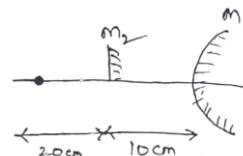


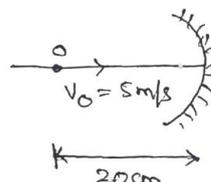
Single Correct Answer Type:

1. A small plane mirror is kept at a distance 10 cm in front of a convex mirror as shown. An object is placed at a distance 20 cm from plane mirror of which image formed in both mirror coincide. Find the focal length of convex mirror.



- (A) 18 cm (B) 15 cm
(C) 14 cm (D) 10 cm

2. Fig shows a concave mirror of focal length 30 cm at rest and an object moving forward it at speed 5 m/s. Find the velocity of image with respect to ground

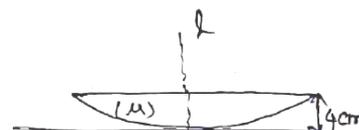


- (A) 45 m/s (B) 35 /s
(C) 30 m/s (D) 48 m/s

3. A thin rod of length $f/3$ is placed along the optic axis of mirror of focal length f such that its image is real and elongated and just touches the rod. Calculate the magnification for this image.

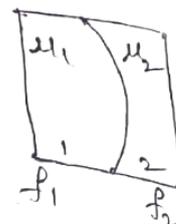
- (A) $5/2$ (C) $1/8$ (C) $3/2$ (D) $3/5$

4. A plano convex lens has thickness 4 cm. When it is placed on a horizontal table with curved surface in contact. The apparent depth of the lens is found to be 3 cm and if lens is inverted its apparent depth is found to be $25/8$ cm. Find the radius of curvature of the lens.



- (A) 20 cm (B) 18 cm (C) 14 cm (D) 25 cm

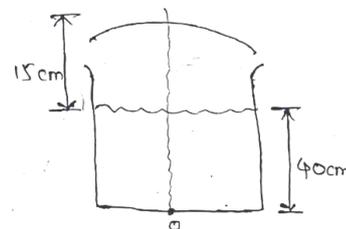
5. A thin glass plate is constructed by combining a plano convex lens and a plano concave lens of different materials of RI μ_1 & μ_2 as shown in fig. Determine the focal length of this plate. The radius of curvature of the common surface is 'R'.



- (A) $f = \frac{R}{\mu_1 - \mu_2}$ (B) $f = \frac{R}{2\mu_2 - \mu_1}$

- (C) $f = \frac{R}{\mu_1 + \mu_2}$ (D) $f = \frac{R}{\mu_1 - 3\mu_2}$

6. A concave mirror is placed over a beaker filled with water ($\mu = \frac{4}{3}$) upto 40 cm as shown. The final image of an image of an object placed at bottom of beaker is formed at a distance is 16 cm below the water level. Find the focal length of mirror.

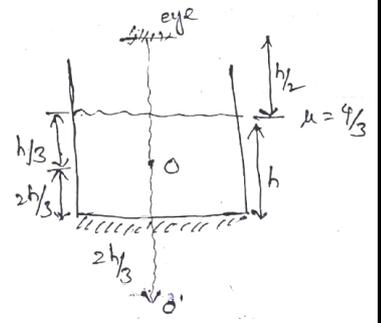


- (A) 18.671 cm (B) 19.782 cm (C) 17.213 cm (D) 16.875 cm

7. A glass slab of thickness 3 cm and refractive index 1.5 is placed in front of a concave mirror of focal length 10 cm. A point object is placed on the principal axis at a distance of 21 cm from the mirror. Find the distance of final image from the mirror.

- (A) 10 cm (B) 2 cm (C) 18 cm (D) 25 cm

8. The base of a cylindrical beaker filled with a plane mirror. The beaker is filled upto a height 'h' with a liquid of Refractive index $\frac{4}{3}$. An observers eye is located at a height $h/2$ above the liquid surface. Find the distance from eye where observer will see the image of an object in the mirror which is located at a depth $h/3$ below the liquid surface.

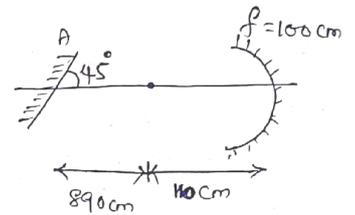


- (A) $\frac{7h}{6}$ (B) $\frac{7h}{3}$ (C) $\frac{7h}{4}$ (D) $\frac{7h}{9}$

9. A point object is placed at a distance of 20 cm from a thin plano convex lens of focal length 15 cm of which plane surface is silvered. Find the location of final image produced.

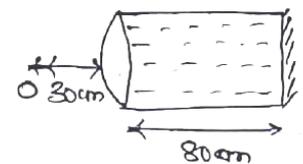
- (A) 11 cm (B) - 12 cm (C) - 18 cm (D) - 22 cm

10. Figure shows a concave mirror and an inclined plane mirror at a separation 1000 cm and a point 'O' placed on topic axis. Find the image of object after two successive reflections taken first at concave mirror.



- (A) 100 (B) 200
(C) 300 (D) 400

11. A thin equi convex lens is made up of glass ($\mu = 3/2$) and having focal length 30 cm in air is sealed in a tube as shown in which water ($\mu = 4/3$) is filled and on the other side a plane mirror is placed. Find the final position of image of object 'O' formed by this system.

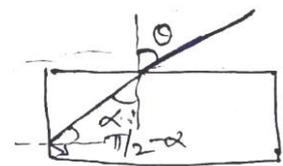


- (A) $V = 80$ cm (B) $V = 75$ cm
(C) $V = 85$ cm (D) $V = 90$ cm

12. On a large horizontal flat mirror facing upward on equilateral prism is placed with $\mu = \sqrt{2}$. A light passes through the prism symmetrically and after emergence it is incident on the mirror. Find the total deviation of light ray.

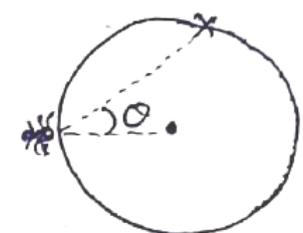
- (A) 0° (B) 90° (C) 45° (D) 60°

13. A glass slab of refractive index μ is placed in air and a light ray incident on its top face at an angle θ as shown in fig. Find min value of ' μ ' for which total internal reflection of light ray takes place at the vertical surface.



- (A) $\mu = \sqrt{1 + \sin^4 \theta}$ (B) $\mu = \sqrt{1 - \sin^2 \theta}$ (C) $\mu = \sqrt{1 - \sin^3 \theta}$ (D) $\mu = \sqrt{1 + \sin^2 \theta}$

14. A spider is at rest on the surface of glass sphere. A fly crawls on the other side of sphere as shown. What should be the value of refractive index of sphere. So that fly will not be visible to spider when $\theta = 60^\circ$



- (A) $\mu \geq \frac{2}{\sqrt{3}}$ (B) $\mu \leq \frac{2}{\sqrt{3}}$ (C) $\mu \geq \frac{4}{\sqrt{3}}$ (D) $\mu \geq \frac{8}{\sqrt{3}}$

15. A fish in an aquarium approaches the left wall at 2.5 m/s observes a fly approaching it at 8 m/s. If the refractive index of water is $4/3$. Find the actual velocity of fly.



- (A) 4.125 m/s (B) 5.148 m/s
(C) 3.216 m/s (D) 8.414 m/s

24. An object is placed in front of a glass slab ($\mu = 1.5$) of thickness 6 cm at a distance 28 cm from it. Other face of glass slab is silvered. Find the position of final image of object.
25. A glass convex lens of refractive index $\frac{3}{2}$ has a focal length 50 cm in air. Find the focal length of this lens if it is immersed in alcohol of refractive index 1 : 3.

KEY

1.	B	2.	A	3.	C	4.	D	5.	A
6.	D	7.	A	8.	C	9.	B	10.	A
11.	D	12.	A	13.	D	14.	A	15.	A
16.	D	17.	C	18.	A	19.	B	20.	C
21.	60	22.	1.578	23.	80	24.	30	25.	162.33

** Wish You^{est} all the Best **