

CHAPTER: REFLECTION AT CURVED MIRROR

EXAM MODEL QUESTIONS:

- Which mirror is convergent, convex or concave?
 - A mirror forms an erect image 30 cm from the object and twice its height. Where the mirror must be situated? What is the radius of curvature of the mirror? Assuming the object to be real, determine whether the mirror is concave or convex. **[40 cm]**
- Why a ray of light falling normally on a mirror retrace its path?
 - At what position an object is placed in front of a concave mirror of a radius of curvature 0.4m so that an erect image of magnification 3 is produced? **[Ans: 0.133m]**
 - An erect image three times the size of the object is obtained with a concave mirror of radius of curvature 36cm. what is the position of the object? **[Ans: 12cm]**
- The image is seen on a glass mirror but not on the newspaper, why?
 - Show the formation of the image by a concave mirror when the object is placed (i) at F (ii) at $2F$ (iii) in between P & F . Also, write the properties of the image formed in each case.
- If a spherical mirror is immersed in water, does its focal length change? Explain.
 - A concave mirror having a radius of curvature 40 cm is placed in front of an illuminated point source at a distance of 30 cm from it. Find the location of the image. **[60cm]**
- Can a plane mirror ever form a real image? If yes, show how by drawing a ray diagram.
 - A concave mirror forms an image of 10 cm high object on a screen placed 5.0 m away from the mirror. The height of the image is 50 cm. Find the focal length of the mirror and the distance between the mirror and the object. **[1.25m, 1m]**
- Explain why the focal length of a plane mirror is infinite, and explain what it means for the focal point to be at infinity.
 - A 1 cm object is placed perpendicular to the principal axis of a convex mirror of focal length 7.5 cm. Find its distance from the mirror if the image formed is 0.6 in size. **[5cm]**
- An object is placed between two plane parallel mirrors. Why do distant images get fainter and fainter?
 - A 3 cm tall object is placed at a distance of 7.5 cm from a convex mirror of focal length 6 cm. Find the location, size and nature of the image. **$[-\frac{10}{3} \text{ cm}, \frac{4}{3} \text{ cm}, \text{virtual}]$**
- A concave mirror is called a converging mirror. Why?
 - Establish the relationship between the radius of curvature and focal length.
 - An object is situated at a distance of 40cm from a convex mirror. When a plane mirror is inserted between the object and the convex mirror at a distance of 32cm from the object, the images in the two mirrors coincide, what is the radius of curvature of the convex mirror? **[120cm]**
- What is mirror formula. Deduce the expression for the mirror formula.
 - A meter scale is placed along the axis of a convex mirror of focal length 25cm, its nearer end being at a distance of 50cm. Calculate the size of the image formed. **[4.76cm]**
- Where must you place an object in front of a concave mirror with radius R so that the image is erect and $2\frac{1}{2}$ times the size of the object? Where is the image? **$[\frac{3}{10}R, -\frac{3}{4}R]$**
- Write any two uses of plane mirror, concave mirror and convex mirror.
 - A pole 4m long is laid along the principal axis of a convex mirror of focal length 1m. The end of the pole nearer the mirror is 2m from it. Find the length of the image formed. **[0.19m]**
- Point out the difference between real and virtual images?
 - A convex mirror forms an image half of the size of the object. When it is moved 15cm away from the object, the size of the image becomes $\frac{2}{5}$ times that of the object. Find focal length of the mirror. **[-30cm]**
- Is it possible to find whether a mirror is plane, concave or convex from the nature of image of an object? Explain.
 - The real image of an object placed at a point in front of a concave mirror is twice its size. When the object is moved 5cm towards the mirror, the image is magnified 3 times. Find the radius of curvature of the mirror. **[60cm]**
- Mirrors used in searchlight are parabolic but not concave spherical. Why?
 - A convex mirror of radius of curvature 30 cm. forms a real image 20 cm from its pole. Explain how it is possible and find whether the image is erect or inverted. **[-8.57cm]**