Name ..... Index No. .....

Candidate's signature .....

Date .....

232/3

PHYSICS
Paper 3

July/August 2016
Time 2½ hours

NYANDARUA SOUTH FORM FOUR JOINT EVALUATION

Kenya Certificate of Secondary Education

PHYSICS

Paper - 232/3

July/August 2016

Time: 2½ hours

INSTRUCTIONS TO CANDIDATES

- Answer ALL the questions in the spaces provided.
- You are not allowed to start working with the apparatus for the first 15 minutes of the 2½ hours allowed in this paper.
- This time is to enable you to read the questions and make sure you have all the apparatus needed.
- Marks are given for a clear record of the observations actually made, their suitability and accuracy, and the use made of them.
- Candidates are advised to record their observations as soon as they are made.
- Mathematical tables and electronic calculators may be used.

FOR EXAMINER'S USE ONLY

Question 1	b(i)	b(ii)	b(iii)	b(iv)	b(v)	c(i)	c(ii)	c(iii)	c(iv)	TOTAL SCORE
Maximum score	6	1	5	2	1	1	2	1	1	20
Candidates score										

Question 2	c	d	e	f(i)	f(ii)	TOTAL SCORE
Maximum score	6	5	2	1	1	20
Candidates score						

This paper consists of 7 printed pages

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

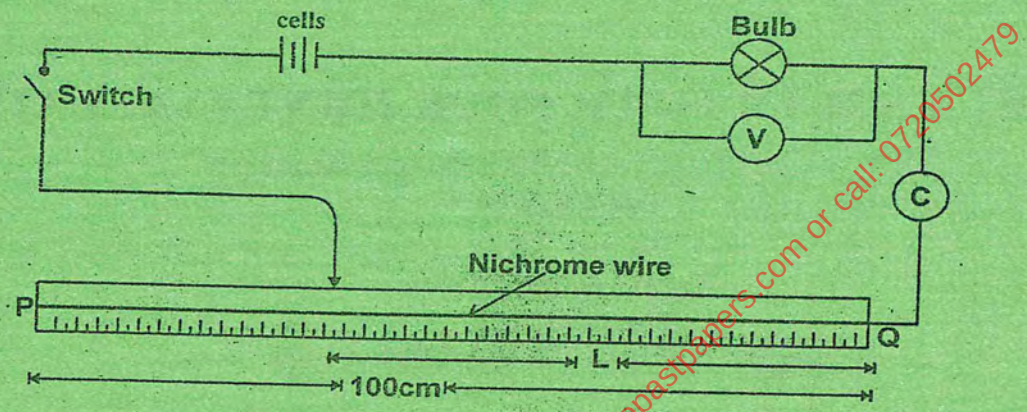
Question one (20 marks)

You are provided with the following apparatus.

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

Proceed as follows:

a) Set up the circuit as shown in figure below.



i) 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 0cm respectively.

Complete the table below.

Table 1

Length, L(cm)	100	80	60	40	20	0
Voltage, V(V)						
Current, I (A)						

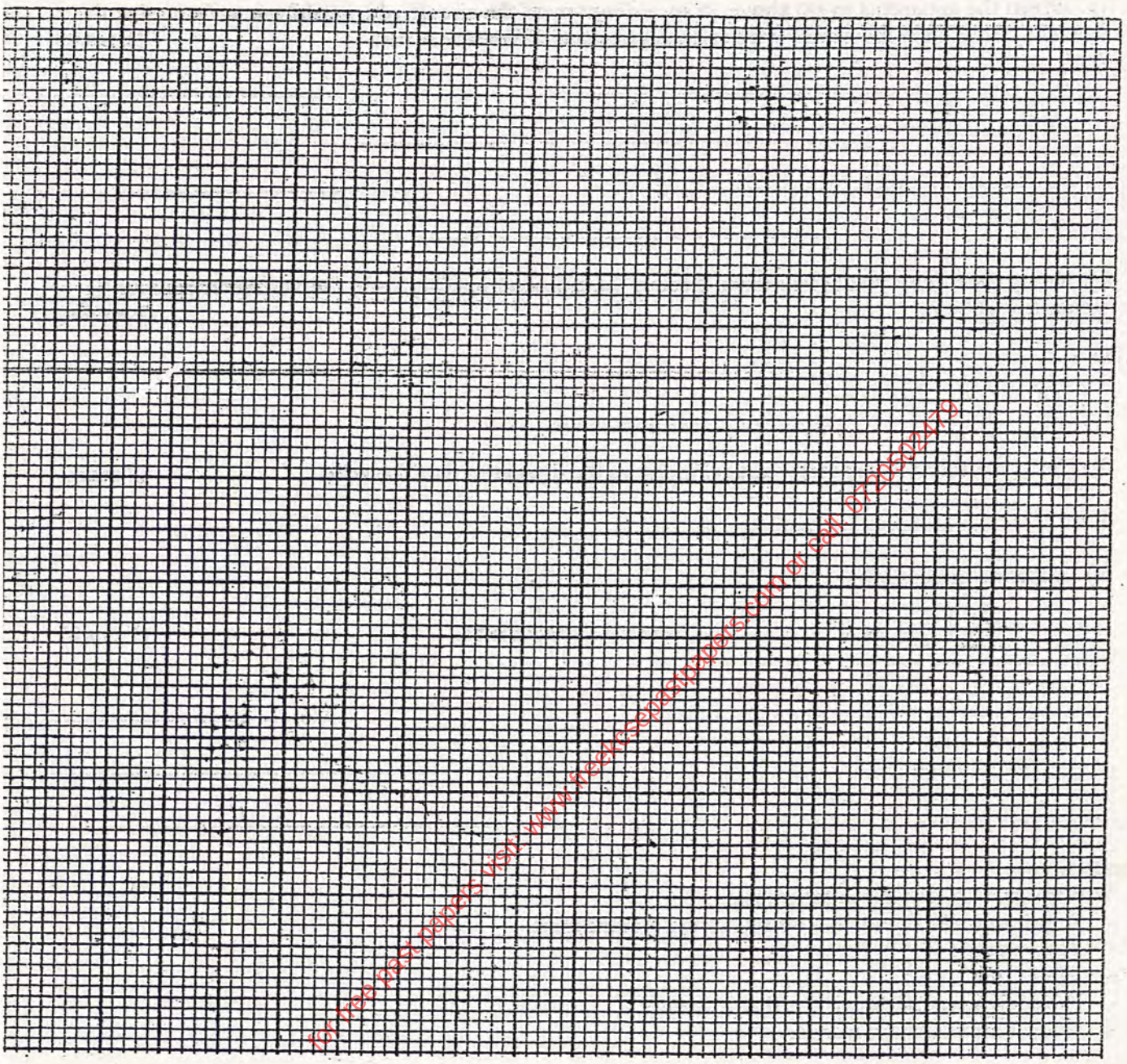
(6 marks)

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

.....

.....

iii) Plot a graph of the ammeter reading (y=axis) against voltmeter reading. (5 marks)



iv) Determine the slope of your graph at V = 1 volts. (2 marks)

.....

.....

v) What **physical quantity** is represented by the slope of the graph at any given point? (1 mark)

.....

c) i) Given the apparatus in (a) above, draw a diagram of the circuit you would use to determine the current through the resistance wire and the potential difference across (1 mark)

.....

.....

.....

.....

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

V =.....

I = ...

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

d = ... m

iv) Calculate the quantity:

$P = 0.785\left(\frac{V}{I}\right)\left(\frac{d^2}{L}\right)$ and give its units, where L is one metre. (1 mark)

.....

.....

.....

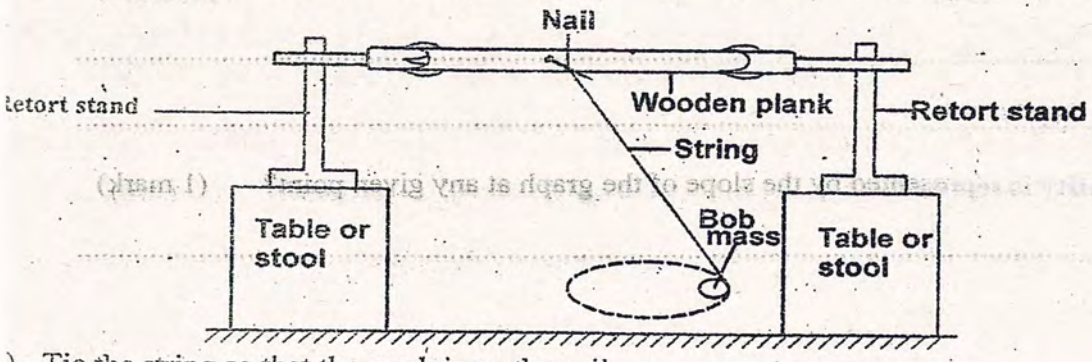
Question two.

You are provided with the following

- A bob mass attached on a string having a mark on it.
- Stop watch
- Metre rule
- Wooden plank with nail fixed at its centre
- Two complete retort stands.

Proceed as follows:

i) Arrange the apparatus as shown.



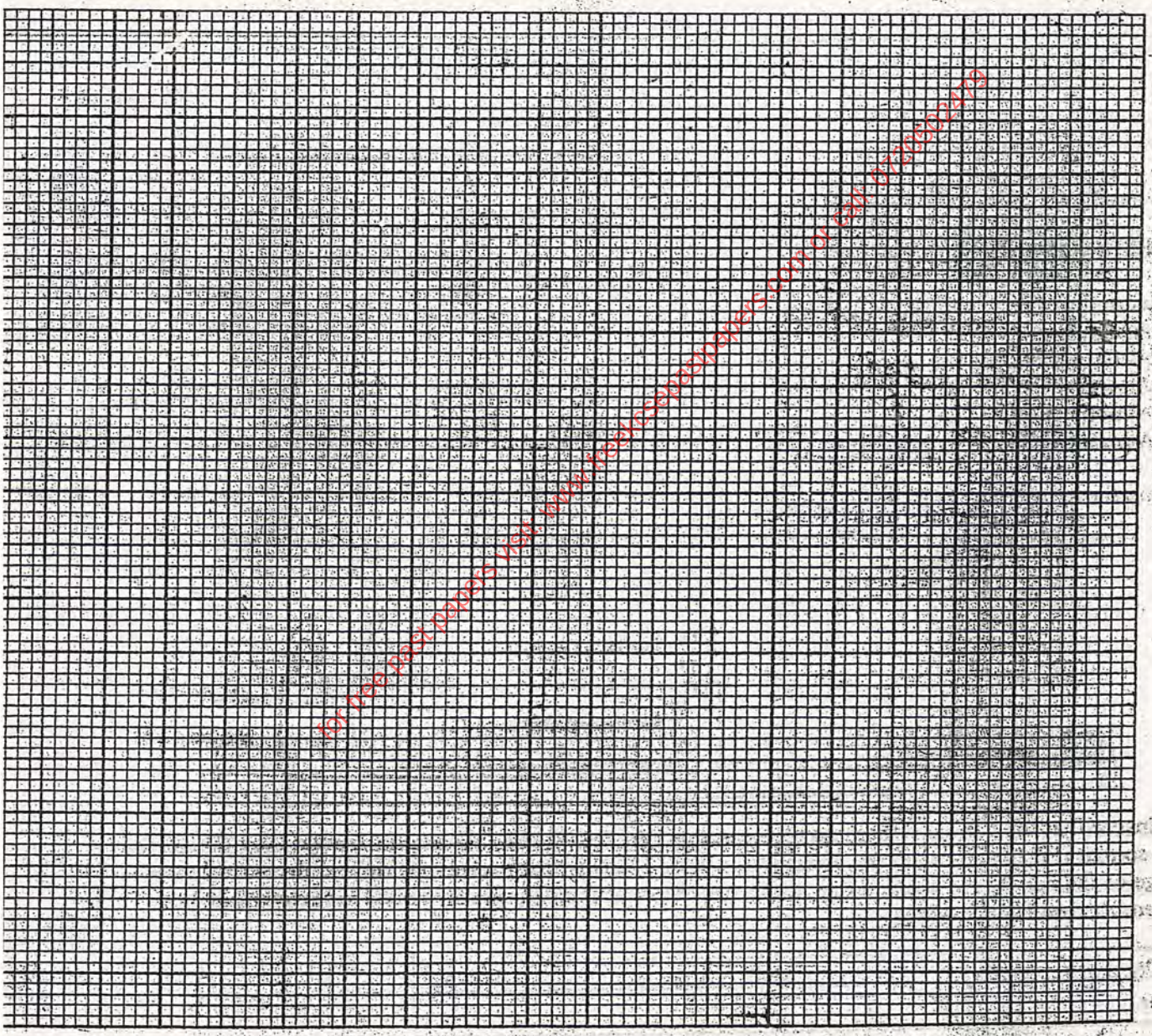
ii) Tie the string so that the mark is on the nail.

c) Set the bob into a conical pendulum oscillation with a small angle displacement to the vertical. Obtain time for 10 oscillations and period T seconds and square of the period. Then reduce the string by a length d and repeat exercise of determining time for 10 oscillations period and square of the period, filling and completing table 2.

TABLE 2

Reduced distance d(m)	0	0.2	0.3	0.5	0.6	0.7	0.8	0.9
Time for 10 oscillations, t, (S)								
Period, T(s)								
Period^2 , T^2, (s^2)								

d) Plot the graph of T^2 (S^2) against reduced distance d(m) (5 marks)



Determine slope, G, of your graph. (2 marks)

.....

.....

Given than

$T^2n + 39478d = 39.478L$ where d is reduced distance and L and n are constants, determine:

i) n (1 mark)

.....

.....

ii) L (1 mark)

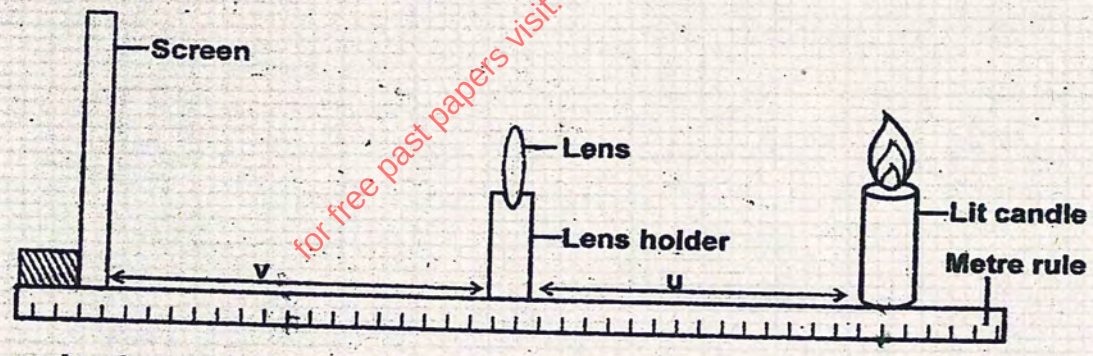
.....

.....

PART B (4 MARKS)

You are provided with the following
- A candle
- A lens and a lens holder
- A screen
- A metre rule
- A match box (to be shared)

Set up the apparatus as shown below.



) Ensure that the candle flame and the centre of the lens lie in a horizontal straight line. Place the lens so that it is 40cm from the candle (u = 40cm). Adjust the position of the screen until a sharp image of the candle is obtained on the screen. Measure the distanced v between the lens and the screen. Record in the table.

u(cm)	40	45	50
v(cm)			
$m = \frac{v}{u}$			

Repeat (b) above to obtain the values of v and record your results, in table above (3 marks)

ii) Given that $f = \frac{v}{m+1}$, where f is the focal length of the lens, use the results in the table above to determine the average value of f.

(2 marks)

.....

.....

.....

.....

.....