**Name:………………………………………...…………………..… Index No…………………….…………..**

**School ……………………………………………………………… Candidate’s Signature:…….……………**

 **Date:…………….………………….……**

**232/3**

**PHYSICS PRACTICAL**

**PAPER 3**

**TIME: 2 ½ HOURS**

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

 **INSTRUCTIONS TO CANDIDATES**

1. *Write your name and index number in the spaces provided above.*
2. *Sign and write the date of examination in the spaces provided above.*
3. *Answer* ***ALL*** *the questions in the spaces provided in the question paper.*
4. *You are supposed to spend the first 15 minutes of the 2½ hours allowed for this paper reading the whole paper carefully before commencing your work.*
5. *Marks are given for a clear record of the observations actually made, their suitability, accuracy and the use made of them.*
6. *Candidates are advised to record their observations as soon as they are made.*
7. *Non-programmable silent electronic calculators may be used.*
8. ***This paper consists of 8 printed pages.***
9. ***Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.***
10. ***Candidates should answer the questions in English.***

**For Examiner’s Use Only**

**Question 1**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **a(ii)** | **a(iv)** | **a(vii)** | **a(viii)** | **a(x)** | **b(i)** | **b(ii)** | **b(iii)** | **Total** |
| **Maximum Score** | ½  | 6  | 5 | 3 | 1 ½ | 1 | 1 | 2 | **20** |
| **Candidate’s Score** |  |  |  |  |  |  |  |  |  |

**Question 2**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **a** | **b** | **c** | **d** | **e(i)** | **e(ii)** | **Total** |
| **Maximum Score** | 1 | 6 | 5 | 3 | 3 | 2 | **20** |
| **Candidate’s Score** |  |  |  |  |  |  |  |

 **GRAND TOTAL**

**Question 1 you are provided with the following:**

* **A voltmeter (0-5v)**
* **2 dry cells.**
* **A cell holder**
* **6(six) connecting wire.**
* **100cmlong mounted nichrome wire labeled AB.**
* **An ammeter**
* **A touch bulb in a bulb holder.**
* **Micrometer screw gauge (to be shared)**
1. Arrange the apparatus as shown below.

  **Voltmeter**

**L**

**V**

**A**

**Crocodile clip**

**Nichrome wire**

**Metre rule**

**B**

**100cm mark**

**0 cm mark**

1. make L=100cm and record the voltmeter reading p.d= volts (1mark)
2. Take the voltmeter reading for more value of L downwards to zero and fill the table below (6marks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **L (m)** | 0.9 | 0.8 | 0.4 | 0.2 | 0.1 | 0.0 |
| **p.d (v)** |  |  |  |  |  |  |

1. Plot a graph of p.d (y-axis) against L. (5marks)
2. Deduce from the graph the limiting p.d of the set up (1mark)

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

1. What length of the wire corresponds to the limit p.d (1mark)

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

1. Dismantle you circuit and rearrange it as show below.

**A**

**A**

**B**

 Record

 (i) the ammeter reading I= ……………………………………………… amperes (1mark)

 (ii) Voltmeter reading V= …………………………………………………….. Volts (1mark)

 iii) Using the micrometer screw gauge provided, measure the diameter **d** of the nichrome wire.

 d=……………………………………………………………………………….metre (1mk)

 iv) Calculate the quantity **q** where: q=take L to be = 1m.

 **q**= …………………………………………………………………………………………………………………(2mks)

v) What quantity does **q** represent? (1mk)

………………………………………………………………………………………………………………………………..

2. PART I.

 You are provided with the following apparatus:

* A glass block
* 5 optical pins
* Plain paper
* Drawing board (piece of soft board)

Proceed as follows:

1. Place the glass slab on the white piece of paper which has been fixed on the soft board then trace the outline of the block on the plain paper
2. Place a pin P1 firmly at one end of the slab with your eye at the opposite end of the slab.
3. Place P2 P3 so that they in line with the image 1 of P1 as shown in the diagram.
4. Similarly locate the same image using P4 P5.
5. Produce lines P2P3 and P4 P5. To their point of intersection which is the position of image I

**D**

**I**

**P1**

**Ps**

**P4**

**P3**

**P2**

1. Measure the real depth DP1 and apparent depth DI

DP1= …………………………………………………………………………………cm (½ mark)

DI = …………………………………………………………………………………..cm (½ mark)

Find the ratio  (2marks)

1. What does the ratio above represent? (1mark)

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

2. PART II

 You are provided with

* A candle
* A white screen
* A meter rule
* A lens
* A lens holder
* A stickers
1. Arrange the apparatus as shown below

Light from a

 Distant object (e.g. Cloud)

 Screen Lens

 Holder

Metre rule

1. Adjust the distance of the lens from the screen until a well-focused image of a very distant object, like a tree or clouds, is lens on the screen. Record the distance between the screen and the lens as d.

 d= …………………………………………………………………………………cm (1mark)

1. Now place the lens at the midpoint of the meter rule. IT WILL REMAIN AT THIS POINT THROUGH OUT THE ENTIRE EXPERIMENT. Arrange the screen and then lit candle as shown below.

 **Screen** **Lens**

 Candle

 **y d d X**

 **C A 50cm B D**

 Make the point **A** and **B** each of which a distance‘**d**’ from lens

1. Place the lit candle at point **d**, 30cm from **B**. adjust the position of the screen until a sharp image appears on it. The screen in then at **C**. measure **BD** and **AC** and record them as **x** and **y** respectively in the table below.
2. Repeat the procedure in d above for other values of x in the table and complete it (6marks)

|  |  |  |
| --- | --- | --- |
| **BD**= x(cm) | **AC**=y(cm) | 1/y (cm)-1 |
| 30 |  |  |
| 25 |  |  |
| 20 |  |  |
| 15 |  |  |
| 10 |  |  |
| 5 |  |  |

1. (i) Draw a graph of 1/y (vertical axis) against x (5marks)

 (ii) Determine the slope (s) of the graph (2marks)

 (iii) Calculate the value of m given that m=$\sqrt{\frac{1}{s}}$ (2marks)