Name………………………………………………… Adm.no:…………..…… Class ……….

FORM 3
232/3
PHYSICS
Paper 3
TRIAL 6
Time: 2 hours

2018
FORM THREE
Kenya Certificate of Secondary Education

INSTRUCTIONS TO CANDIDATES:

- *Write your **name** and **admission 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 and that 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
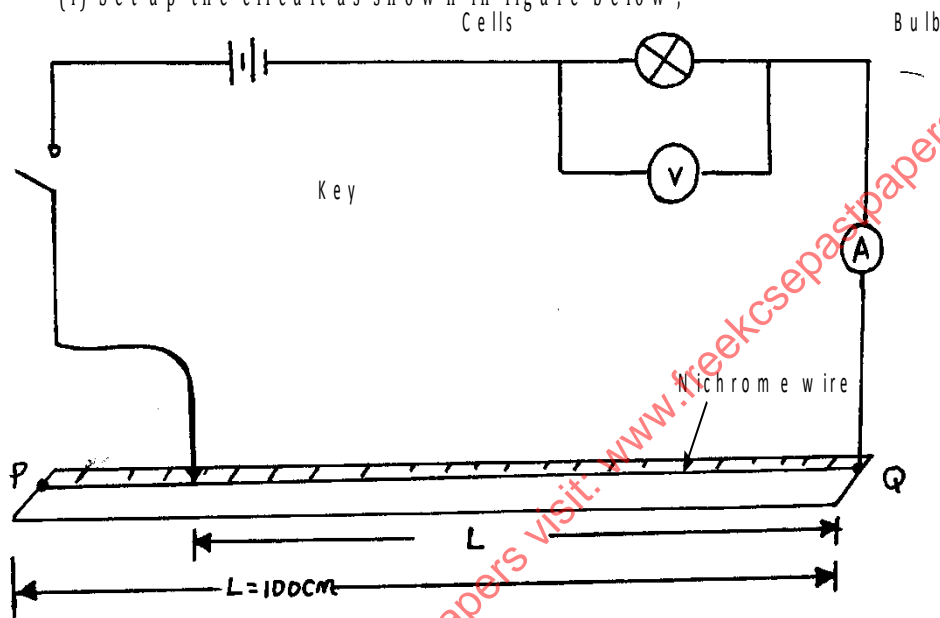
QUESTION 1

You are provide with the following;

- Two dry cells
- One bulb
- Voltmeter (0 – 3 v or o – 5v)
- Ammeter (0 – 2.5A)
- A mounted nichrome wire on millimetre scale;
- Switch
- Seven connecting wire at least two with crocodile clips.
- Micrometer screw gauge

Procedure as follows;

a)   (i) Set up the circuit as shown in figure below;

ii) With the crocodile clip at P take the voltmeter reading and the ammeter reading. Record V and I. Repeat the readings for L = 80,60,40,20 and 0 cm respectively. Complete the table below;
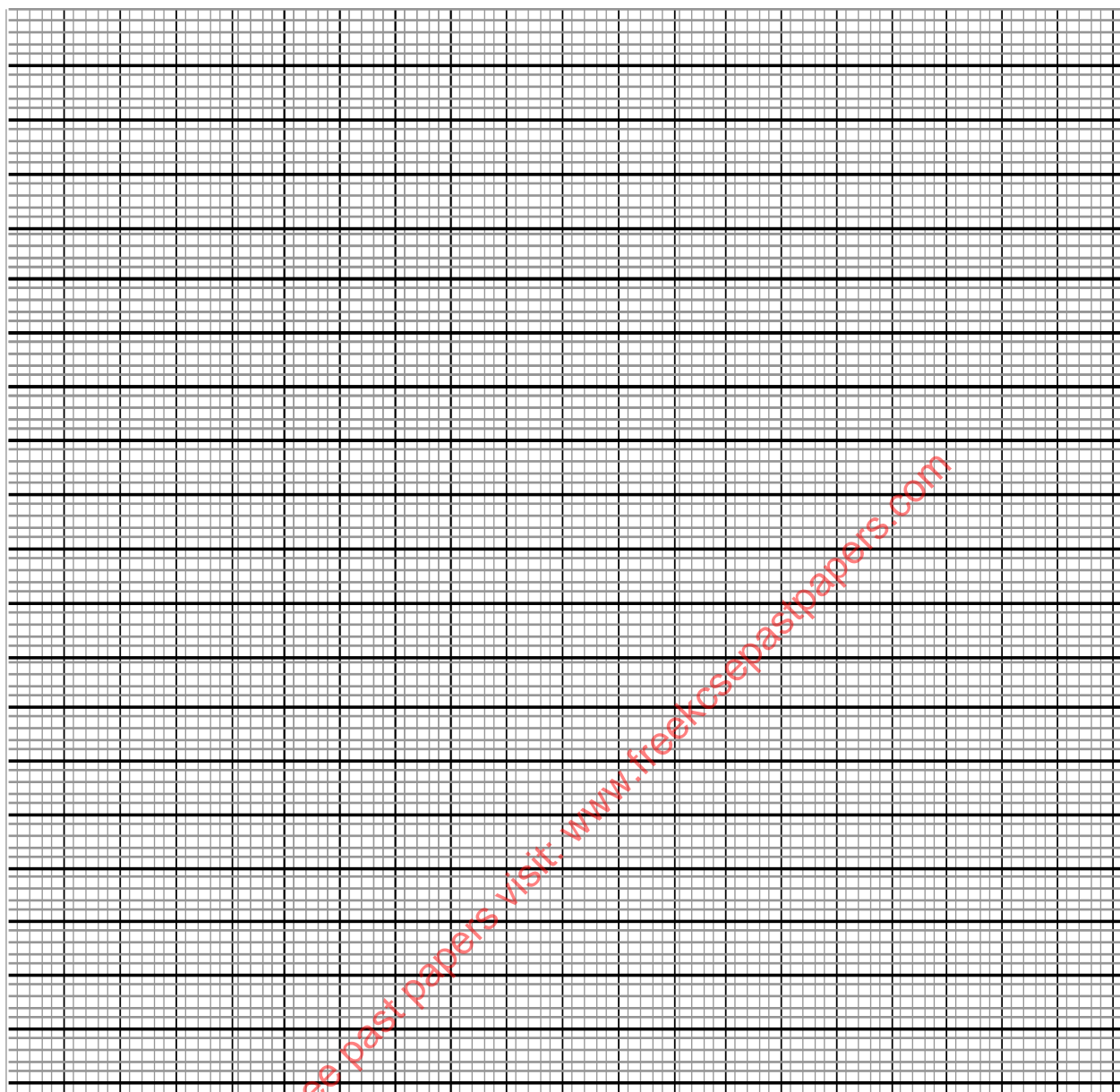
Length L (cm)	100	80	60	40	20	0
Voltage V (v)						
Current, I (A)						

(4mks)

(iii) What changes do you observe on the bulb as L decreases from P?   (1mk)

(iv) Plot a graph of the ammeter reading (y = axis) against voltmeter reading   (5mks)

v) Determine the slope of your graph at V = 1 volt   (3mks)

(vi) What physical quantity is represented by the slope of the graph at any given point.?

(1mk)

b)   (i) Given the apparatus in a (i) above, draw a diagram of the a circuit you would use to determine the current through the resistance wire and the potential difference across it.

(1mk)

(ii) Set up the circuit you have drawn. Record the ammeter reading I and the voltmeter reading
V, when L = 100cm.   (2mks)

V = ……………………………………………… .
I = …………………………………………… ..

(iii) Using a micrometer screw gauge, measure the diameter d of the wire.   (1mk)

d = ………………………… m

(iv)   Calculate the quantity,
p = 0.785 $\left(\dfrac{V}{I}\right)\left(\dfrac{d^2}{L}\right)$ and give its units, where L is one metre.   (2mks)

QUESTION 2. You are provided with the following;
•   A Complete retort stand
•   A Stop watch/stop clock
•   A Metre rule
•   Two identical springs labeled R and P.
•   A Weighing balance (to be shared)
•   A Set of masses 10g, 20g, 50g and 100g
•   A Pendulum bob
Proceed as follows
a. Join springs R and P in parallel so that it has only one hook at one end and then arrange the apparatus as shown in the figure below.

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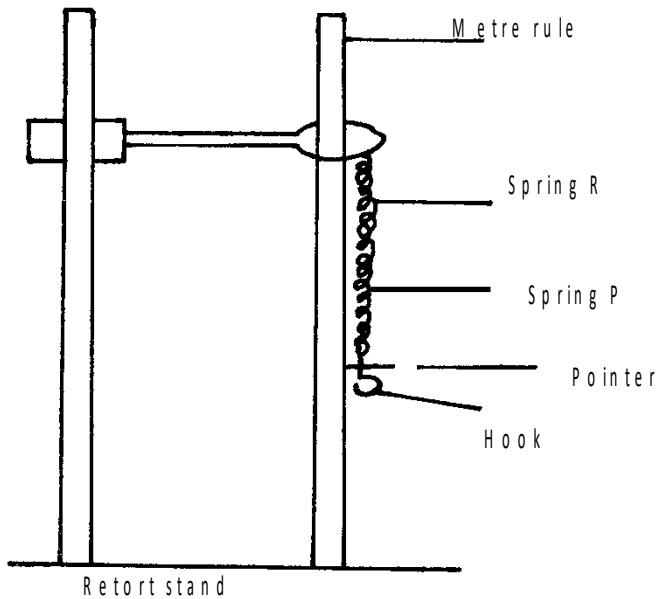
Note and record the initial pointer reading.

Initial pointer reading = …… cm mark.

(This mark should be maintained throughout the experiment)

b. Hang the 30g mass on the hook of the combined spring balance and record the final pointer reading. Hence calculate the extension, e, for m = 30g.

c. With mass, m = 30g, still suspended, slightly displace the mass vertically and time 20 complete oscillations

d. Repeat the experiment for m = 50, 70, 100, 120 and 150g and record your results in the table below.

Mass m (g)	Extension e (cm)	e (m)	Time, t, for 20 complete oscillations	Periodic time, T (s)	$T^2 (s^2)$
30					
50					
70					
100					
120					
150					

(7 mks)

e.　　(i) On the grid provided, plot a graph of e(x – axis) against T^2　　　(5 mks)
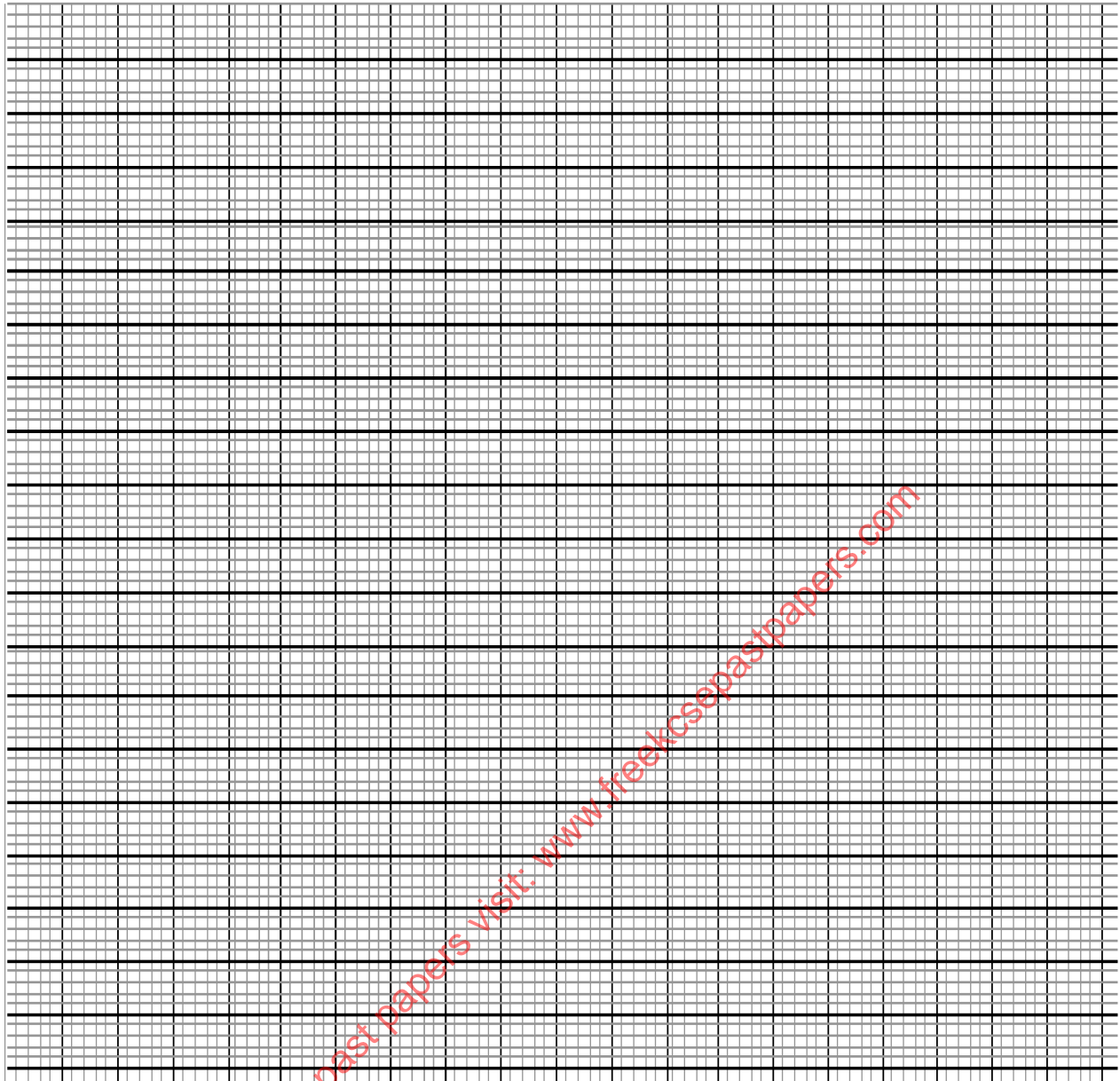
ii) determine the slope, S, of the graph.   (2 mks)

f.   If the experiment obeys the law $T = 2\Pi\sqrt{\dfrac{e}{k}}$ where k is a constant, determine the value of k ($\Pi = 3.142$)   (2 mks)

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g. Weigh and record the mass of the pendulum bob provided.

Mass, m of pendulum bob = …………..…………..g = ………………….…….kg

(1 mk)

h. Suspend the pendulum bob on the combined spring balance and note the extension produced.

extension e_1 = ………………………….………..cm = …………………..……..m

(1 mk)

i. If $v = \dfrac{mg}{e}$ where m = mass of the pendulum bob and e is the extension produced, find the value of v where v is the elastic constant of the springs.   (2 mks)