**NAME:………………………………………………INDEX………………..…..DATE…………..**

**SCHOOL:……………………………………………………SIGNATURE…………….…………**



[**TEACHER.CO.KE SERIES 31**](https://teacher.co.ke/notes/)

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PHYSICS

PAPER 3

(PRACTICAL)

**INSTRUCTIONS TO CANDIDATES**

* *Write your name, index number, date and sign in the spaces provided above.*
* *You are advised to spend the first* ***15 minutes*** *of the hours given reading the entire question paper*
* *Answer all the questions in the spaces provided*
* *Marks are given for clear record of observations actually made for their suitability and accuracy for the use of them.*
* *Candidates are advised to record their observations as soon as they are made.*
* *K.N.E.C Mathematical tables and Non programmable silent electronic calculators may be used.*

**For Examiner’s Use Only**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum Score** | **Candidates’ Score** |
| Q1  |  |  |
| Q2 |  |  |
| **Total**  |  |  |

**QUESTION 1**

You are provided with the following apparatus:

* clamp
* boss
* stand
* optical pin
* copper wire (15 cm long)
* protractor
* two pieces of plasticine
* cork
1. Set up the apparatus as shown in the diagram below



Angle

1. Bend the wire in the middle so as to make an angle of 500. Attach the two small pieces of plasticine at both ends of the bent wire as shown in the diagram.
2. Place the bent wire on the optical pin and give a small horizontal displacement. Take the time for 10 complete oscillations and record in the table below.
3. Repeat the procedure above for other values of ![](data:application/x-msmetafile;base64...) and complete the table below. (9mks)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Angle  | Time’t’for10oscillations (s) | Period T (s) | Frequency f (Hz) | f2 (Hz)2 | Cos  |
| 5060708090100 |  |  |  |  |  |

1. On the graph paper provided, pot a graph of f2 (y-axis) against cos ![](data:application/x-msmetafile;base64...) (5mks)

Determine the gradient ‘S’ of the graph (3 mks)

1. The equation for the oscillation of the wire is given by the formula:

 ![](data:application/x-msmetafile;base64...)

 Given that L = 0.15m, use the gradient of the graph to determine the value of Z. (3mks)

**QUESTION 2**

You are provided with the following:

* One dry cell and a cell holder
* One voltmeter
* One ammeter
* A wire mounted on a mm scale labelled R
* Seven (7) connecting wires with at least 4 with crocodile clips
* A micrometer screw gauge (to be shared)
1. Set up the apparatus as shown in the figure below

 

1. Starting with L equal to 20cm close the switch and record the readings of voltage ‘V’ and ammeter (A), then open the switch.
2. Repeat the procedure in (b) above for the values of L equal to 30cm, 40cm, 50cm, 60cm, and 70cm and record your results in the table below. (6mks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Length L (cm) | 20 | 30 | 40 | 50 | 60 | 70 |
| Voltage V (v) |  |  |  |  |  |  |
| Current I (A) |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

1. Plot a graph of ![](data:application/x-msmetafile;base64...)against L (5mks)
2. Find the slope ‘S’ of your graph (3 mks)
3. Calculate the value of R. Given that R=100 S (2 mks)
4. Measure the diameter D of the wire (2 mks)
5. Calculate the resistivity P of the wire given by ![](data:application/x-msmetafile;base64...) (2 mks)