Name: ……Index No. ……

School: …… Candidate's Sign. ……

232/3

PHYSICS

PAPER 3

TIME: 2 ½ HOURS

FORM 4

INSTRUCTIONS TO CANDIDATES:

- *Write your **name** and **index number** in the spaces provided above.*
- *Sign and write the **date** of the examination in the spaces provided above.*
- *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 observation actually made, their suitability, accuracy and the use made of them.*
- *Candidates are advised to record their observations as soon as they are made*
- *Non-programmable silent electronic calculators **may be** used.*
- *Candidates should check the question paper to ascertain that all the pages are printed andthat no questions are missing.*

For Examiner's Use Only.

Question	Maximum score	Candidate's score
1	20	
2	20	
Total	40	

This paper consists of 6 printed pages candidates should check the questions to ascertain that all pages are printed as indicated and that no questions are missing

1A. You are provided with the following apparatus:

- A candle
- A lens holder
- A convex lens
- A screen
- A metre rule
- An object

Proceed as follows:

Using an object at infinity outside the room, focus its image on the screen provided. The image should be as sharp as possible and inverted. Measure the distance from the lens to the screen hcm. Repeat the same for three other values of h. Record your results and then calculate the average value of the three results, Hcm.

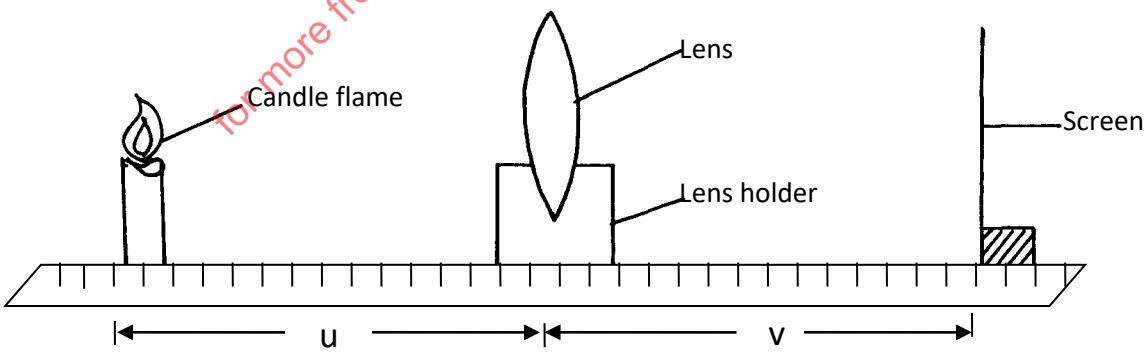
First reading of h…… **(1mk)**

Second reading of h …… **(1mk)**

Third reading of h …… **(1mk)**

The average value of h(H) …… **(1mk)**

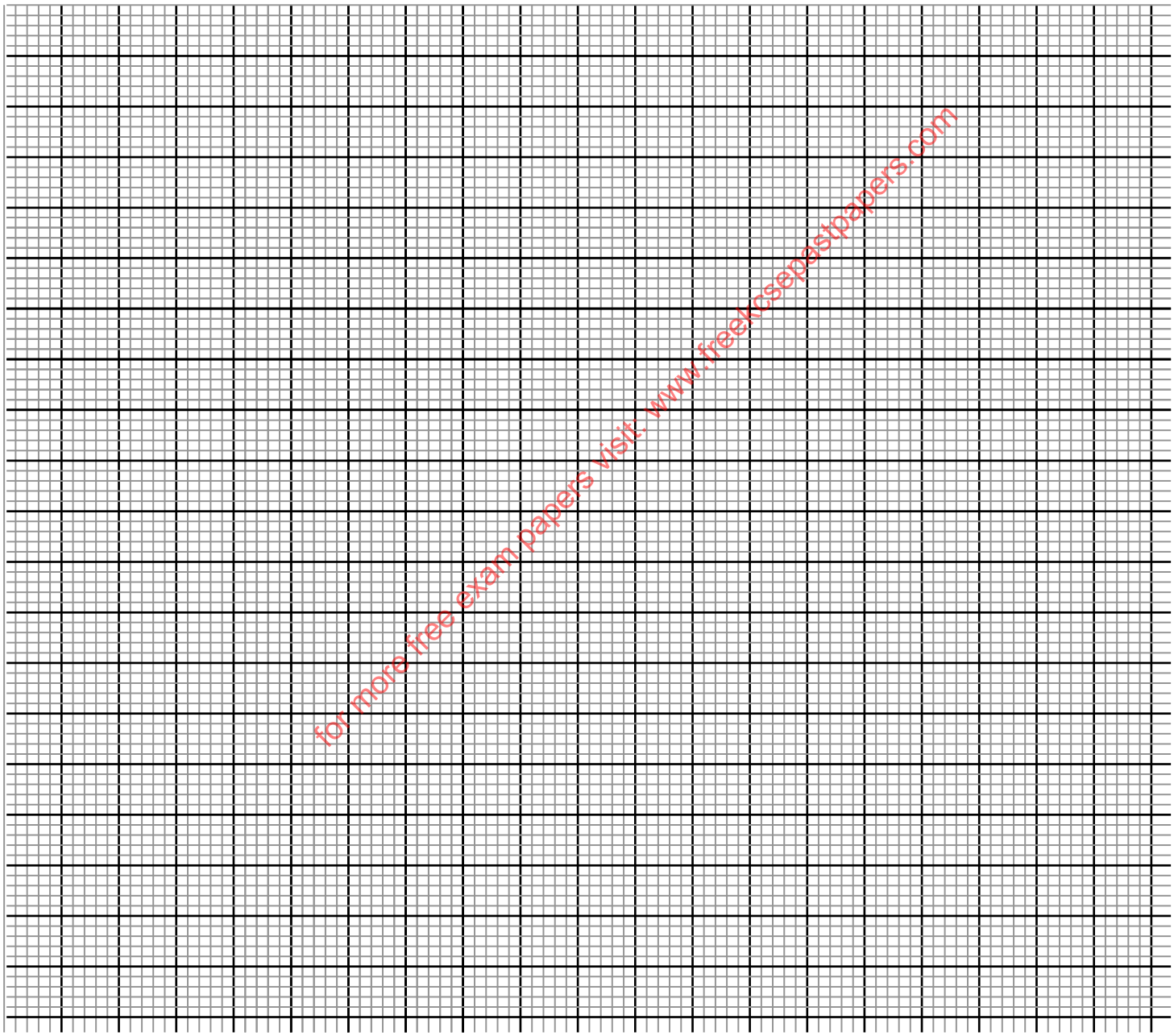
Arrange the candle flame, the lens, and the screen as shown in the diagram below:



b) i) For particular value of u, adjust the position of the screen until a sharp image appears on the screen. Measure distance Vcm. Repeat the experiment for each of the other values of u, and enter the results in the table below: **(5 marks)**

Distance L(cm)	Distance V(cm)	uv(cm^2)	U + v (cm)
12			
15			
18			
21			
24			
27			
30			

(ii) Plot a graph of uv against u + v **(5 marks)**



(iii) From your graph, calculate the slope S **(3 marks)**

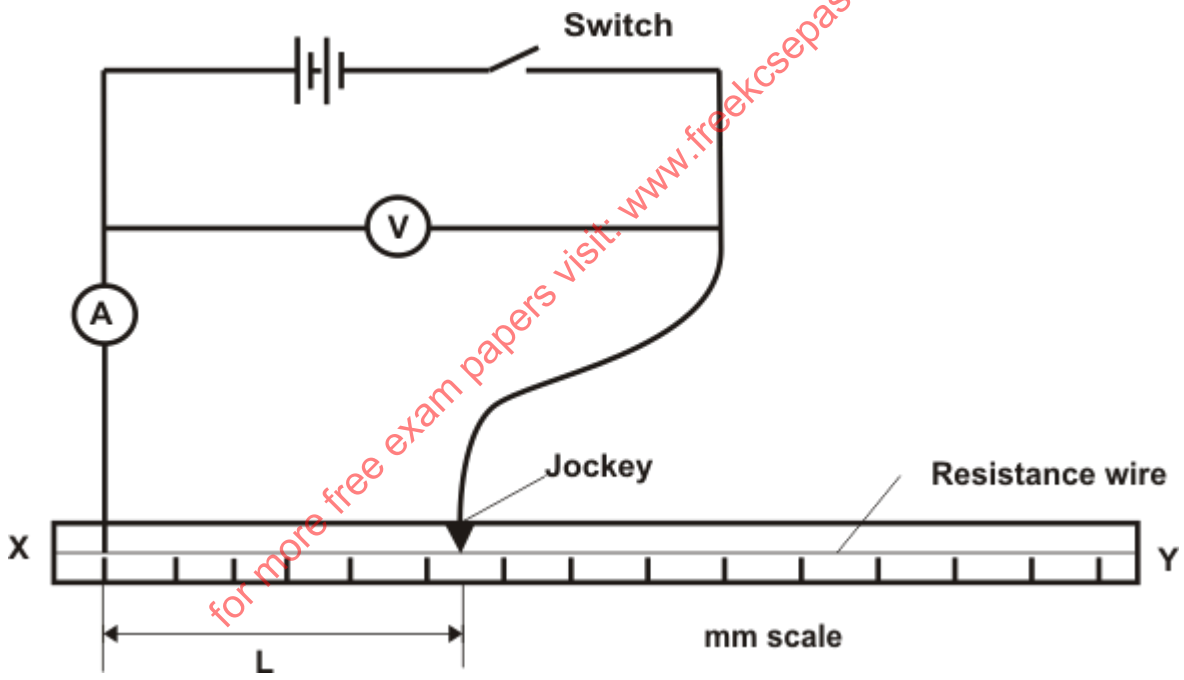
(iv). Calculate the value of k given that kH = S **(3 mark)**

QUESTION 2

You are provided with the following:

- Two new dry cells
- An ammeter 0 – 1A
- A voltmeter 0 – 5V
- A resistance wire labelled XY on mm scale
- Jockey or crocodile clip
- Cell holder
- Switch
- Six connecting wires at least three with crocodile clips at one end

(a) Set up the circuit as shown in figure 4



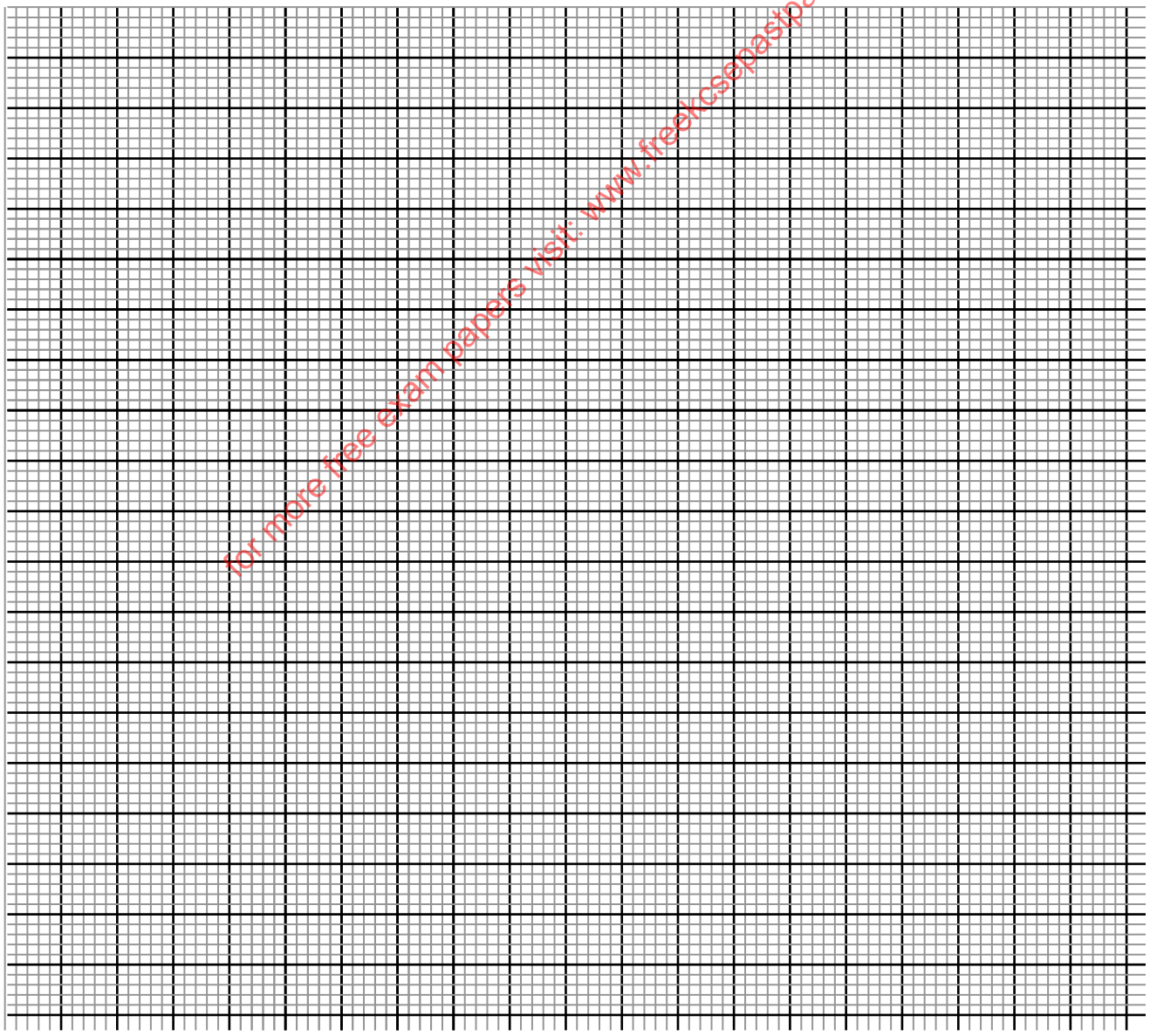
(b) Close the switch and place the jockey in contact with the resistance wire such that the length, L, of the wire XY = 0.20m. Measure and record the current, I, through the wire XY and the P.d., V, across it and enter the results in table below.

(c) Repeat procedure (b) above for the other values of L given. Read and record the corresponding values of I and V.

L (cm)	0.2	0.4	0.5	0.6	0.7	0.9	1.0
p.d. (V)							
I (A)							
R (Ω)							
$\frac{1}{I}$ (A^{-1})							

(7marks)

(d) Plot a graph of $\frac{1}{I}$ (y axis) against R **(5 marks)**



(e) Determine the slope, S, of your graph **(3 marks)**

……

……

……

(f) Given that I and R of the graph are related by the equation $\frac{1}{I} = \frac{R}{E} + \frac{r}{E}$, use your graph to determine the values of : E = **(2 marks)**

……

……

r = **(3 marks)**

……

……