KCSE CLUSTER TESTS 11

Physics Paper 3

1.

You are provided with the following apparatus:

Converging lens

- ✓ A suitable lens holder.
- ✓ A candle.
- ✓ A mounted white screen
- ✓ A metre rule

Procedure as follows:

a) Arrange the apparatus as shown in the figure 1(a) below such that the candle flame and the centre of the lens lie in a straight line. Set the distance u =22.5 cm

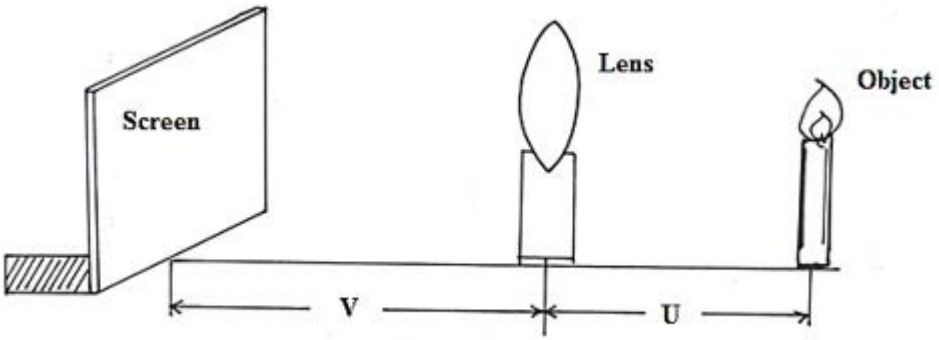


Figure 1(a)

b) Adjust the position of the screen until a sharp image of the object is just observed on it.

c) Measure and record the distance V in Table 1.

υ	22.5	25.0	32.5	35.0	40.0	45.0
V cm						

d) Repeat the experiment for the other values of υ and record your results in the table.

e) On the grid, plot a graph of V (y-axis) against υ.Draw the best fit curve. (5marks)

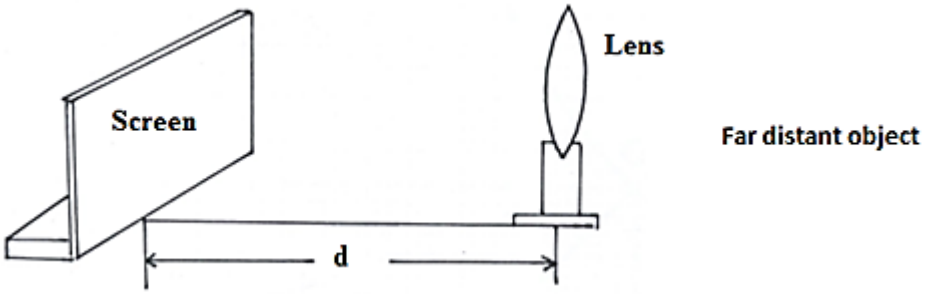
f) Draw a line to bisect the origin (0, 0) to meet the curve at a point c. (1mark)

i) Drop a perpendicular CX from C to the –U- axis. Record the distance OX from the origin to point X.
OX=..... (cm) (1mark)

ii) Drop a perpendicular CY from C to the V axis. Record distance OY.
OY ..... (cm) (1mark)

g) Given that the focal length –f- of the lens used $= \frac{0x+0y}{4}$ find the value of f correct your answer to 2 significant figures. (2s.f) (3marks)

h) Set up the apparatus as shown in figure below.



i) Using a far distant object outside the room, adjust the screen until a sharp image is observed in the screen, Record the distance –d- between the lens and the screen. d =…… (cm) (1mark)

ii) What does – d-represents? (1mark)

……
.....
……
.....

iii) Given that the average focal length f_{av} is given by $f_{av} = \frac{f+d}{2}$, determine f_{av}. 2marks)

20 marks

2.

You are provided with the following apparatus:-

- 100cm nichrome wire mounted on a metre rule labelled MN.

- An ammeter.
- A voltmeter.
- Three dry cells.
- Cell holder.
- A switch.
- Eight connecting wires(at least 4 with crocodile clips at the end)
- A torch bulb fixed into a lamp holder.

Procedure

a) Connect the apparatus provided as shown in the circuit below.

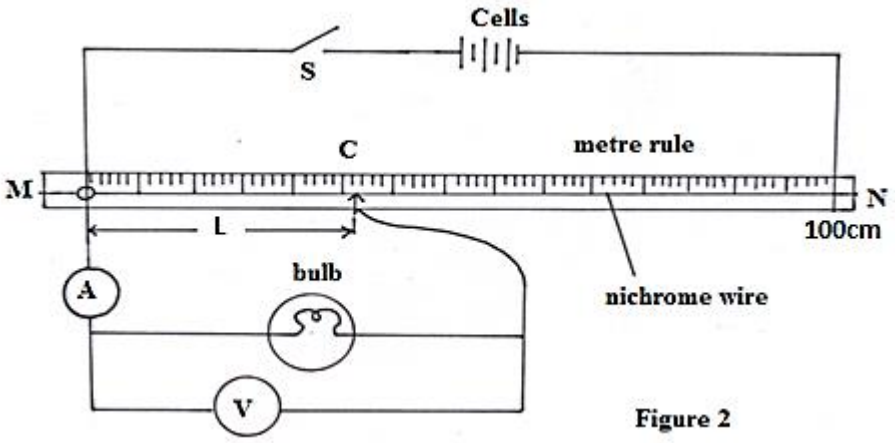


Figure 2

b) Place the sliding contact at C, 25 cm from M, and then close the switch. Take the ammeter and the voltmeter readings.

Length L (cm)	I (A)	Pd(V)	I(mA)	Pd(mV)	Log I	Log V
5						
25						
40						
60						
70						
90						

(8marks)

c) Repeat the above experiment by placing the sliding contact C at 5 cm, 40 cm, 60cm, 70 cm and 90 cm. Record your readings and complete the table below.

d) Find logarithms of mA and mV i.e milliAmperes and milli volts respectively.

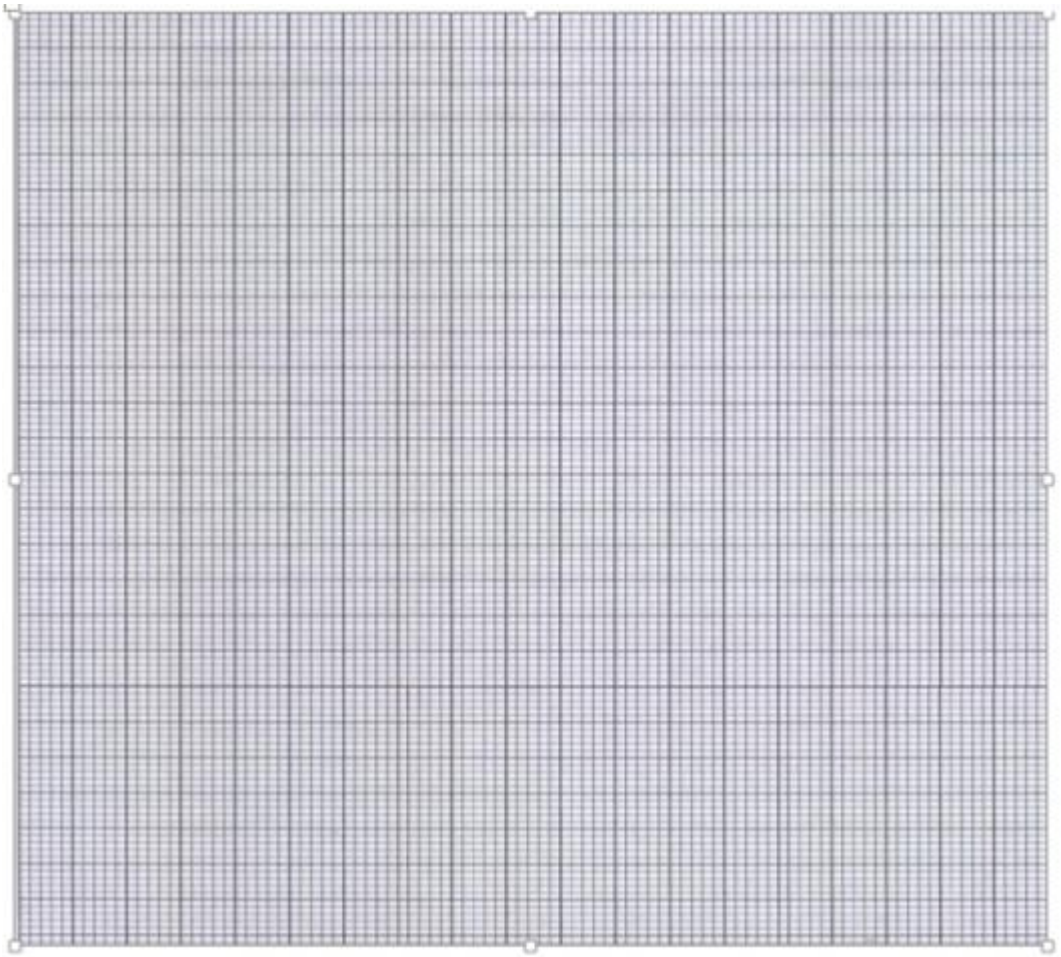
e) i) Plot a graph of log I(y –axis) against log V.

ii) Determine the slope of the graph.

f) Given the relation

$I=K^{Vn}$

Using your graph determine the values of K and n.



20 marks