1.

1.Angles of incidence i	15	30	45	60	75
LY (mm)	8.0	17.0	23.0	29.0	32.5
MN (mm)	13.0	25.5	36.0	44.0	49.0
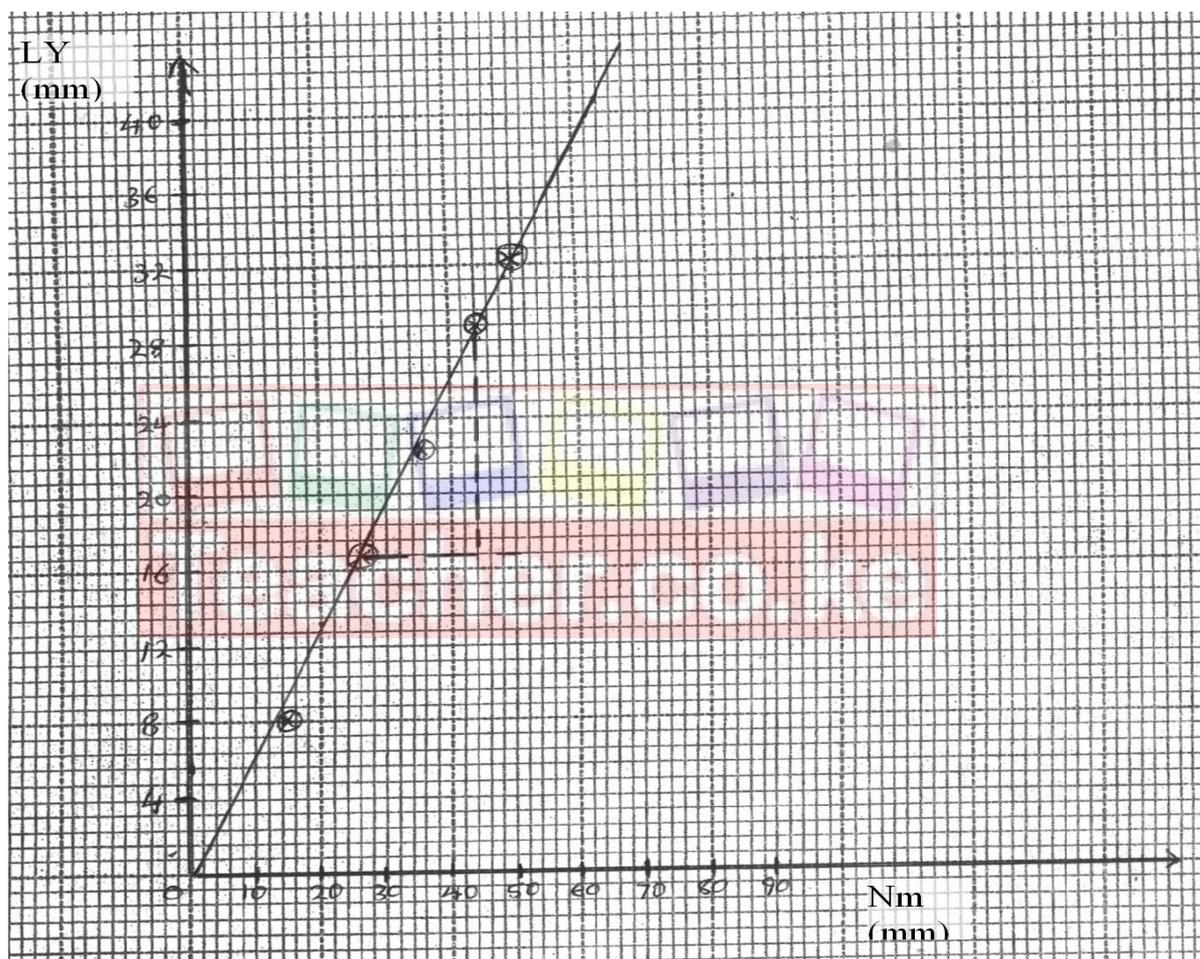
(i)

PART II

b) v_1 = 26 CM^3 OR 26 Ml

c)   l = 30.8 cm

d)   K = $\dfrac{30.8}{10x3.142}$

K = 0.9803 cm

N/B :- K is the radius of the 50g mass.

e) $Q = \dfrac{V_1 - 20}{50}$

$= \dfrac{26 - 20}{50}$

$= 0.12 \text{ cm}^3/g$

N/B:- Reciprocal of Q gives the density of the 50g brass mass.

Proof: $\dfrac{1}{q} = \dfrac{1}{0.12}$

$= 8.333 \text{ g/cm}^3$

2. c)

d (cm)	80	70	60	50	40	30
d (m)	0.80	0.70	0.60	0.50	0.40	0.30
$\dfrac{i}{d^2}$ (m-2)	1.563	2.041	2.778	4.000	6.250	11.11
Time for 20 Osc. (s)	12.21	14.13	17.82	19.72	24.25	32.60
Period T (S)	0.6105	0.7065	0.8910	0.9860	1.2130	1.630
T^2 (S^2)	0.3727	0.4991	0.7939	0.9722	1.471	2.657

d)
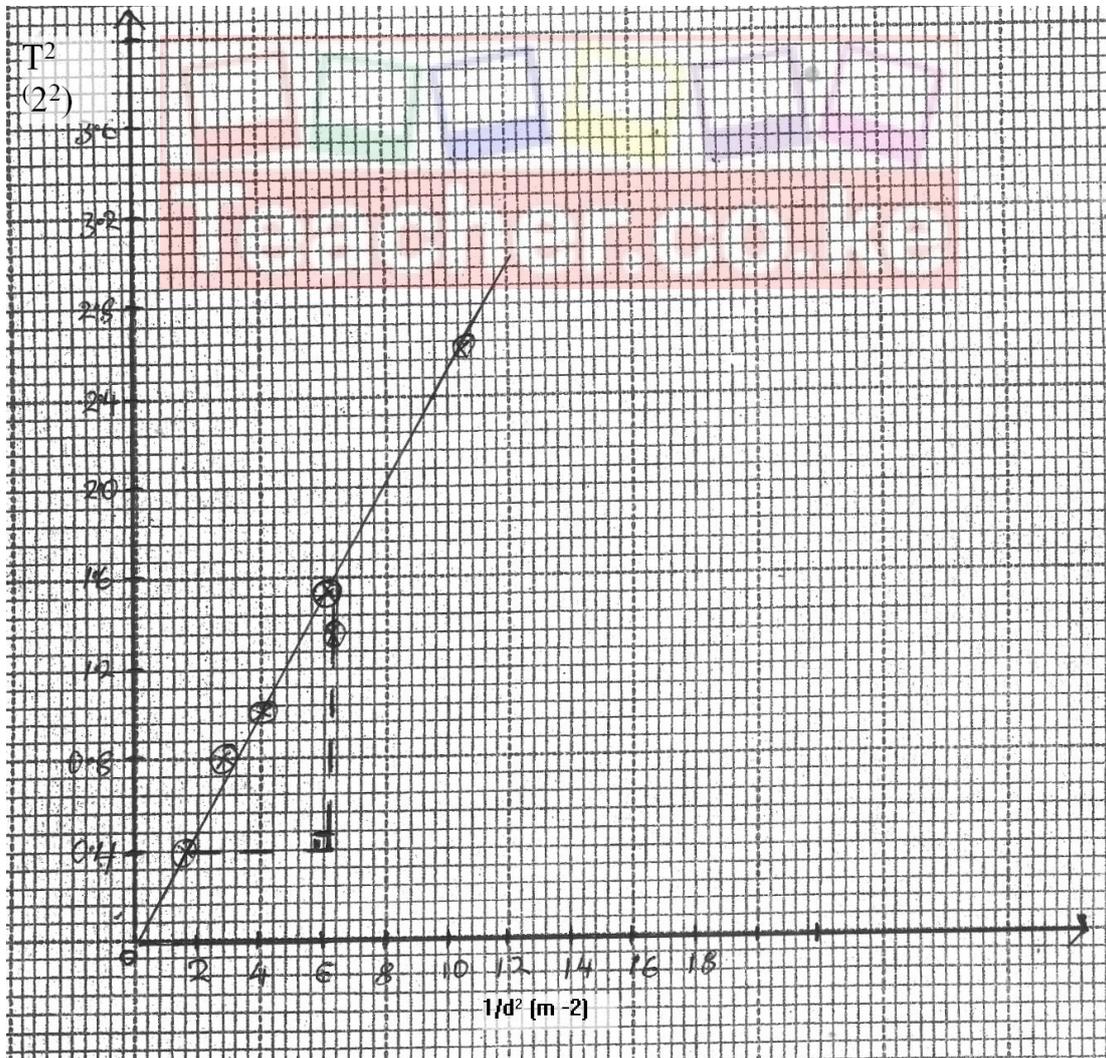
Part II

(a) $V_0 = 1.50$ V

N/B:- V_0 is the e.m.f of the cell; and may vary from 1.50 V to 1.65V

d) I = 0.16 A

u = 1.30 U

c) $\rho = \dfrac{i}{V_0 - V}$

N/B: ρ is reciprocal of internal resistance of the cell

$= \dfrac{0.16}{1.50 - 1.30}$

$= 0.8$ A/V

$= 0.8$ AV^{-1}

Proof : $\dfrac{1}{\rho} = \dfrac{1}{0.8}$

$= 1.25 \ \Omega$

PART III

b) $U_1 = 27.3$ cm

c) $U_2 = 72.5$ cm

d) $d = U_2 - U_1$

$= 72.5 - 27.3$

$= 45.2$ cm

e)

$\theta = \dfrac{1+m}{Mu_1}$ But m = $\dfrac{100 - u_1}{u_1}$ $= \dfrac{100 - 27.3}{27.3}$ $= \dfrac{72.7}{27.3}$ $= 2.663$	$\theta = \dfrac{1 + 2.663}{2.663 \times 27.3}$ $= 0.05039$ NB: The quantity θ gives the reciprocal of the focal length of the lens. Proof: $\dfrac{1}{\theta} = \dfrac{1}{0.05039}$ $= 19.85$ cm

	= 20 cm