

**BCM SCHOOL, BASANT AVENUE, DUGRI
ROAD, LDH.**

ASSIGNMENT

SUBJECT – PHYSICS

CLASS – XII

CHAPTER – RAY OPTICS

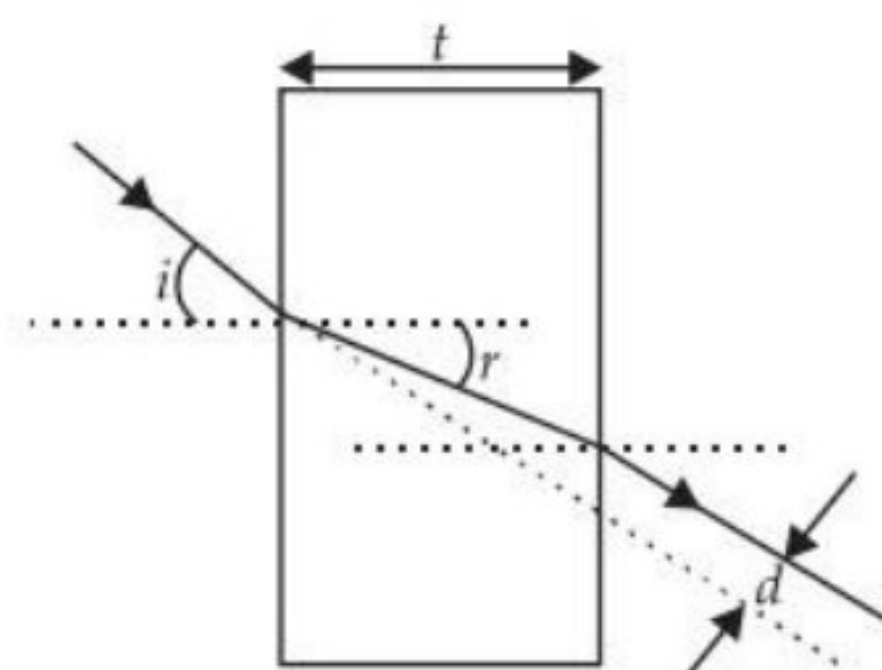
MULTIPLE CHOICE QUESTIONS

OBJECTIVE TYPE QUESTIONS

➡ Multiple Choice Questions (MCQs)

1. From a point source, a light falls on a spherical glass surface ($\mu = 1.5$ and radius of curvature = 10 cm). The distance between point source and glass surface is 50 cm. The position of image is
(a) 25 cm (b) 50 cm
(c) 100 cm (d) 150 cm
2. A screen is placed 90 cm away from an object. The image of the object on the screen is formed by a convex lens at two different locations separated by 20 cm. Find the focal length of lens.
(a) 42.8 cm (b) 21.4 cm
(c) 10.7 cm (d) 5.5 cm
3. A convergent beam of light passes through a diverging lens of focal length 0.2 m and comes to focus 0.3 m behind the lens. The position of the point at which the beam would converge in the absence of the lens is
(a) 0.12 m (b) 0.6 m
(c) 0.3 m (d) 0.15 m
4. The focal length of the lenses of an astronomical telescope are 50 cm and 5 cm. The length of the telescope when the image is formed at the least distance of distinct vision is
(a) 45 cm (b) 55 cm
(c) $\frac{275}{6}$ cm (d) $\frac{325}{6}$ cm
5. Two lenses of power +10 D and -5 D are placed in contact. Where should an object be held from the lens, so as to obtain a virtual image of magnification 2?
(a) 5 cm (b) -5 m
(c) 10 cm (d) -10 cm
6. Mirage is a phenomenon due to
(a) refraction of light
(b) total internal reflection of light
(c) diffraction of light
(d) none of these.
7. A biconvex lens has a focal length $\frac{2}{3}$ times the radius of curvature of either surface. The refractive index of the lens material is
(a) 1.75 (b) 1.33
(c) 1.5 (d) 1.0
8. An object approaches a convergent lens from the left of the lens with a uniform speed 5 m s^{-1} and stops at the focus. The image
(a) moves away from the lens with an uniform speed 5 m s^{-1} .
(b) moves away from the lens with an uniform acceleration.
(c) moves away from the lens with a non-uniform acceleration.
(d) moves towards the lens with a non-uniform acceleration.
9. A convex lens of focal length 0.2 m and made of glass (${}^a\mu_g = 1.5$) is immersed in water (${}^a\mu_w = 1.33$). Find the change in the focal length of the lens.
(a) 5.8 m (b) 0.58 cm
(c) 0.58 m (d) 5.8 cm
10. A small telescope has an objective lens of focal length 144 cm and an eyepiece of focal length 6.0 cm. What is the separation between the objective and the eyepiece?
(a) 0.75 m (b) 1.38 m
(c) 1.0 m (d) 1.5 m
11. The far point of a near sighted person is 6.0 m from her eyes, and she wears contacts that enable her to see distant objects clearly. A tree is 18.0 m away and 2.0 m high. How high is the image formed by the contacts?
(a) 1.0 m (b) 1.5 m
(c) 0.75 m (d) 0.50 m
12. A ray of light is incident on a thick slab of glass of thickness t as shown in the figure. The emergent ray is parallel to the incident ray but

displaced sideways by a distance d . If the angles are small then d is,



- (a) $t\left(1 - \frac{i}{r}\right)$ (b) $rt\left(1 - \frac{i}{r}\right)$
 (c) $it\left(1 - \frac{r}{i}\right)$ (d) $t\left(1 - \frac{r}{i}\right)$

13. A converging lens is used to form an image on a screen. When the upper half of the lens is covered by an opaque screen,

- (a) half the image will disappear
 (b) complete image will disappear
 (c) intensity of image will decrease
 (d) intensity of image will increase.

14. A tank is filled with water to a height of 12.5 cm. The apparent depth of a needle lying at the bottom of the tank is measured by a microscope to be 9.4 cm. If water is replaced by a liquid of refractive index 1.63 upto the same height, by what distance would the microscope have to be moved to focus on the needle again?

- (a) 1.00 cm (b) 2.37 cm
 (c) 1.73 cm (d) 3.93 cm

15. A mark placed on the surface of a sphere is viewed through glass from a position directly opposite. If the diameter of the sphere is 10 cm and refractive index of glass is 1.5. The position of the image will be

- (a) -20 cm (b) 30 cm
 (c) 40 cm (d) -10 cm

16. Two lenses of focal lengths 20 cm and -40 cm are held in contact. The image of an object at infinity will be formed by the combination at

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

17. The final image in an astronomical telescope with respect to an object is

- (a) virtual and erect (b) real and erect
 (c) real and inverted (d) virtual and inverted

18. An object is placed at a distance of 1.5 m from a screen and a convex lens is interposed

between them. The magnification produced is 4. The focal length of the lens is

- (a) 1 m (b) 0.5 m (c) 0.24 m (d) 2 m

19. The image of the needle placed 45 cm from a lens is formed on a screen placed 90 cm on the other side of the lens. The displacement of the image, if the needle is moved by 5.0 cm away from the lens is

- (a) 10 cm, towards the lens
 (b) 15 cm, away from the lens
 (c) 15 cm, towards the lens
 (d) 10 cm, away from the lens

20. A real image of a distant object is formed by a planoconvex lens on its principal axis. Spherical aberration is

- (a) absent.
 (b) smaller, if the curved surfaces of the lens face the object.
 (c) smaller, if the plane surface of the lens faces the object.
 (d) same, whichever side of the lens faces the object.

21. A convex lens is dipped in a liquid whose refractive index is equal to the refractive index of the lens. Then its focal length will

- (a) become zero
 (b) become infinite
 (c) become small, but non-zero
 (d) remain unchanged

22. A concave mirror of focal length f_1 is placed at a distance d from a convex lens of focal length f_2 . A beam of light coming from infinity and falling on this convex lens – concave mirror combination returns to infinity. The distance d must equal

- (a) $f_1 + f_2$ (b) $-f_1 + f_2$
 (c) $2f_1 + f_2$ (d) $-2f_1 + f_2$

23. A ray incident at a point at an angle of incidence of 60° enters a glass sphere of refractive index $\sqrt{3}$ and is reflected and refracted at the farther surface of the sphere. The angle between the reflected and refracted rays at this surface is

- (a) 50° (b) 60°
 (c) 90° (d) 40°

24. For a glass prism ($\mu = \sqrt{3}$) the angle of minimum deviation is equal to the angle of the prism. The angle of the prism is

- (a) 45° (b) 30° (c) 90° (d) 60°