Bal Bharati Public School, Pitampura
Assignment: Light   (numericals)
Class 10th

Q-1 An object is placed 30 cm from a convex lens. A real image is formed 20 cm from the lens. Find the focal length of the lens.

Q-2 A 2.0-cm-long pin is placed perpendicular to the principal axis of a convex lens of focal length 12 cm. The distance of the pin from the lens is 15 cm. Find the size of the image.

Q-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.

Q-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.

Q-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?

Q-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.

Q-7 A beam of light traveling parallel to the principal axis of a concave lens appears to diverge from a point 20 cm behind the lens after passing through the lens. Find the power of the lens.

Q-8 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 placed so that its image is formed on the wall?

Q-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.

Q-10 A 4.0-cm-high object is placed at a distance of focal length 20 cm. Find the size of the image.

Q-11 A convex lens of focal length 20 cm is placed is 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.

Q-12 An object is placed at a distance of 30 cm from a convex lens of focal length 20 cm (a) Find the position of the image.

(b) Is the image real or virtual?
(c) Is the image erect or inverted?

Q-13 A 1.0-cm-high object is placed at a distance of 12 cm from a convex lens of focal length 16 cm.
(a) Find the position of the image.
(b) Is the image real or virtual?
(c) Find the size of the image.
(d) Is the image erect or inverted?

Q-14 A 2.0-cm-high object is placed 12 cm from a convex lens, perpendicular to its principal axis. The lens forms a real image, whose size is 1.5 cm. Find the power of the lens.

Q-15 An object is placed at a distance of 10 cm from a concave lens of focal length 20 cm. Find the position of the image and discuss its nature.

Q-16 A 3.5-cm-high object is placed at a distance of 12 cm from a concave lens of focal length 16 cm. Find the size of the image.

Q-17 An object is placed at a distance of 50 cm from a concave lens. The image is formed at a distance of 20 cm from the lens. Find the focal length of the lens.

Q-18 An object is placed before a concave lens of focal length 12 cm. The size of the image formed by the lens is half the size of the object. Calculate the distance of the object from the lens.

Q-19 What is the power of a concave lens of focal length 50 cm?

Q-20 A convex lens of focal length 18 cm and a concave lens of focal length 24 cm are placed in contact such that they have a common principal axis. Will the combination acts as a convex lens or a concave lens? Find the focal length and power of the combination.

Q-21 The far point of a person suffering from myopia is 2 meters from the eye. Find the focal length and power of the corrective lens that will correct his vision.

Q-22 The near point of an elderly person is 50 cm from the eye. Find the focal length and power of the corrective lens that will correct his vision.