**NAME………………………………………………………….. INDEX NO…………………………….**

**SCHOOL……………………………………………………….. CANDIDATES SIGNATURE……….**

**DATE…………………….……………**

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**232/3**

**PHYSICS(PRACTICAL)**

**PAPER 3**

**TIME: 21/2HOURS**

**INSTRUCTIONS TO CANDIDATES**

-Answer ALL the questions in the spaces provided in the question paper.

-You are supposed to spend the first 15 minutes of the 21/2 hours allowed for this paper reading the whole paper carefully before commencing with your work.

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

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

-Mathematical tables and Electronic calculators may be used.

**FOR EXAMINER’S USE ONLY**

|  |  |  |
| --- | --- | --- |
| Question | Maximum score | Candidate’s score |
| 1 | 20 |  |
| 2 | 20 |  |
| Total | 40 |  |

1. You are provided with the following apparatus :

-Resistance wire mounted on a scale labelled MN

-Switch

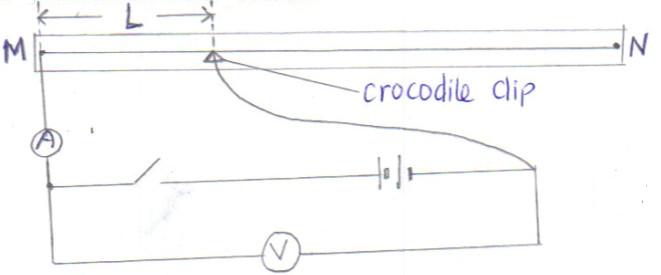
-Voltmeter

-Ammeter

-Two dry cells in a cell holder

- Seven connecting wires

i) Set up the apparatus as shown in the figure below:



ii) Remove the crocodile clip from the resistance wire MN and close the switch. Record the voltmeter reading.

Y = ……………………………V (1mk)

iii) Attach the crocodile clip to the resistance wire such that L =10cm.

iv) Record the voltmeter and the ammeter readings in table 1.

v)Repeat procedures (iii) and (iv) for L=20cm , 30cm, 40cm, 50cm, 60cm, 70cm, and 80cm .

vi) Complete table 1

Table 1

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Length (cm) | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| Current I(A) |  |  |  |  |  |  |  |  |
| p.d. (V) |  |  |  |  |  |  |  |  |
| Y-V(v) |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| R**=** ( Ω) |  |  |  |  |  |  |  |  |

(9mks)

vii) a) Plot a graph of (y-axis) against R. (5mks)



b) Determine the slope of your graph. (3mks)

c)Given that the law relating V, Y and R is

=+ d,determine the values of M and d. (3mks)

2)You are provided with the following:

- A glass block

-soft board

-a plane paper

-four optical pins

-four paper pins

- a protractor

- a 30cm plastic ruler

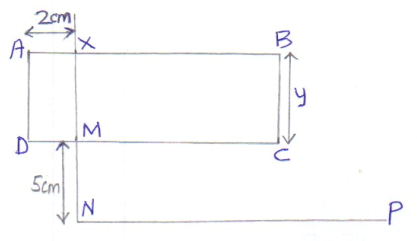
a)Fix the plane paper on the soft board using the four paperpins .

b)Place the glass block on the plane paper. Let the glass block rest on the paper from the broader face.

c)Trace the glass block using a pencil

d) Remove the glass block.

Mark a point X on one of the longer side of the traced glass block as shown in figure 2. Point X should be 2cm from edge A.



e)Construct a normal at X to emerge through line DC. Let this normal meet line DC at point M.

f)Mark point N along the emergent normal 5cm from M.

g)Construct the line NP to meet the normal at N at 900. Line NP can be about 10cm.

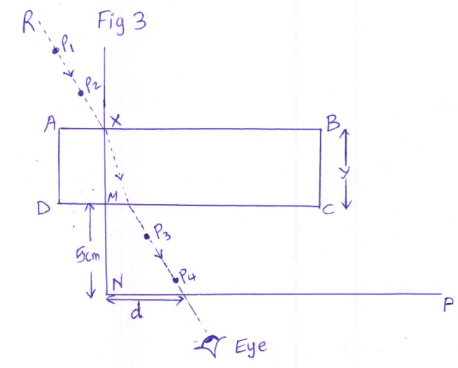
h)Using a protractor, construct an incident ray RX at an angle of incidence = 100. Fix two pins P1 and P2 along RX.

i)Replace the glass block to the traced figure.

j)View the path of the incident ray RX through the glass block using the other two pins P3 and P4. This can be done by ensuring that the images of P1 and P2 are in a straight line with the pins P3 and P4.

k)Remove the glass block and draw the emergent ray through P3 and P4.

l)Measure the distance,d of the emergent ray from point N along line NP as shown in figure 3.



m)Record the corresponding values of d in table 2

Table 2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Angle of incidence i | 100 | 200 | 300 | 400 | 500 | 600 |
| Distance ,d (cm) |  |  |  |  |  |  |
| Sin i |  |  |  |  |  |  |
| Sin2 i |  |  |  |  |  |  |

n)Repeat the procedure for other values of i. (12mks)

o)Plot a graph of sin2 i (y-axis) against d (5mks)

p)Calculate the gradient of the graph. (3mks)

