PHYSICS

FORM 4

PAPER 3

MARKING SCHEME

QUESTION 1A

Height h(cm)	Time (s)			
	Trial 1	Trial 2	Trial 3	Mean time t
70				
65				
60				
55				
50				
45				
40				
35				
30				
25				
20				

(b) **.(i)** h = 15cm $\pm$ 1cm ✓1

(iii).d = 2cm $\pm$ 1cm ✓1

(iv).t = h – d = (15.0 – 2.0)cm

=13.0cm✓1

(v).m = 61.2g $\pm$ 10g✓1

(vi).D = 2.53cm $\pm$ 0.1cm✓1

$$\text{(vii).R} = \frac{D}{2} = \frac{2.53}{2} = 1.265\text{cm}\checkmark$$

$$\text{(viii).} m = 12p\pi R^2$$

$$\Rightarrow p = \frac{m}{13\pi R^2}$$

$$= \frac{61.2\ \checkmark^2}{\qquad}$$

$12 \times 3.142 \times (1.265)^2$

$= \frac{61.2}{60.335}$

$= 1.014 gcm^{-3}$ ✓1

QUESTION 2

PART A

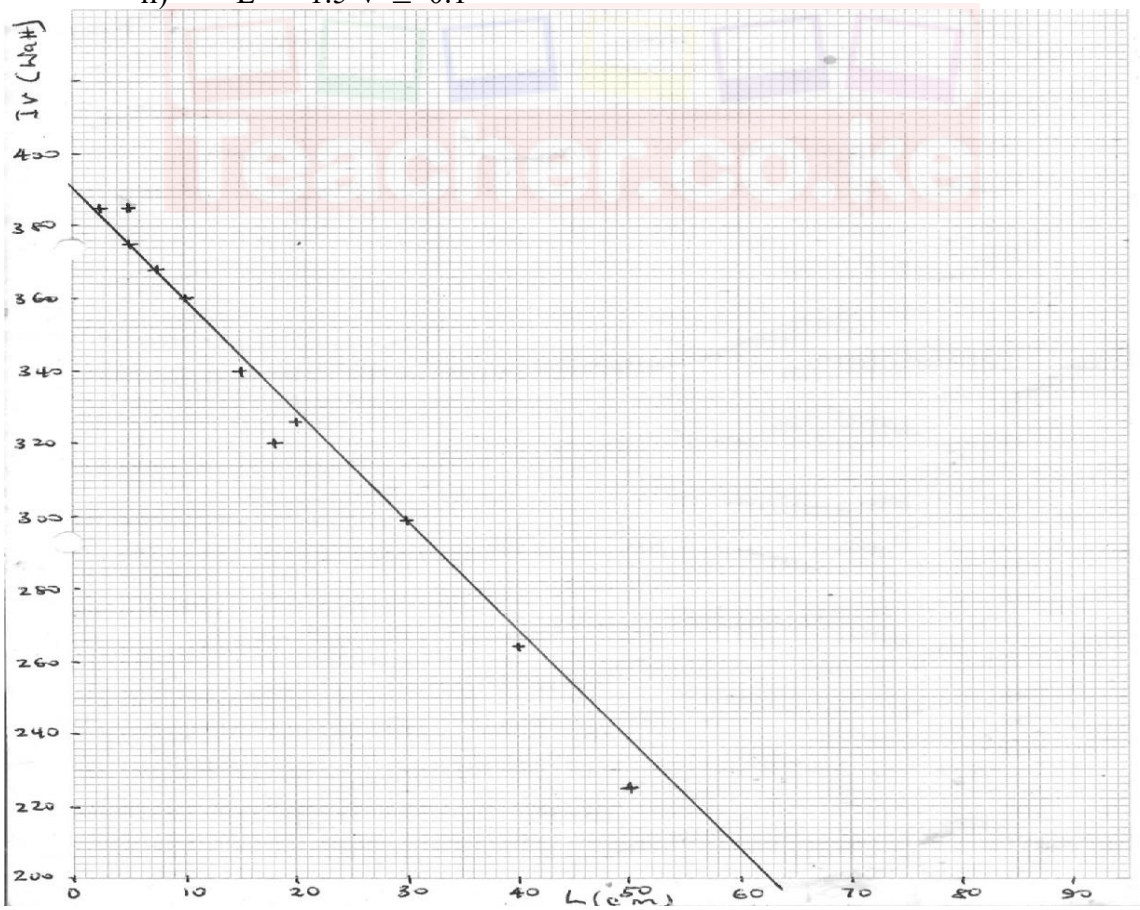
L (cm)	2.5	5.0	7.5	10	15	18	20	30	40	50
P.D V (Volts)	0.70	0.75	0.80	0.90	1.00	1.00	1.05	1.15	1.20	1.25
Current , I (A)	0.55	0.50	0.46	0.40	0.34	0.32	0.31	0.25	0.22	0.18
IV (Watt)	0.385	0.375	0.368	0.360	0.340	0.320	0.326	0.289	0264	0.225

Total (6mks)

ii) Scale✓ (5mks)
Plots✓
Line✓
Axes✓

a) i) $d = 0.35 \text{ min} = 3.5 \times 10^{-4} \text{ m}$

ii) $L^2 = 1.5 V \pm 0.1$



iii) $L_0 = 63$ cm (students x – intercept Correctly read)
(1mk)

c) i) $r = 1.30 \sqrt{\ } \ 1$ ✓

$I = 0.17 \sqrt{\ } \ 1$ ✓

ii) $r = \frac{E - r}{I}$

$= \frac{1.5 - 1.3}{0.17} = 1.176\Omega$ ✓ (1) (1 ± 0.2)

d) $e = \frac{\pi x 1.176 x (3.5 x 10^{-4})^2}{4 x 0.63}$ ✓ (1) $= \frac{\pi r d^2}{4 L_0}$

$= 1.796 \times 10 \ \Omega m$ ✓(1) 20 mks