**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Index No. \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Candidates signature \_\_\_\_\_\_**

**Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**232/3**

**PHYSICS**

**PAPER 3**

**PRACTICAL**

**2 ½ HOURS**

**INSTRUCTIONS TO CANDIDATES**

- Answer all the questions in the spaces provided on the question 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 commencing your work

- Marks are given for a clear record of the observations actually made for their suitability accuracy and for the use made of them.

- Candidates are advised to record their observations as soon as they are made

- Mathematical tables and calculators may be used.

**FOR EXAMINER’S USE ONLY**

**Question 1**

|  |  |
| --- | --- |
| Maximum score | 20 |
| Candidates score |  |

**Question 2**

|  |  |
| --- | --- |
| Maximum score | 20 |
| Candidates score |  |

|  |  |
| --- | --- |
| Candidate’s total |  |

***This paper consists of 4 printed pages***

***Turn Over***

1. You are provided with the following apparatus

- Torch bulb fixed in a bulb holder

- Ammeter (0 -5A)

- Voltmeter (0-5V)

- Switch (s)

- 8 connecting wires (4 with crocodile clips)

- A mounted wire 100cm long

- Two cells

- A cell holder

Set up the apparatus as shown below

A B A Bulb V

**Proceed as follows.**

(a) With the crocodile clip at A (i.e. L = 100cm) take both voltmeter (V) and Ammeter (A) readings. Record these values in the table provided below.

(b) Repeat the procedure in (a) above for L = 80cm, 60cm, 40cm, 20cm and 0cm respectively

(c) Use the value obtained to complete the table below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Length, L, (cm) | 100 | 80 | 60 | 40 | 20 | 0 |
| Current, I (A) |  |  |  |  |  |  |
| Voltage (V) |  |  |  |  |  |  |
| V2 (V2) |  |  |  |  |  |  |
| V/I = R ( Ω ) |  |  |  |  |  |  |

(7mk)

(d) On the grid provided, plot a graph of V2(y – axis) against R (5mks)

(e) Determine the slope of the graph at the point when

(i) R = 7 (3mks)

(ii) R = 4 (3mks)

(f) Give the physical quantity represented by the slope of the graph at any given point. (2mks)

**Question 2**

You are provided with the following

- A screen with cross wires at the centre

- A white screen

- A lens and a lens holder

- A candle

- A match box

- A metre rule

**Proceed as follows**

(a) Arrange the lens and the white screen as shown in the diagram below

Lens holder d screen

Adjust the distance of the screen from the lens until a sharp image of a distant object is formed on the screen. Measure and record the distance, d (cm) (2mks)

(b) Place the metre rule on a horizontal table so that the millimeter scale faces upwards, place the candle at one end of the metre rule and the screen with cross wires at the zero cm mark.

Arrange the lens and the white screen as shown

Candle cross wires lens white screen a b

(i) Adjust the lens so that the distance a is 30cm

(ii) Adjust also the position of the white screen to obtain a sharp image of the cross wires and record the value of distance b in the table.

(iii) Repeat steps b (i) and b (ii) above for values of a = 35cm, 40cm 45cm and 50cm each time recording the corresponding value of b in the table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a (cm) | 30 | 35 | 40 | 45 | 50 |
| b (cm |  |  |  |  |  |
| a + b (cm) |  |  |  |  |  |
| ab (cm2) |  |  |  |  |  |

(7mks)

(c) Plot a graph of a + b (y – axis) against ab.

NB. Your scale on all the axes do not need to start from zero. (5mks)

(d) Determine the slope, s of the graph (3mks)

(e) If the equation of the graph is

f a + b = 1

ab

Use the graph to find the value of f. (3mks)