535/3
PHYSICS
PRACTICAL
PAPER 3
July/August 2023
$2^{1}/_{4}$ hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

PHYSICS PRACTICAL

Paper 3

2hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

- Answer question 1 and one other question. You will not be allowed to start with the apparatus for the first 15 minutes.
- Marks are given mainly for a clear record of the observations actually made and use made of them. Whenever possible candidates should put their observations in a suitable table drawn in advance, as soon as they are made.
- An account of the method of carrying out the experiment is not required.
- Graph papers may be provided.
- Mathematical tables and silent non-programmable calculators may be used.

Turn Over

1. **In this experiment you will determine a constant ß of the spring provided**

PART I

(a) Suspend a mass **W** = 0.20 kg from the suspended spring.

(b) Push **W** down wards a short depth and release it

(c) Measure and record the time, t, for 20 oscillation.

(d) Calculate the time, T, for one oscillation.

PART II

(a) Clamp the given spring provided as shown in figure 1 below.

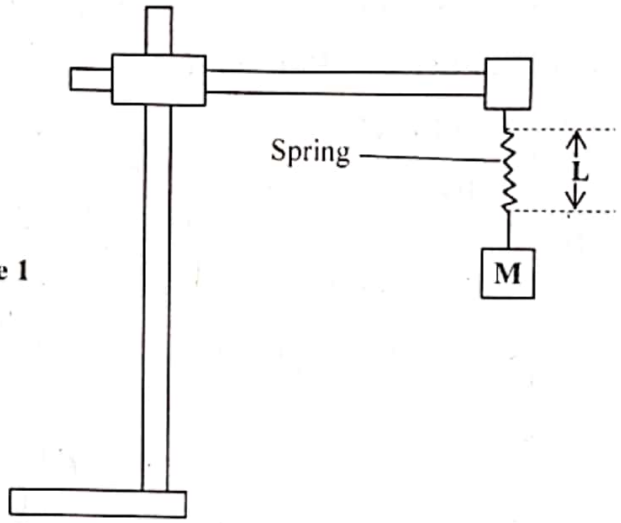

Figure 1

(b) Measure and record the length L_o of the unstretched spring in ~~meters.~~ metres

(c) Add a mass M = 0.05 kg to the spring, measure and record the new length L of the spring in meters.

(d) Repeat procedures (c) for M = 0.10, 0.15, 0.20, 0.25 and 0.30 kg

(e) Tabulate your results.

(f) Plot a graph of L against M.

(g) From your graph find the value of M for which $L = 2L_o$. Call this value M_1

(h) Calculate ß from

$$\beta = \frac{W \times L_0}{M_1 \times T^2}$$

(i) State the possible sources of errors.

2. In this experiment you will determine the refractive Index, n, of glass

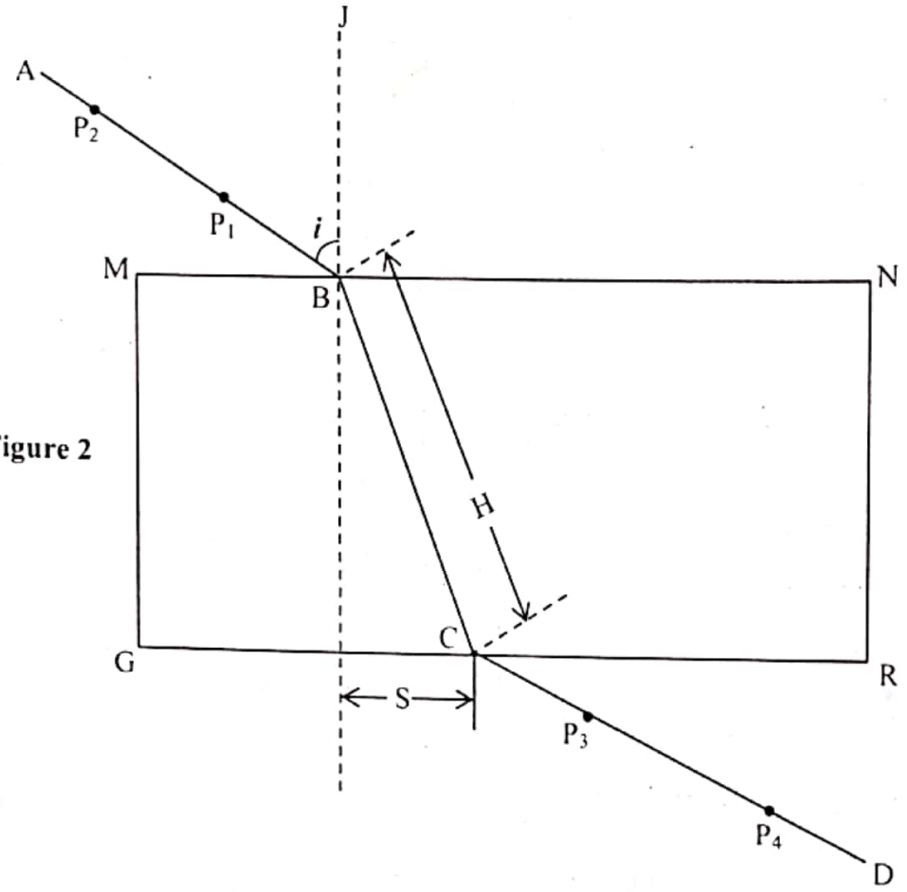

Figure 2

(a) Fix the white sheet of paper provided on a soft board.

(b) Place the glass block in the middle of the sheet of paper but towards yourself and trace its outline **MNRG** as shown in *figure 2* above.

(c) Remove the glass block.

(d) Draw a normal **JB** to **MN** at **B,** 2cm from **M.**

(e) Draw a line **AB** at an angle $i = 10^0$ from **JB.**

(f) Replace the glass block on its outline.

(g) Stick two pins $\mathbf{P_1}$ and $\mathbf{P_2}$ vertically along **AB.**

(h) Looking through the glass block from the opposite face **GR**, stick two pins $\mathbf{P_3}$ and $\mathbf{P_4}$ such that they appear to be in line with images of $\mathbf{P_1}$ and $\mathbf{P_2}$

(i) Remove the glass block and draw a line CD through $\mathbf{P_3}$ and $\mathbf{P_4}$

(j) Join **B** to **C**

(k) Measure and record the distances, **S** and **H**

(l) Repeat procedures (e) to (k) for values of $i = 20^0, 30^0, 40^0, 50^0$ and 60^0

(m) Enter your results in a table including values of sin i and $\frac{S}{H}$

(n) Plot a graph of sin i against $\frac{S}{H}$

(o) Find the slope, n , of your graph.

(p) State the possible sources of errors.

HAND IN YOUR TRACING PAPER

Turn Over

3. **In this experiment you will determine the internal resistance, r, of the pair of dry cells.**

PART I

(a) Connect up the circuit as shown in figure 3 below

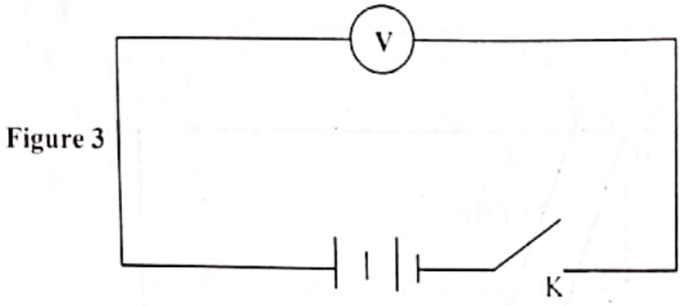

Figure 3

(a) Close switch, K

(b) Read and record the voltmeter reading, E

PART II

(a) Disconnect the circuit in part I and connect the circuit as shown in figure 4 below.

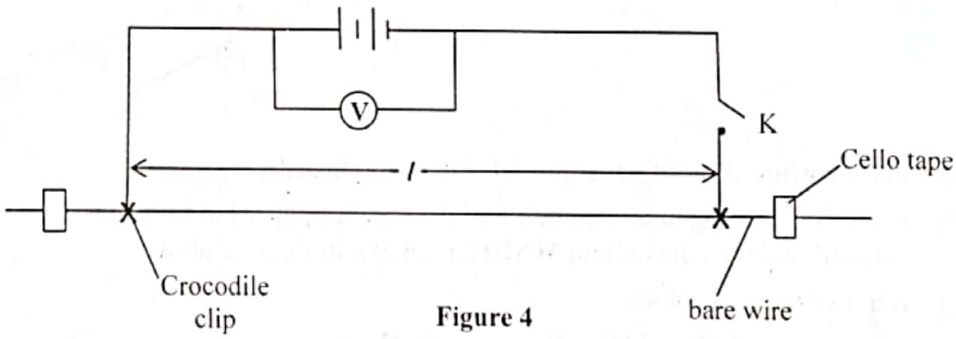

Figure 4

(b) Adjust, the length, l to 0.200 m

(c) Close switch, K

(d) Read and record the voltmeter reading, V

(e) Open switch, K

(f) Repeat the procedures (b) to (e) for values of l = 0.300, 0.400, 0.500, 0.600 and 0.700 m

(g) Record your results in a suitable table including values of **(E-V)** and $\left(\frac{V}{l}\right)$

(h) Plot a graph of **(E-V)** (along the vertical axis) against $\frac{V}{l}$ along the horizontal axis.

(i) Find the slope, **S,** of the graph.

(j) Calculate the resistance per metre, r from the expression $\mathbf{r} = 4.20s$

(k) What are the possible sources of error.

END