

KAPSABET HIGH SCHOOL

PHYSICS PP3 MARKING SCHEME

(b) $\frac{0.37+0.38+0.36}{3}$

= 0.37mm

$D = 0.00037 \text{ m}$

Averaging concept a must for one to score

(c) Area = $\frac{22}{7} \times \left(\frac{3.7}{2} \times 10^{-4}\right)^2 = 1.076 \times 10^{-7} \text{ m}^2$

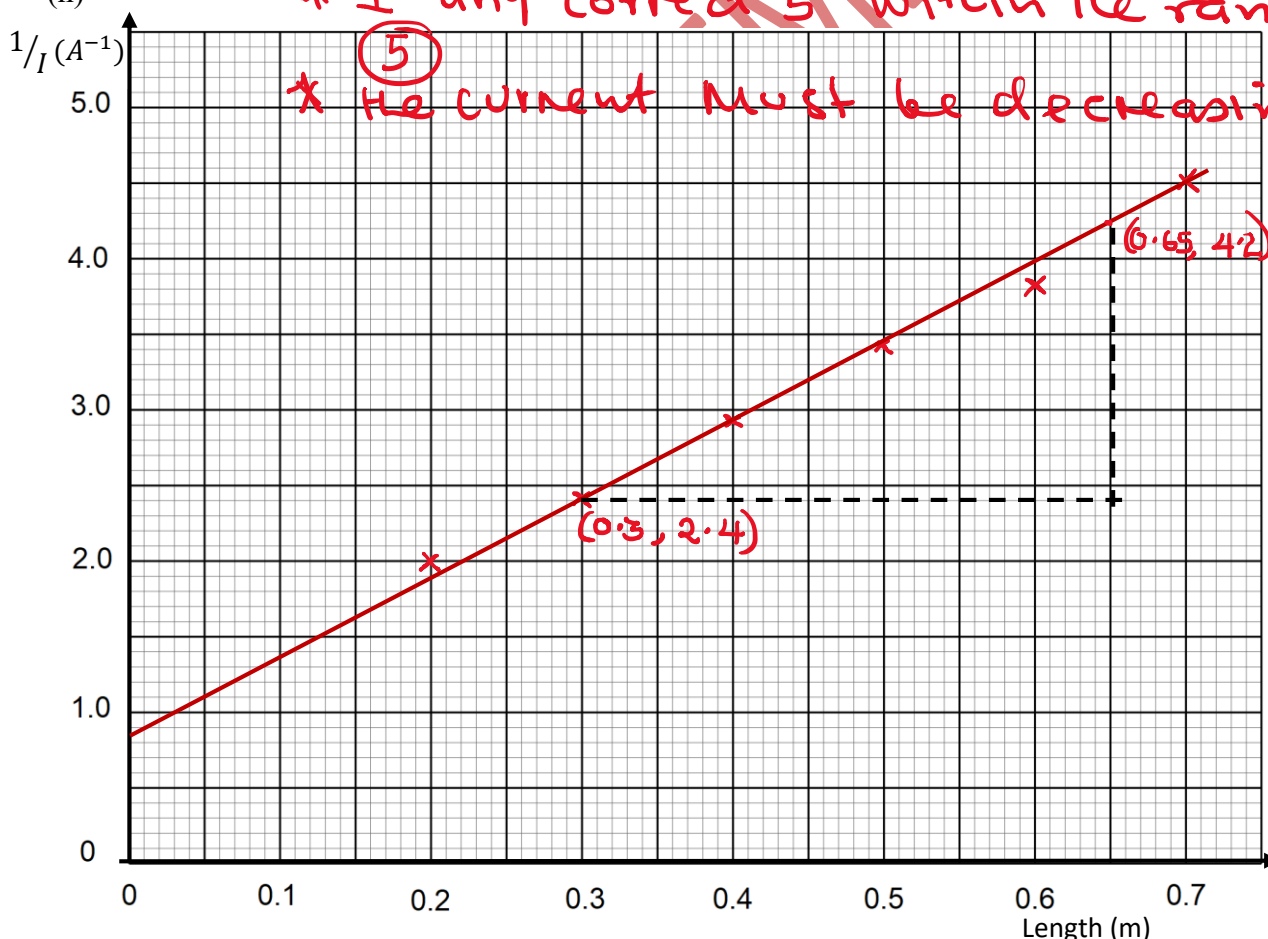
(e) $E = 3.0 \pm 0.2 \text{ V}$

(f)

Length, ℓ (m)	0.2	0.3	0.4	0.5	0.6	0.7
Current, I (A)	0.50	0.42	0.34	0.29	0.26	0.22
$\frac{1}{I} \text{ (A}^{-1}\text{)}$	2.000	2.381	2.9412	3.448	3.846	4.545

$0.45 < I < 0.20$

(h)



A_1 - award for correctly labelled axis and unit of the quantity given

$S1$ - award if the scale is uniform, simple and accommodative

$P2$ - Award 2 marks if all the points in the table are correctly plotted. Denie one mark for between 3 and 5 points plotted correctly. Otherwise give a give zero.

$L1$ - Award one mark for line of best fit. (MUST pass through at least three points)

$$(j) \text{ Slope} = \frac{\Delta \frac{1}{l} (A^{-1})}{\Delta l (m)} = \frac{4.2-2.4}{0.65-0.30} \quad \checkmark \quad (2)$$

$$= 5.143 A^{-1} m^{-1} \quad \checkmark$$

$$(k) \text{ Slope} = \frac{\delta}{EA}$$

$$\delta = 5.143 \times 3.0 \times 1.076 \times 10^{-7} \quad \checkmark \quad (2)$$

$$= 1.6602 \times 10^{-6} \Omega m \quad \checkmark$$

$$\frac{1}{l} \text{ intercept} = \frac{r}{E} \quad \checkmark$$

$$r = 3.0 \times 0.8 = 2.4 \Omega \quad \checkmark \quad (2)$$

QUESTION 2

PART A

(a) Balance point = 50.0 cm $\pm$ 1 cm $\checkmark$ (1) 1 dp a must

(d) $X = 14.0 \text{ cm} \pm 1$ (1) 1 dp a must

(e) $F_1 d_1 = F_2 d_2$

$$1 \times 14 = F_2 \times 30 \quad \checkmark$$

$$F_2 = 0.4667 \text{ N} \quad \checkmark \quad (2) \quad \text{use students value}$$

$$U_W = 0.5 - 0.4667$$

$$= 0.0333 \text{ N} \quad \checkmark \quad (1) \quad \text{use students value}$$

(g) $X = 14.2 \text{ cm} \quad \checkmark \quad (1) - 1 \text{ dp a must}$

(h)(i) $1 \times 14.2 = WL \times 30 \quad \checkmark$

$$WL = 0.4733 \text{ N} \quad \checkmark \quad (2) \quad \text{use students value}$$

(ii) $UL = 0.5 - 0.4733$

$$= 0.02667 \text{ N} \quad \checkmark \quad (1)$$

(iii) $\text{RD of } L = \frac{0.02667}{0.03333} = 0.8001$

PART B

(h)

Angle of incidence	30°	50°	70°
--------------------	-----	-----	-----

(3)

Angle of deviation	45°✓	40°✓	46°✓	±2 , denie if no units.
--------------------	------	------	------	-------------------------

Each value within the range a mark

(g) (i) $\theta = 27^\circ$ ✓ (1 mark) (1)

$E = 90 - 27 = 53^\circ$ ✓ (1 mark) (1)

marks students' value

(ii) $K = 2 \sin \left(30 + \frac{F_0}{2} \right)$ ✓
 $= 2 \sin \left(30 + \frac{38}{2} \right)$ (1 mark)
 $= 2 \sin(30 + 19)$
 $= 2 \sin 49$ ✓
 $= 1.509$ (1 mark)

marks students' value

MARKING SCHEME 2023