Date :- 18.11.24

Subject :- PHYSICS

TENDER HEART HIGH SCHOOL, SEC-33B, CHD.

CLASS - IX

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Chapter-5 (Refraction through a lens) Page-1

Lens :→ A lens is a transparent medium bounded by either two spherical surfaces, or one spherical surface and the other surface plane.

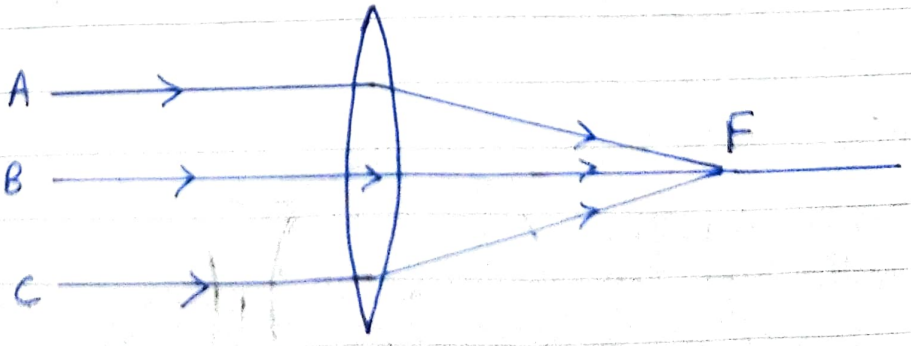
(Type of lenses)

- Convex lens (Converging lens)
- Concave lens (Diverging lens)

(This lens is thick at middle and thin at the periphery.)

(This lens is thin at middle and thick at the periphery.)

⇒ **Convergent action of convex lens :→**



Convex lens converges the parallel rays to a point F (focus).

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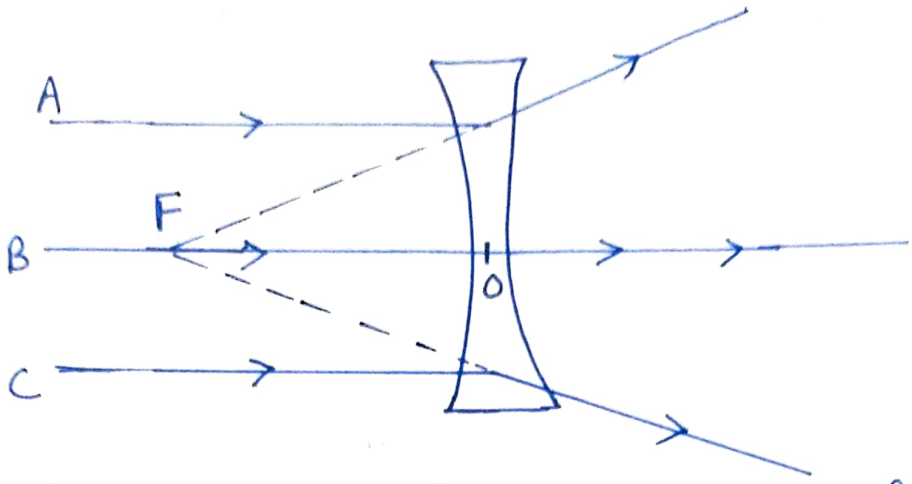
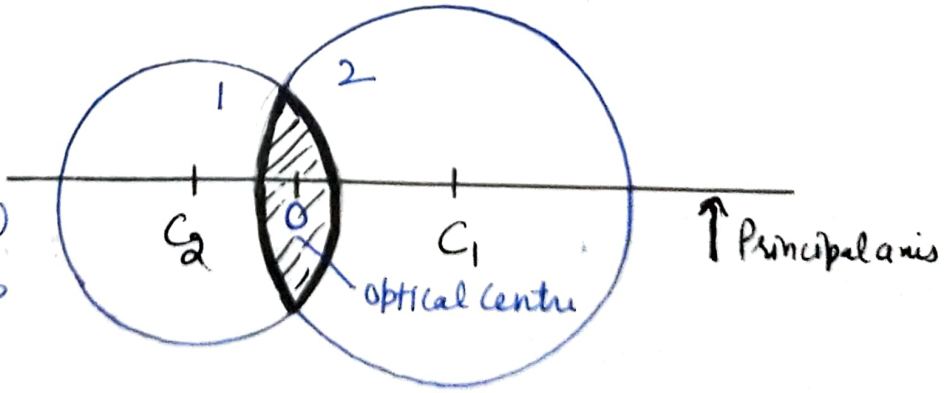
⇒ Divergent action of a Concave lens :→



Concave lens diverges the parallel rays as if they are Common point F (focus.)

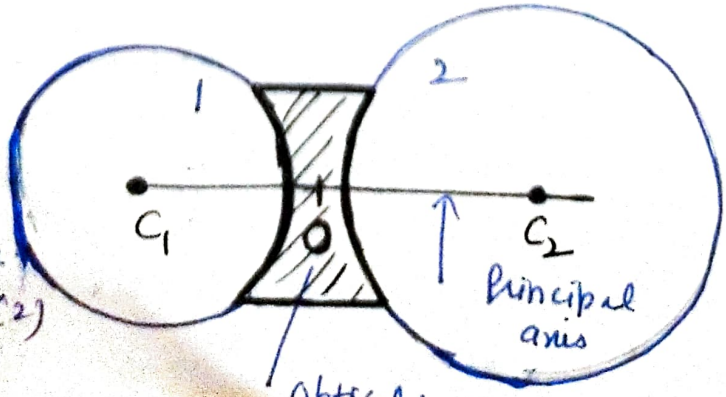
⇒ Terms related to a lens :→

(a) Centre of Curvature :→ Each surface of a lens is a part of a sphere. The centre of the sphere, whose part is the lens surface, is called the centre of curvature of that surface of the lens.



for convex lens;
C_1 – Centre of Curvature of Right surface (2)
C_2 – Centre of Curvature of left surface (1)

for Concave lens :→



C_1 → Centre of Curvature of left surface (1)

C_2 :– Centre of Curvature of Right surface (2)

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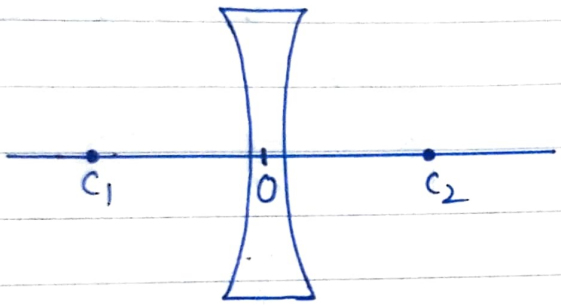
(b) **Radius of Curvature** :→ The radius of the sphere, whose part is the lens surface is called radius of Curvature of that surface of the lens.

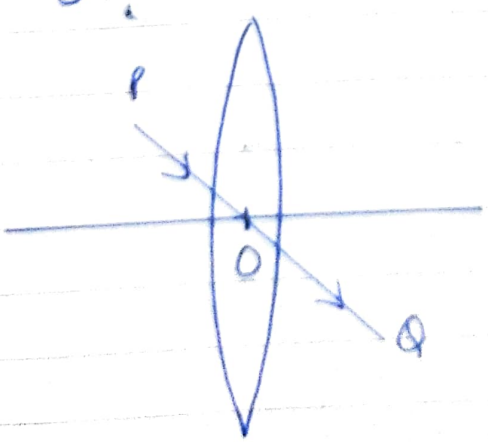
Or Radius of Curvature is the distance of Centre of Curvature from the optical centre.

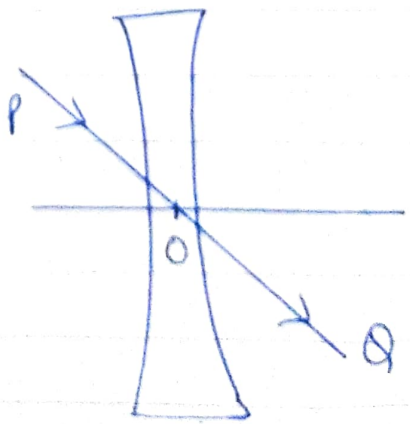
(c) **Principal Axis** :→ It is the line joining the centre of Curvature of the two surfaces of the lens.



In figure; C_1C_2 line is the principal axis

(d) **Optical centre** :→ It is denoted by O and it is taken in the middle of the lens. It is a point on the principal axis of the lens such that ray of light passes through this point shows no deviation in its path. Or ray of Light passes ~~pass~~ undeviated through optical centre (o)





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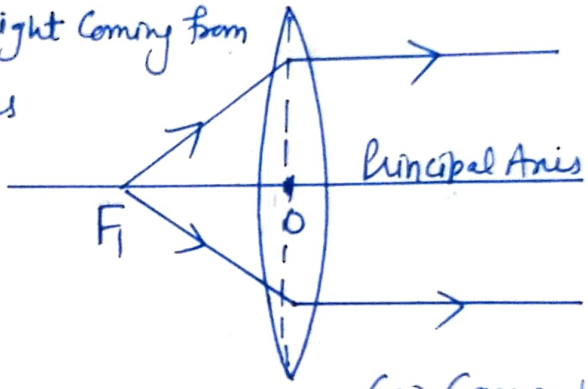
(c) Principal foci :→ A lens has two principal foci, one on either side of the lens. These are known as first focal point (or first focus) F_1 and second focal point (or second focus) F_2.

* If medium is same on either side of the lens, the two foci are situated at equal distances from the optical centre.

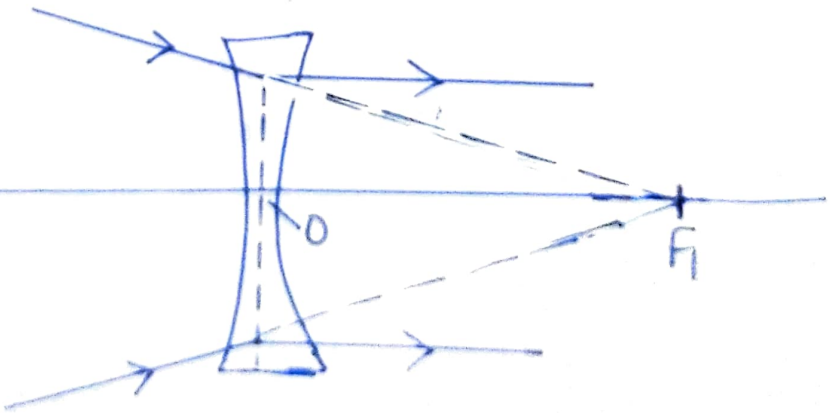
* First Focal point :→ light coming from it After refraction from the lens becomes parallel to the Principal axis of the lens. It is denoted by F_1.



(a) Convex Lens.

For Concave lens :→

It is a point on the principal axis such that incident rays appear to meet at it and after refraction become parallel to principal axis.



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