

Date - 11/11/24

Subject - PHYSICS

Teacher - Chhaganlal

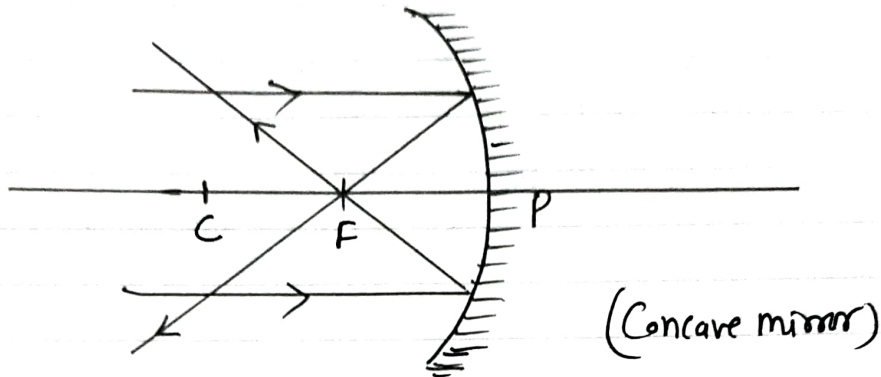
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CLASS - VIII

Ch-7 (C) (CONTINUE)

Ray Diagrams for the formation of Images in a Concave Mirror :→

Case-i) (When Object is at Infinity)

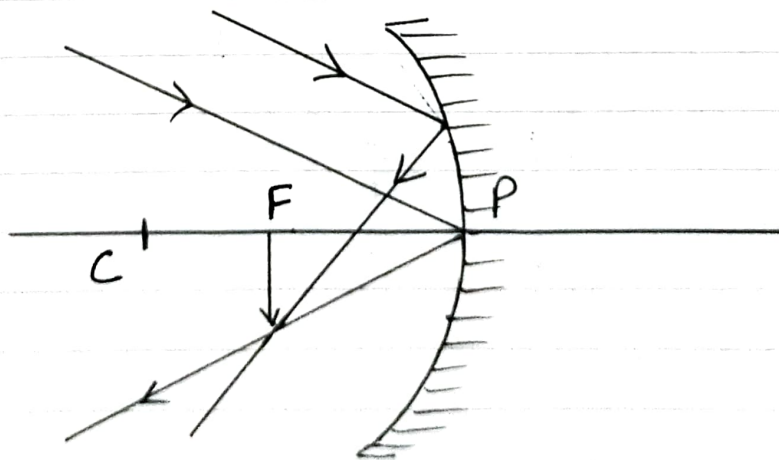


⇒ Image Position :→ At the focus

⇒ Size of Image :→ diminished to a point

⇒ Nature of Image :— Real and Inverted

Case-ii :→ When the Object is at far distance :→

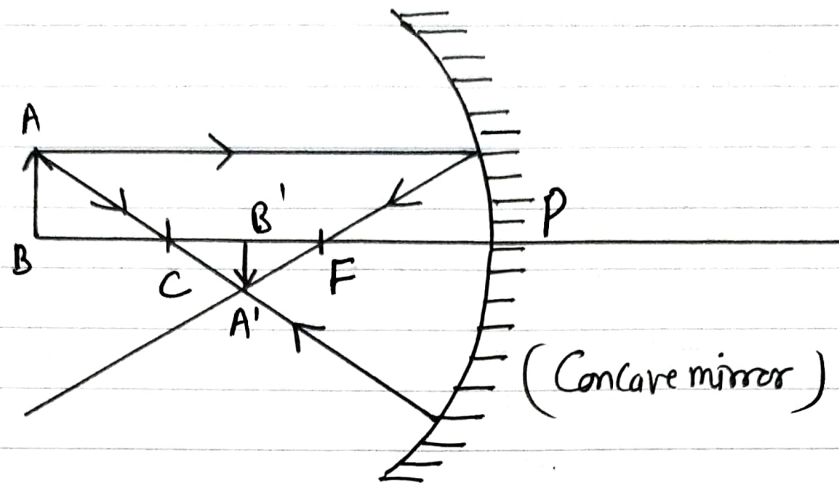


⇒ Image is diminished (highly)

Real and inverted

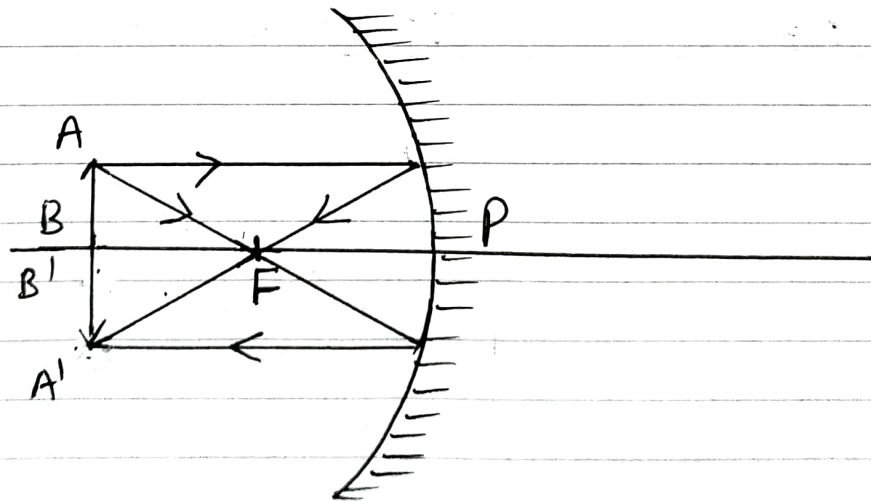
It is in the focal plane of mirror

Case-iii : $\rightarrow$ When object is beyond the centre of Curvature (C)



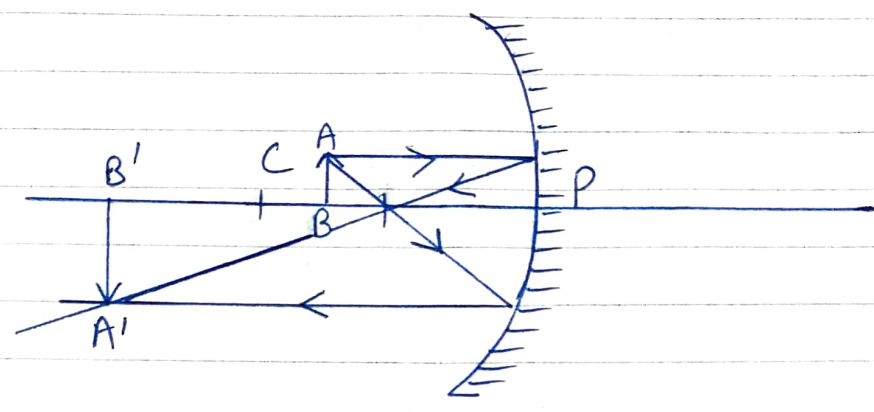
- $\rightarrow$ Image is in between F and Centre of Curvature (C)
- $\rightarrow$ Real and Inverted.
- $\rightarrow$ Diminished

Case-iv : $\rightarrow$ When the Object is at Centre of Curvature (C) :—



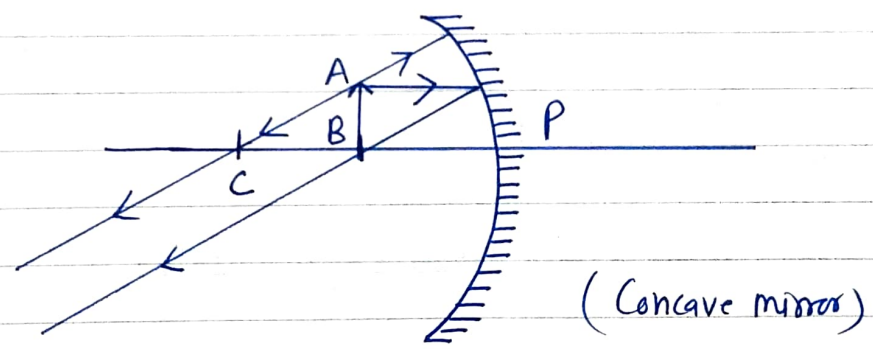
[Image is at centre of Curvature (C)
Real and Inverted.
Same Size as that of object]

(Case - V) $\therefore \rightarrow$ When the Object is between the Centre of Curvature (C) and focus F $\therefore \rightarrow$



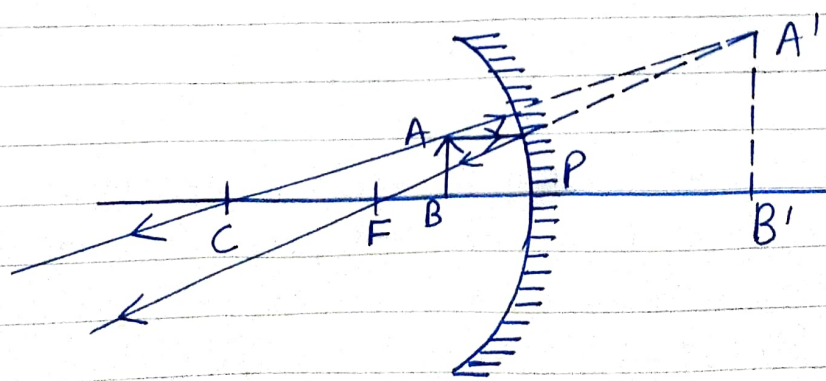
[Image is formed beyond C (Centre of Curvature)
Real and Inverted
Magnified]

Case - vi $\therefore \rightarrow$ When the Object is at F $\therefore \rightarrow$



[Image is at infinity
Real and Inverted
Highly magnified]

Case - vii $\therefore \rightarrow$ When the Object is in between focus (F) and Pole (P) $\therefore \rightarrow$

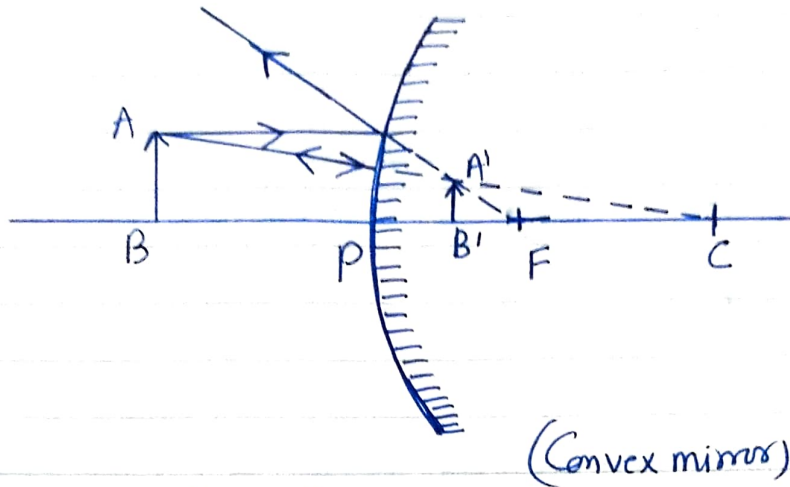


[* Image is formed behind the mirror
* Image is Virtual and Erect
* Magnified]

⇒ Ray Diagram for the formation of Image in a Convex mirror:→

(i)

When Object is placed at any point in front of the Convex mirror:→



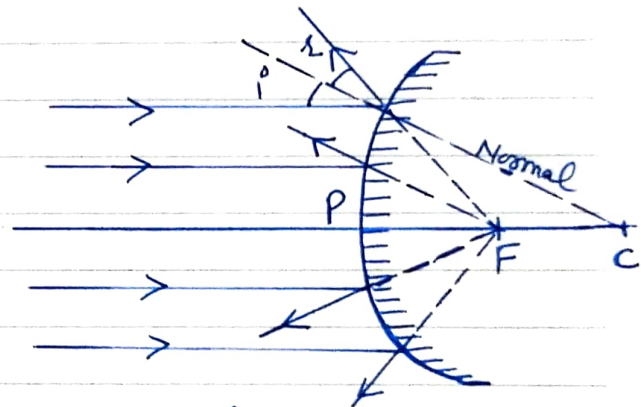
* Image is formed between focus F and pole P.

* It is Virtual and Erect (upright).

* Image is diminished.

(ii) When Object is at Infinity:→

Image is formed at focus
Virtual and erect
Diminished to a point



* Relationship b/w The focal length and Radius of Curvature:—

$$f = \frac{1}{2} R$$

f — focal length

R — Radius of Curvature

* Mirror formula:→

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

v — Image distance from pole of a mirror

u — Object distance from pole of a mirror

f — focal length of a mirror

* This topic is for understanding only *

Sign Conventions for a Convex mirror and Concave mirror for measurement of distances:

- (1) All distances are measured from pole of a mirror.
- (2) The distances measured along principal axis in the direction of incident light are taken positive while others are taken negative.
- (3) ^{The} Distances above the principal axis are taken positive while below the principal axis are taken negative.

Imp. Remember *

Focal length of a Concave mirror is "negative"
Focal length of a Convex mirror is "positive"

Imp. points to remember

For Concave mirror:

→ u is negative
 → f is negative] always

[v is negative for Real and Inverted Image.
 v is positive for Virtual and Erect Image.]

For a Convex mirror:

[→ u - negative
 → v and f are always positive]

— α — α — α — α — α —

⇒ Magnification (m) :

$$m = \frac{\text{Height of image}}{\text{Height of Object}} = \frac{I}{O}$$

It is defined as the ratio of height of image to the height of Object.

[Where I - Image Size
 O - Object Size]