

O P JINDAL SCHOOL, SAVITRINAGAR

ASSIGNMENT

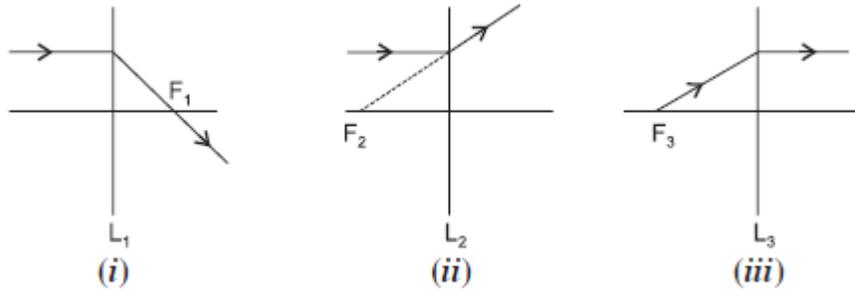
CLASS X PHYSICS

- 101 The image of a candle flame placed at a distance of 30 cm from a spherical lens is formed on a screen placed on the other side of the lens at a distance of 60 cm from the optical centre of the lens. Identify the type of lens and calculate its focal length. If the height of the flame is 3 cm, find the height of its image. 3
- 102 A 6 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 15 cm. The distance of the object from the lens is 10 cm. Find the position, size and nature of the image formed, using the lens formula. 3
- 103 A convex lens has a focal length of 10 cm. At what distance from the lens should the object be placed so that it forms a real and inverted image 20 cm away from the lens? What would be the size of the image formed if the object is 2 cm high? With the help of a ray diagram show the formation of the image by the lens in this case. 3
- 104 An object placed on a metre scale at 8 cm mark was focussed on a white screen placed at 92 cm mark, using a converging lens placed on the scale at 50 cm mark.
(i) Find the focal length of converging lens. 3
(ii) Find the position of the image formed if the object is shifted towards the lens at a position of 29.0 cm.
(iii) State the nature of the image formed if the object is further shifted towards the lens.
- 105 An object 2 cm high is placed at a distance of 64 cm from a white screen. On placing a convex lens at a distance of 32 cm from the object it is found that a distinct image of the object is formed on the screen. What is the focal length of the convex lens and size of the image formed on the screen? Draw a ray diagram to show the formation of the image in this position of the object with respect to the lens. 3
- 106 (a) Two lenses have powers of (i) + 2D and (ii) – 4D. What is the nature and focal length of each lens? 3
(b) An object is kept at a distance of 100 cm from each of the above lenses. Calculate the (i) image distance and (ii) magnification in each of the two cases.
- 107 An object is kept at a distance of 18 cm, 20 cm, 22 cm and 30 cm respectively from a lens of power +5D. 3
(i) In which case or cases would you get a magnified image?

(ii) Which of the magnified image can be got on a screen?

108 (a) What is the focal length of the lens used in sunglasses?

(b) The following figures show the path of light rays through three lenses marked L_1 , L_2 and L_3 and their focal points F_1 , F_2 and F_3 respectively. Identify the nature of lenses.



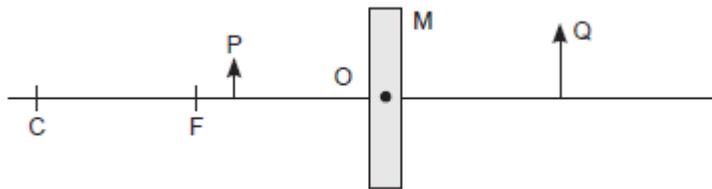
3

109 (a) Define the following terms in the context of spherical mirrors:

(i) Pole (ii) Centre of curvature (iii) Principal axis (iv) Principal focus

(b) Draw ray diagrams to show the principal focus of a (i) concave mirror (ii) convex mirror

(c) Consider the following diagram in which M is a mirror and P is an object and Q is its magnified image formed by the mirror.



5

State the type of the mirror M and one characteristic property of the image Q.

State the type of the mirror M

110 (a) To construct a ray diagram, we use two light rays which are so chosen that it is easy to know their directions after reflection from the mirror. List these two rays and state the path of these rays after reflection. Use these rays to locate the image of an object placed between centre of curvature and focus of a concave mirror.

5

(b) Draw a ray diagram to show the formation of image of an object placed between the pole and principal focus of a concave mirror. How will the nature and size of the image formed change, if the mirror is replaced by converging lens of same focal length?