Name: …… Index No. ……..……

Candidate's Sign. ……..…….....

Date: ……..……

232/3

PHYSICS PRACTICAL

Paper 3

TIME: 2 ½ HOURS

Kenya Certificate of Secondary Education (K.C.S.E.)

Physics
Paper 3
Time: 2 ½ Hours

INSTRUCTIONS TO THE CANDIDATES:

- *Write your **name** and **index number** in the spaces provided above.*
- *Answer **all** questions in the spaces provided in the question paper.*
- *You are supposed to spend the first 15 minutes of the 2 ¼ hours allowed for this paper reading the whole paper carefully.*
- *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.*
- *Mathematical tables, slide rules and calculators may be used.*
- *Take $\pi = 3.14$ and gravitational acceleration $g = 10m/s^2$*
- *Record your observations as soon as you make them.*

For Examiners' Use Only

Question 1	**a**	**d**	**e**	**f**
Max. score	1	7	5	7
Candidate's score				
Total				

Question 2	**a**	**b**	**c**	**d**	**f**	**g**	**h**	**i**
Max. score	1	11	2	2	$^1/_2$	$^1/_2$	1	2
Candidate's score								
Total								

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

You are provided with the following:

- A metre rule
- vernier callipers
- A 300g mass
- Some threads
- Two knife edges

Proceeds as follows:

(a) Place the metre rule on the knife edge such that each knife edge is 45cm from the 50cm mark(centre of the rule.) Ensure that the millimeter scale of the metre rule is facing upwards. The distance **L** between the knife edge is now 900mm.

Place the vernier callipers vertically against the metre rule at the 50cm mark with the depth gauge lowered to touch the bench as shown in figure 1 below:

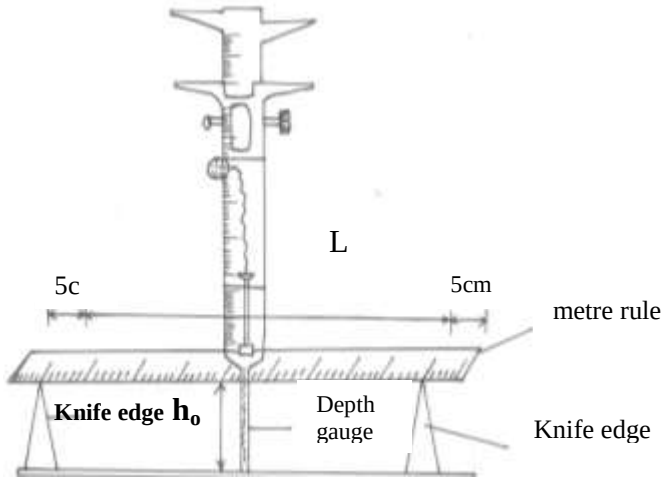


Figure 1

Record the height h_o of the upper edge of the meter rule at 50cm mark

h_0= ----------mm (1mk)

(b) Using the thread provided, hang the 300g mass at the 50cm mark of the metre rule. Ensure that the mass does not touch the bench. Measure and record in table 1. The height **h** of the edge of the metre rule at the 50cm mark.

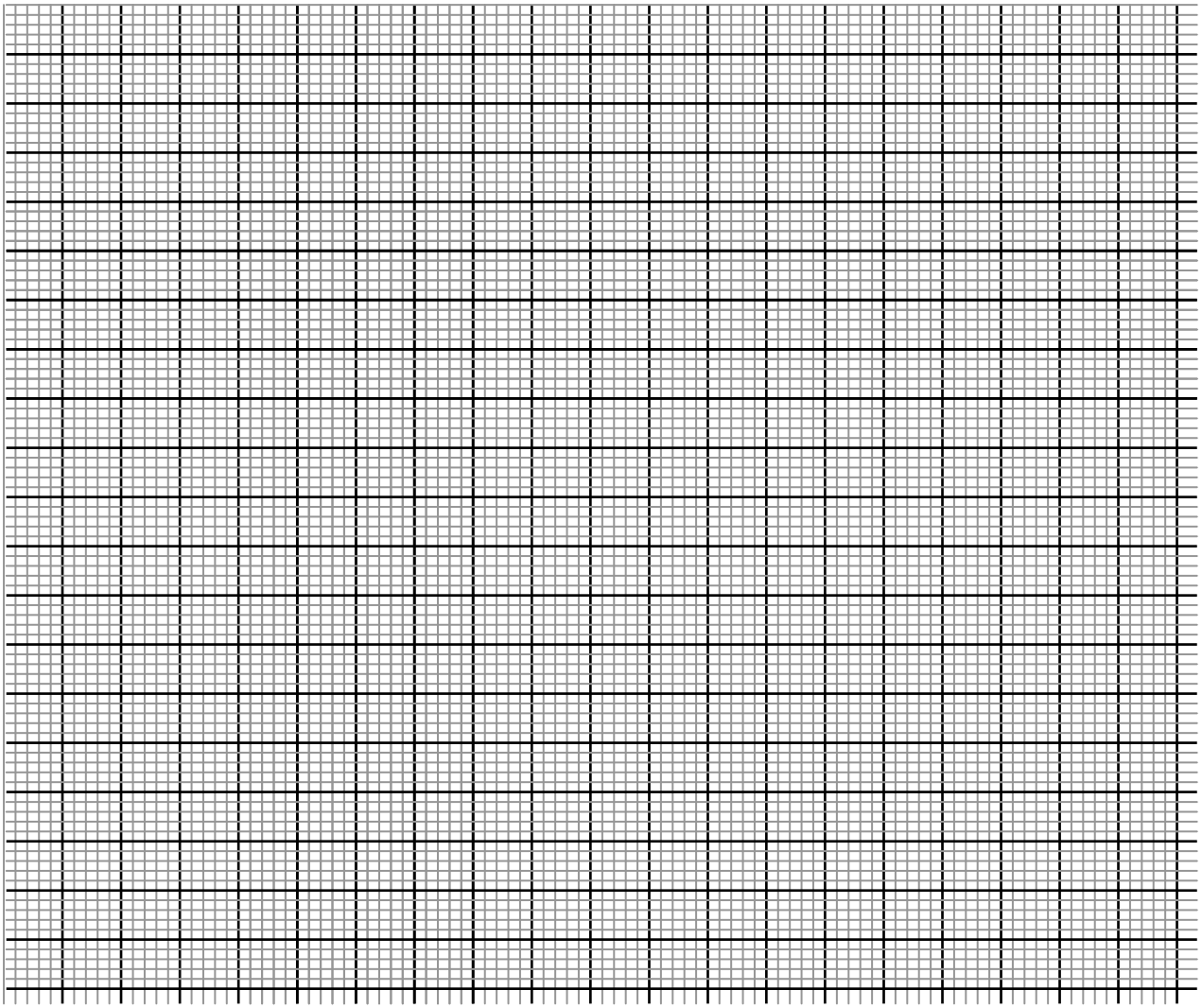
(c) With the 300g mass still at the 50cm mark, adjust the position of the knife edege so that **L** is now 800mm. (The knife edges should be equidistant from the centre of the metre rule). Measure and record in table 1 the height **h** of the edge of the metre rule at the 50cm mark.

(d) Repeat the procedure in (c) for other values of **L** shown in table 1. Complete the table. (7mks)

Table 1

Length . L(mm)				
Height h(mm)				
Depression d(h_0-h) mm				
log L				
log d				

(e) Plot a graph of **log L**(y-axis) against **log d.** (5mks)



(f) (i) Determine the slopes, **S** of the graph. (3mks)

(ii) Evaluate $\mathbf{y = {}^{1}/S}$

y = ---------- (1mk)

(iii) Determine **G**. the value of log **L**, when log **d**=0 (2mks)

(iv) Given that **G= $\frac{\log k}{y}$** , determine the values of **k**. (1mk)

2. PART A (16MARKS)

You are provided with following:

- A micrometer screw gauge (to be shared)
- A voltmeter (0-3 or 0-5V)
- An ammeter (0-1A)
- Nichrome wire mounted on mm scale, **AB**
- A switch
- A jockey/long wire with crocodile clip attached.
- One dry cell
- 8 new connecting wires with clips attached to one end.

Proceed as follows:

(a) Set up the circuit as shown in the figure 2, ensure that when the switch is open , both meters read zero. Keep the switch open when readings are not being taken.

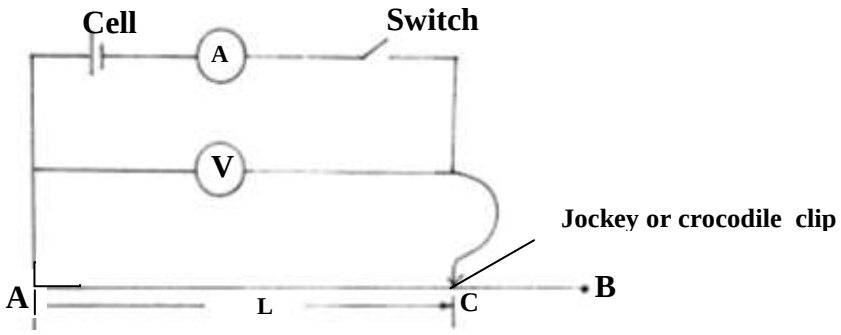


Figure 2

(i)Measure and record the diameter **d** of the nichrome wire **AB** using the micrometer screw gauge.

d = …….. m ($^1/_2$mk)

(ii)Disconnect the jockey from wire **AB** and close the switch. Record the value **E** of the Voltmeter reading. **E**.....

(b) Now, connect the jockey on **AB** at a distance **L**=2.5cm close the switch and record the voltmeter readings, **V** and **I** respectively in table 2.

Table 2

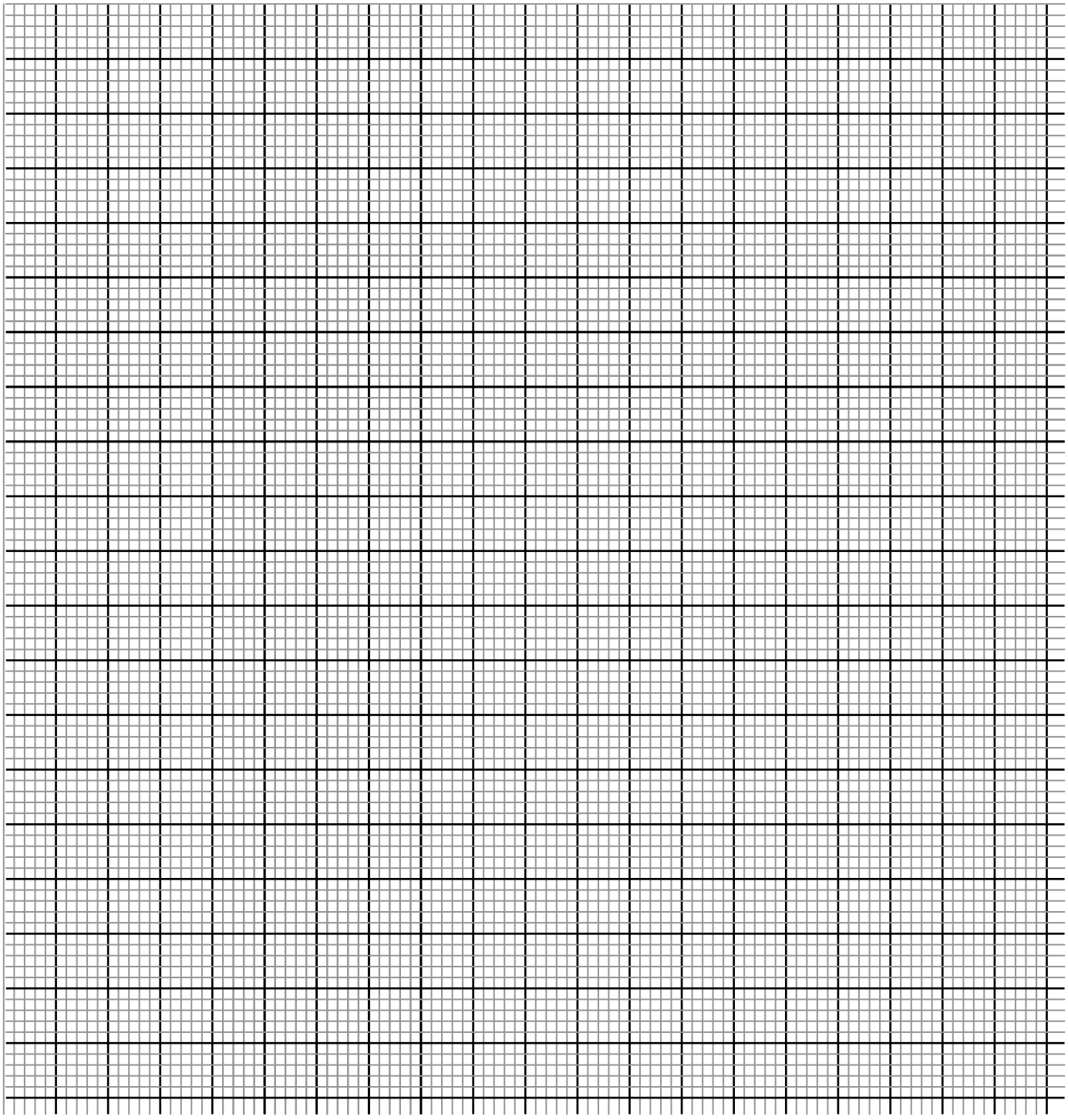
L(cm)	2.5	5.0	7.5	10	15	18	20	30	40	50
P.d V(volts)										
Current, I (A)										
IV(Watts)										

(i) Complete the table for values of I V (5mks)

(ii) Plot a graph of I V (vertical axis) against **L**. (5mks)

(iii) Using your graph, find the value **Lo** where your graph cuts, the horizontal axis.

Lo= …….. (1mk)



(c) (i) Now, place the jockey on wire **AB** such that length **L** is equal to the value of **Lo** obtained in (iii) above. Close the switch and record both the voltmeter reading. **V** and the ammeter reading **I**

V = …… (½ mks)

I = …… (½ mks)

(ii) Work out the value of **r** where; (1mk)

$$\mathbf{r = \frac{E - V}{I}}$$

(d) Work out the value of **e** where (2mks)

$$\mathbf{e = \frac{\pi r d_2}{4Lo}}$$

PART B (4MKS)

You are provided with the following apparatus:

- 50ml measuring cylinder
- one 50g hooked mass
- 50cm piece of thread
- some water in a beaker

(e) Pour exactly $20cm^3$ of water into the measuring cylinder.

(f) Tie on end of the thread provided to the hooked mass using the thread, lower the 50g mass carefully and gently into the water contained in the measuring cylinder. Record the new level $\mathbf{V_1}$ of water in the measuring cylinder.

V_1= _ _ _ _ _ _ _ _ _ _ _cm^3 ($^1/_2$mks)

(g) Detach the thread from the mass at a point near the hook. Wind five close turns round the mass. Place an ink mark at the beginning of the first turn and at the end of the fifth turn. Unwind the thread and determine length **L** between the two ink marks using the half metre rule.

L = _ _ _ _ _ _ _ _ _ _ _mm

(h) Determine the quantity **k** defined by:

$$\mathbf{k = \frac{L}{1o\pi}}$$ Where π **= 3.142** (1mk)

(i) Find the quantity **Q** defined by:

$$\mathbf{Q = \frac{V_1 - 20}{50}}$$ **(2mks)**