Name:…………………………………………………………………………………

Adm. No. ……………Class: ………………………Signature:…………………….

**232/3**

**PHYSICS**

**PRACTICAL**

**FEBRUARY 2023**

**TIME: 2 ½ HRS**

**CHOGORIA MURUGI ZONE**

**Kenya Certificate of Secondary Education**

**PHYSICS PAPER 3**

**PRACTICAL**

**Instructions**

* *Write your name, admission number, class and signature in the spaces provided at the top of the page.*
* *Answer* ***all*** *the questions in the spaces provided in this paper.*
* *You are supposed to spend the first 15 minutes of the 2 ½ hours allowed for this paper reading the whole paper carefully before your start.*
* *Marks will be given for clear record of observations actually made, for their suitability and accuracy, and the use made of them.*
* *Candidates are advised to record their observations as soon as they are made.*
* *Electronic calculators and mathematical tables may be used.*

**FOR EXAMINER’S USE ONLY**

|  |  |  |
| --- | --- | --- |
| **Question(s)** | **Maximum Score** | **Candidate’s Score** |
| **1** | 20 |  |
| **2** | **A** 11 |  |
| **B**  9 |  |
| **TOTAL** | **40** |  |

This paper consists of **8** printed pages. Candidates are advised to check and to make sure all pages are printed.

**QUESTION ONE.**

You are provided with the following;

* 2 new dry cells
* Cell holder
* Ammeter (0-1A)
* Voltmeter
* 6 connecting wires (at least 3 with crocodile clips)
* Nichrome wire mounted on millimeter scale
* Micrometer screw gauge (may be shared)
* Jockey .

Proceed as follows;

1. Using micrometer screw gauge, measure the diameter, D of the nichrome wire.
2. D = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm
3. D = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m (1mark)
4. The cross sectional area A is obtained by;

$A=πr^{2}$ Where r = D/2

 Determine the cross sectional area (A) in SI units. (2marks)

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1. Set up the apparatus as shown below.



1. Record the e.m.f across the terminals of the dry cells when the switch is open.

Emf = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Adjust the position of jockey key such that length AX= 10cm.

Close the switch and record the voltmeter and ammeter reading on the table given.

1. Repeat step d) above for the other lengths shown on the table.
2. Complete the table. (5 marks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Length, L AX (cm) | 10 | 20 | 30 | 50 | 70 | 80 |
| Voltage (V) |  |  |  |  |  |  |
| Current (A) |  |  |  |  |  |  |
| Resistance(V/I)(Ω) |  |  |  |  |  |  |

1. Plot a graph of resistance (Ω) against Length (cm) on the graph provided below.(5 marks)



1. i) Determine the slope of your graph. (3marks)

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1. The relationship between L and R is given by the equation;$ R=\frac{⍴L}{A} $**,** determine the value of $⍴$. (2marks)

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1. Suggest what constant $⍴$ represents. (1mark)

………………………………………………………………………………………………………………………………………………………………………………

**QUESTION TWO (A)**

You are provided with the following apparatus;

* Retort stand, clamp and boss
* A piece of thread
* Two small pieces of wood blocks
* Pendulum bob
* Meter rule
* Stop watch

**Procedure;**

Tie the bob to one end ***20cm length*** of the thread and suspend it from the retort stand with the help of the wooden blocks as shown in the diagram.

20 cm

Meter rule

Retort

stand

Wooden pieces blockssblocksMetere rul

Bob

Displace the bob by a small angle say 100; start the stopwatch simultaneously and allow it to swing to make **ten** oscillations. Stop the clock and record the time taken in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Length L (m)** | **0.20** | **0.40** | **0.60** | **0.80** |
| Time t for 10 oscillations (s) |  |  |  |  |
| Period T (s) |  |  |  |  |
| T2 (s2) |  |  |  |  |
| Q = 4π2 L T2 |  |  |  |  |

Repeat the same procedure for different lengths of thread 40cm, 60cm, 80cm and record the corresponding times t taken in the table above.

Fill in the table above by determining the various values of T, T2 and Q as stated in the table. (8marks)

Determine the average value of quantity **Q** and state its SI units (2 marks)

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Name the physical quantity represented by Q (1 mark)

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**QUESTION TWO (B)**

You are provided with the following apparatus.

* A concave mirror
* Mirror holder
* White screen
* Meter rule
* A candle

Procedure

1. Set the apparatus as shown in the diagram below

Screen

x

u

Metre rule

Concave mirror

Candle

4

ii) Place a candle at a distance of x = 10 cm from the screen. Move the mirror to and fro to focus a clear, sharp image of the candle flame on the screen.

iii) Measure the distance u between the mirror and the candle and the distance v between the candle and the screen.

iv) Repeat the experiment for x = 15 cm and 20 cm. Complete the table below. (6 marks)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| X (cm) | 10 | 15 | 20 | 25 |
| *u*(cm) |  |  |  |  |
| *V =( u + x)*(cm) |  |  |  |  |
| $ Z=\frac{uv}{u+v}$ (cm) |  |  |  |  |

v)

Determine the average value of Z. (2marks)

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vi) What is the significance of Z? (1mark)

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