535/3
PHYSICS
PRACTICAL
PAPER 3
July/August 2017
$2^{1}/_{4}$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 working with the apparatus for the first 15 minutes.
- Marks are given mainly for a clear record of the observations actually made, for their suitability and accuracy, and for the use made of them.
- Candidates are reminded to record their observations as soon as they are made. Whenever possible, candidates should put their observations and calculations in a suitable table drawn in advance.
- 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 the constant C for a material of a bicycle spoke.

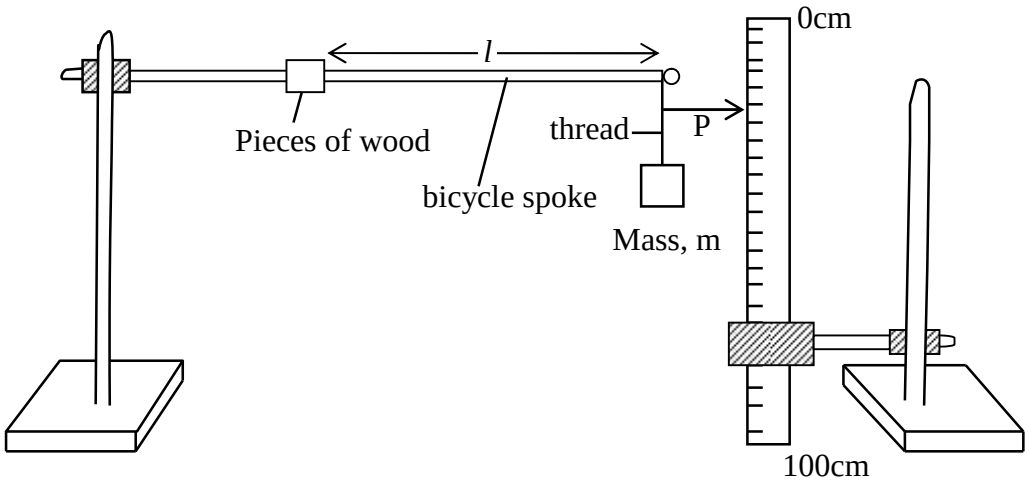

Figure 1

(a) Clamp the spoke firmly between two pieces of wood with a length, l = 20.0cm projecting, as shown in figure 1 above.

(b) Clamp a metre rule vertically and place it next to the spoke.

(c) Attach a pointer provided on the thread tied on the spoke using cello tape.

(d) Read and record the initial position of the pointer, P_0.

(e) Suspend a mass, m = 0.10kg on the thread from the spoke.

(f) Read and record new position, P of the pointer on the metre rule.

(g) Determine the depression x of the spoke.

(h) Repeat procedures (c) to (g) for values of m = 0.12, 0.14, 0.16, 0.18 and 0.20kg.

(i) Record your results in a suitable table.

(j) Plot a graph x (along the vertical axis) against m (along the horizontal axis)

(k) Determine the slope, S of the graph.

(l) Calculate the constant, C from the expression

$$C = \frac{32gl^3}{0.02®S}$$

2. In this experiment you will determine the refractive index, n of a material of a glass block.

(a) Fix the plain white sheet of paper on the soft board using drawing pins.

(b) Place the glass block on the white sheet of paper and trace out its outline ABCD as shown in figure. 2 below.

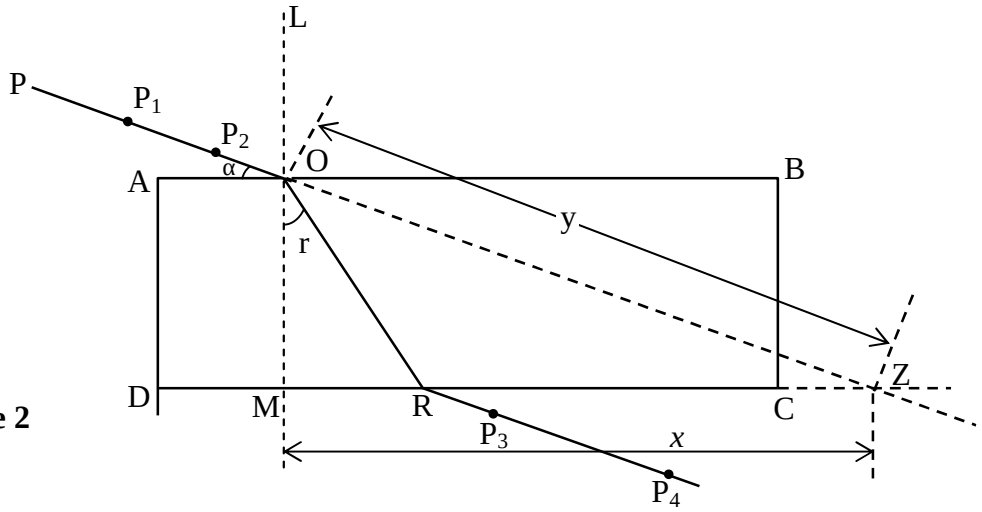

Figure 2

(c) Remove the glass block and draw a normal LM at O, 2cm from A.

(d) Draw a line PO such that the angle $\alpha = 25^{o}$ from AO.

(e) Place the glass block back on its outline.

(f) Stick two pins P_1 and P_2 vertically along PO.

(g) Looking through the face DC of the glass block, fix two pins P_3 and P_4 such that they are in line with the images of P_1 and P_2.

(h) Remove the glass block and the pins, and then draw a line through P_3 and P_4 to meet DC at R.

(i) Draw a line to join R to O.

(j) Produce PO and DC to meet at Z.

(k) Measure and record the length x and y and the angle r.

(l) Repeat producers (d) to (k) for value of $\alpha = 35^{o}, 45^{o}, 55^{o}$ and 65^{o}.

(m) Record your results in a suitable table including values of $\frac{x}{y}$ and $\sin r$.

(n) Plot a graph of $\frac{x}{y}$ against $\sin r$.

(o) Determine the slope, n of the graph.

NB: Fasten the tracing paper used in the experiment on the front page of your answer script.

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

(a) Read and record the resistance R_S of the resistor R provided.

(b) Connect the circuit with the cells in series and the voltimeter across as in figure, 3 below.

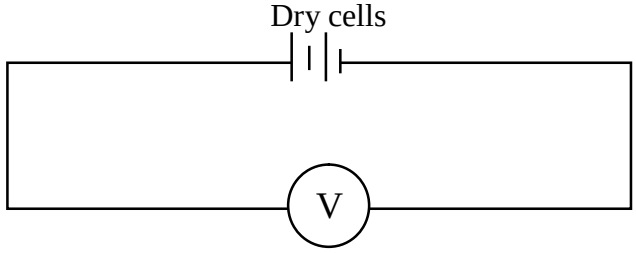

Figure 3

Turn Over

(c) Read and record the voltimeter reading V_0.

(d) Fix the bare wire, P provided on the bench or metre rule using cello tape.

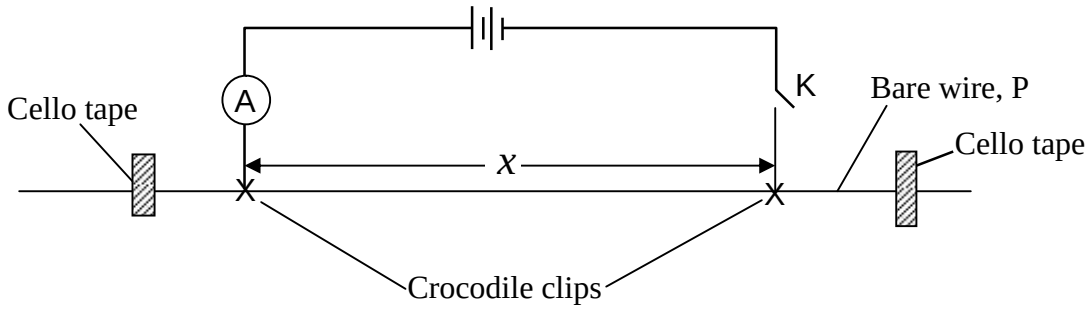

Figure 4

(e) Connect the circuit as shown in figure 4, above starting with length x = 0.200m.

(f) Close switch, K

(g) Read and record the ammeter reading, I

(h) Open switch, K

(i) Repeat procedures (e) to (h) for values of x = 0.300, 0.400, 0.500, 0.600 and 0.700

(j) Record your results in a suitable table including values of $\frac{1}{I}$ and $\frac{1}{x}$

(k) Plot a graph of $\frac{1}{I}$ against $\frac{1}{x}$

(l) Find the intercept, C on the $\frac{1}{I}$ axis.

(m) Calculate the internal resistance, r from the expression

$$r = V_0C - R_S$$

END