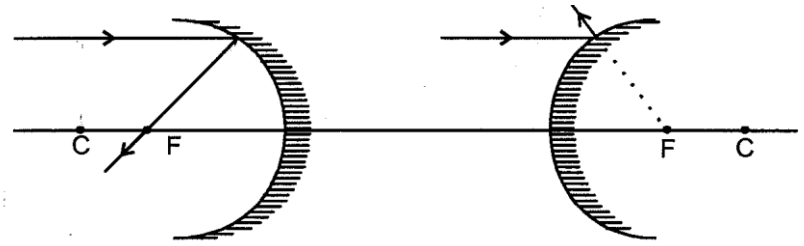
Light - Reflection and Refraction
concave mirror

CONCAVE AND CONVEX MIRROR:

Convex mirror is a spherical mirror, whose inner (cave type) surface is silvered and reflection takes place at the outer (convex) surface. Concave mirror is a spherical mirror, whose outer bulged surface is silvered and reflection takes place from the inner hollow (cave type) surface.

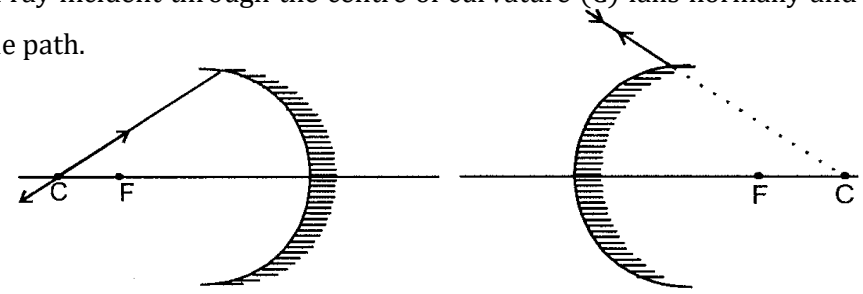
(a) Rules for the formation of images by concave & convex mirrors:

(i) A ray incident parallel to the principal axis actually passes (concave) or appears to pass (convex) through the focus.



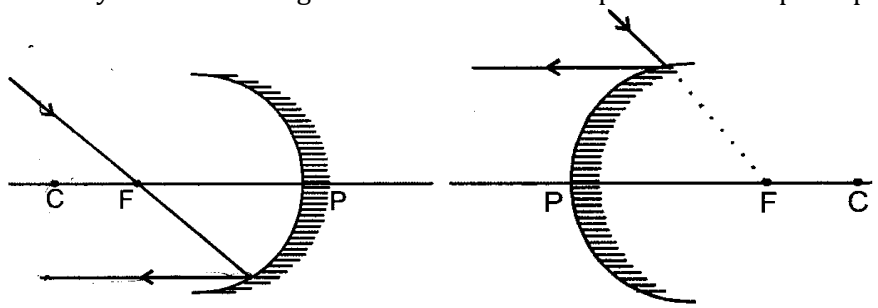
Concave Convex

(ii) A ray incident through the centre of curvature (C) falls normally and is reflected back along the same path.



Concave Convex

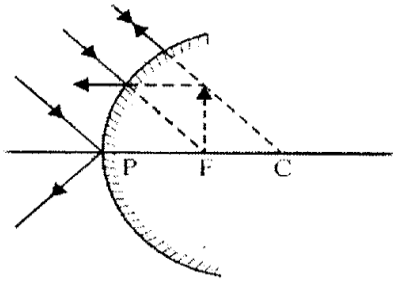
(iii) A ray incident through the focus is reflected parallel to the principal axis.



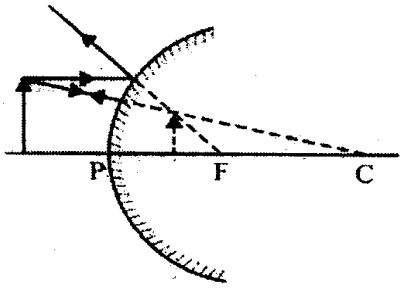
Concave Convex

(b) Formation of image by convex mirror:

(i) When the object is placed at infinity then image is formed at the focus. The image formed is virtual, erect and extremely demised.



(ii) When the object is placed between infinity and the pole then the image is formed between the focus and the pole. The image formed is virtual, erect and diminished.

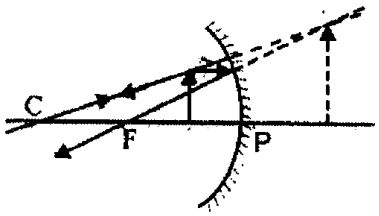


Uses of convex mirror :

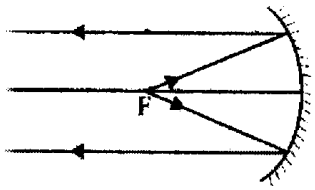
Convex mirror is used as rear view mirror is automobiles like cars, trucks and buses to see the traffic at the back side.

(c) Formation of image by concave mirror

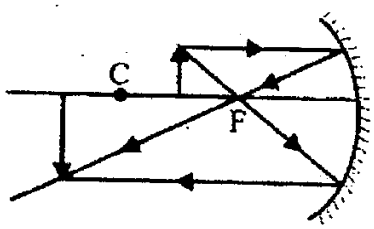
(i) When the object is placed between the pole and the focus, then the image formed is virtual, erect and magnified.



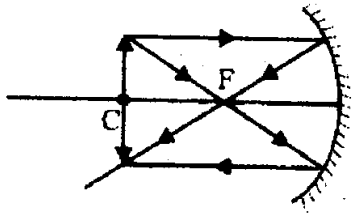
(ii) When the object is placed at the focus then the image is formed at infinity. The image is externally magnified.



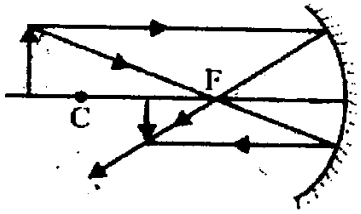
(iii) When the object is placed between the focus and the centre of curvature then the image is formed beyond the centre of curvature. The image formed is real, inverted and bigger than the object.



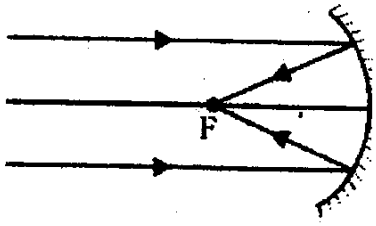
(iv) When the object is placed at the centre of curvature, then the image is formed at the centre of curvature. The image formed is real, inverted and equal to the size of the object.



(v) When the object is placed beyond the centre of curvature, then the image is formed between the focus and centre of curvature. The image formed is real, inverted and diminished.



(vi) When the object is placed at infinity then the image is formed at the focus. The image formed is real, inverted and extremely diminished is size.



(D) Used of concave mirror :

(i) They are used as shaving mirrors.

(ii) They are used as reflectors in car head-lights, search lights, torches and table lamps.

(iii) They are used by doctors to concentrate light on body parts like ears and eyes which are to be examined.

(iv) Large concave mirrors are used in the field of solar energy to focus sun-rays on the objects to the heated.