NAME: ……. **INDEX NO:……..…….**

SCHOOL: …… **Candidate's signature: ……..**

Date: ……

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PHYSICS
PAPER 3
(PRACTICAL)

INSTRUCTIONS TO CANDIDATES

- Write your name and index number in the spaces provided above.
- Answer **ALL** the questions in the spaces provided in the question paper.
- You are supposed to spend the first 15 minutes of the 2 ½ hours allowed for this paper reading the whole paper carefully before commencing your work.
- Marks are given for a clear record of the observations actually made, for their suitability and accuracy and the use made of them.
- Candidates are advised to record their observations as soon as they are made.
- Mathematical table and electronic calculators **may be** used.

For Examiners Use Only

Question 1	b	f	g(i)	g(ii)	h	Part B I - IV
Maximum Score	1	5	5	3	2	4
Candidate's Score						

Total ☐

Question 2	a(i)	(ii)	(iii)	(iv)	(v)
Maximum Score	1	8	5	3	3
Candidate's Score					

Total ☐

Grand Total ☐

This paper consists of 7 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

1. You are provided with the following:

-A lensand a lens holder labelledL_1.

-A candle.

-A graph paper 1mm mounted on a screen.

-Ametre rule.

-Object consisting of a circular hole and parallel wires in a stiff card.

Proceed as follows.

a) Arrange the object, lens and screen in line as shown in figure 1 below

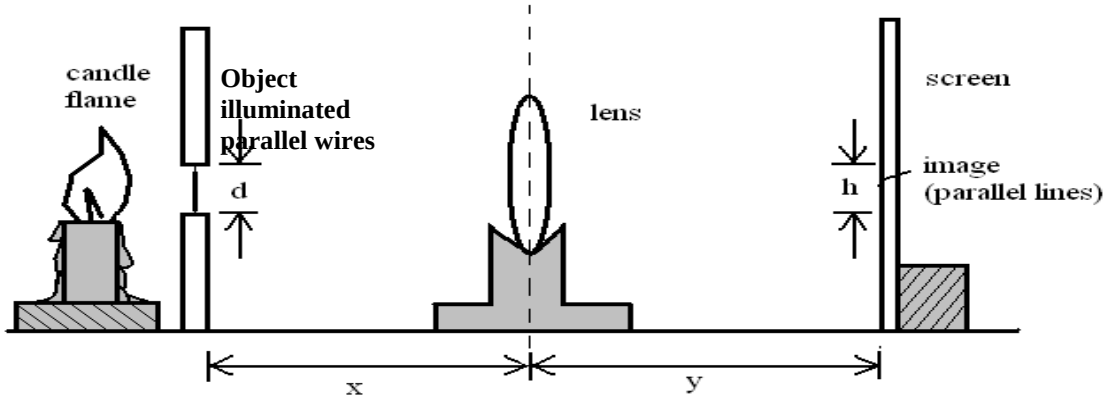


Figure 1

b) Measure the distance, d, between the two parallel wires that acts as the object.

d = …… (1 mark)

c) Adjust the lens, u to 50cm.

d) Move the screen until a clear image is formed on it.

e) Measure the distance, h, of the image, making sure that what you measure is an image corresponding to the previous reading, d.Record this value in the table below.

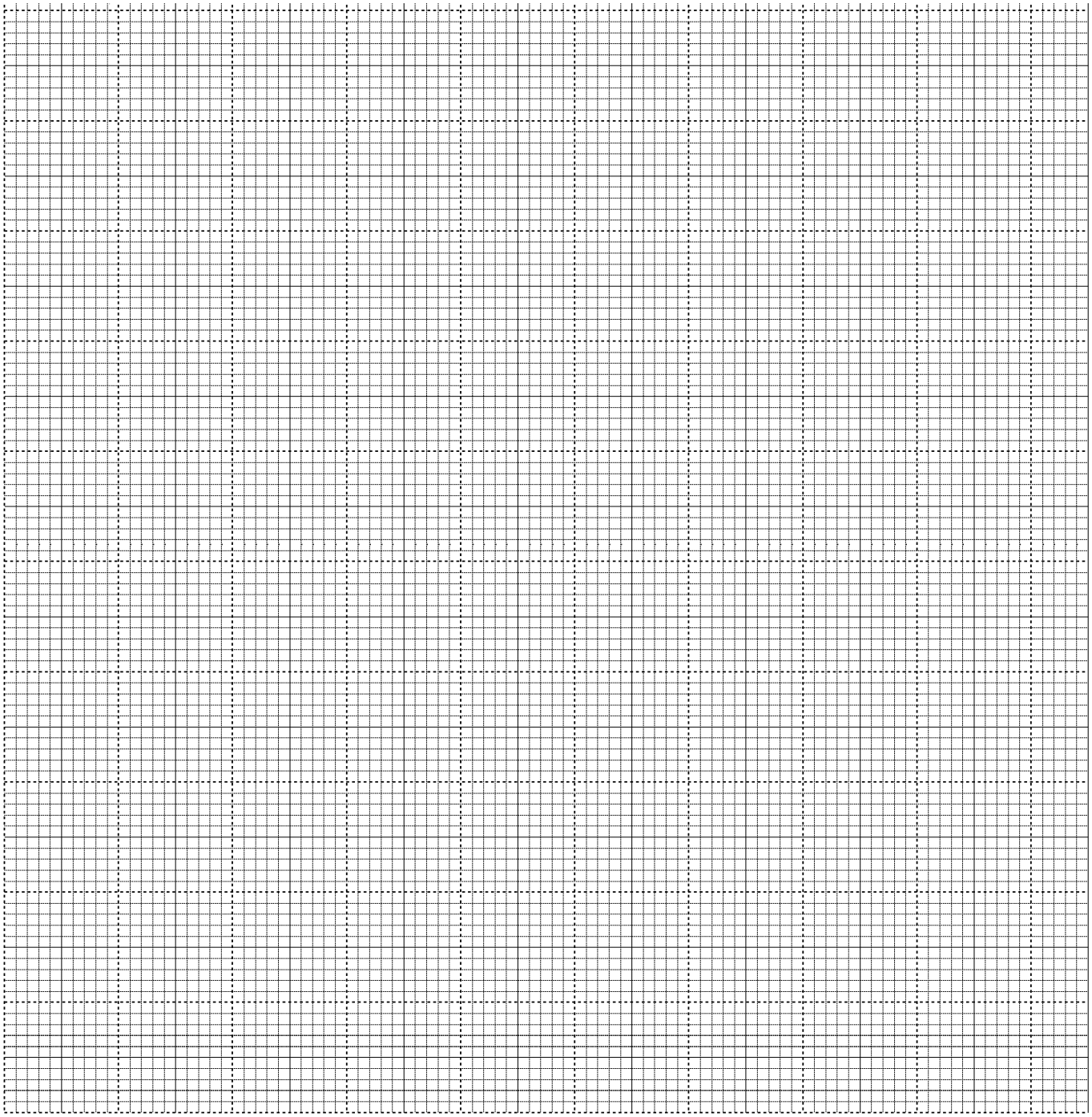
f) Repeat (iii) above for values of x= 25, 35, 40 and 50cm. and tabulate your result.

Table2

$x(cm)$	50	40	35	30	25	20
y(cm)						
h(cm)						
M= h/d						

(5 marks)

g) (i) On the grid provided plot a graph of M (y – axis) againsty. (5 marks)



(ii) Determine the slope, s, of the graph. (3 marks)

……

……

……

……

(h)The equation of the graph is given as $M = \frac{v}{p} - 1$ where p is a constant use the slope s of the graph to determine p. (2marks)

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PART B

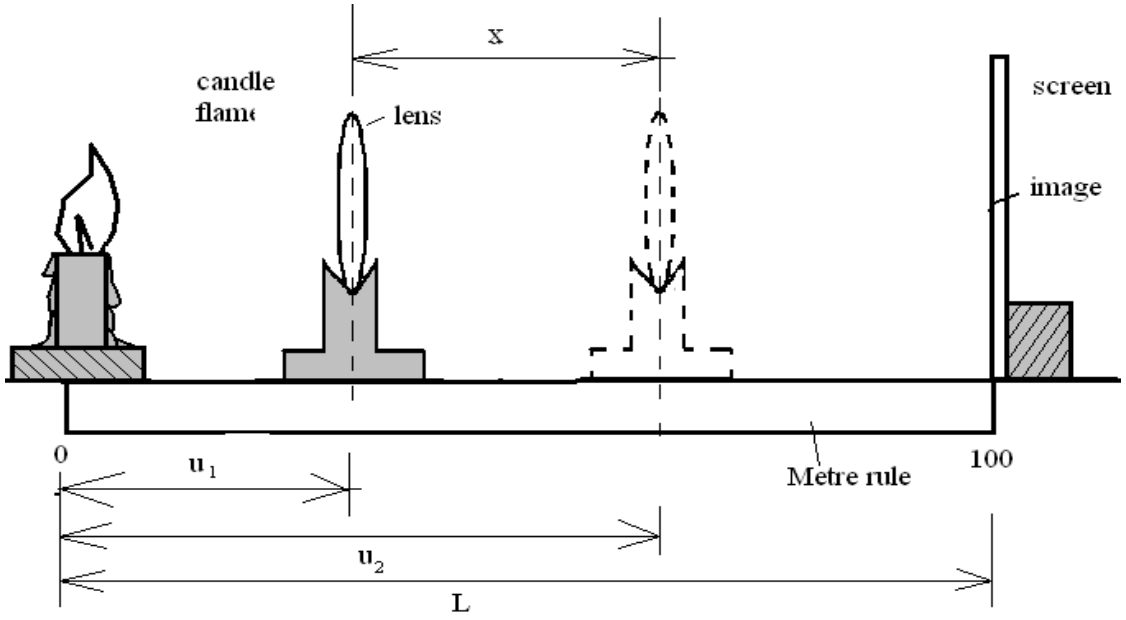


Figure 2

Proceed as follows:

i) Set up the apparatus as shown in figure 2 above. (Ensure that the candle and the lens are in the line).

J) With the candle placed a distance $L = 100cm$ from the screen, determine the position of a sharply focused magnified image of the candle on the screen by moving the lens.

I. Determine the distance of the lens to the candle u_1 =…….. cm (1mark)

II. Now move the lens towards the screen until you get a sharply focused diminished image. Determine the new distance of the lens from the candle, u_2.

u_2 = ……..cm (1mark)

III. Calculate the displacement of the lens $x = u_2 - u_1 = \ldots\ldots\ldots\ldots\ldots cm$ (1mark)

IV. Given that $f = \dfrac{L^2 - x^2}{4L}$, Calculate the value of, f. (1mark)

2. You are provided with the following apparatus.
   - 2 new dry cells size D.
   - A cell holder.
   - 8 connecting wireat least two with crocodile clips.
   - A resistance wire PR 1m long mounted on a metre rule.
   - An ammeter (0-1A).
   - A voltmeter (0 -3v).
   - Lamp R.
   - Switch S.
   - A micrometer screw gauge (to be shared).

   Proceed as follow:-

   Connect the circuit as in figure 2 below;

   PR is the resistance wire.

   S

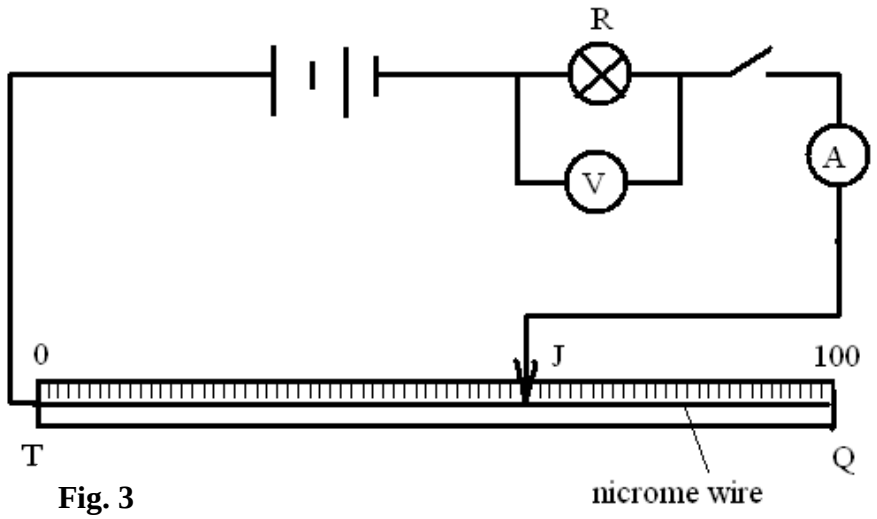


Fig. 3

(i) With the jockey J at Q (*Y*= 100 cm from T) record the ammeter and voltmeter readings.

V=…… I=…… (1 mark)

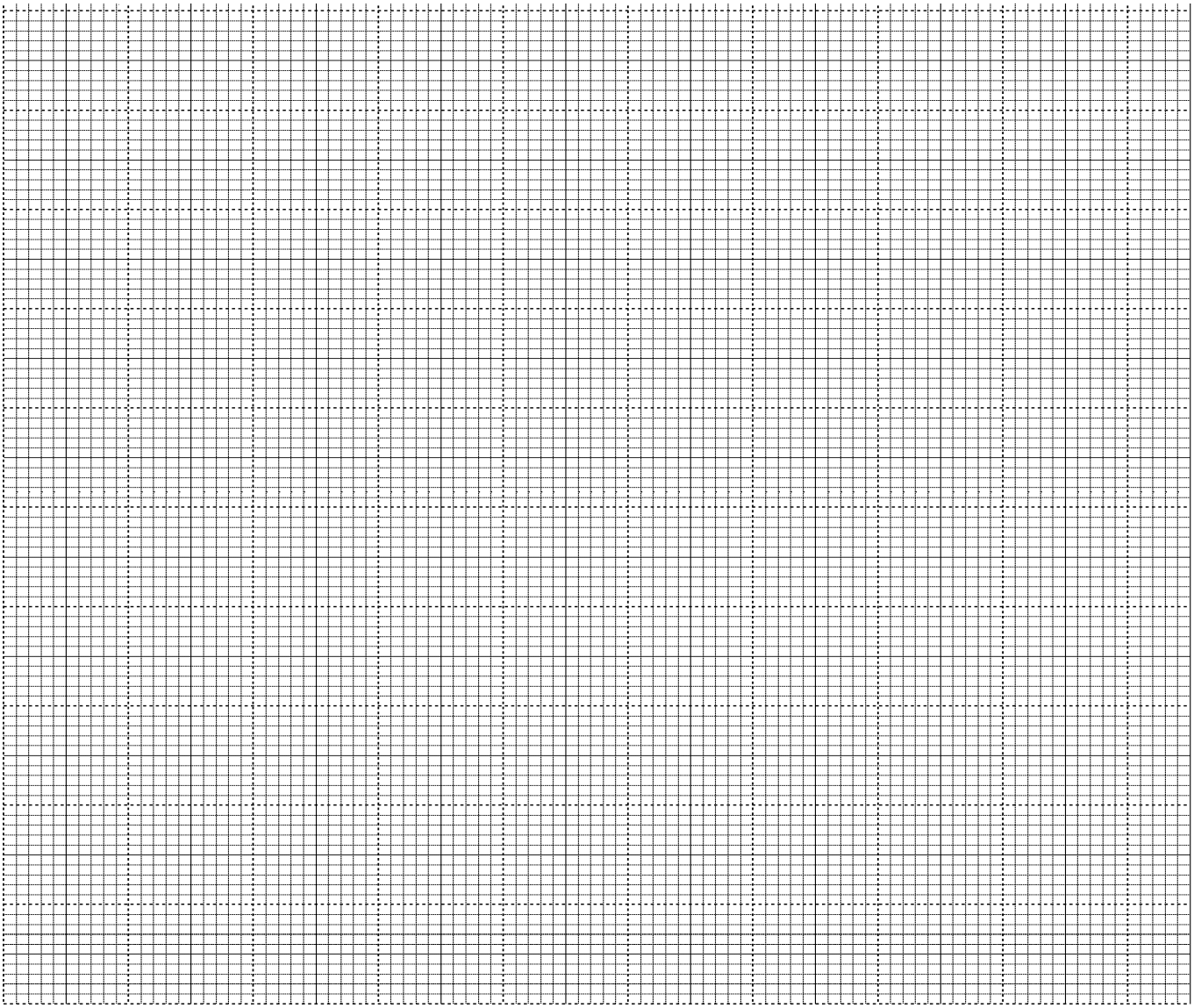
(ii) Repeat (a) (i) for other values of l and records the ammeter and voltmeter readings in the table below.

Table 2

Y(cm)	80	60	40	20	0
Ammeter reading I (A)					
Voltmeter reading V (v)					
$R = \frac{V}{I}$ Ω					

(8 marks)

(iii) Plot a graph of R against *Y*. (5marks)



iv) From your graph, find the slope **s** at Y=40cm. (3marks)

(v)Using a micrometer screw gauge, measure the diameter D of the wire. (1mark)

D = ……m

Calculate the quantity,

p = 0.5 $\left(\frac{D^2}{s}\right)$ at Y=40cm. (2marks)