**NAME ……………………………………..…… CLASS …………………………**

**ADM NO. …………….………………….……..….. SIGNATURE ….………..…..………..**

**232/3**

**PHYSICS**

**PAPER 3**

**PRACTICAL**

**TIME: 2 1/2HOURS**

**FORM 3 END OF TERM 3 EXAMINATION 2022**

**INSTRUCTIONS TO CANDIDATES**

* Write **your name** and **admission number** in the spaces provided
* Answer **ALL** the questions in the spaces provided in the question paper.
* You are supposed to spend the first 15 minutes of the 2 1/2 hours allowed for this paper reading the whole paper carefully before commencing your work.
* Marks are given for clear record of observations made, their suitability, accuracy and the use made of them.
* Candidates are advised to record their observations as soon as they are made.
* **Non-programmable** silent electronic calculators and KNEC mathematical table may be used.
* This paper consists of ***5 printed pages***. Candidates should check to ensure that all pages are printed as indicated and no questions are missing

**FOR EXAMINER’S USE ONLY**

 **QUESTION MAXIMUM SCORE CANDIDATES SCORE**

1. **20**
2. **20**

 **TOTAL 40**

1. You are provided with the following apparatus:-

* + - * A rectangular glass slab.
			* A soft board.
			* White sheets of paper.
			* 4 optical pins.
			* Four tamp pin

NB: You should have mathematical tables / calculator, geometrical set and a transparent ruler.

 **Proceed as follows:**

* + - * 1. Fix a white sheet of paper on the soft board using tamp pins.
				2. Place the glass slab on the white piece of paper. Trace the outline of the glass slap on the paper.
				3. Stick two pins P1 and P2 so that the line joining them falls on the edge of the glass obliquely, forming an angle of 150 with normal NA.
				4. Stick two other pins P3 and P4 so that they appear to be in line with the images of object pins P1 and P2 in the slab as shown on the diagram below.



* + - * 1. Now remove the slab. Draw the lines joining P1 and P2 and P3 and P4. Extend the two lines to meet the outline of the block at the points A and B respectively. The lines P1 and P2, AB and P3 and P4 show the path the ray follows as it passes from one medium to another: air to glass and back to air again. Mark the direction with arrows.
				2. Measure the angle of refraction (r) between AB and the normal. Record it in the table below. Repeat the procedure for angles of incidence of 300, 450, 600 and 750 and record the values in the table below. (7mks)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Angle of incidence (i0) | 150 | 300 | 450 | 600 | 750 |
| Angle of refraction (r0) |  |  |  |  |  |
| Sin i0 |  |  |  |  |  |
| Sin r0 |  |  |  |  |  |

* + - * 1. Draw a graph of sin i0 (Y-axis) against sin r0 (X-axis) in the grid provided below. (5mks)



* + - * 1. Determine the gradient of the graph and write down the equation of the graph. (3mks)
				2. Compare the value of refractive index, ŋ, if ŋ = sin i / sin r using a point on the graph. (3mks)
				3. NB: Remember to hand in the pieces of white sheet of paper you used. (2mks)
1. You are provided with the following apparatus
* Two dry cells
* An ammeter
* A voltmeter
* A cell holder
* Five connecting wires
* A jockey
* A nichrome wire mounted on a mm scale labeled PQ

 **PROCEDURE**

1. Set up the apparatus as shown below

100

0

P

R

Q

 Disconnect the jockey from the wire at point R and record the voltmeter reading V and the corresponding ammeter reading. (2marks)

 V =........................................................................................................................................

 I = ............................................................................................................................................

1. Now connect the jockey at the 70cm mark and record the voltmeter reading V and the corresponding ammeter reading in the table below. Repeat for values of V and J at the 50cm, 40cm, 30cm,20cm and10cm mark (6 marks)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Length cm | 70 | 50 | 40 | 30 | 20 | 10 |
| p.d (v) |  |  |  |  |  |  |
| Current I(A) |  |  |  |  |  |  |

1. Plot a graph of p.d (v) against current I (5marks)



1. From the graph determine
	1. The e.m.f of one cell (2marks)
	2. The internal resistance of one cell, given that E = V + Ir (3marks)
	3. The voltage p.d when current I=0.05A (1mark)
	4. The current I when the p.d voltage is 1.0V (1mark)