

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**

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

**Total**

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

**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 lens and a lens holder labelled  $L_1$ .
- A candle.
- A graph paper 1mm mounted on a screen.
- A metre 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

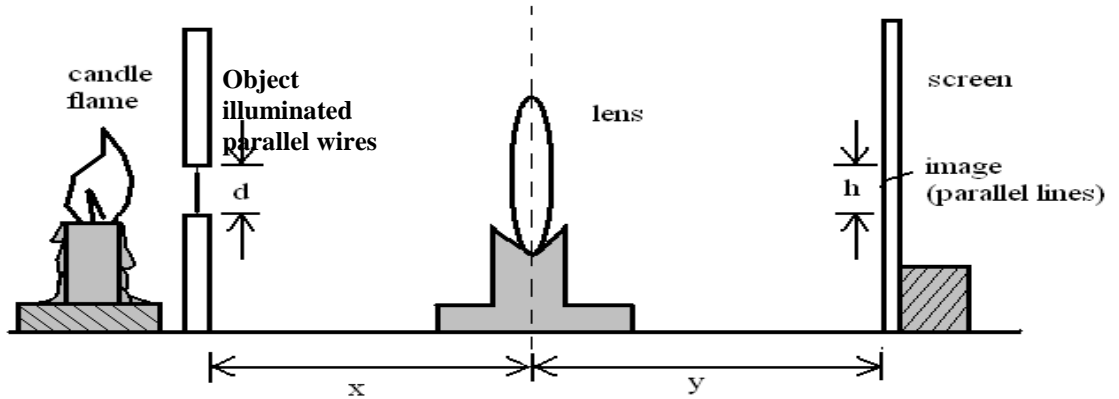


Figure 1

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

$d = \dots\dots\dots$  (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  $50$ cm. and tabulate your result.

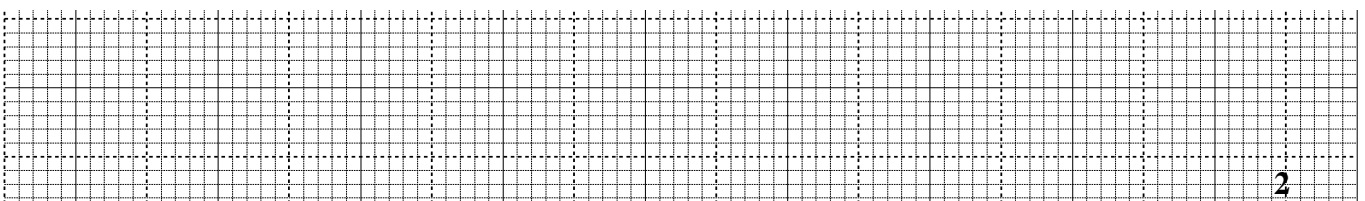
Table 2

$x(\text{cm})$	50	40	35	30	25	20
$y(\text{cm})$						
$h(\text{cm})$						
$M = \frac{h}{d}$						

(5 marks)

g) (i) On the grid provided plot a graph of  $M$  ( $y$  – axis) against  $y$ .

(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**

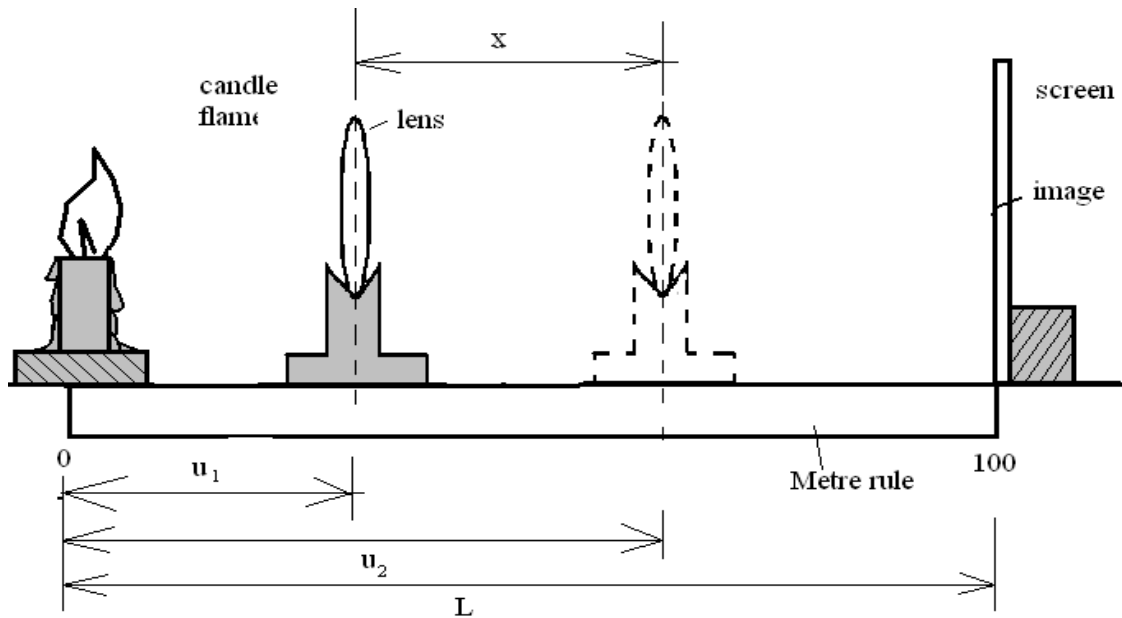


Figure 2

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  $L = 100\text{cm}$  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  $u_1 = \dots\dots\dots \text{cm}$  (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,  $u_2$ .

$u_2 = \dots\dots\dots \text{cm}$  (1mark)

III. Calculate the displacement of the lens  $x = u_2 - u_1 = \dots\dots\dots \text{cm}$  (1mark)

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

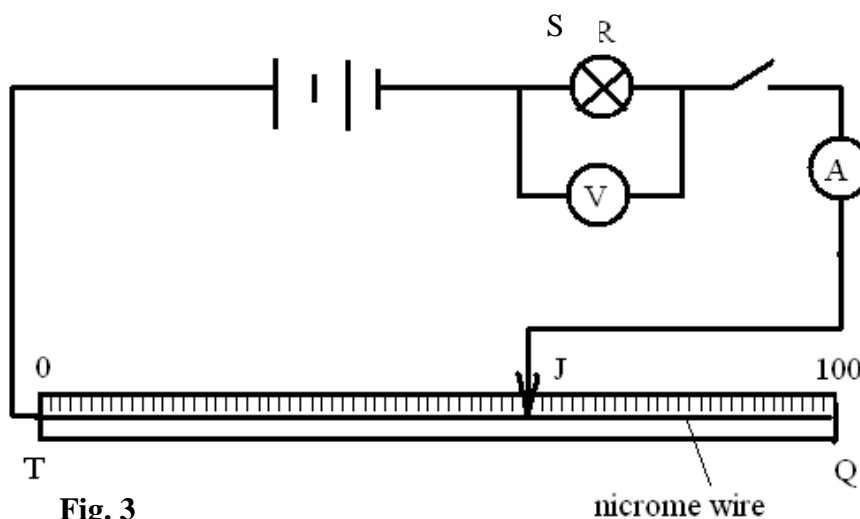
2. You are provided with the following apparatus.

- 2 new dry cells size D.
- A cell holder.
- 8 connecting wires at 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.



**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.

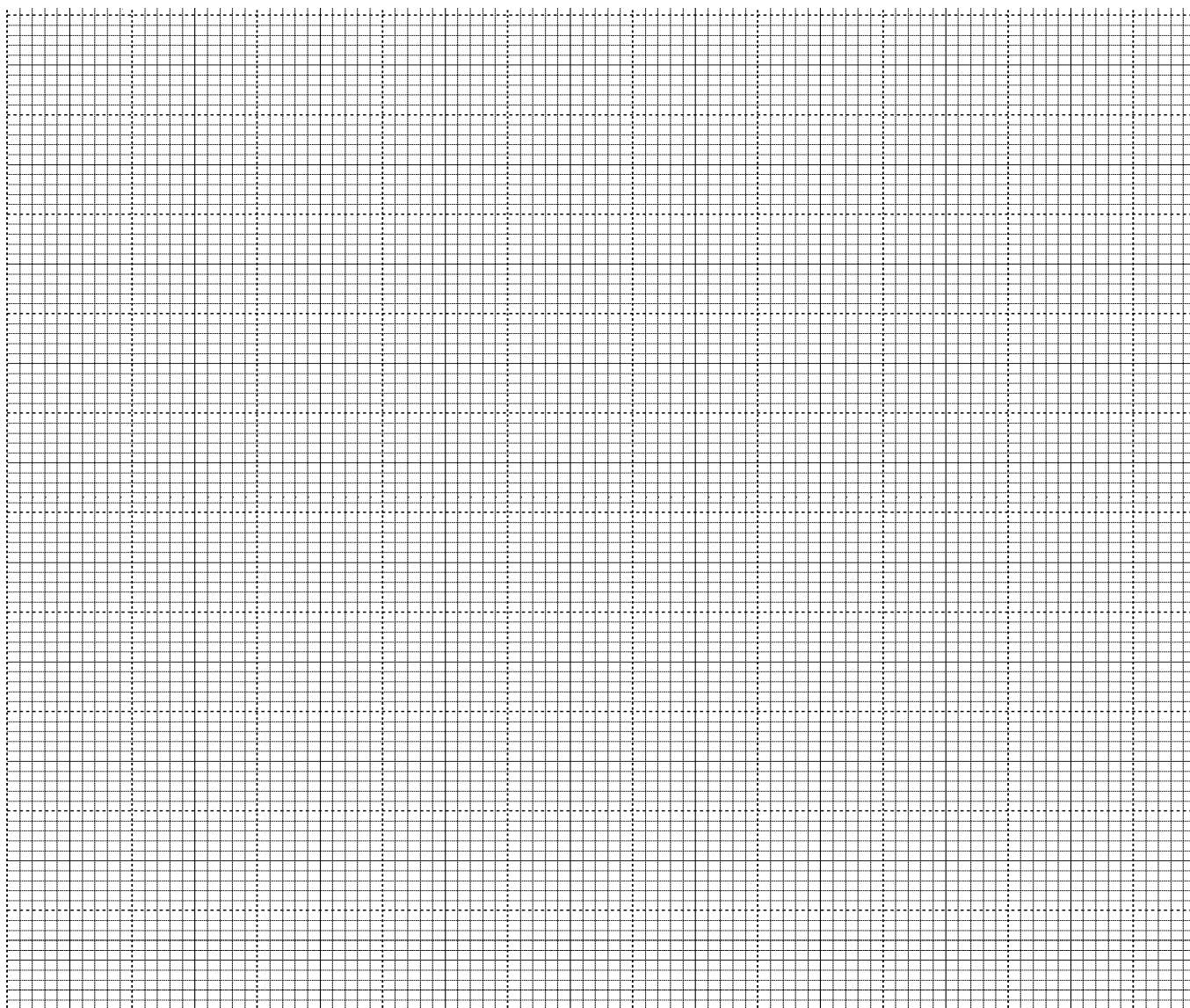
**Table 2**

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

(8 marks)

(iii) Plot a graph of  $R$  against  $Y$ .

(5marks)



iv) From your graph, find the slope  $s$  at  $Y=40\text{cm}$ .

(3marks)

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

$D = \dots\dots\dots\text{m}$

Calculate the quantity,

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