

FORM FOUR CLUSTER KCSE MODEL1

PHYSICS PAPER 3 ANSWERS

1.

Table for distance $d(\text{cm})$ and force $f(\text{N})$

Distance $d(\text{cm})$	10	20	30	40	50	60	70	80
Springs balance reading (g)	100	125	150	175	200	220	250	275
Force F, N	1.00	1.25	1.50	1.75	2.00	2.20	2.50	2.70

A graph of Force, F (N) against distance d (cm)

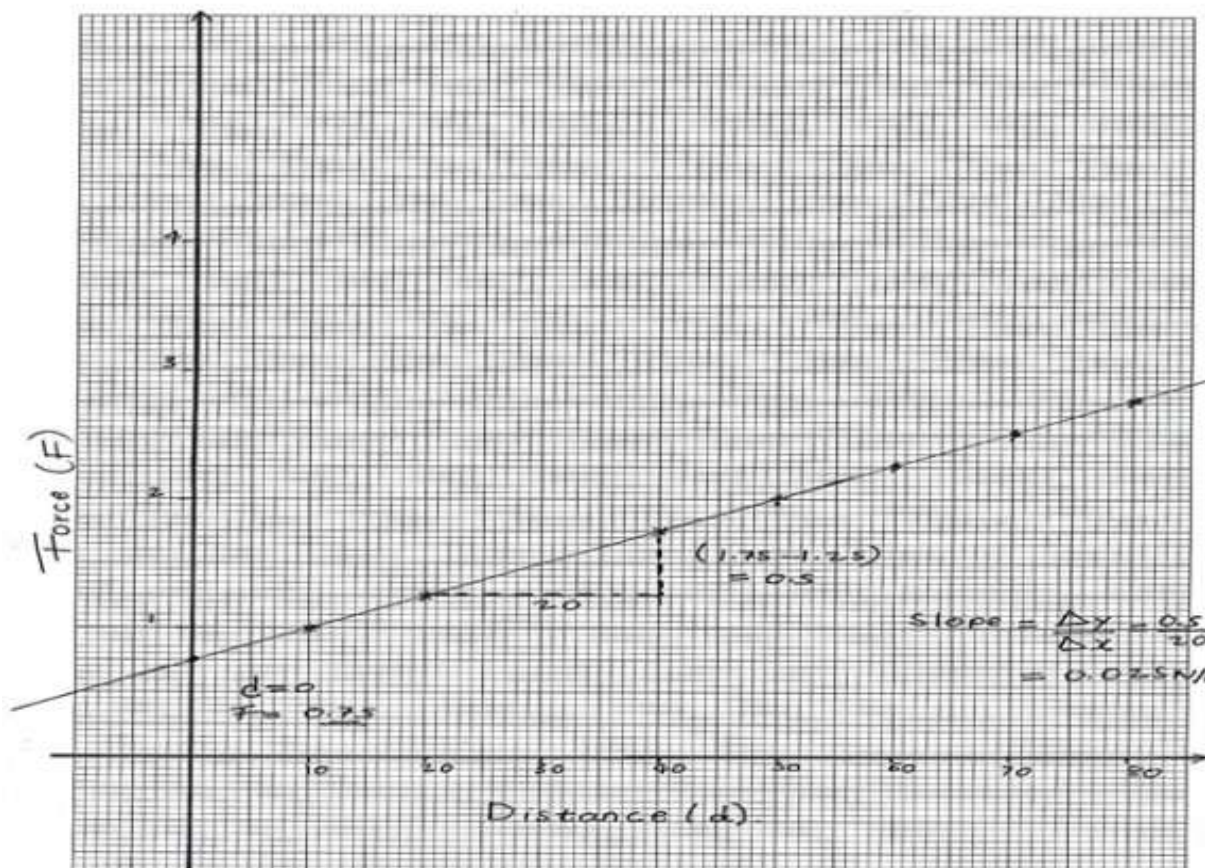
Graph axis/label -1

Scale -1

Plotting -2 (any 4 correct 1 mark)

Line -1

Total -5



i. $\text{Slope} = \frac{\Delta F}{\Delta d} = \frac{1.75 - 1.25}{40 - 20} = \frac{0.5}{20} = 0.025 \text{ N}$

ii. The value of F, when d=0
0.75N

g) $85 F = 2 md + 4K$

$$\text{Gradient} = \frac{2m}{85} = 0.025$$

$$m = \frac{0.025 \times 85}{2}$$

$$= 1.0625$$

$$\text{Intercept} = \frac{80}{85} k = 0.75$$

$$k = \frac{0.75 \times 85}{80}$$

$$= 0.796.$$

2. a) $t = 0.27 \pm 0.01 \text{ mm}$

b) $V = 1.5 \pm 0.01 \text{ V}$
 $I = 0.08 \pm 0.01 \text{ A}$

c(i) $P = \frac{11t^2}{14IL} = \frac{11}{14} \times \frac{1.5}{0.08} \times \frac{2.7^2}{2} \times 10^{-8}$
 $= 1.07 \times 10^{-6} \Omega \text{ m}$

(ii) P represents resistivity of the material

ci)

Length xy	80	70	60	50	40	30	20
Voltmeter reading (iv)	1.4	1.38	1.30	1.25	1.25	1.15	1.10
Ammeter reading (A)	0.10	0.15	0.15	0.20	0.20	0.25	0.30

(8 marks)

(ii) Graph of voltmeter reading against ammeter reading

✓scale

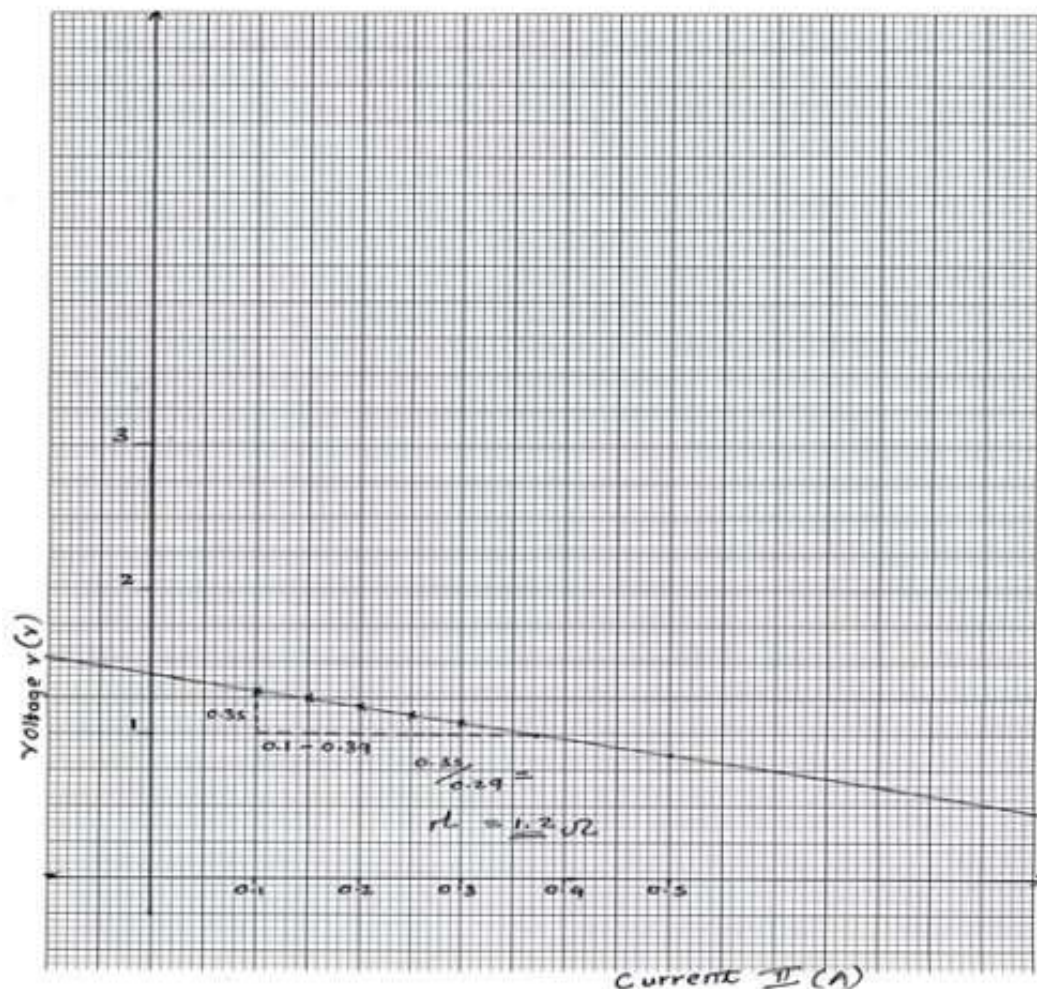
✓axes

✓plotting

✓line 5 marks

$$(iii) \quad \text{Slope} = \frac{1.25 - 1.4}{0.35 - 0.15} = -\frac{0.15}{0.2} \\ = -0.75\Omega$$

2B) (ii) A graph of voltage,(V) against current,(I)



Scale -1

Axis -1

Plotting -2

Line -1

Total 5

(iv) Emf of the cell = Intercept on p.d axis = 1.32V √2marks

(v) To keep the wire at constant temperature so that its resistance does not rise with current flowing in it.