CLASS X
SAMPLE PAPER
SCIENCE

Light-Reflaction and Refaction

1. A ray of light LM is incident on a mirror as shown in the figure. The angle of incidence for this ray is the angle between it and the line joining two other points in the figure. Name these two points
2. (i) A concave mirror produces three times enlarged image of an object placed at 10 cm in front of it. Calculate the focal length of the mirror.

   (ii) Show the formation of the image with the help of a ray diagram when the object is placed 6 cm away from the pole of the mirror

3. Why is a concave mirror preferred to a plane mirror for shaving?
4. Define refractive index of a medium.
5. What is a lens?
6. Describe with the help of a diagram, the nature, size and position of the image formed when an object is placed beyond the centre of curvature of a concave mirror.
7. Why do we prefer a convex mirror as a rear-view mirror in vehicles?
8. Find the focal length of a convex mirror whose radius of curvature is 32 cm.
9. A concave mirror producers three times magnified (enlarged) real image of an object placed at 10 cm in front of it. Where is the image located?
10. Light enters from air to glass having refractive index 1.50. What is the speed of light in the glass? The speed of light in the glass? The speed of light in vacuum is 3 x 108 m/s.
11. Find the power of a concave lens of focal length 2 m.
12. An object 3 cm high is placed at a distance of 20 cm in front of a convex lens of focal length 12 cm. Find the position, nature and size of the image formed.
13.
    a. State the relation between object distance, image distance and focal length of a spherical mirror.
    b. Draw a ray diagram to show the image formed by a concave mirror when an object is placed between pole and focus of the mirror.
    c. A concave mirror of focal length 15 cm forms an image of an object kept at a distance of 10 cm from the mirror. Find position, nature and size of the image formed by it.
14. What should be the position of an object relative to biconvex lens so that it behaves like a magnifying glass?
15. A lens has two focal points where as a mirror has only one. Why? 4. Write down the relation between the angle of incidence and the angle of refraction for a medium.

16. A doctor has prescribed a corrective lens of power + 1.5 D. Find the focal length of the lens. Is the prescribed lens diverging or converging?
17. Draw a ray diagram to show the
    i. position and
    ii. nature of the image formed when an object is placed between focus F and pole P of a concave mirror.
    18 Why a convex mirror does have a virtual principal focus?
    19 Give two uses of concave mirrors.
    20 What happen if ray of light travels from a rarer medium to a denser medium?
    21 An object placed 15 cm in front of a lens forms a real image three times magnified. Where is the image formed? What is the focal length of the lens?
    22 An object 3 cm high is placed at a distance of 9 cm in front of a concave mirror of focal length 10 cm. Find the position, nature and size of the image formed.
    23 You are given two lenses of equal size-concave and convex. How will you distinguish then without touching their surface

24. Draw the ray diagram in each case to show the position and nature of the image formed when the object is placed:
    i. At the centre of curvature of a concave mirror.
    ii. etween the pole P and focus F of a concave mirror.
    iii. In front of a convex mirror.
    iv. t 2F of a convex lens.
    v. In front of a concave lens.
25. Two lens of focal length +20cm and +50cm are combine .What is the power of two combined lenses?
26. Refractive index of Diamond is 2.42.What is the speed of light in diamond?
27. The magnification produced by a plane mirror is +1, what does this mean?
28. An object 5cm in length is held 25cm away from a converging lens of focal length 10cm. find the position, size and the nature of the image formed.
29. Draw the image by convex lens when object is at
    a. 2f
    b. Between f and 2f
    c. Between f and optical centre
    30 Draw the image by concave lens when object is at
    d. Infinity
    e. between f and 2f

    31 The power of a lens is +2.5D What kind of lens it is and what is the focal length?
    32 Define in spherical mirror the terms, Radius of curvature, Pole, Principle axis,Aperture of mirror, Focus point, and Focal length?
    33 An object of size 5cm is placed at a distance of 25cm from the pole of a concave mirror of radius of curvature 30cm. Calculate the distance and size of the image so formed. What will be the nature of image?
    34 An object of 5cm high is placed 15cm in front of a plane mirror, what is the nature, size, position of the image so formed? Why?

35 A virtual, erect, magnified image of an object is to be produced with a concave mirror of focal length 12cm, which of the following distance should be chosen for this purpose?
   a. 10cm
   b. 15cm
   c. 20cm

36 An object 2.5cm high is placed at a distance of 25cm from diverging mirror of focal length 20cm. Find the nature, position and size of the image formed?

37 Draw with concave mirror when object is at
   a. radius of curvature
   b. between C and F

38 Draw with convex mirror when object is at (a) between C and F

39 Write two uses of spherical mirror?

40 Sign Conventions for Reflection by spherical Mirrors.

41 Sign Conventions for Refraction by lens

42 A doctor has prescribed a corrective lens of power + 1.5 D. Find the focal length of the lens. Is the prescribed lens diverging or converging?

43 What is refraction of light? Write a law of refraction.

44 Light enters from air to glass having refraction index 1.50. What is the speed of light in the glass? The speed of light in vacuum is 3×10^8 m/s

45 An object is placed at a distance of 10cm from a convex mirror of focal length 15 cm. Find the position and nature of the image.

46 An object 5 cm in length is held 25 cm away from a converging lens of focal length 10cm. Draw the ray diagram and find the position, size and nature of the image formed.

47 Write the mirror's formula. An object of size 7 cm is placed 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 and focused image can be obtained? Find the size and nature of image formed