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PHYSICS 232/3 MARKING SCHEME

Q1.

(a) Balance point = 49.5cm allowance of 0.5cm on the higher side. ✓1 mark

(b) χ - 17.8cm ✓1 mark

D – 40.5cm ✓1 mark

$$W_1 = \frac{1 \times 17.8}{40.5} \checkmark = 0.4395 \checkmark 2 \text{ marks}$$

$U_w = 0.5 - 0.4395 = 0.0605N$ ✓1 mark

(c) (i) χ = 18.4cm ✓

(ii) $W_2 = \frac{1 \times 18.4}{40.5} = 0.4543N$ ✓1 mark

$U_L = 0.5 - 0.4543$ ✓1 mark

$= 0.0457N$

(d) R.D = 0.755 ✓

(e) Density = 0.755 x 1000

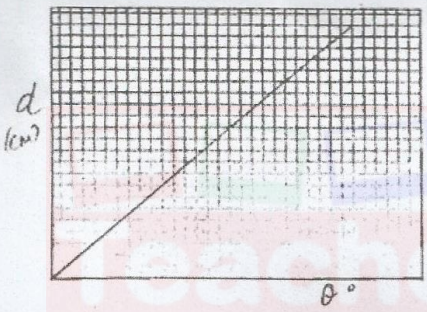
$= 755kg/m^3$ ✓

PART B (i)

θ(deg)	25	35	40	45	55	60	65
d(cm)	1.2	1.8	2.1	2.15	3.1	3.6	4.2

Each value ½ mark – maximum 3 marks

j(i)



Axis – Labelled with units ✓1 mark

Scale – Simple and uniform ✓1 mark

Plotting – 4 points - ½ mark each maximum 2 marks

Line through the origin ✓1 mark

j(ii) d = 0cm.

Question 2

(b) E = 1.50V ± 0.1V

(c) I = 0.2A ± 0.05A

V = 1.50V ± 0.1V

(d) 1.54 = 1.52 ± 0.2r - correct substitution of E, V and A – ½ mk

r = 0.02/0.2

r = 0.1 ohms - correct evaluation – ½ mk

(Candidates values)

1.52 = 0.2 x - correct substitution of V and I in the equation V = IX – ½ mk

X= 1.52

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0.2

= 7.6 ohms - correct evaluation of X – ½ mk

Number of 10Ω resistors	One	Two	Three	Four	Five	Six	
a(cm)1mk each for 4 correct pts	42	60	70	76	81	83 ± 2cm	4mks
$^{1}/_{R}\Omega^{-1}$ All correct $^{I}/_{R}$ (1mk) at least 2d.p	0.1	0.05	0.03	0.025	0.02	0.0167	1mk
$^{1}/_{a}$ (cm^{-1}) All correct $^{1}/_{a}$ (1mk) 3d.p	0.024	0.0167	0.014	0.013	0.012	0.012	1mk

(i) Determining the slope m.

Slope = $\frac{(2.14 - 1.7)}{(8.20 - 5.20)}$ – correct $\frac{\Delta y}{\Delta x}$ – ½ mk

= $\frac{0.44}{3.0}$ - correct evaluation – ½ mk

= 0.147 cm - Accuracy: (0.140 – 0.150) cm – 1mk

(j) Slope = $^{w}/_{k}$

0.147 = $^{w}/_{100}$ - Correct substitution – 1mk

w = 14.7Ω - Correct evaluation – 1mk

(Student's value)

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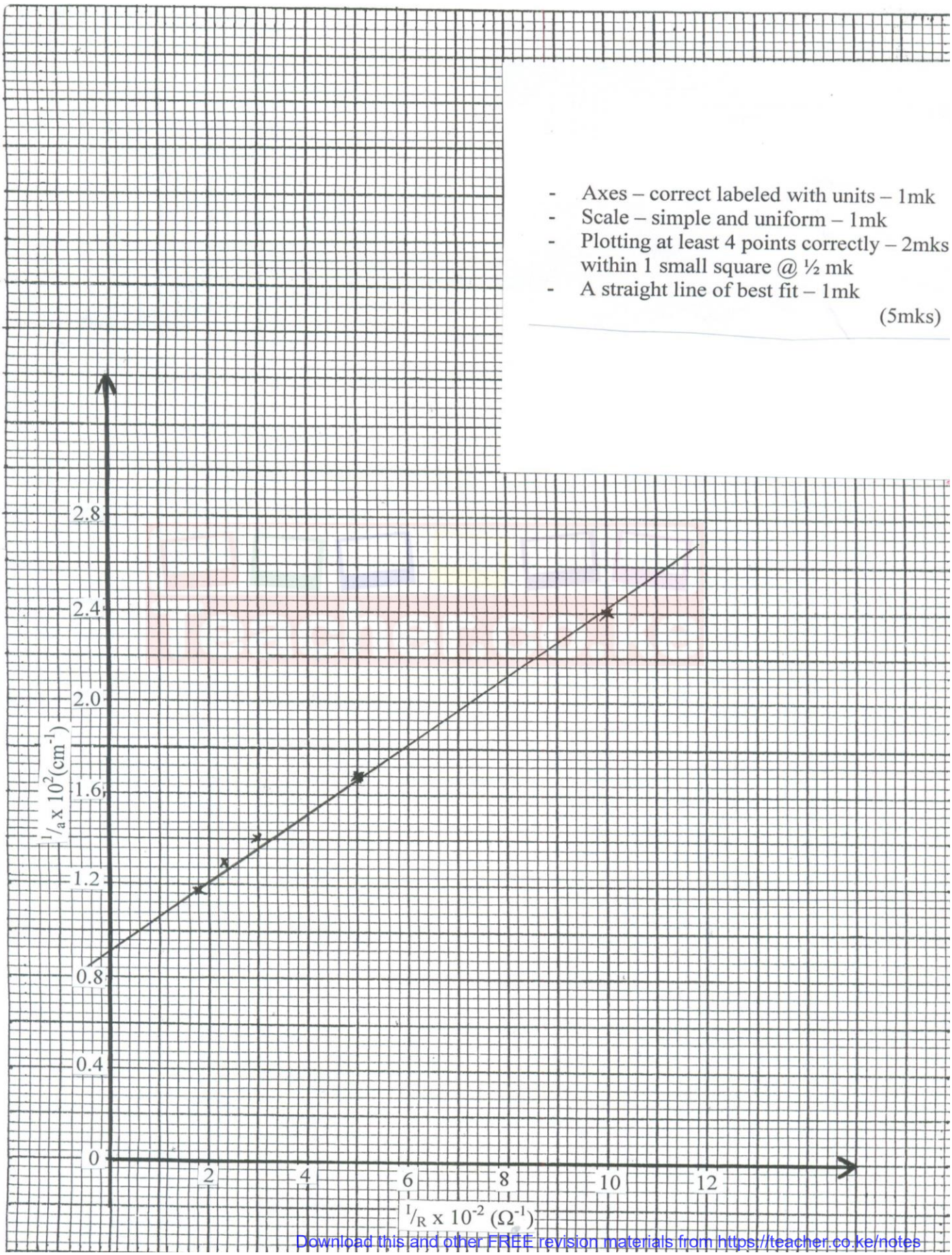
- Axes – correct labeled with units – 1mk
- Scale – simple and uniform – 1mk
- Plotting at least 4 points correctly – 2mks
  within 1 small square @ ½ mk
- A straight line of best fit – 1mk

(5mks)



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