FORM FOUR CLUSTER KCSE MODEL10

PHYSICS PAPER 3 QUESTIONS

1. You are provided with
   - Bare copper wire 55cm

   - A test tube

   - A metre rule

   - Vernier calipers

   - Micrometer screw gauge

   - 4 masses of 20g

   - One mass of 50g

   - One mass of 100g

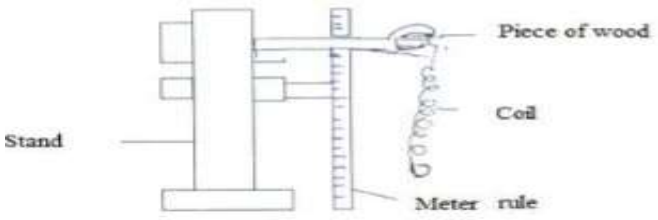
   - Retort clamp. Proceed as follows:

   a) Measure the length L of the wire using a metre rule.

   Give your answer in metres. L…..(1mark)

   b) Wind the whole length of the wire tightly to the test tube making sure that the turns are as close as possible out not overlapping.

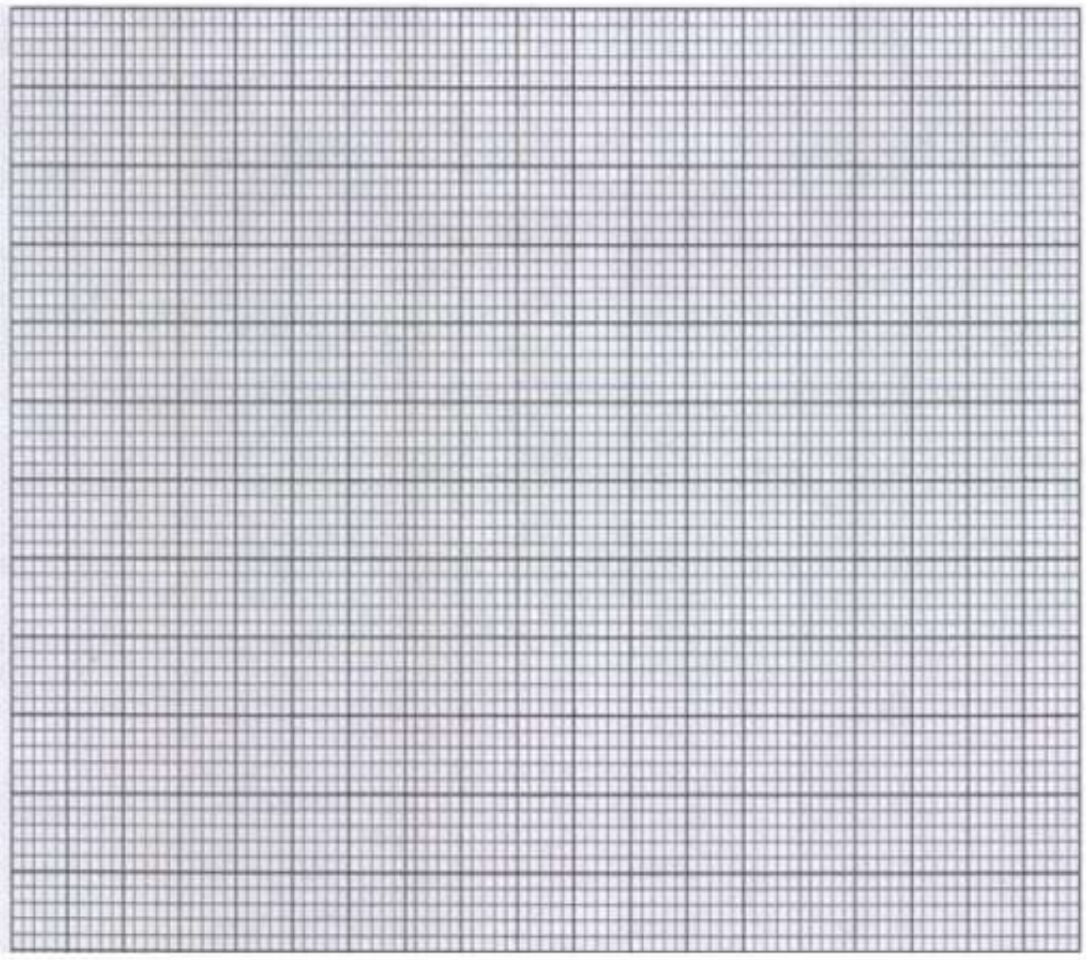
   c) Remove the coil from the test tube straighten the first and last turns of the coils. Bend one end to make a hook.
   i) Count and record the number of complete turns N.
   N…..(1mark)
   ii) Measure the diameter D of the coil using the vernier calipers.
   D…..(1mark)
   iii) Measure the diameter d of the wire using micrometer screw gauge
   d…..(1mark)
   d) Set up the apparatus as shown:-



   e) Starting with a load of 20g measure the extension produced and record in the table below.
   f) Repeat the procedure in e above for other loads indicated in table 1 below

Mass g	0	20	40	50	60	80	90	100
Force (N)								
Extension (cm)								
Extension m								

i) Plot a graph of extension (Y –axis) in metres against force (N) (5marks



ii) Calculate the slope S of your graph (3marks)

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.....
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iii) Determine the value of P given that $P = \frac{Nd^4S}{8D^3}$ (2marks)

should be in metres)

2. . You are provided with the following apparatus:-

(Values of d & D

- A lens and a lens holder

- Candle

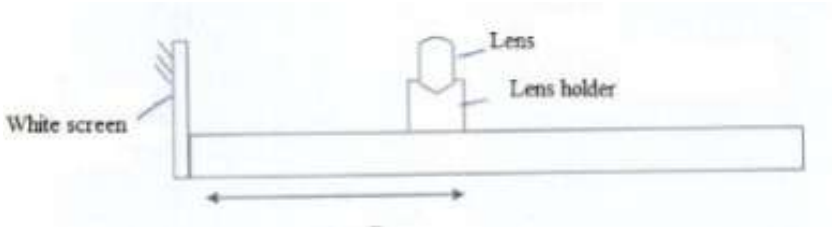
- A white screen

- Metre rule

Proceed as follows:-

PART I

a. Set up the apparatus in figure 2 below



Move the lens to and fro along the meter rule to focus clearly the image of a distant object like a tree or window frame.

Measure the distance between the lens and the screen F..... cm (1mark)

PART II

a) Set up the apparatus as shown in figures below.

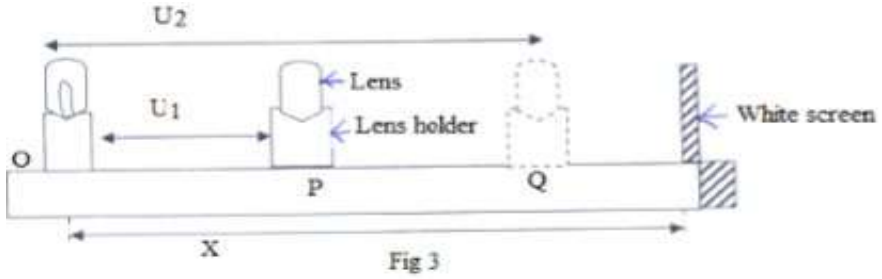


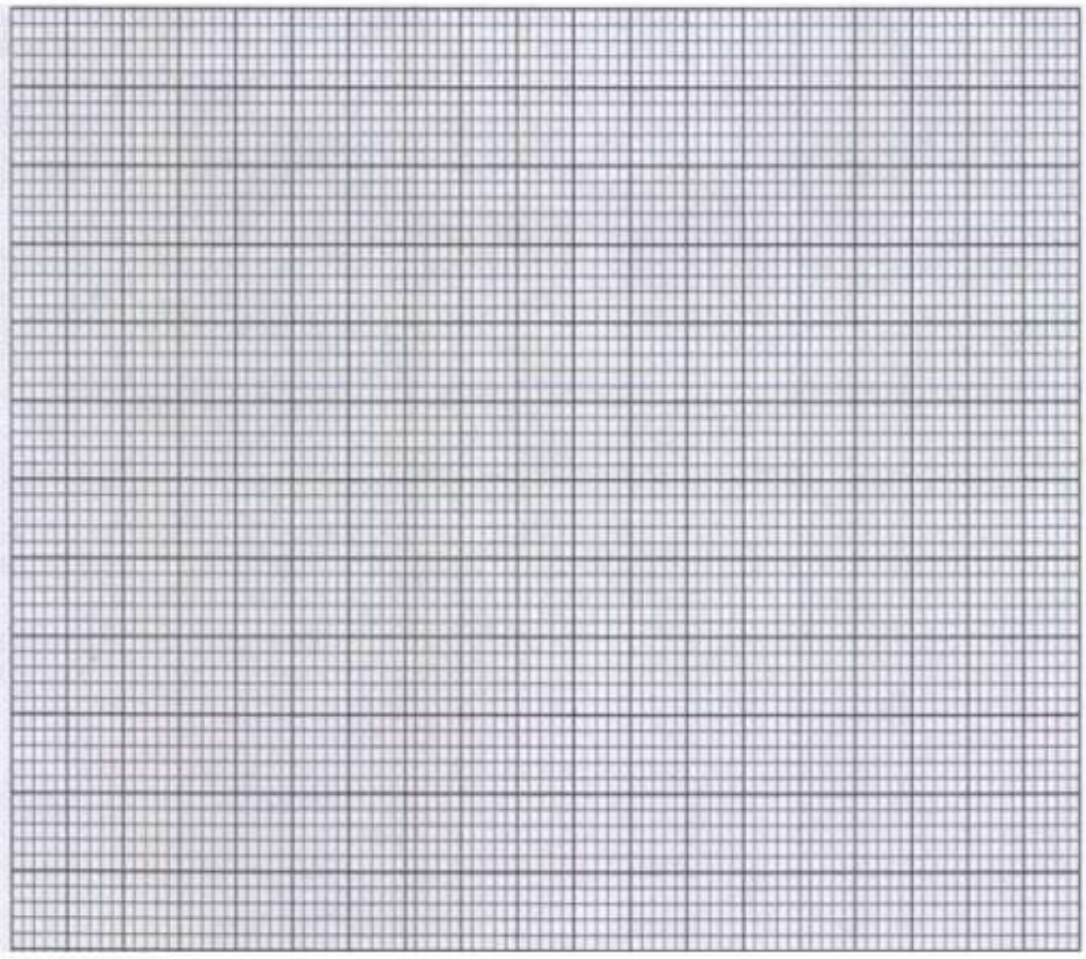
Fig 3

b) Place the white screen a distance + =100cm from the candle. Let the lens be at position P, adjacent to the lit candle move the lens towards the screen until an enlarged image of the candle is formed on the screen. Measure and record the distance U1 in table 2.

c) Move the lens to a second position Q where the image of the candle is sharp but diminished on the screen, measure and record distance u2 hence determine the value for d= U2 – U1

d) Repeat the procedure in (b) and (c) above for values of x= 95cm, 90cm 85cm and 80cm hence fill and complete table 2 below.

e) i) Plot a graph of x(y-axis) against $(x^2 - d^2)$ (5marks)



ii) Determine the slope S of your graph (3marks)

iii) given that $4fs = x^2 - d^2$

Determine the value of f (2marks)