Class X

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AIM: To determine the focal length of a convex lens by obtaining an image of a distant object.

Apparatus/Material Required :

A convex lens, convex lens stand, a small screen (hard sheet of white paper/cardboard) fixed to a stand, a measuring scale.

Procedure :

1. Fix the comex lens on the lens holder or stand and place it place it on the table near an open window of the laboratory.
2. Locate a distant tree/buliding from the open glass window (if an open window is not available then obtain the image of the window itself on the screen.
3. Place the screen behind the convex lens.
4. Adjust the position of the convex lens and the screen so that a sharp, inverted and diminished image of a distant object is formed clearly on the screen.
5. Note the positions of the screen and the convex lens stand with the help of measuring scale.
6. Find the distance between the optical centre of the lens and the screen. This distance is equal to the focal length of the convex lens. Record the the focal length.
7. Repeat the experiment a few times by changing the positions of the convex lens stand and note the corresponding changed position of the screen.
8. Calculate the mean value of the focal length.

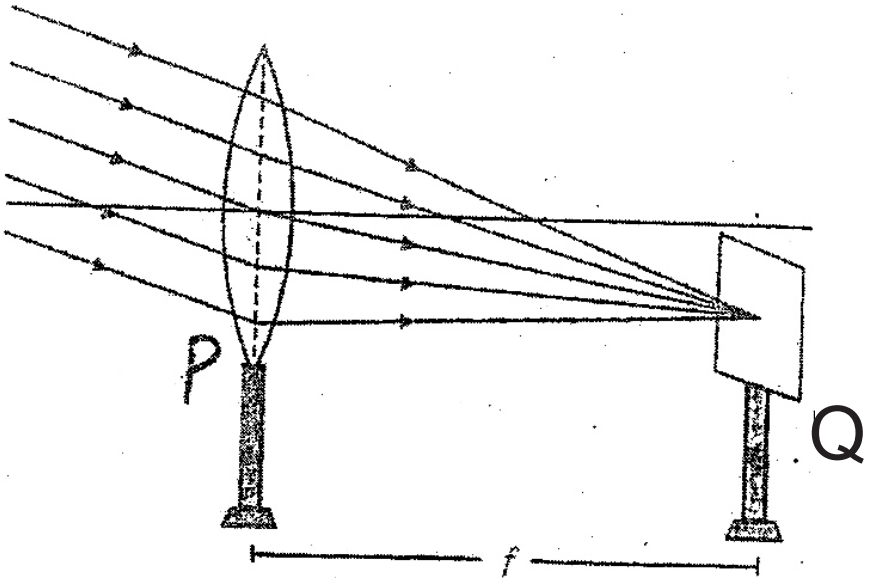
Observation and Calculation:

S.No.	Position of the convex lens (P) (in cm)	Position of the white screen (Q) (in cm)	Focal length of the convex lens (Q-P) (in cm)
1	30	7.5	f1 = 10
2	34	7.7	f2 = 10
3	38	7.9	f3 = 10
4	42	8	f4 = 10

Mean value of focal length of concave mirror f

$$= \frac{f1+f2+f3+f4}{4}$$

= --------- cm



Precautions :

1. Fix the convex lens vertically in the lens holder.

2. The base of the lens stand and white screen should be in line with the measuring scale.

3. Record the position of the lens and screen only when a well defined sharp image is formed.