

Student Name:**Date:****REFRACTION AND DISPERSION OF LIGHT****I. Multiple Choice Questions**

Select and write one most appropriate option out of the four options given for each of the questions 1-5.

1. The lens makes the image at the white painted screen. The image is
(a) virtual (b) real
(c) may be real or virtual (d) none of the two.
2. Where should an object be placed so that a real and inverted image of the same size is obtained, using a convex lens
(a) between the lens and its focus
(b) at the focus
(c) at twice the focal length
(d) at infinity.
3. A student obtained a sharp image of the grill of a window on a screen using a convex lens. For getting better results, the teacher suggested focussing of a distant tree instead of the grill. In which direction should the lens be moved for this purpose?
(a) away from the screen (b) very far away from the screen
(c) behind the screen (d) towards the screen.

4. The quantity, $\frac{\sin i}{\sin r} = n$ is called the of the medium.
 (a) Refraction index (b) Inverted
 (c) Plane mirror (d) None of these.
5. The amount of lateral displacement is proportional to slab
 (a) length (b) breadth
 (c) thickness (d) material.

II. Fill in the Blanks Type Questions

Fill in the blanks with a suitable word for each of the questions 6–10.

6. The quantity, $\frac{\sin i}{\sin r} = n$ is called the of the medium.
7. In case of refraction from a rectangular glass slab, angle of emergence e is angle of incidence i .
8. Rays are diverged by a lens.
9. Object distance for an object on the left side of a lens is
10. When a second lens is combined with a first lens, the total power decreases. The second lens has power.

III. True or False

State whether the following statements are true or false for each of the questions 11–15.

11. Due to refraction, a normally incident ray also bends.
12. A convex lens is thick in the middle.
13. A concave lens has only two types.
14. A concave lens makes a diminished as well as an enlarged image.
15. Power of a lens does not depend on its thickness.

IV. Very Short Answer Type Questions

Answer each of the questions 16–20.

- 16.** What do you mean by an optical medium?

- 17.** Out of air, water and glass which is optically densest medium?

- 18.** What is the minimum value of refractive index?

- 19.** Refractive index of medium 2 w.r.t. medium 1 is reciprocal of refractive index of medium 1 w.r.t. medium 2. Prove it.

20. Why does a light ray incident on a rectangular glass slab immersed in any medium emerges parallel to itself? Explain using a diagram.

V. Short Answer Type Questions

Answer each of the questions 21–25.

21. A pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water. Will the pencil appear to be bent to the same extent, if instead of water we use liquids like, kerosene or turpentine. Support your answer with reason.

22. How is the refractive index of a medium related to the speed of light? Obtain an expression for refractive index of a medium with respect to another in terms of speed of light in these two media?

- 23.** A pond of depth 20 cm is filled with water of refractive index $4/3$. Calculate apparent depth of the tank when viewed normally.

- 24.** An object of size 7.0 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror, should a screen be placed, so that a sharp focussed image can be obtained? Find the size and nature of the image?

- 25.** A 2.0 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the lens is 15 cm. Find the nature, position and size of the image. Also find the magnification.

Teacher's Signature