FORM FOUR CLUSTER KCSE MODEL1

PHYSICS PAPER 3 QUESTIONS

1. You are provided with the following.

   - A metre rule.

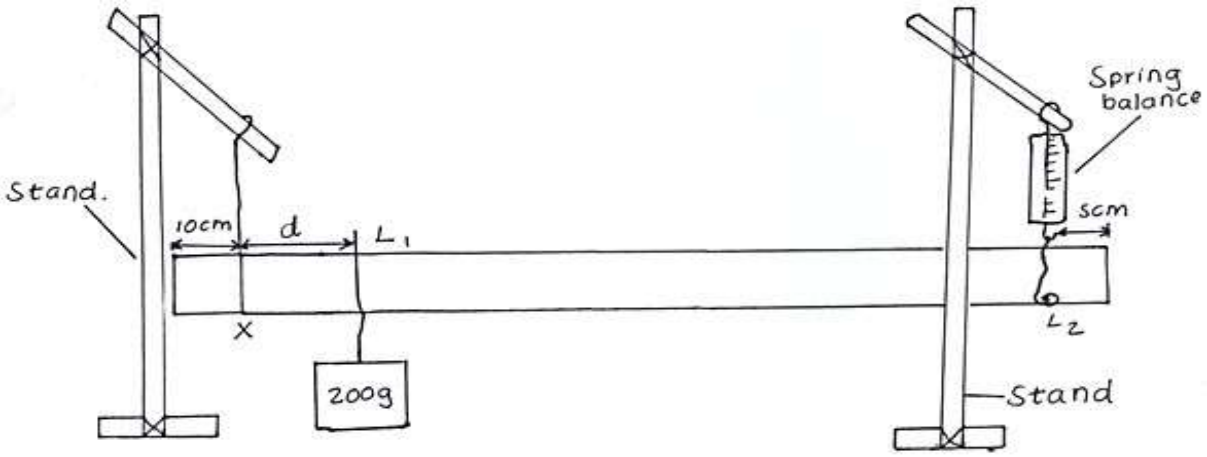
   - A spring balance.

   - Two 100 g masses. - Two retort stand.

   - Three light strings; two

   - 10 cm long and the other 30 cm long.

   Proceed as follows.
   a) Using the two shorter strings make two loops to be used as hooks at L1 and L2 in the diagram.



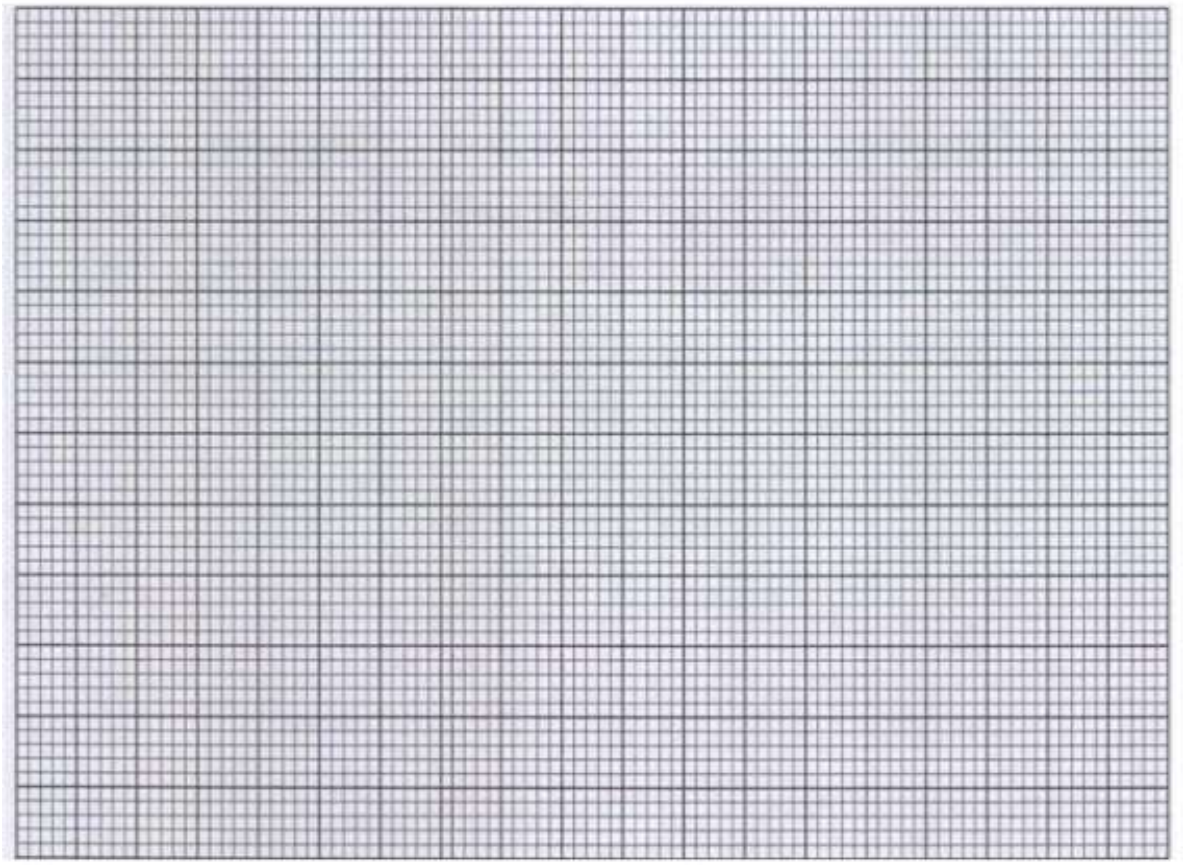
   b) Suspend the spring balance from a clamp using one of the loops above. Support the rule from the spring so that the loop L2 is on the 95 cm mark.

   c) Support the other end of the rule with the other stand and the 30 cm string, so that the rule is horizontal

   d) Using loop L1 suspend 200 g mass at a distance d=10 cm from X, as shown. Take the reading of the spring balance. Record the results in the table below.

   e) Adjust the distance d to 20 cm, 30 cm and so on. Record the spring balance reading.

   ii. Plot a graph of Force (F) against distance d. (5 marks)



f) From your graph determine

I. The slope of the graph. (3 marks)

II. The value of F when d= 0. (2 marks)

g) Given that 85F=2md+40K
Using information from the graph, determine constant K and M. (4 marks)

2. A) You are provided with the following apparatus.

- Voltmeter (0- 2.5V)

- Ammeter (0-1A)

- Nichrom wire x gauge 28

– 1 m long mounted on mm scale.

- New dry cell 1.5V, and cell holder.

- 5 connecting wire

- 2 with crocodile clip.

- Micrometer screw gauge.

- Switch.
a) Measure the thickness of the wire X
t= .....(1 mark)
b) Connect the cell, ammeter and wire X in series. Measure the potential difference V across the wire X and current I flowing through it.
V= ..... V (1 mark)
I = ... A (1 mark)
c(i) Calculate the quantity P given

$$P = \frac{11vt^2}{14IL},$$

where L is the length of wire X (2 marks)

(ii) What does P represents. (2 marks)
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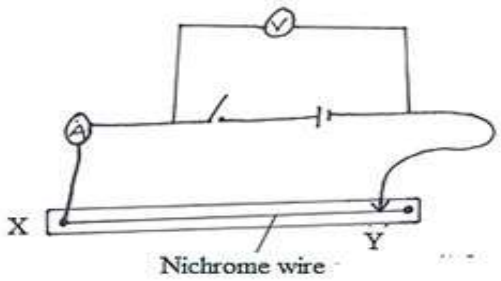
2 B)



a) Set up the apparatus as shown. The switch should always be off when no readings are being taken.

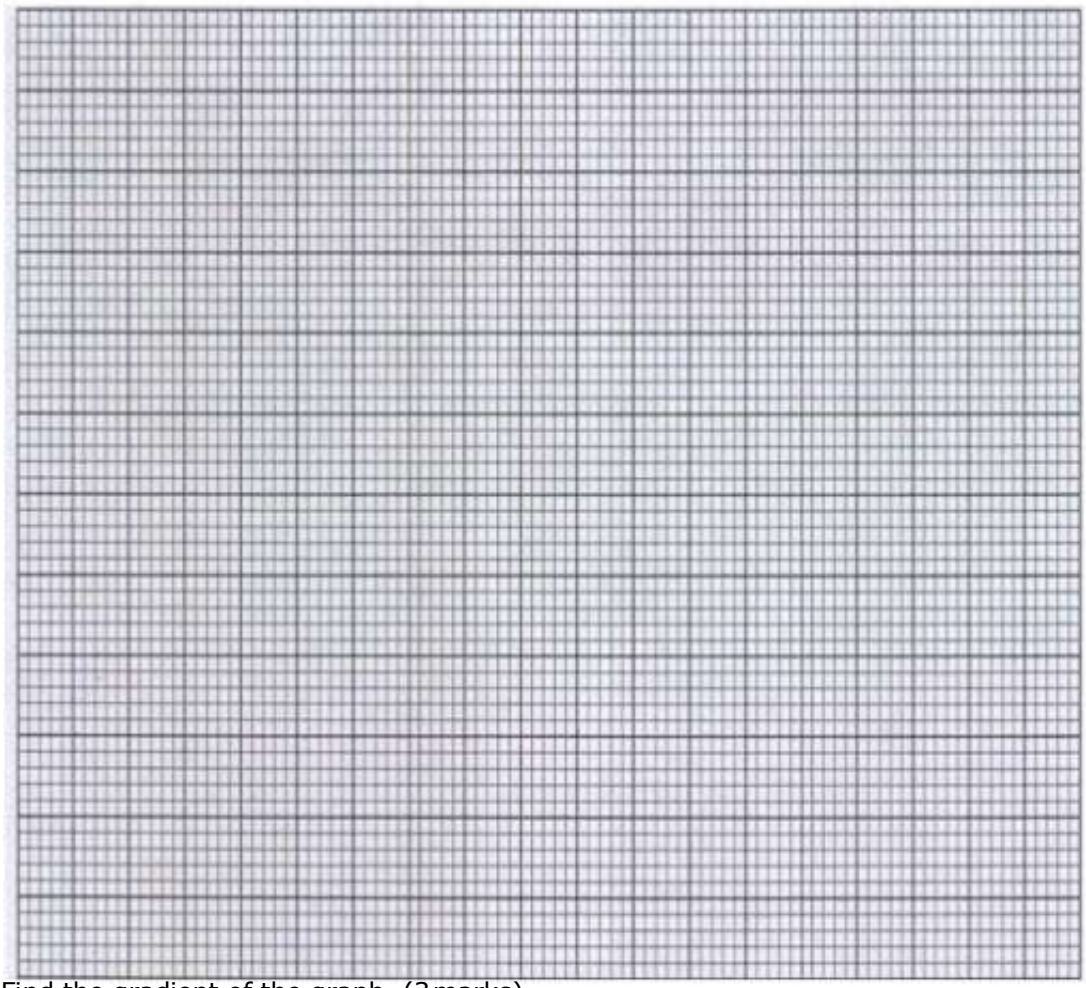
b) With the crocodile clip at Y=80 cm from X and switch on, record voltmeter and ammeter reading.

ci) Repeat (b) for different length of XY and record your reading in the table below.

Length XY cm	80	70	60	50	40	30	20
Voltmeter reading (V)							
Ammeter reading (A)							

(8 marks)

ii) Plot a graph of voltmeter reading (Y-axis) against ammeter reading. (5 marks)



iii) Find the gradient of the graph. (3marks)

iv) Determine the emf of the cell from the graph. (2 marks)

v) State the reason why the switch should be off when no reading are being taken. (1 mark)
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