness 1 cm,2 cm,3 cm....to n cm are arranged one over another. A point object is seen through this

combination with perpendicular light. If the shift of object by the combination is 5 cm then the value of 'n' is ....

(a) 5 (b) 18

(c) 33 (d) 2

Answer Key

Q.1 c	**Q.2 c**	**Q.3 b**	**Q.4 c**	**Q.5 b**
Q.6 a	**Q.7 c**	**Q.8 a**	**Q.9 a**	**Q.10 b**
Q.11 a	**Q.12 d**	**Q.13 a**		