

FORM FOUR CLUSTER KCSE MODEL5

PHYSICS PAPER 3 ANSWERS

1.

- 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 $\frac{1}{2} \times 6 = 3$ mks

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

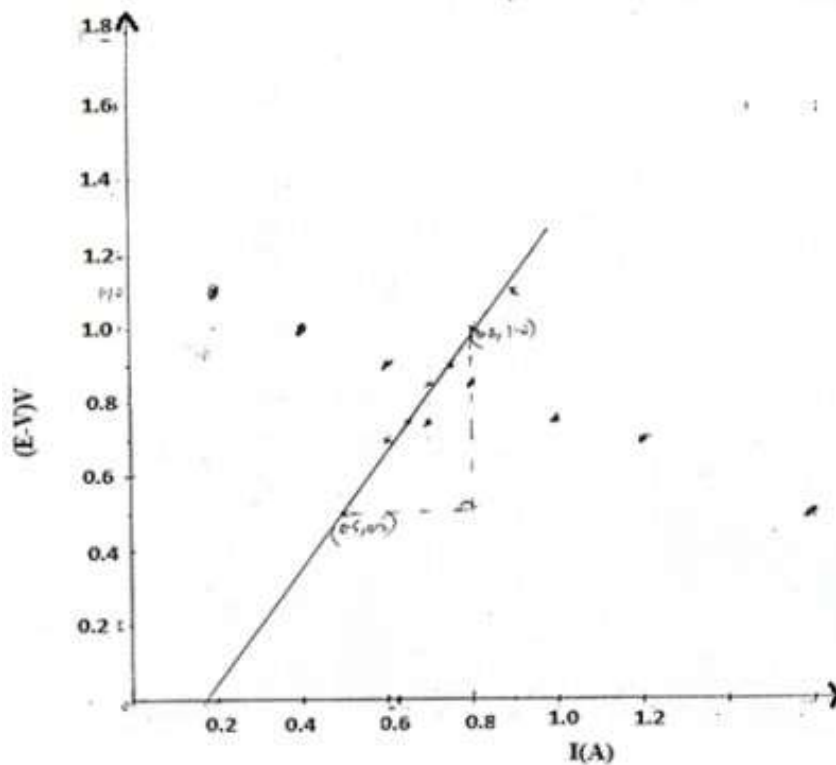
(ii) $Gradient = \frac{\Delta(E - V)}{\Delta I}$

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

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

N/B: No line no slope.

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



- Axis labelled with units✓
- Simple uniform scale✓
- At least 5 correctly plotted points✓✓
- Straight line through at least 5 correctly plotted points

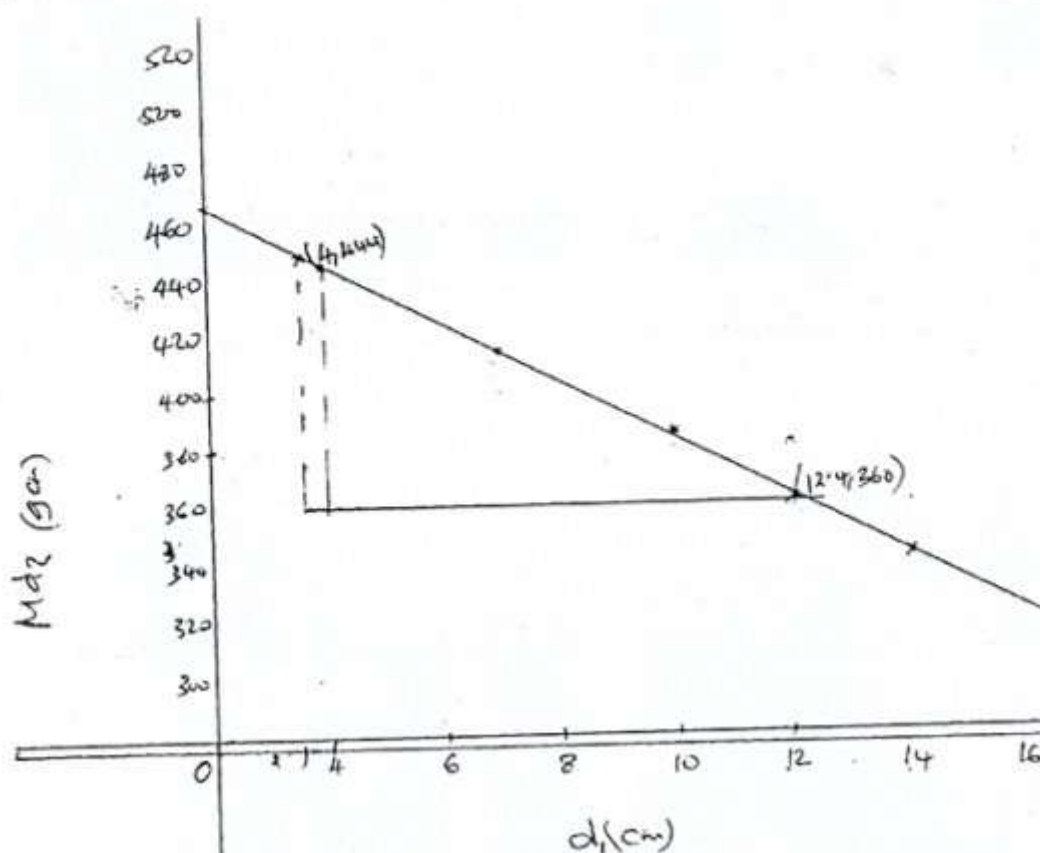
2.

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

(e) (i)

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) x Distance, $d_2 (md_2)$	448.0	415.0	385.0	362.0	342.0	322.0	V(1mk)

ii) Graph



- Axis labeled with units (1mk)
- Scale simple and uniform (1mk)
- Atleast 4 correctly plotted points (2mks)
- 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	$60 \sqrt{\frac{1}{2}} \text{mk}$	$3 \sqrt{\frac{1}{2}} \text{mk}$
30	$30 \sqrt{\frac{1}{2}} \text{mk}$	$1 \sqrt{\frac{1}{2}} \text{mk}$

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

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

$$\text{Average value} = \frac{15+15}{2} = 15 \text{cm} \pm 2 \text{cm} \sqrt{\frac{1}{2}}$$