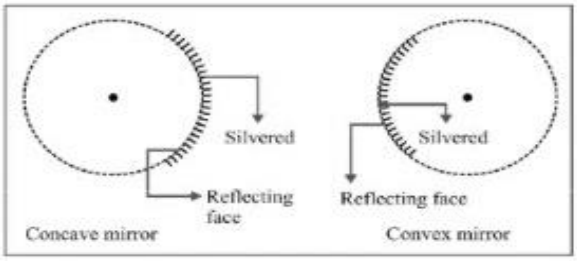
4. SPHERICAL MIRRORS

A spherical mirror is a part of sphere. If one of the surfaces is silvered, the other surface acts as the reflecting surface. When convex face is silvered, and the reflecting surface is concave, the mirror is called a concave mirror. When its concave face is silvered and convex face is the reflecting face, the mirror is called a convex mirror.



Before the discussion of reflection by curved mirrors, you shall carefully comprehend the meaning of following terms

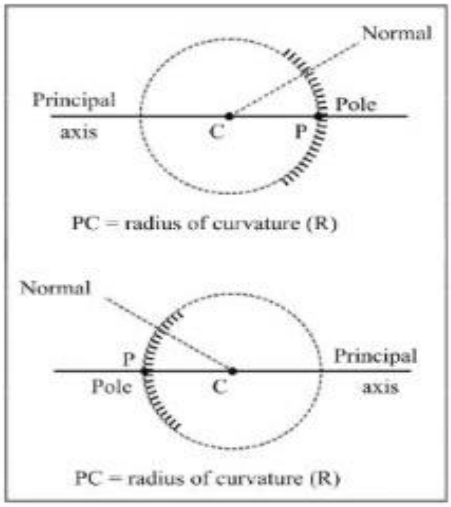
(i) Centre of curvature : Centre of curvature is the centre of sphere of which, the mirror is a part.

(ii) Radius of curvature : Radius of curvature is the radius of sphere of which, the mirror is a part.

(iii) Pole of mirror : Pole is the geometric centre of the mirror.

(iv) Principal axis : Principal axis is the line passing through the pole and centre of curvature.

(v) Normal : Any line joining the mirror to its centre of curvature is a normal.



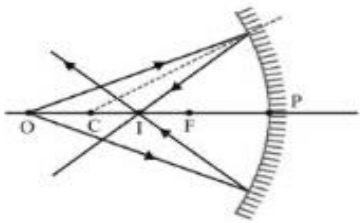
Paraxial rays : Rays which are close to principal axis and make small angles with it, i.e., they are nearly parallel to the axis, are called paraxial rays. Our treatment of spherical mirrors will be restricted to such rays which means we shall consider only mirrors of small aperture. In diagrams, however, they will be made larger for clarity.

Images formed by spherical mirrors

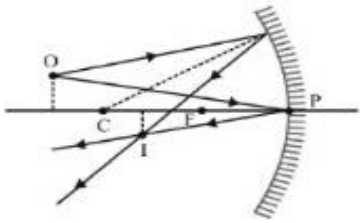
Let us consider various cases depending on the nature of the object and the image

(i) Real object and real image

(a)

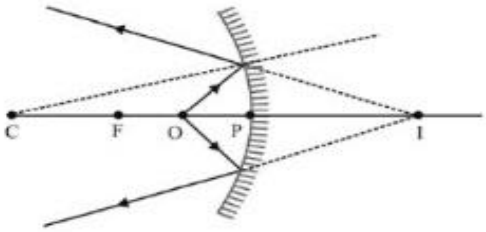


(b)



(ii) Real object and virtual image

(a)



(b)