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PHYSICS PRACTICAL

## PAPER 3

FORM 4
MARCH/APRIL 2 2 捔
TIME:2 HOURS

## BARINGO NORTH TRIAL EXAMINATIONS

## The Kenya Certificate of Secondary Education (KCSE)

## INSTRUCTIONS:

a) Write your name and index number un the spaces provided above.
b) Answer all the questions in the spaces provided in the question paper.
c) You are supposed to spend the first $\mathbf{1 5}$ minutes of the $2^{1 / 2}$ hours allowed for this paper reading the whole paper carefully before commencing your work.
d) Marks are given for a clear record the observations actually made their suitability accuracy and the use made of them.
e) Candidates are advised to record their observations as soon as they are made
f) KNEC mathematical table and non-programmable silent calculators may be used.

QUESTION 1

|  | c | d | e | f | g | h | Total |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Maximum score | 5 | 1 | 5 | 1 | 2 | 6 | 20 |
| Candidates score |  |  |  |  |  |  |  |

QUESTION 2

|  | (a) | (b) | (d) | (e) | (f) | (g) | (h) | Total |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Maximum score | 3 | 1 | 6 | 5 | 2 | 2 | 1 | 20 |
| Candidates score |  |  |  |  |  |  |  |  |


| Grand Total |  |
| :--- | :--- |

Q1. You are provided with the following apparatus

- 2 dry cells, size $D$ and a cell holder
- Two carbon resistors
- 100 cm nichrome wire mounted on a millimeter scale
- 8 connecting wires ,at le least 4 with a crocodile clips
- A switch
- A jockey
- An ammeter ( $0-1 \mathrm{~A}$ )
- A 20 oltmeter $(0-5 \mathrm{~V})$


## Proceed aşfollows

a) $\rho_{\text {Connect the apparatus as shown in fig. } 1 \text { shown below }}$


Fig. 1
b) Place the jockey at $L=20 \mathrm{~cm}$ from $\boldsymbol{x}$ and then close the switch. Record the ammeter reading and the voltmeter reading in the table 1 below.
c) Repeat procedure (b) above with the jockey at $\boldsymbol{L}=40,60,70,80$ and 90 cm from $\boldsymbol{x}$. Record the voltmeter and ammeter readings and complete the table.

| Length <br> L(cm) | I(A) | p.d(v) | I (MA) | p.d(MV) | $\log$ I | $\log$ V |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 20.0 |  |  |  |  |  |  |
| 40.0 |  |  |  |  |  |  |
| 60.0 |  |  |  |  |  |  |
| 70.0 |  |  |  |  |  |  |
| 80.0 |  |  |  |  |  |  |
| 90.0 |  |  |  |  |  |  |

d) On the grid provided, plot a graph off Log I (yefixis) against Log V.

e) Determine the slope of the graph.
 constants.
From the equation $\log I=n \log \operatorname{DV}^{5}+\log \boldsymbol{K}$. Determine using your graph the value of;

$$
n
$$


k


## Q2. Rairt $A$

## You are provided with the following:

- A coin (20shillings coin)
- Metre rule (labeled with its mass)
- Knife edge
- Measuring cylinder, 100 ml
- Container with water


## Procedure

i) $\quad$ Record the mass of the rule $\mathrm{M}_{\mathrm{r}}$.

$$
M_{r} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots, g
$$

ii) Balance the rule on the knife edge
C.O.G = $\qquad$ cm
iii) Put the rule on the knife edge $\boldsymbol{d}_{I} \mathrm{~cm}$ from the centre of the rule.
iv) Place the coin as shown in the fig below and adjust it until it gain balances horizontally.

Fig. 2


vii) Using the measuring cylinder, estimate the volume of the coin

viii) Calculate the density of the material of the coin

$$
\begin{aligned}
\ell c & =\frac{M_{c}}{V_{c}} \\
\ell \mathrm{c} & =\ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \cdot \mathrm{g} / \mathrm{cm}^{3}
\end{aligned}
$$

## Part B

## You are provided with:

- $\quad$ Beaker labeled B, 1000 ml
- Plain paper - white
- Complete retort stand
- $\quad$ Plane mirror ( 10 cm by 5 cm )
- Optical pin P
- Water in a container
- Plasiticine
- $\quad$ Half metre rule, 1 metre rule
- Cork


## Procedure

i) Mark a black line on the white paper provided and place it beneath the base of the beaker, with the mark near the centre of the base of the beaker.
ii) Set up the apparatus provided as shown in fig 3 below.

iii) Measure the distance, AN

AN $\qquad$
iv) Introduce water into the beaker to a height of $\mathrm{h}=6.5 \mathrm{~cm}$
v) Adjust the height of the pin above the mirror by sliding the cork up and down the glass rod until there is no parallax bet iveen its image in the mirror and the image of the black line.
vi) Measuregind record distance AP.
AP ......................................... Cm
(1/2mark)

Record g, where $\mathrm{g}=\mathrm{AP}-(\mathrm{AN}-\mathrm{h})$
viii) Repeat steps (iv) to (vii) for four other heights $\boldsymbol{h}$, shown in the table below.

| Height h(cm) | 6.5 | 9.0 | 11.0 | 13.5 |
| :--- | :--- | :--- | :--- | :--- |
| AP (cm) |  |  |  |  |
| $\mathrm{g}(\mathrm{cm})$ |  |  |  |  |

ix) Plot a graph of height, $\boldsymbol{h}$ against $\boldsymbol{g}$.
(1)
x) Calculate the slope of the graph.


