

FORM FOUR CLUSTER KCSE MODEL 4
PHYSICS PAPER 3 ANSWERS

Question one.

- a) (i) $I = 0.5 \pm 0.05 A \checkmark$ (1mk)
 $p.d = 2.50 \pm 0.2 V \checkmark$ (1mk)
(ii) $E.m.f, E = 3.0 V \pm 0.2 V \checkmark$ (1mk)

b)

Length	100	70	60	50	40	30	20		
Current(A)	0.50	0.60	0.65	0.70	0.75	0.80	0.90	± 0.05	3mks
P.d(V)	2.50	2.30	2.25	2.15	2.10	2.00	1.90	± 0.2	3mks
e-v(v)	0.50	0.70	0.75	0.85	0.90	1.00	1.10		1mk

Current –correct values award $\frac{1}{2} \times 6 = 3\text{mks}$

P.d (V)-correct values award $\frac{1}{2} \times 6 = 3\text{mks}$

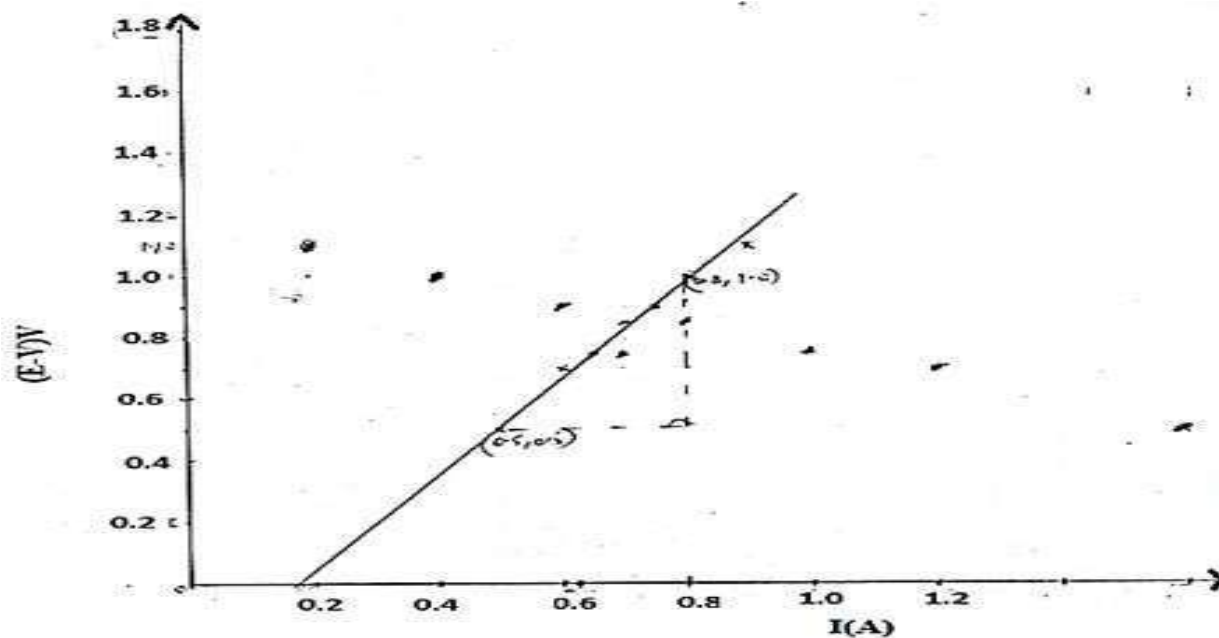
(ii) $Gradient = \frac{\Delta(E - V)}{\Delta I}$

$$\frac{1.0 - 0.5}{0.8 - 0.5} = \frac{0.5}{0.3} = 1.667 \Omega$$

Correct extraction $\checkmark$ correct substitution $\checkmark$ correct Answer and units $\checkmark 1 \checkmark$

N/B: No line no slope.

- (iii) $E = V + Ir$
 $r = \text{gradient/slope} \checkmark$



- Simple uniform scale
- Straight line through at least 5 correctly plotted points

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Part A

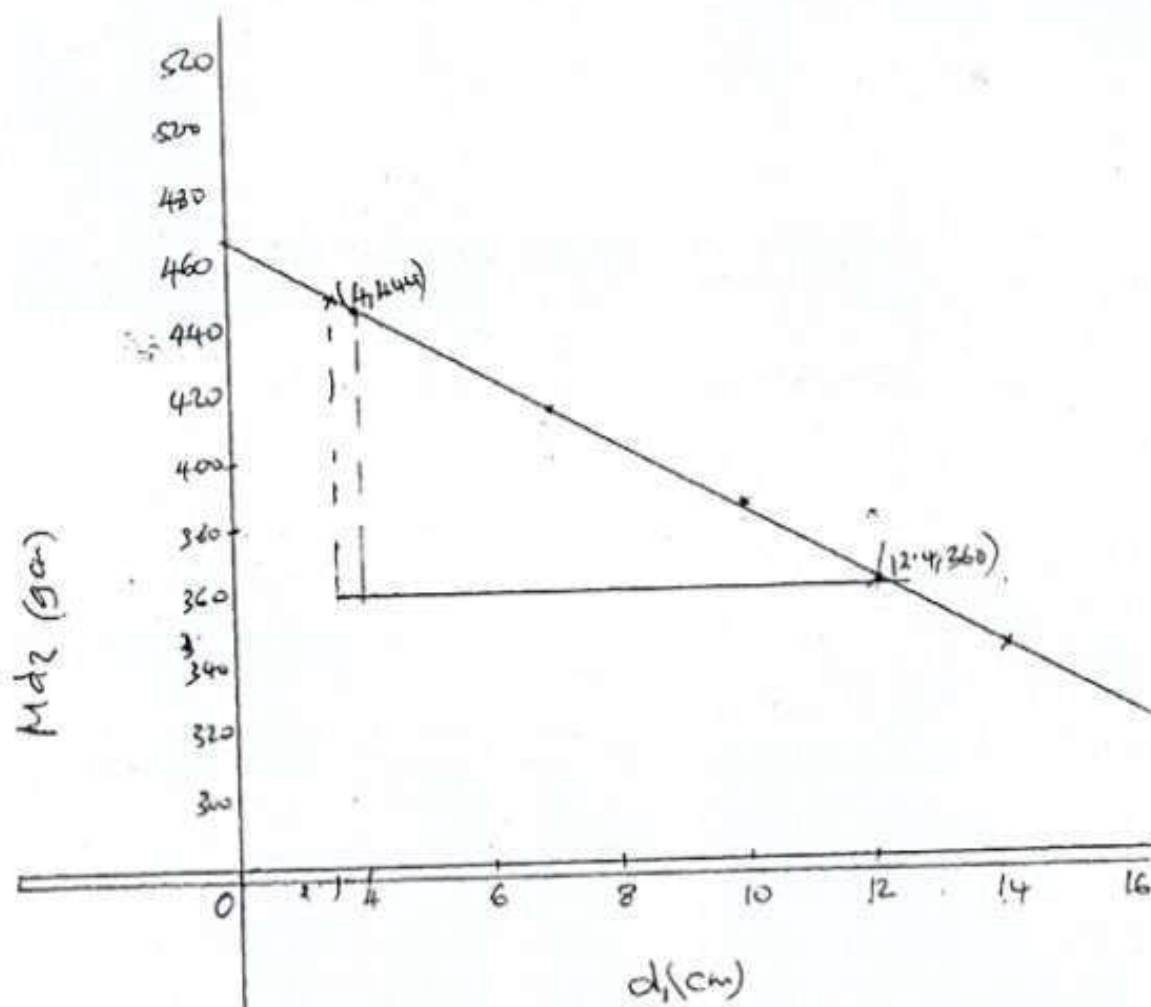
(c) $c.o.g = 50.0 \pm 0.5 \sqrt{1}$

⊕

(e) (j)

Mass, $m(g)$	10	20	30	40	50	60	
Distance, $d_1(cm)$	3.70	7.00	10.00	12.30	14.40	16.40	$\pm 0.01 (3mks)$
Distance, $d_2 (cm)$	44.80	41.50	38.50	36.20	34.20	32.20	$\pm 0.01(3mks)$
Mass, $(cm) \times$ Distance, $d_2 (md_2)$	448.0	415.0	385.0	362.0	342.0	322.0	V(1mk)

ii) Graph



- Scale simple and uniform (1mk)
- Line through atleast 3 correctly plotted points (1mk) Total marks 5 mks

(iv) Gradient

$$\begin{aligned}\frac{\Delta Y}{\Delta X} \\&= \frac{\Delta md_2}{\Delta d_1} \\&= \frac{360 - 444}{12.4 - 4} \\&= \frac{-84}{8.4} = \\&= -10\end{aligned}$$

✓ 1 Evaluation

✓ 1 answer

Total mks

u(cm)	v(cm)	m = $\frac{v}{u}$
20	60 $\sqrt{1/2}$ mk	3 $\sqrt{1/2}$ <u>mk</u>
30	30 $\sqrt{1/2}$ <u>mk</u>	1 $\sqrt{1/2}$ mk

$$f = \frac{v}{1+m} = \frac{60}{1+3} = 15cm + 2cm \checkmark$$

$$f = \frac{v}{1+m} = \frac{30}{1+1} = 15cm + 2cm \checkmark 1 \checkmark 1$$

$$\text{Average value} = \frac{15+15}{2} = 15cm \pm 2cm \checkmark$$