# FORM FOUR CLUSTER KCSE MODEL5

PHYSICS PAPER 3 QUESTIONS

1. You are provided with the following:

   - Two cell of 1.5V each.

   - Nichrome wire labelled W mounted on a metre rule.

   - An ammeter (0 – 1.5A) or (0 -2.5A)

   - A cell holder

   - Voltmeter 0 – 5v - 8 connecting wires atleast 4 with crocodile clips (or jockey)

   - A switch - A metre rule Proceed as follows:

   a) Connect the circuit as shown in the figure 1 below.
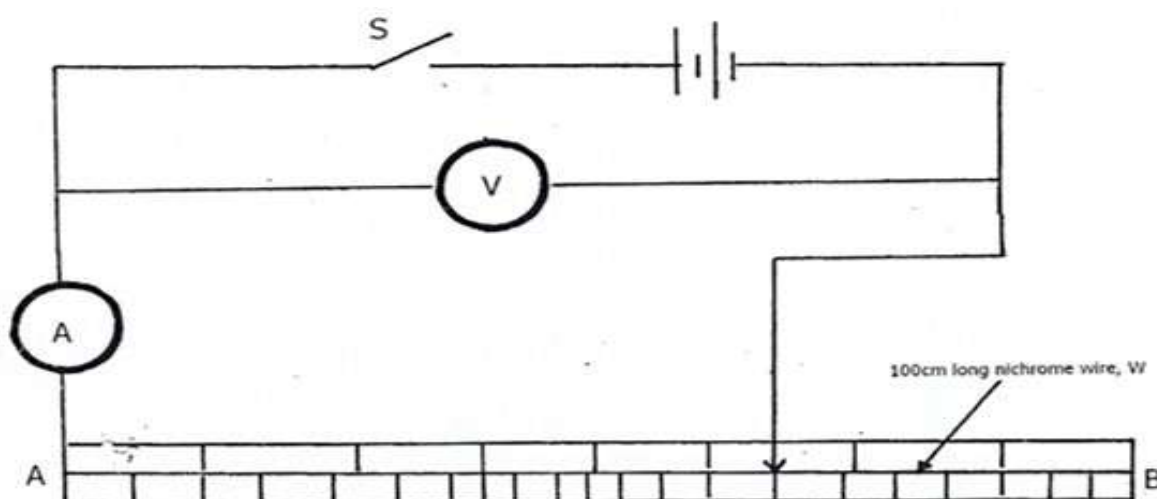
   b)

   (i) Connect the end of A and point B when AB = 100cm across the terminals as shown in figure 1 above.

   Close the switch and measure both current I and p.d, V across the wire AB

   Current I… ....A

   P.d, V… V

   ii) Measure the emf of cell, E =_____V

   c) Reduce the length AB as shown, 100cm, 70cm, 60cm, 50cm, 40cm, 30cm and 20cm.

   In each case record the current (I) and the corresponding values of p.d (V)

   d) Enter the length as shown in table I below:

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Length AB (cm)	100	70	60	50	40	30	20
Current I (A)							
P.d							
E -V							

e) Complete the table

i) Plot a graph of (E-V) against I (A) (on the graph)
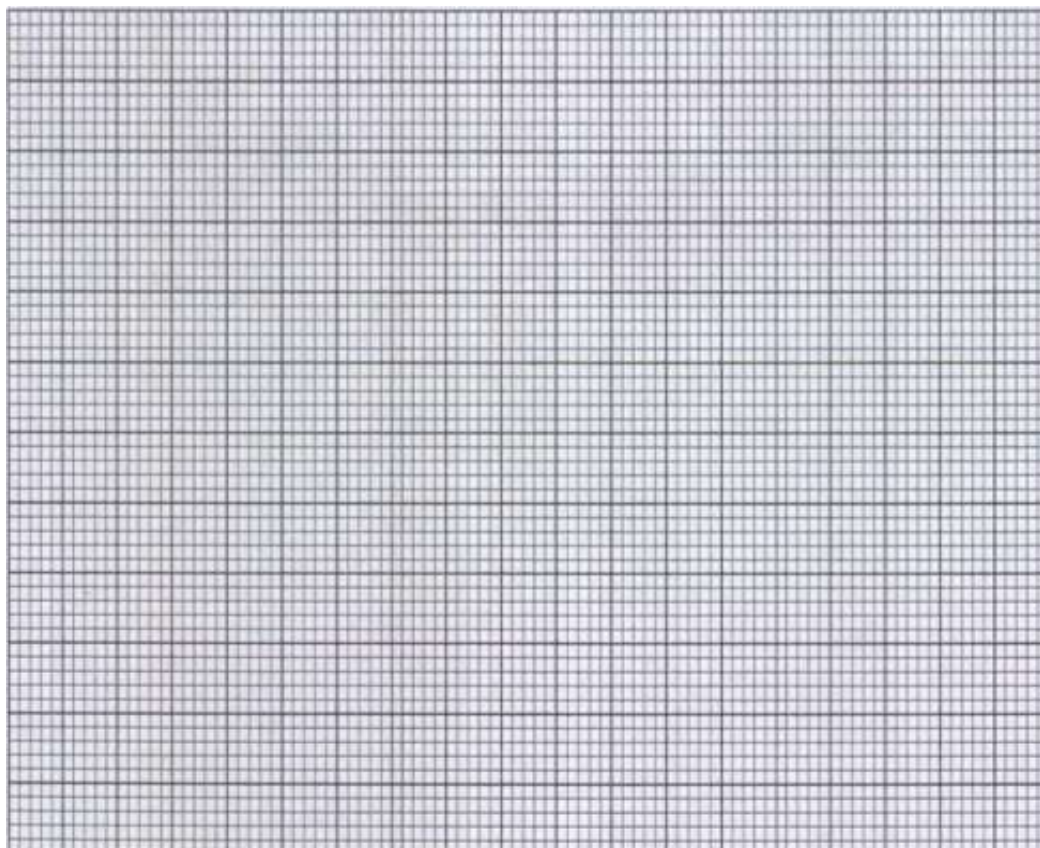
ii) Determine the gradient of the graph

iii) Given the equation, E = V+Ir, determine the internal resistance of each cell.

2.   Part A

You are provided with the following apparatus

- A wooden metre rule

- 10cm long cotton thread

- Masses, two of 10g and two of 20g

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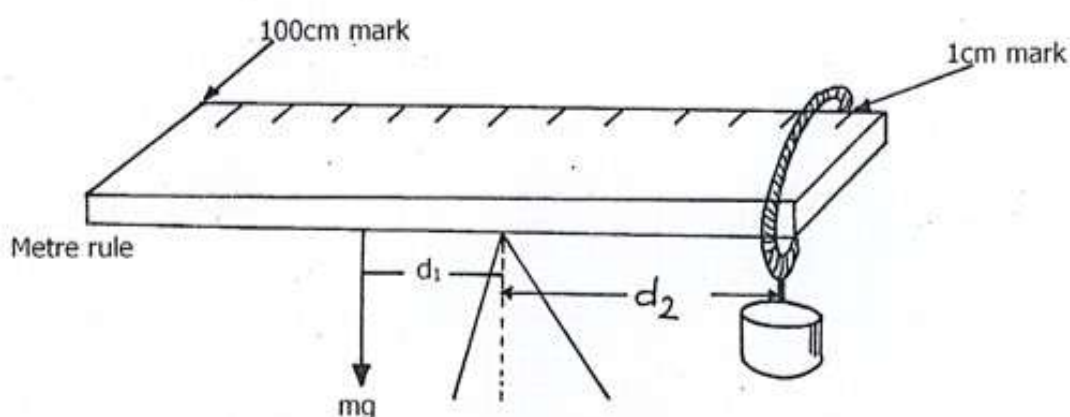
- Knife edge-20cm high

Proceed as follows

a) Arrange the apparatus shown in figure 2 below

b) Balance the metre rule on the knife edge and adjust the metre rule until it balances horizontally when there is no mass on it.

The knife edge is now at the position of centre of gravity (cog)

c) Record the position of (cog) Position of c.o._____cm

Figure 2

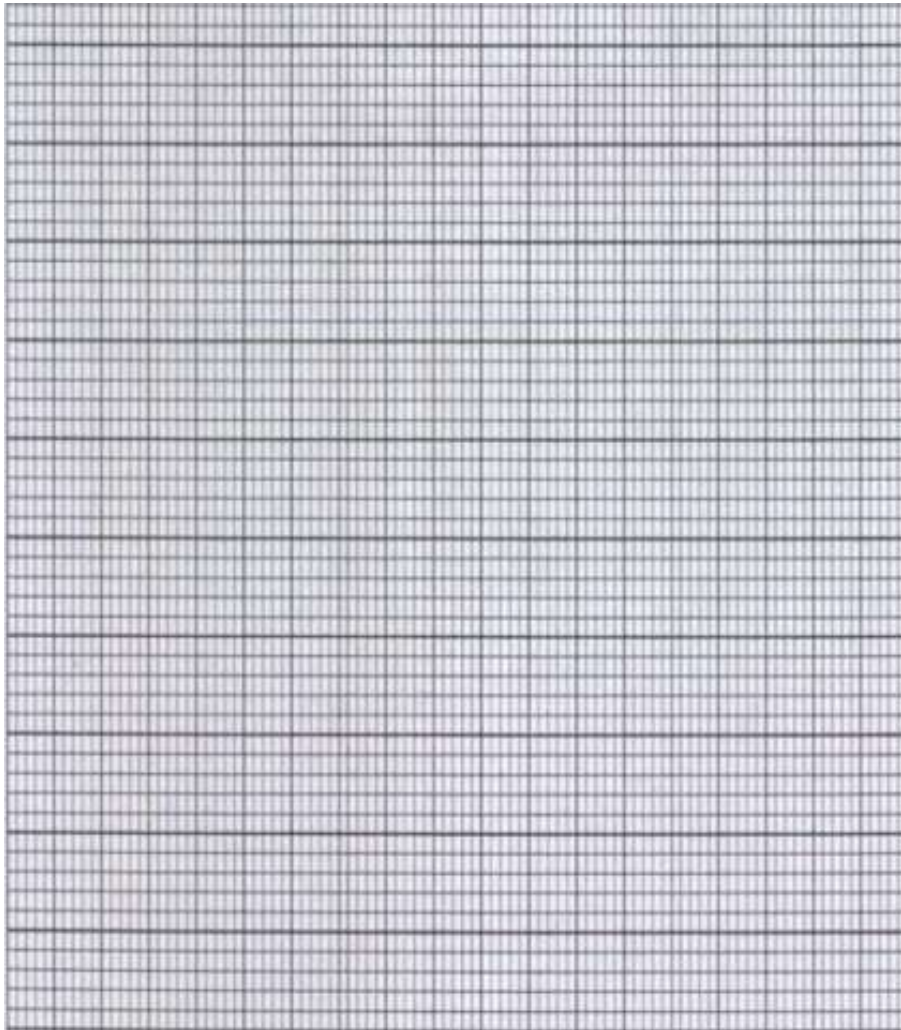d) Now hang a mass on the metre rule by use of the thread at 1cm mark.

Adjust the knife edge until the metre rule balances again at new mark.

Record the length d1 and the corresponding length d2.

(i) Repeat the procedure for different masses and complete table 2 below.

Mass, $m(g)$	10	20	30	40	50	60
Distance $d_1(cm)$						
Distance $d_2(cm)$						
Mass (m) x distance $d_2=md_2$						

(ii) Plot a graph of md2 against d1

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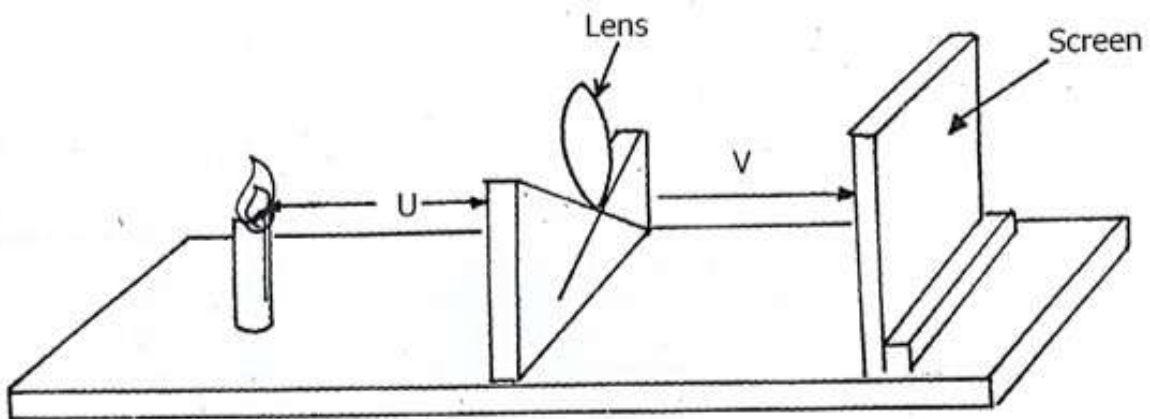
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(iii) Calculate the slope s of the graph

PART B
You are provided with the following apparatus
- A lens
- A lens holder
- A candle
- A white screen
- A metre rule
Procedure f) Set up the apparatus as shown in the figure 3 below:

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g) Starting with u = 30cm adjust the position of the screen to obtain a sharp image of the candle.

Record value of V in the table shown below:

h) (i) Repeat the procedure above for u =20cm and complete table below:

Table 3

u cm	v cm	$M = \frac{v}{u}$

i) Given that the focal length of the lens satisfies the equation, $f = \dfrac{v}{1+m}$

determine the average value of the focal length.

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