Name: ……..Index No. ……

School: ……Candidate's Sign. …….....

Date: …….....

232/3
PHYSICS
PAPER 3
JULY /AUGUST 2013
TIME: 2 ½ HOURS

NAKURU DISTRICT JOINT TRIAL EXAMINATION

Kenya Certificate of Secondary Education (KCSE)

Physics 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 2½ 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, their suitability, 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.*

Answer both questions in the spaces provided.

Question 1

You are provided with the following apparatus:

-micrometer screw gauge

-clamp

-boss

-stand

-optical pins

-Copper wire (15cm)

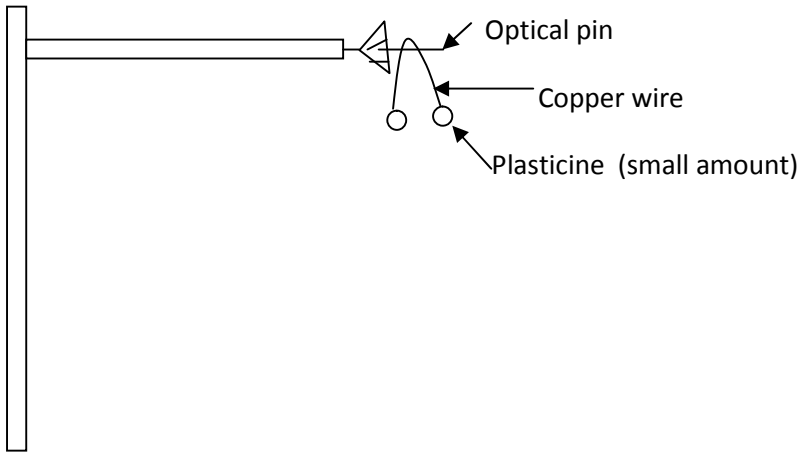
-protractor

-Two pieces of plasticine

-cork

Procedures/ methods

1) Measure the diameter of the wire using the micrometer screw gauge……cm. (1mk)
2) Set up the apparatus as shown in the diagram below



b) Bend the wire in the middle so as to make an angle of 40^{o}. Attach the two small pieces of plasticine at both ends of the bend as shown in the diagram.

c) Place the bent wire on the optical pin and give a small horizontal displacement. Note the time for 10 complete oscillations and record in the table below.

d) Repeat the procedure above for other values of Θ and complete the table below (8mks)

Angle Θ^o	Time t for 10 oscillations (s)	Period T (s)	Frequency f (Hz) =1/T	$f^2(Hz)^2$	$\cos\left(\frac{\theta}{2}\right)$
40^0					
60^0					
80^0					
100^0					
120^0					

On the graph paper provided, plot a graph of f^2 (y-axis) against $\cos\frac{\theta}{2}$ (5mks)

(i) Determine the gradient S of the graph(3mks)

(ii) The equation for the oscillation of the wire is given by the formula:

$$f^2 = \frac{150}{4\pi^2 L} Z \cos\left(\frac{\theta}{2}\right)$$

Given that **L** 15cm find the value of **Z**. (3mks)

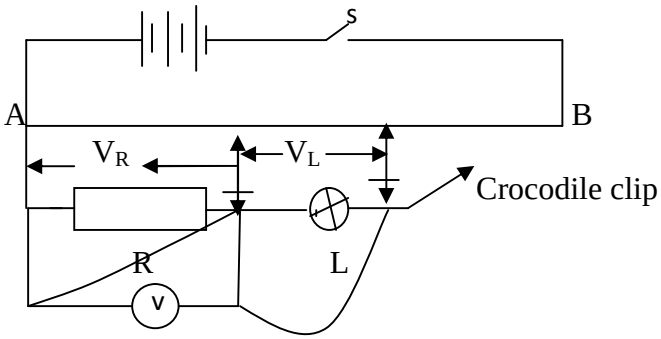
Question 2

You are provided with the following apparatus:

- 3 dry cells, cell holder and a switch
- Nichrome wire 1m long mounted on a metre scale
- Resistor R 5Ω
- A bulb
- Voltmeter
- Eight connecting wires one with a crocodile clip or jokey

Proceed as follows:

i) Connect the three dry cells in series with the switch and nichrome wire.



ii) Connect the resistor and bulb in series at the end A of the wire.

iii) Connect the voltmeter across the resistor R. Close the switch and check that the reading on the voltmeter can be varied by altering the position of the crocodile clip on the wire AB.

iv) Adjust the position of the crocodile clip to 40cm from end A. record the voltmeter reading V_R across the resistor R.

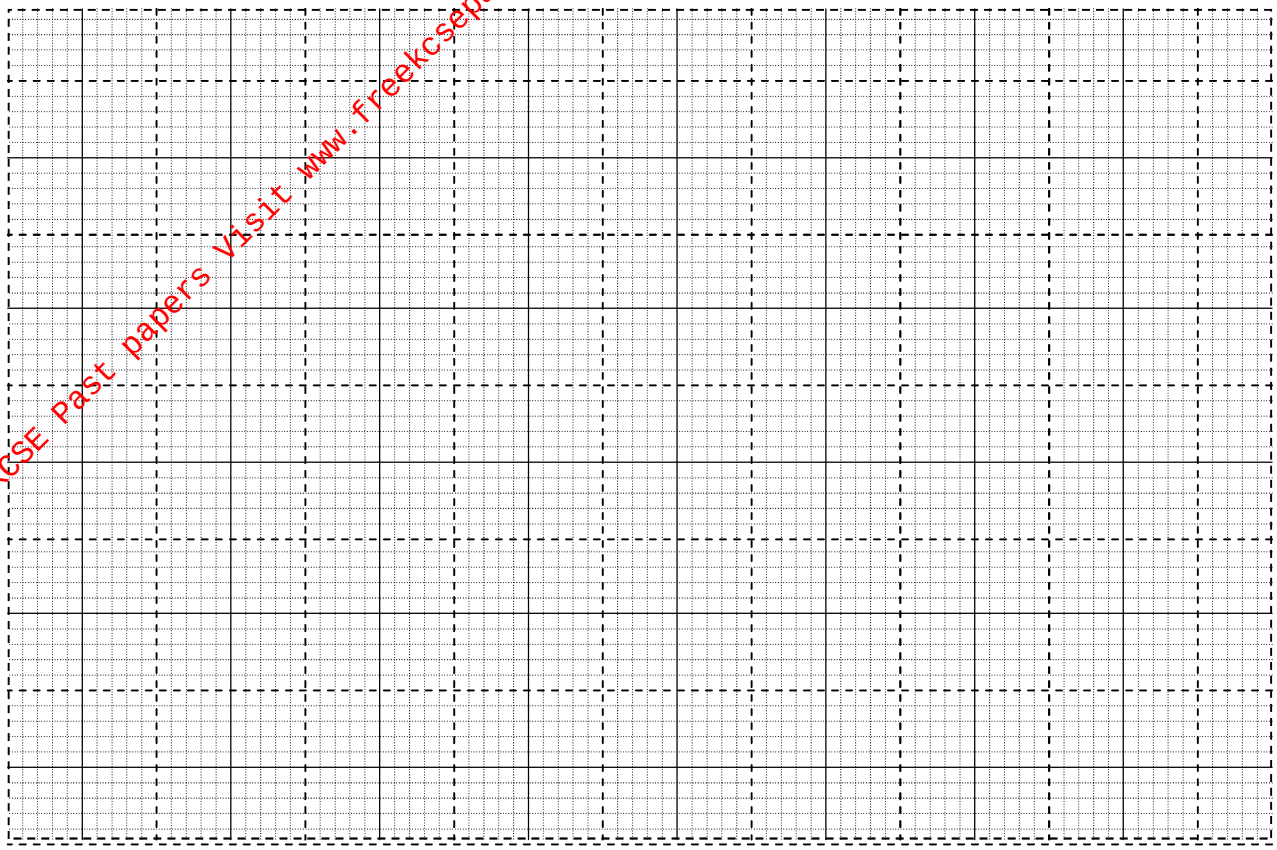
v) Repeat this experiment using the table below.

vi) Disconnect the voltmeter and reconnect it across the bulb L without altering anything else in the circuit. Record the voltmeter reading V_L across the lamp.

vii) Repeat the experiment using the table below. (7mks)

Length L(cm)	40	50	60	70	80	90	100
V_R							
V_L							

viii) Plot a graph of V_L against V_R on the axis provided.(5mks)



ix) From the graph find the value of V_R when $V_R = V_L$. Use this value and the value of R given to calculate the current flowing in the bulb. (4mks)

x) Calculate also the resistance of the bulb. (3mks)

xi) Determine the slope of the graph at the point where $V_R = V_L$. (2mks)