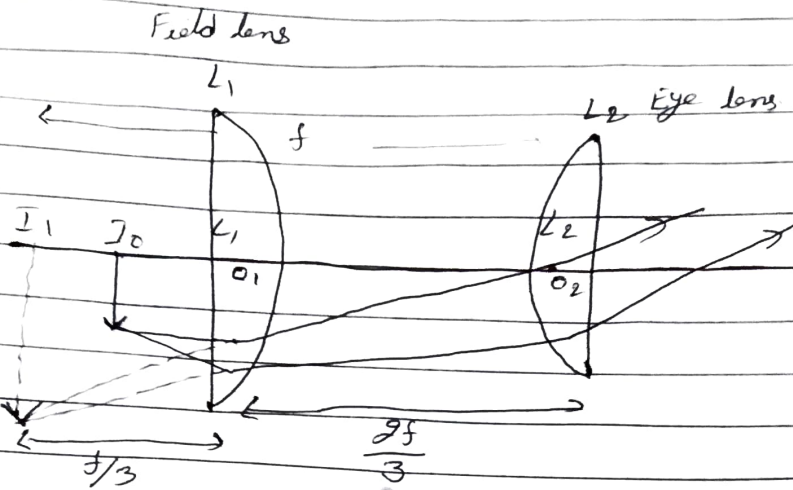


RAMSDEN EYEPIECE



Ramsden eyepiece consist of two plano convex lenses each of focal length f separated by a distance equal to $(\frac{2}{3}f)$. The lenses are kept with their curved surfaces facing each other which is reduced the spherical aberration.

The field lens is little larger than eye lens. both lenses have equal magnification.

Theory \rightarrow

The objective lens forms the real inverted image I_0 of a distant object. This serves as an object for the field lens, which gives rise to a virtual image I_1 . I_1 is the object for eye lens which gives the final image at infinity.

Working \rightarrow

Image of eye lens is at infinity it means object is at focus.

By applying lens formula for L_1 (field lens)

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

$$\Rightarrow -\frac{1}{u} + \frac{1}{\frac{f}{3}} = \frac{1}{f}$$

$$\Rightarrow -\frac{1}{u} - \frac{3}{f} = \frac{1}{f}$$

$$\Rightarrow -\frac{1}{u} = \frac{1}{f} + \frac{3}{f}$$

$$\Rightarrow -\frac{1}{u} = \frac{4}{f}$$

$$\therefore u = -\frac{f}{4}$$

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