PHYSICS 232/3
MAKING SCHEME

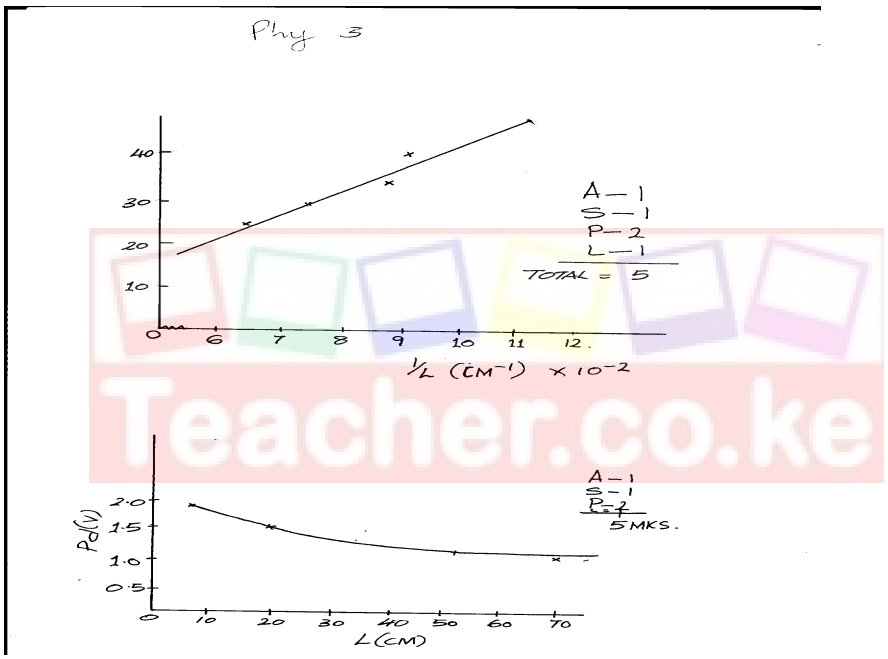
1(a) (i) Diameter "d" = 1.7cm ± 0.1cm √ (1mk)
(ii) Radius r = 0.85cm √

(b) (i) M = 5.8g ± 0.6g. √ (1mk)
(ii) P = 0.4 x 5.8 x $(0.85)^2$ √ (1mk)
= 1.676

(c) Table I

Height h (cm)	8	9	10	11	12	13	14	15
Average time t (s)	1.75	1.61	1.61	1.49	1.52	1.43	1.38	1.25
t^2 (s^2)	3.06	2.50	2.50	2.22	2.31	2.04	1.90	1.56
1/h (cm^2)	0.725	0.111	0.100	0.091	0.083	0.077	0.071	0.067

(6mks)



(ii) $s = \frac{1.25 \times 10^{-5}}{3.2 \times 10^{-5}}$
$= \frac{12.5}{3.2} \times 10^{-3}$
$= 3.91 \times 10^{-3}$ (3mks)

(iii) $G = Mr^2 \left(\frac{5 - 1}{20}\right)$ √ (2mks)
$= 5.8 \times 0.85^2 \ \frac{3.91 \times 10^{-3}}{20} - 1$ √
$= 5.8 \times 0.7225 \times (0.1955 \times 10^{-3} - 1)$ √
$= 4.19$ (2mks)

2.(a) Lo = 0.8M (80cm) √ (1mk)
d = 0.28mm, ± 0.01mm √
d = 2.8×10^{-4}m √ (1mk)
r = 1.4×10^{-4}m √ (1mk)

(b) (i) V_R = 1.2V √ (1mk)

$V_G = 1.4$ V √ (1mk)

(ii) I = 0.12 Ampere √

(iii) $H = \frac{100VG}{I \times Lo}$ √ (1mk)

$H = \frac{100 \times 1.4}{0.12 \times 1.4}$

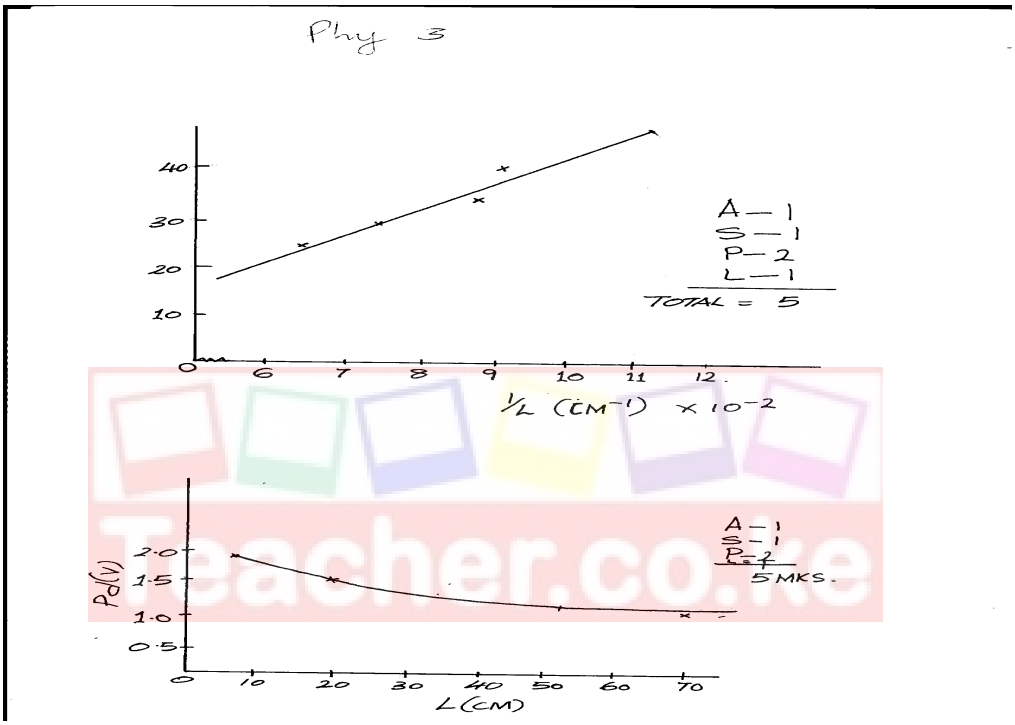
$= 1458.3$

(c)

Distance l(cm)	0	5	10	20	30	40	60	70
Pd v across R(v)	2.2	1.8	1.7	1.6	1.5	1.48	1.4	1.2

(3mks)

(i)



(ii) $Vo = \frac{1.7}{2}$ volt

$= 0.85$ v.

L1 = 68cm or 0.68m √ (1mk)

(f) $D = \frac{R}{L1} \times \frac{300}{Vo}$

$= \frac{4}{0.68} \times \frac{300}{0.85}$ √

$= \frac{1200}{0.578}$

$= 2076.12$

$= 2.1 \times 10^3 \Omega / mV$ √ (2mks)

(g) $P = \frac{\pi r^2}{2} (D + H)$

$\pi \times \frac{(1.4 \times 10^{-4})^2}{2} (2.1 \times 103 + 14583)$ √

$= 9.8 \times 10^{-9} (3558.3)$

$= 3.487 \times 10^{-5}$

$= 3.5 \times 10\text{-}5$ √ (2mks)