

EXPERIMENT - 4

AIM :-

To find the value of v for different values of u in case of a concave mirror and to find the focal length.

APPARATUS REQUIRED :-

- An optical bench
- A spherical mirror holder
- 2 needles.
- A concave mirror
- A knitting needle
- A meter scale

THEORY :-

A relation between image distance (v) object distance (u) and focal length (f) of an object spherical mirror is called as mirror formula i.e given by

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

RESULT :-

The focal length of the given concave mirror is determined from :

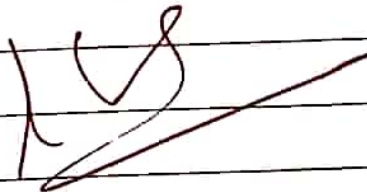
Focal length of the given mirror is -14.38 cm.

PRECAUTIONS :-

1. Parallax should be removed from tip to tip.
2. The bench correction should be applied.
3. The upright might be vertical.
4. Observations should be obtained with great care.

SOURCES OF ERROR

1. Error may be due to parallax.
2. Error may be due to defect of vision of the student.
3. Error may occur in observation due to careless experiment or insensitive scale.



Teacher's Signature : _____

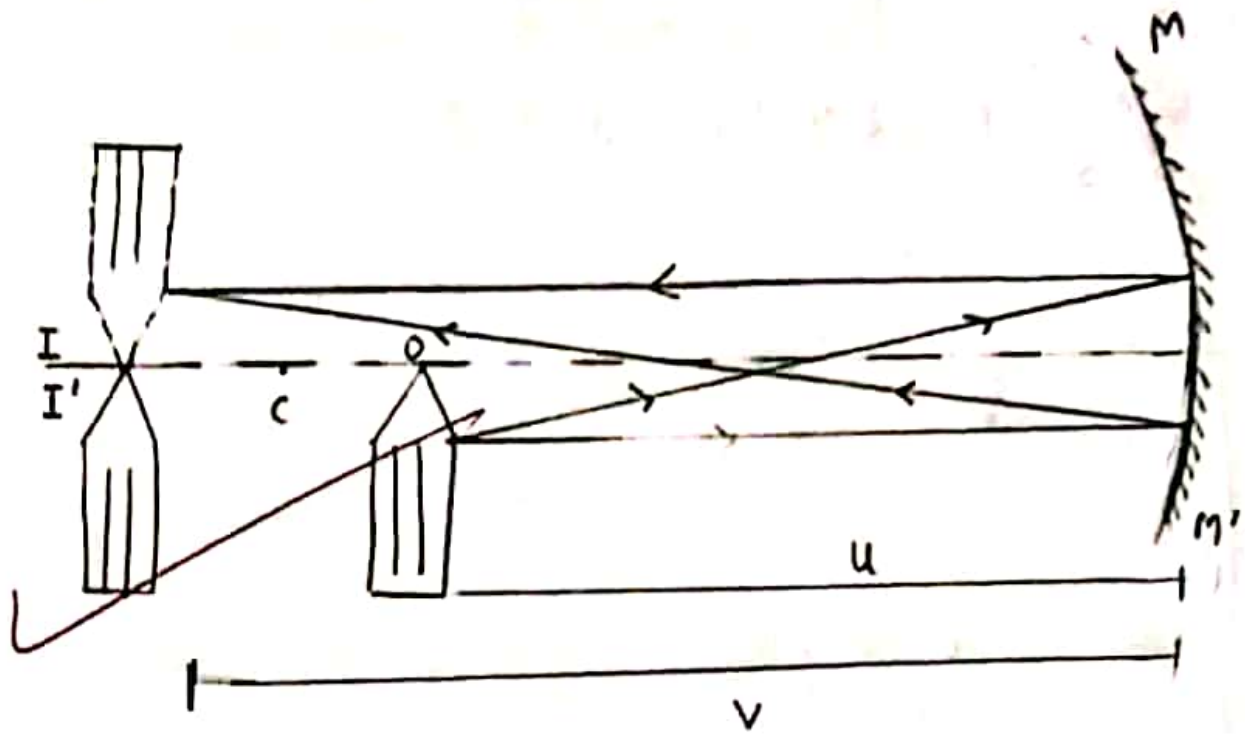


Figure - Ray diagram for 2 pin method

OBSERVATION TABLE

S. No	Position of Object needle (a) (cm)	Position of Image made (b) (cm)	Mirror (c) (cm)	Object distance $u = c - a$	Image distance v (cm)
1.	5	74	34	-21	-30
2.	90	105	65	-25	-40
3.	112	121	85	-27	-38
4.	100	111	75	-26	-36

Calculations

Mean value =

$$f = \frac{-12.83 - 15.38 - 15.42 - 14.40}{4}$$

$$= - \frac{57.53}{4}$$

$$= - 14.38 \text{ cm}$$