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FORM 4 ENTRANCE EXAMS 2023

**Name …………………………………..…………………………..……. Adm No ……………..**

**Class…………..…… Date……….……………….Student’s signature………………………..**

**232/3**

**PHYSICS**

**Paper 3**

**Time 21/2 HOURS**

***Kenya Certificate of Secondary Education (K.C.S.E)***

**Paper 3(232/3)**

**(Practical)**

**232/3**

**PHYSICS**

**Paper 3**

**Time 21/2 HOURS**

**INSTRUCTIONS TO CANDIDATES**

1. Write your **name, index number, class, date** and **signature** in the spaces provided above.

2. This paper consists of two questions **1** and **2.**

3. Answer all questions in the spaces provided.

4. Non-programmable calculators and mathematical tables may be used.

5. Show all your workings.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **QUESTION 1** | **a(ii)** | **a(iii)** | **a(iv)** | **a(v)** | **a(vi)** | **b(vii)** | **TOTAL** |
| **Maximum score** | **6** | **5** | **3** | **1** | **2** | **3** |  |
| **Candidates score** |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **QUESTION 2** | **a(i)** | **a(ii)** | **a(iii)** | **b(vii)** | **b(viii)** | **b(ix)** | **b(xi)** | **b(xii)** | **b(xii)I** | **b(xii)II** | **b(xiii)** |
| **Maximum score** | **1** | **1** | **1** | **6** | **2** | **1** | **1** | **1** | **1** | **2** | **3** |
| **Candidates score** |  |  |  |  |  |  |  |  |  |  |  |

***This paper consists of 8 printed pages.***

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

**Question 1**

**You are provided with the following:**

-Two dry cell

- Cell holder

-A piece of resistance wire labeled **W**

-Voltmeter (**0 - 3V** or **0 - 5V**)

-Ammeter (**0 - 1A**)

-A nichrome wire mounted on a millimeter scale labelled **PQ**

-Seven connecting wires in which four are with crocodile clips on both ends and three are with crocodile clips on one end

- Jockey attached to a connecting wire

- Micrometer screw gauge (can be shared)

**Proceed as follows:**

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

**W**

**Q**

**P**

Jockey

Nichrome wire

**L**

ii) With the Jockey at **Q** i.e. **L= 0.0 cm**, take the voltmeter reading and ammeter reading. Record **V** and **I.** Repeat to get the readings for **L=20.0cm**, **40.0cm**, **60.0cm**, **60.0cm, 80.0cm** and **100.0cm** respectively and complete the table below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Length L (cm)** | **0.0** | **20.0** | **40.0** | **60.0** | **80.0** | **100.0** |
| **Voltage V (v)** |  |  |  |  |  |  |
| **Current I (A)** |  |  |  |  |  |  |

(6marks)

iii).Plot a graph of voltmeter readings (y-axis) against ammeter readings. (5marks)

iv) Determine the slope of the graph (3marks)

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

vi) Using a micrometer screw gauge, measure the diameter, **d** of the wire **W**.

**d** =  **mm** (1mark)

=  **m** (1mark)

vii) Calculate the quantity and give its units. (3marks)

**Question 2**

**PART A**

**You** are **provided with the following apparatus**

- A meter rule

- A concave lens with holder

- A candle stick

- A white screen

- A stop watch

- Marble

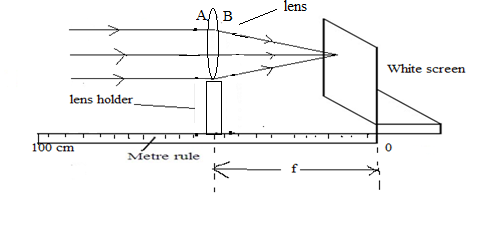
- Watch glass

- Plasticine

- Micrometer screw gauge

**Proceed as follows:**

(a) Find the approximate focal length by focusing a sharp image of a distant object onto a screen. The object (preferably window frame) must be **at least 4m** away. Turn lens such that side A faces the screen

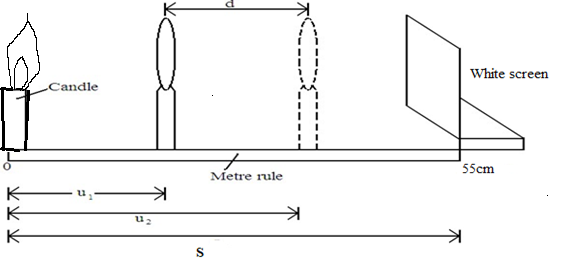


i) f1=…………………………… (1mark)

(ii) f2=…………………….. (1mark)

iii) Find the Average of f1 and f2 (1mark)

b)(i)Now Set up the apparatus as shown in figure below such that S=55cm.Adjust the position of the lens to obtain a sharp enlarged image of the candle flame. (**Ensure that the candle flame, the lens and white screen same horizontal level)**

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ii)Measure the distance **u1** between the candle and the lens

iii)Without changing the positionof the candle and the screen, move the lens to obtain a sharp diminished image of the candle flame

iv)Measurethe distance u2 between the candle and the lens

v) Record the values of **u1** and **u2** in the table below.

vi) Repeat the procedure in (i) above for S=45cm.

(vii)Complete the table (6marks)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S(cm)** | **U1(cm)** | **U2(cm )** | **d=U1-U2** |  |
| 55 |  |  |  |  |
| 45 |  |  |  |  |

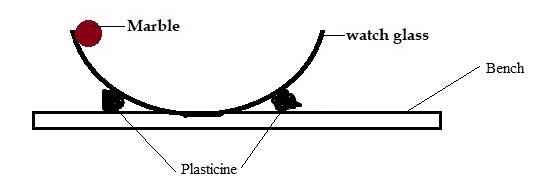
viii) Determine the average value of K (2marks)

ix) What does physical quantity K represent (1mark)

**PART B**

**Procedure:**

x. Arrange the apparatus as shown in the figure below:



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xi.Release the marble from the edge of the watch glass to freely oscillate. Measure the time taken, t, for **5 oscillations.**

t = …………………… (1 mark)

xii. Calculate the periodic time, T

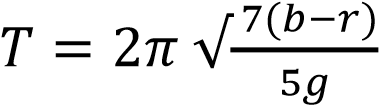
T = ……………………… (1 mark)

(I) Measure the diameter, D of the marble using the micrometer screw-gauge.

D = ……………………m (1 mark)

(II) Determine the volume, V of the marble. (2 marks)

xiii) The period, T, of oscillation of the marble and radius, r of the marble are related by the equation:



Where g = 10 m/s2 and b is a constant of the watch glass. Determine the value of b

(3 marks)