Experiment No: Date:

# Concave Mirror

**Aim**:

To find the Focal Length of the Concave Mirror and hence to find its Radius of Curvature.

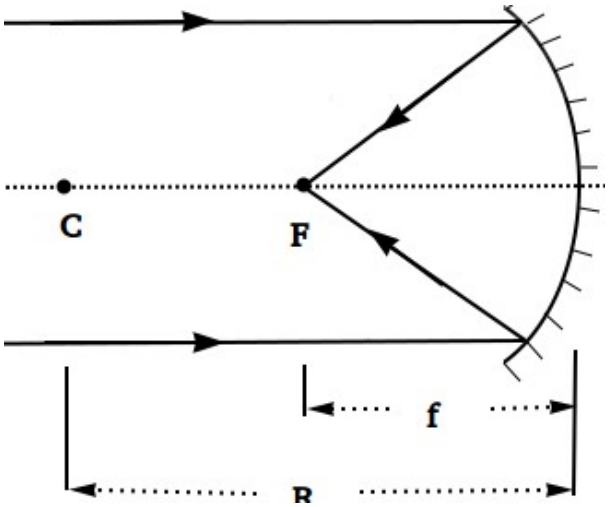
**Apparatus**:

Concave Mirror, Screen, Illuminated wire Gauze, Stand, metre scale etc.

**Principle**:

1. **The distance object method**:

   If the object is placed in **infinity**, the distance between the lens and the screen is the **focal length**



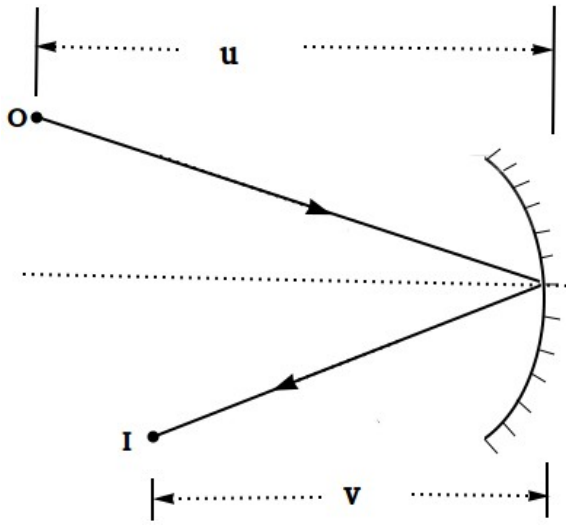

**Distance Object Method**

2. **u – v method**:

   The focal length

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

   **where u is the object distance and v is the image distance**

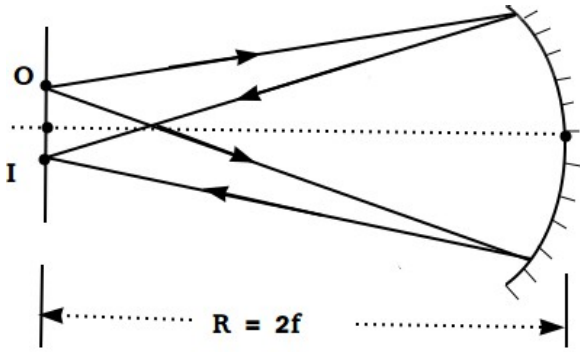



**u – v method**

3. **Normal Reflection Method:**

   In this method **u = v = R**

   then 2f = R or $f = \frac{R}{2}$




**Normal Reflection Method**

4. **from u – v graph:**

   The focal length

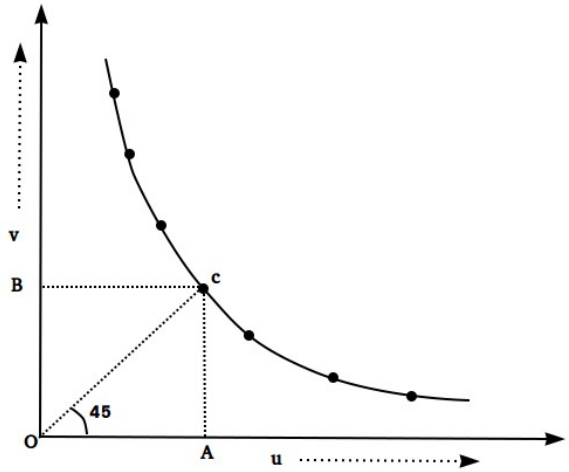
$$f = \frac{OA+OB}{4}$$

   where **OA** and **OB** are the coordinates at the point where **u = v**

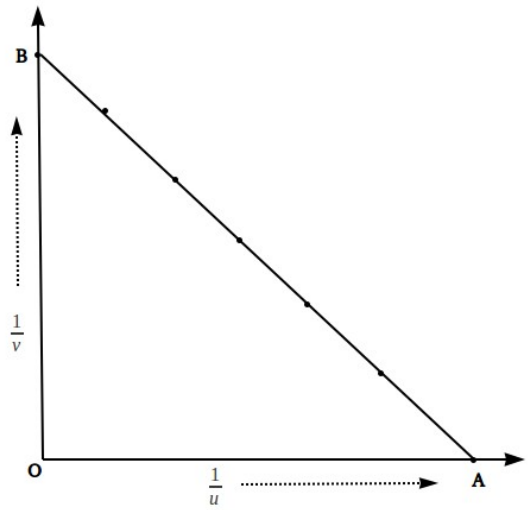
5. **From** $\frac{1}{u} - \frac{1}{v}$ **graph:** The focal length

$$f = \frac{2}{OA+OB}$$

   where OA and OB are the **intercepts** at X – axis and Y – axis.




**u-v graph**




$\frac{1}{u}-\frac{1}{v}$ graph

**Observations:**

**Distance Object Method:**

| | | | |
|---|---|---|---|
| f1 = cm | f2 = cm | f3 = cm | **Mean f** = cm = m |

**Normal Reflection Method:**

| | | | |
|---|---|---|---|
| R1 = cm | R2 = cm | R3 = cm | **Mean R**= cm = m |
| | | | Focal Length f = R/2 = cm = m |

**u – v method**

| Trial No | Object Distance (u) cm | Image Distance (v) cm | $\frac{1}{u}$ | $\frac{1}{v}$ | $f=\frac{uv}{u+v}$ | Mean f |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |

**Calculations:**

**From u – v graph:** $f=\frac{OA+OB}{4}$ = = cm= m

**From** $\frac{1}{u}-\frac{1}{v}$ **graph:** $f=\frac{2}{OA+OB}$ = = cm= m

**Results:**

1. Focal length of the given Concave Mirror from u-v method = m
2. Focal length of the given Concave Mirror from u-v graph = m
3. Focal length of the given Concave Mirror from $\frac{1}{u}-\frac{1}{v}$ graph = m
4. Focal length of the given Concave Mirror from distant object method = m
5. Radius of Curvature of the Concave Mirror = m