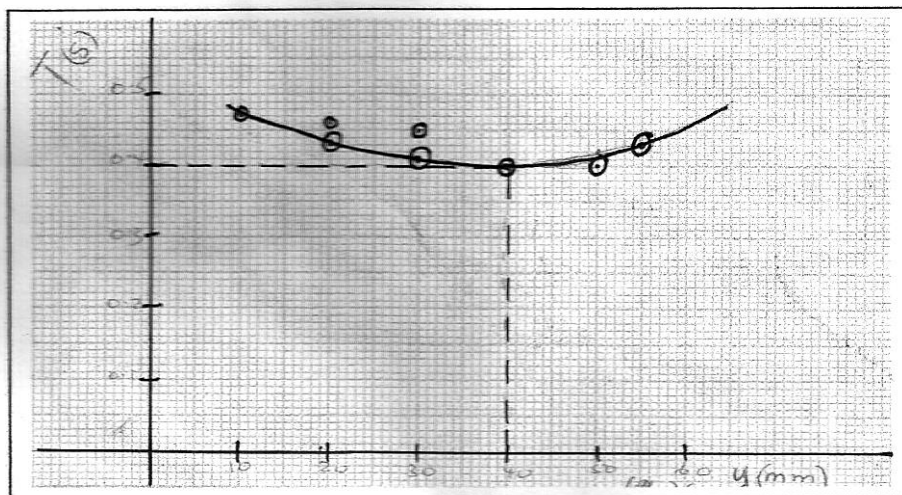


**PHYSICS 232/3**  
**Marking scheme**

Q1 a) PM =  $h = 12.0 \pm 1.0 \text{ cm}$  (11.0-13.0) to 1 dp  $\sqrt{1 \text{ mk}}$   
 c)

<b>Y (mm)</b>	<b>10</b>	<b>20</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>55</b>
<b>t(s) <math>\pm 1.0</math></b>	<b>2.35</b>	<b>2.28</b>	<b>2.05</b>	<b>2.00</b>	<b>2.10</b>	<b>2.13</b>
<b>T(s)</b>	<b>0.47</b>	<b>0.43</b>	<b>0.41</b>	<b>0.42</b>	<b>0.43</b>	<b>0.74</b>



g) -Working  $x = \frac{1}{3} h \sqrt{1}$

- Evidence of extraction from graph  $\sqrt{1}$

-Reading of value from her/ his graph

Within range (0.40-0.45)  $\sqrt{1}$

h)  $T = 0.4$

$$t = 0.4 \times 5 = 2 \text{ sec}$$

$$\frac{1}{3}h = \frac{1}{3} \times 12 = 4 \text{ cm} = 40 \text{ mm}$$

T when  $y = 40 \text{ mm} = 0.4 \text{ s}$  (shown on the graph)

$$(2)^2 = \left( \sqrt{\frac{33.6}{k}} \right)^2 \sqrt{1}$$

$$4 = \frac{33.6}{K} \sqrt{1}$$

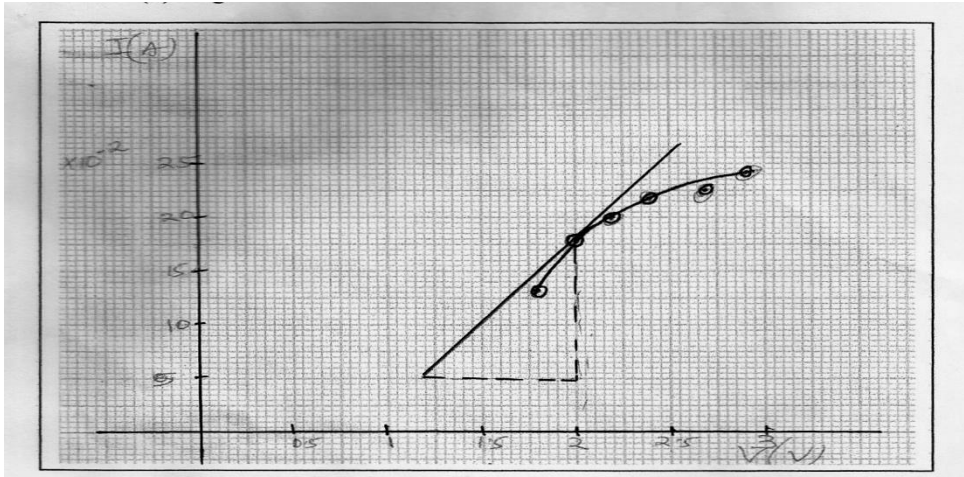
$$K = \frac{33.6}{4} \sqrt{1}$$

$$= 8.4 \sqrt{1}$$

2. a (ii)

<b>Length L</b>	<b>100</b>	<b>80</b>	<b>60</b>	<b>40</b>	<b>20</b>	<b>0</b>
<b>Voltage V</b>	<b>1.8</b>	<b>2.0</b>	<b>2.2</b>	<b>2.4</b>	<b>2.7</b>	<b>2.9</b>
<b>Current I (A)</b>	<b>0.16</b>	<b>0.18</b>	<b>0.20</b>	<b>0.22</b>	<b>0.22</b>	<b>0.24</b>

ii) Brightness increases  $\checkmark$



iv) Axes -1

Scale - 1

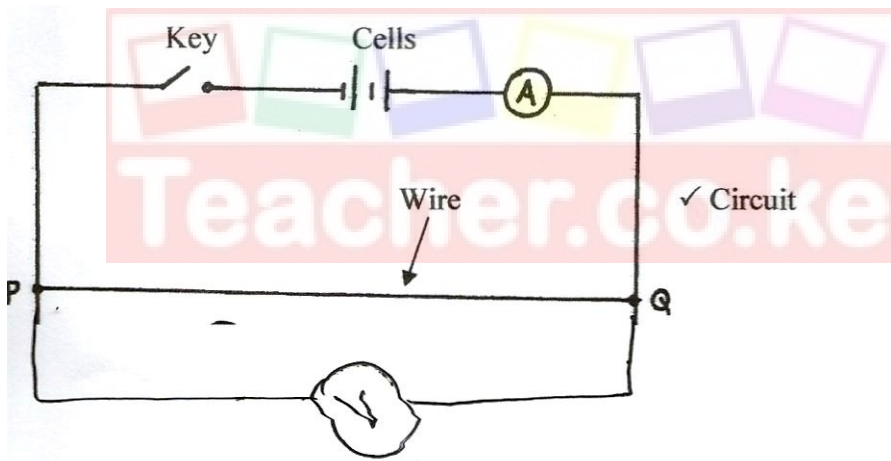
Plotting - 2 at least four each 1/2 mark

Curve -1 to pass through at least 3 correct plotted points.

v) Tangent at the point

$$g = \frac{17.5 - 5}{2 - 1.2} \times 10^{-2} = 1.5625 \times 10^7 \text{ A/V}$$

$$= \approx 1.563 \times 10^7 \text{ A/V}$$



NB - ammeter cell and switch in series voltmeter parallel to wire

$$V = 2.4 \text{ V } \checkmark \frac{1}{2}$$

$$I = 0.3 \text{ A } \checkmark \frac{1}{2}$$

$$d \approx 0.36 \text{ mm} = 3.6 \times 10^{-4} \pm \sqrt{0.01} \text{ mm}$$

$$P = 0.785 \left( \frac{2.4}{0.3} \right) \left( \frac{3.6 \times 10^{-4}}{1} \right)^2 \quad \checkmark 1 \text{ substitution of own values}$$

$$= 8.1389 \times 10^{-7} \Omega \text{ m } \checkmark \frac{1}{2} \text{ calculated } \checkmark \frac{1}{2} \text{ unit}$$