



DELHI PUBLIC SCHOOL HOWRAH
CLASS ASSIGNMENT
CLASS – X

SUBJECT – PHYSICS (NUMERICALS ON REFRACTION OF LIGHT)

1. A ray of light travelling in air is incident on the plane surface of a transparent medium. The angle of incidence is 45° and the angle of refraction is 30° . Find the refractive index of the medium.
2. A ray of light travelling in air falls on the surface of a rectangular slab of plastic material whose refractive index is 1.6. If the incident ray makes an angle of 53° with the normal, find the angle made by the refracted ray with the normal ($\sin 53^\circ = 4/5$).
3. Find the refractive index of glass with respect to water. The refractive indices of these with respect to air are $3/2$ and $4/3$ respectively.
4. A point object is placed at a distance of 12 cm from a convex lens on its principal axis. Its image is formed on the other side of the lens at a distance of 18 cm from the lens. Find the focal length of the lens.
5. The image of an object formed by a convex lens is of the same size as the object. If the image is formed at a distance of 40 cm, find the focal length of the lens. Also, find the power of the lens. At what distance from the lens is the object placed?
6. An object is placed on the principal axis of a concave lens at a distance of 20 cm from it. If the focal length of the lens is also 20 cm, find the location of the image.
7. A convex lens of focal length 20 cm is placed in contact with a concave lens of focal length 12.5 cm in such a way that they have the same principal axis. Find the power of the combination.
8. A 4.0 cm high object is placed at a distance of 60 cm from a concave lens of focal length 20 cm. Find the size of the image.
9. A pin which is 2 cm long is placed at a distance of 16 cm from a convex lens. Assuming it to be perpendicular to the principal axis, find the position, size and the nature of the image if the focal length of the lens is 12 cm.
10. A convex lens of power 4 D is placed at a distance of 40 cm from a wall. At what distance from the lens should a candle be placed so that its image is formed on the wall?