ACTIVITY No. 2
LAW OF MOMENTS

Aim: To determine the mass of a given body using a meter scale by principle of moments.

Apparatus: A meter scale suspended at C.G., hanger with slotted weights, a body of unknown mass.

Diagram:

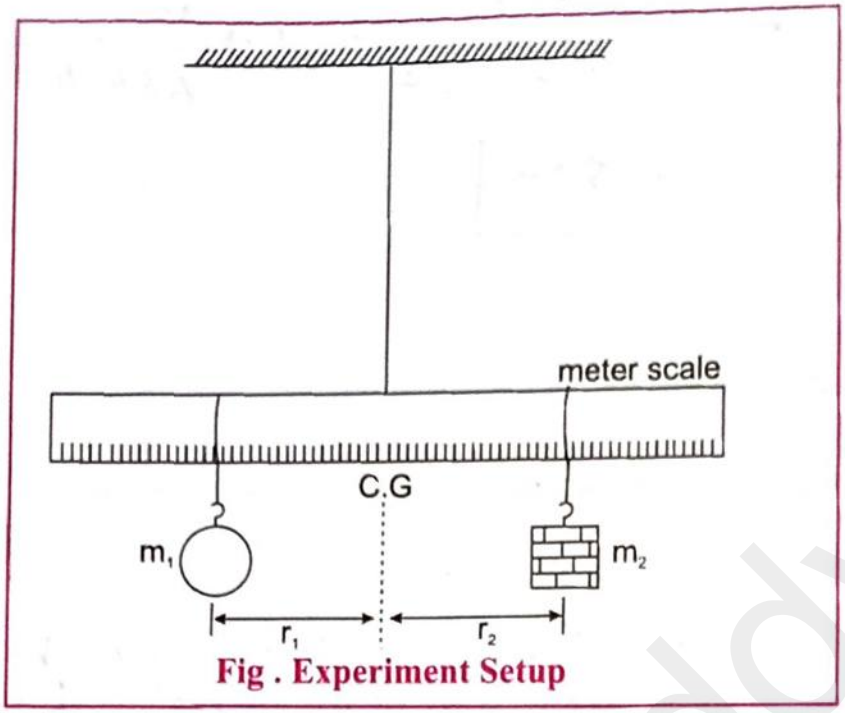

Fig . Experiment Setup

Formula:

$$m_1 r_1 = m_2 r_2$$

$$\therefore m_1 = \frac{m_2 r_2}{r_1}$$

Procedure:

1. Balance the meter scale carefully at its C.G. and note down the position of the C.G.
2. Suspend the body of unknown mass (m_1) at a fixed distance (r_1) from C.G. as shown in the figure.
3. Suspend the hanger with slotted masses (m_2) at some distance from C.G. to the other side as shown in the figure.
4. Adjust the distance (r_2) in such a way that, the meter scale becomes horizontal.
5. Repeat the steps 3 and 4 by changing the slotted weights (m_2) and note down the corresponding distance (r_2) in each case for three times.

Observations :

Fixed distance of unknown mas from C.G. = r_1 = 20 cm.

Sr. No.	Mass suspended with hanger (m_2) g	Distance of hanger from C.G. at balance (r_2) cm	$m_2 r_2$ gcm	Unknown (m_1) mass g
1	40	29		58
2	60	19		57
3	80	14.5		58

Mean mass = _____

Result : The unknown mass of a body (m_1) = 57.7 g.

Precaution: Find centre of gravity of scale using knife edge.

FOR NOTES

$m_1 u_1 = m_2 u_2$

$m_1 \times 20 = 40 \times 29$

$m_1 \times 20 = 1160$

$m_1 = \frac{1160}{20}$

$\boxed{m_1 = 58}$

Remark and sign of teacher: .....