

Q:1. A man runs towards the plane mirror at 2 m/s . The relative speed of his image w.r.t. him will be:

- (a) 2 m/s (b) 4 m/s (c) 8 m/s (d) 10 m/s

Q:2. A perfectly reflecting mirror has an area of 1 cm^2 . Light energy is allowed to fall on it for one hour at the rate of 10 W cm^{-2} . The force that acts on the mirror is:

- (a) $2.4 \times 10^{-4}\text{ N}$ (b) $1.34 \times 10^{-7}\text{ N}$ (c) $3.35 \times 10^{-8}\text{ N}$ (d) $6.7 \times 10^{-8}\text{ N}$

Q:3. A ray of light is incident on a plane mirror at an angle of incidence of 30° . The deviation produced by the mirror is,

- (a) 30° (b) 60° (c) 90° (d) 120°

Q:4. A plane mirror is approaching you at 10 cm/s . Your image shall approach you with a velocity of,

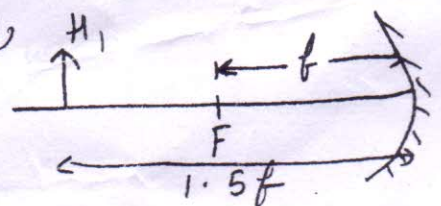
- (a) $+10\text{ cm/s}$ (b) -10 cm/s (c) $+20\text{ cm/s}$ (d) -20 cm/s

Q:5. A convex mirror has a focal length of 20 cm . A real object is placed at a distance of 20 cm in front of the mirror from the pole. The mirror produces an image at

- (a) infinity (b) 20 cm (c) 40 cm (d) 10 cm

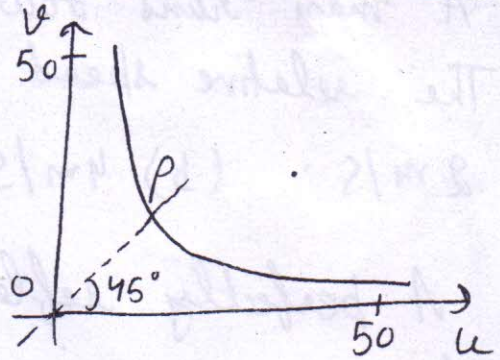
Q:6. If in the fig., height of object is $H_1 = +2.5\text{ cm}$, then height of image H_2 formed is,

- (a) -5 cm (b) $+5\text{ cm}$
(c) $+7.5\text{ cm}$ (d) -7.5 cm



Q:7. In case of a spherical mirror of focal length f , a graph is plotted as shown. The co-ordinates of the point P are,

- (a) $(2f, 2f)$
- (b) (f, f)
- (c) $(f/2, f/2)$
- (d) $(4f, 4f)$



Q:8. The ratio of the speed of an object to the speed of its real image of magnification m in the case of a convex mirror is,

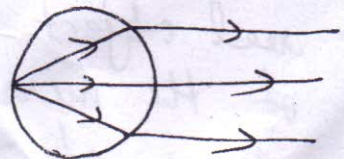
- (a) $-1/m^2$
- (b) m^2
- (c) $-m$
- (d) $1/m$

Q:9. The radius of curvature of a concave mirror is 24 cm and the image is magnified by 1.5 times. The object distance is,

- (a) 20 cm
- (b) 8 cm
- (c) 16 cm
- (d) 24 cm

Q:10. For a medium in the form of sphere, rays starting from one end of a diameter in a small cone emerge from the opposite surface as a parallel beam. The ref. index of material of the sphere is,

- (a) $3/2$
- (b) $2/3$
- (c) $1/2$
- (d) $2/1$



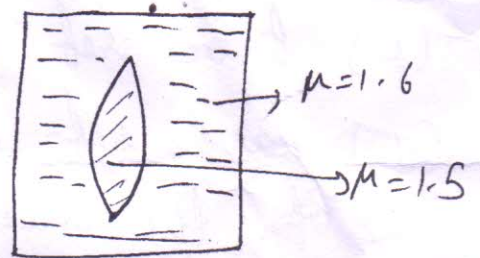
~~Q:11.~~

Q:11. Light is incident from a medium into air at two ~~other~~ possible angles of incidence (1) 20° and (2) 40° . In the medium, the light travels 3 cm in 0.2 ns. The ray will

- (a) suffer total internal reflection in both cases 1 & 2
- (b) suffer total internal reflection in case 2 only
- (c) have 100% transmission in case 1
- (d) have partial reflection & partial transmission in case 2

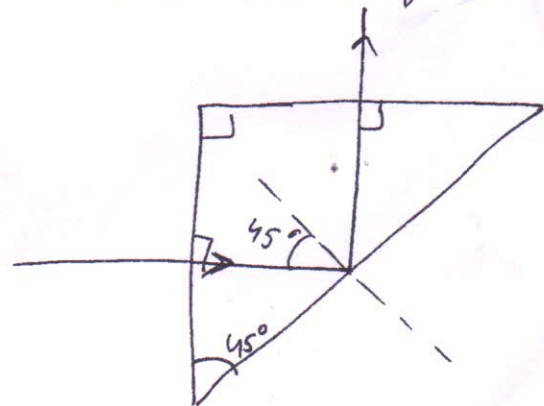
Q:12. Shown in fig. is a convergent lens placed inside a cell filled with a liquid. The lens has focal length +20 cm when in air and its material has ref. index 1.5. If the liquid has ref. index 1.6, the focal length of the system is,

- (a) +80 cm
- (b) -80 cm
- (c) -24 cm
- (d) -100 cm



Q:13. A light ray is incident perpendicularly to one face at a 90° prism and is totally internally reflected at the glass-air interface. If the angle of reflection is 45° , we conclude that the ref. index n ,

- (a) $n < \frac{1}{\sqrt{2}}$
- (b) $n > \sqrt{2}$
- (c) $n > \frac{1}{\sqrt{2}}$
- (d) $n < \sqrt{2}$



Q:14. A plano-convex lens of ref. index 1.5 and radius of curvature 30 cm is silvered at the curved surface. Now this lens has been used to form the image of an object. At what distance from this lens, an object be placed in order to have a real image of size of object?

- (a) 20 cm (b) 30 cm (c) 60 cm (d) 80 cm

Q:15. An object is immersed in a fluid. In order that the object becomes invisible, it should

- (a) behave as a perfect reflector
(b) absorbs all light falling on it
(c) have ref. index one
(d) have ref. index exactly matching with that of the surrounding fluid.