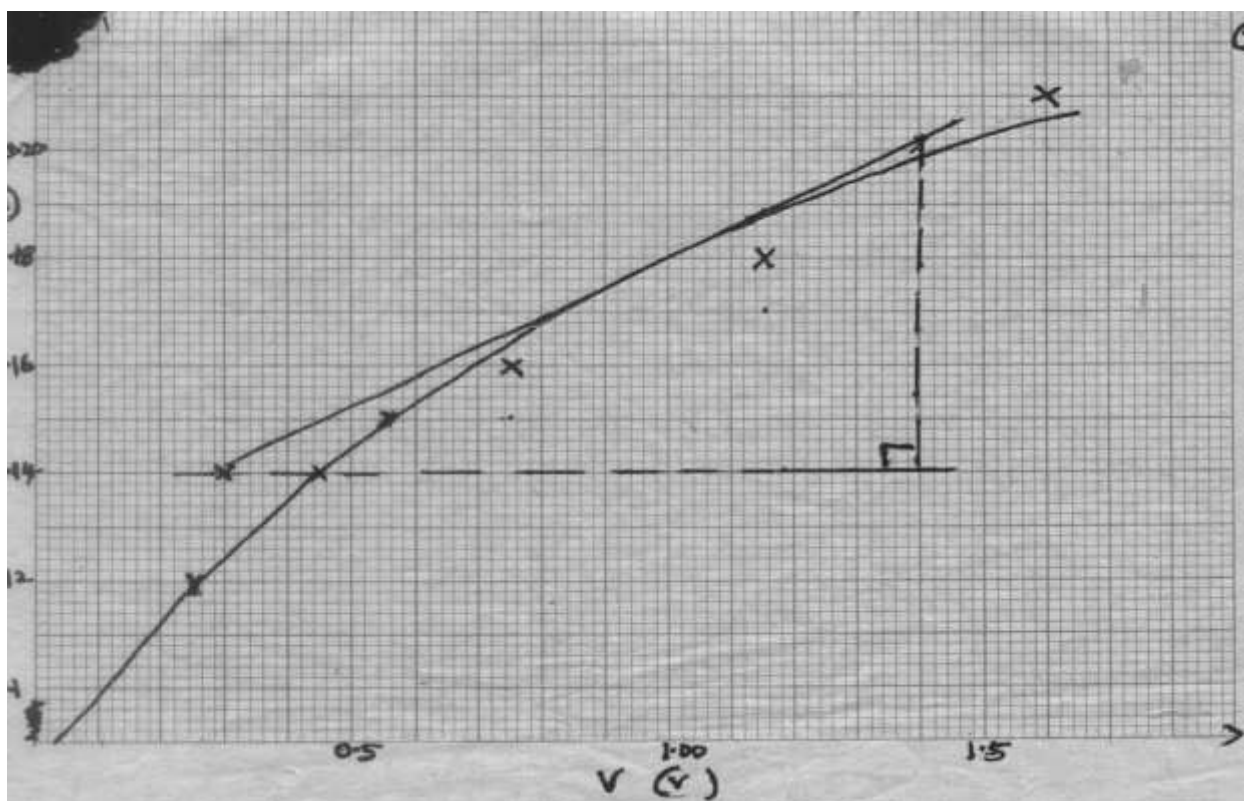


MARKING SCHEME PHYSICS FORM THREE TERM 2 2019

1i)	Length L (cm)	100	80	60	40	20	0
	Voltage v (v)	<u>0.25</u>	<u>0.45</u>	<u>0.55</u>	<u>0.75</u>	<u>1.15</u>	<u>1.60</u>
	Current I (A)	<u>0.12</u>	<u>0.14</u>	<u>0.15</u>	<u>0.16</u>	<u>0.18</u>	<u>0.21</u>

(ii) Brightness increase ✓ 1

1 mk



(iv)

Axes – 1

Scale - 1

Plotting – 2 at least four each ½ mark

Curve - 1

(v) Tangent at the point

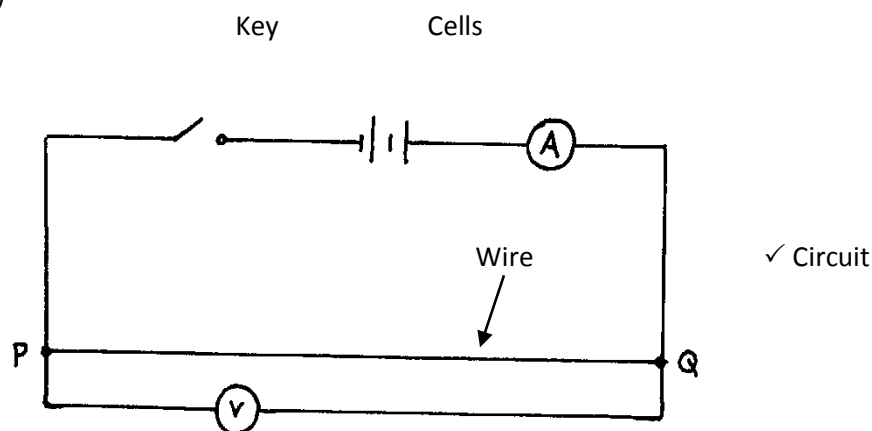
$$\text{Slope} = \frac{0.16 - 0.14}{1.4 - 0.3} \checkmark 1 \text{ correct intervals}$$

$$= \frac{0.02}{1.1}$$

$$= 0.018 \Omega^{-1} \checkmark 1 \text{ correct evaluation}$$

(vi) Reciprocal of resistance $\checkmark 1$

(b) (i)



NB – ammeter in cell switch in series voltmeter parallel to wire

(ii) $V = 1.8 \text{ V} \checkmark 1$

$$I = 0.14 \text{ A} \checkmark 1$$

(iii) $d = 3.6 \times 10^{-4} \text{ m} \checkmark 1$

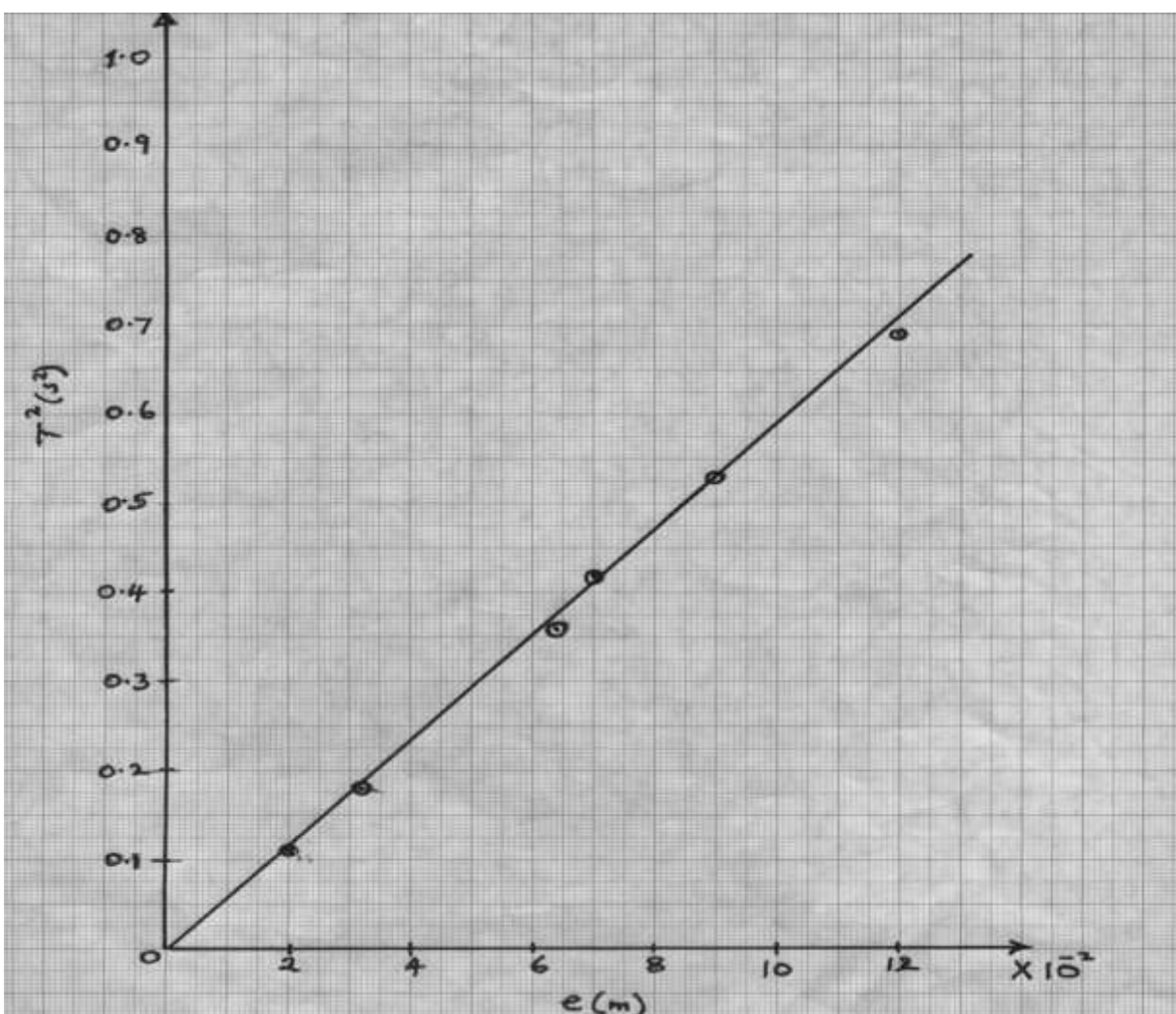
$$\rho = 0.785 \times \left(\frac{1.8}{0.14} \right) \times \left(\frac{(3.6 \times 10^{-4})^2}{1} \right) \checkmark 1 \text{ correct substitio}$$

$$= 1.308 \times 10^{-6} \Omega \text{ m} \checkmark 1 \text{ evaluation and correct units}$$

2 a) Initial pointer reading = “Candidates” cm mark

Mass m(g)	Extension e(cm)	e (m) $\times 10^{-2}$	Time t, for 20 complete oscillations	Periodic time T (s)	$T^2 (S^2)$
30	2.0	2.0	6.63	0.3317	0.11
50	3.2	3.2	8.49	0.4243	0.18
70	6.3	6.3	12. 00	0.6	0.36
100	7.5	7.5	12. 96	0.6481	0.42
120	9.0	9.0	14. 97	0.7483	0.56
150	12	12	16. 61	0.8307	0.69

d) (7mks)



e)

Labelling- correct quantity + units

1 mark

Scale – simple and uniform

1 mark

Plotting- $\frac{1}{2} \times 4$

2 marks

Line

1 marks

5 marks

f)

$$S = \frac{0.561 - 0.113}{(9.0 - 2.0) \times 10^{-2}}$$

$$= 9.6$$

correct internal 1mk

Correct evaluation 1 mk

g)

$$T = \sqrt{\frac{e}{k}}$$

$$T^2 = \frac{4\pi^2}{k} e$$

$$\text{Slope, } S = \frac{T^2}{e} = \frac{4\pi^2}{k}$$

$$k = \frac{4\pi^2}{S} = \frac{4 \times 3.142^2}{9.6}$$

$$= 4.113$$

2mks

h)

$$m = 26 \text{ g} \quad \checkmark \frac{1}{2} \text{mk} \quad = \quad 0.026 \text{ kg} \quad \frac{1}{2} \text{mk}$$

i)

$$e = 0.42 \text{ cm} \quad \frac{1}{2} \text{mk} \quad = \quad 4.2 \times 10^{-3} \checkmark \frac{1}{2} \text{mk}$$

j)

$$v = \frac{mk}{e}$$

$$\frac{0.026 \times 4.113}{4.2 \times 10^{-3}}$$

Correct substitution

1 mks

$$= 6.190$$

Correct evaluation

1 mk