**Term 1 - 2023**

**PHYSICS PAPER 3 (PRACTICAL) -232/3**

**FORM FOUR**

**2.5 Hours**

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

**School**: ……………………………………………………….. **Class**: …………………..

**Signature**: …………………………………………………….. **Date**: …………………...

**INSTRUCTIONS**

* Answer all the questions in this paper
* You are supposed to spend the first 15 minutes of the $2\frac{1}{2}$ hours allowed for this paper reading the whole paper carefully before starting your work.
* Marks are given for clear record of the observations made, their suitability and accuracy and the use made of them.
* Candidates are advised to record observations as soon as they are made
* Mathematical table and electronic calculators may be used.

 For Examiner’s use only:

|  |  |  |
| --- | --- | --- |
| **QUESTION** | **TOTAL MARKS**  | **CANDIDATE’S SCORE** |
| 1 | **20** |  |
| 2 | **20** |  |
| GRAND TOTAL | **40** |  |

**This paper consists of 5 printed pages**

**QUESTION ONE**

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

• Two dry cells

• A cell holder

• A bulb

• A volt-meter

• An ammeter

• A switch

• Amounted resistance wire labelled AB

1. Set up the apparatus as shown in the circuit below.



Figure

1. With the crocodile clip at A (i.e. L = 100cm) take the voltmeter reading (V) and the ammeter reading (I). Record V and I in the table 1 below.

**Table 1**

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

 (7 marks)

1. Repeat the procedure in (b) above for the lengths shown and complete the table above.
2. Explain the changes you observe on the bulb as L decrease from A. (2 marks)

1. Plot a graph of voltage against current (5 marks)



1. Determine the slope of the graph when L = 0.60 m (3 marks)
2. State the significance of the gradient (1 mark)

**QUESTION TWO**

**PART A**

You are provided with the following

* A candle
* A lens and a lens holder
* A screen
* A metre-rule
* Some plasticine
1. Set up the apparatus as shown in figure 2 below (ensure that the candle flame and the lens are approximately the same height above the bench)



Figure 2

1. Set the position of the lens so that it is 40cm from the candle (U = 40 cm). Adjust the position of the screen until a sharp image of the candle flame is obtained. Measure the distance, V between the lens and the screen. Record the value of V

V = ………… cm (1mark)

1. Repeat the procedures in b) above for other values of U in the table b below. (4 marks)

**Table 2**

|  |  |  |  |
| --- | --- | --- | --- |
| U(cm) | 45 | 50 | 55 |
| V(cm) |  |  |  |
| Magnification (m) $=\frac{v}{u}$  |  |  |  |

1. Given that f = $\frac{v}{m+1,}$ where f is the focal length of the lens, use the results in table above to determine the average values of ‘f’ (4 marks)

**PART B.**

You are provided with the following:

* rubber bung.
* Vernier calipers.
* beam balance. (or electric balance)

**Proceed as follows:**

1. Using a Vernier caliper, measure the lengths D, d, and h as shown in **figure 2.**

**d**

**h**

**D**

**Figure 2**

 D = ....................................................... m (1 mark)

 d = ........................................................ m (1 mark)

 h = ........................................................ m (1 mark)

1. Measure the mass, M of the rubber bung using the electric balance.

M = …………………. g M = ............................................... kg (2 marks)

1. Given that $Q= \frac{d+D}{4} $ determine the value of Q. (2 marks)
2. Determine the value of r given that: $πrQ^{2}= \frac{M}{h}$ (3 mark)
3. State the significance of r (1 mark)

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