 **232/3 - PHYSICS - PAPER 3**

 **(PRACTICAL)**

 **MAY 2022- 2 ½ hours**

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

**Name----------------------------------------------------- Index No -----------------------**

**Candidate sign. ----------Date -------------**

**2022 TRIAL 1 MAY INTERNAL EXAMINATION**

**Instructions to candidates**

* *Answer All the questions in the spaces provided in the questions 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 your work.*
* *Marks are given for a clear record of the observations actually made, their suitability, accuracy and the use of them.*
* *Non-programmable silent electronic calculators and KNEC mathematical tables may be used*.

**For examiners use only**

Questions 1

Question 2

Grand total

**Question 1**

PART A

You are provided with the following.

* A resistance wire PQ mounted on a mm scale
* An ammeter
* A voltmeter
* A switch
* Two new dry cells and cell holder
* Seven connecting wires at least two with crocodile clips

Proceed as follows:

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

 cells

 Wire on mm scale

 P L Q

1. Open the switch and record the voltmeter readings

E=.......................................volts (1mk)

1. (i) Starting with L =70cm, read and record the readings of voltmeter in table 1 provided.

Table 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Length L (cm) | 70 | 50 | 40 | 30 | 20 | 10 |
| Current I(A) |  |  |  |  |  |  |
| P.d V(volts) |  |  |  |  |  |  |

(ii) Repeat step c (i) above for other values of L given in the table 1 above (5marks)

1. Plot a graph of p.d (y-axis) against I (5marks)



1. Given that the graph is govern by the equation E=V+Ir,determine
2. The e.m.f of the two cells in series (2marks)
3. The internal resistance of the two cells (2marks)

PART B

You are provided with the following

* A lens and lens holder
* A candle
* A screen
* A metre rule

Proceed as follows:

Set up the apparatus as shown in figure 2

candle lens screen

 U V

1. Starting with U =30cm,adjust the position of the screen to obtain a sharp image of the candle. Record the value of V in table 2
2. Repeat the procedure in (f) for U=40cm.Complete the table. (2marks)

|  |  |  |
| --- | --- | --- |
| U(cm) | V(cm) | m=V U  |
| 30 |  |  |
| 40 |  |  |

Table 2 tfbvg

1. Given that the focal length of the lens satisfies the equation f= V determine the average value of focal length f.

 1+m (3marks)

**Question 2**

PART A

You are provided with the following :

* A metre rule
* A knife edge
* One 50g mass and a 100g mass
* Some thread
* Liquid L in a beaker
* Tissue paper

Proceed as follows:

1. Balance the metre rule on the knife edge and record the reading at this point

Balance point............................cm (1mk)

For the rest of this experiment the knife edge must be placed at this position

1. Set up the apparatus as shown in the figure 1. Use the thread provided to hang the masses such that the positions of the support can be adjusted.

 X D 10cm

 Water

 50g

100g

 Figure 1

The balance is attained by adjusting the position of the 100g mass. Note that the distance X and D are measured from the knife edge and the 50g mass is fully immersed in water. Record the values of X and D

X=..............................cm (1mark)

D=..............................cm (1mark)

 Apply the principle of moments to determine the weight W1 of the 50g mass in water and hence determine the uphrust Uw in water

W1 =................................................ (2marks)

Uw=................................................. (1mark)

Remove the 50g mass from water and dry it using tissue paper.

1. (i) now balance the metre rule when the 50g mass is fully immersed in the liquid L. Record the value of distance X

X=................................................................................................(1mark)

1. Apply the principle of moments to determine the weight W2 of the 50g mass in the liquid L and hence determine the uphrust UL in the liquid.

W2=............................................................................. (1mark)

UL=.............................................................................. (1mark)

1. Determine the relative density R.D of the liquid L given that:

R.D = UL (1mark)

 UL

1. Find the density of liquid X in kg/m3.( given that density of water is 1000kg/m3) (1mark)

PART B

You are provided with the following

* A rectangular glass block
* Four optical pins
* A piece of soft board
* A plain sheet of paper
* 4 thumb pins

Proceed as follows

1. Place the plain sheet of paper on the soft board and fix it using the thumb pins provided .

Place the glass block at the centre of the sheet, draw its outline. Remove the glass block .

 P1 glass block

 P2

 Ø

 P3

 P4

 d

1. Draw a normal at a point 2cm from the end of the longer side of the block outline. This normal line will be used for the rest of the experiment. Draw a line at an angle of angle Ø=250 from the normal .Stick two pins p1 and p2 vertically on this line.
2. By viewing through the glass from the opposite side, stick two other pins p3 and p4 vertically such that they are in line with the images of the first two pins. Draw a line through the marks made by p3 and p4 to touch the outline. Extend the line p1p2 through the outline (dotted line) .Measure and record in the table the perpendicular distance d between the extended line and the line p3 and p4 Record this value in the table.
3. Repeat the procedure in (g) and (h) for other values of Ɵ shown in the table.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ɵ (deg) | 25 | 35 | 40 | 45 | 55 | 60 | 65 |
| d(cm) |  |  |  |  |  |  |  |

 (3marks)

1. (i) plot a graph of d against Ɵ (5mark)



 (ii) Use the graph to estimate the value of d when Ɵ =0 (1mark)