535/3
Physics practical
Paper 3
July/August 2019
2¼ hours

BUGANDA EXAMINATIONS COUNCIL MOCKS

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 quarter of an hour.
- ✓ 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 minded 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 carryout the experiment is not required.
- ✓ Mathematical tables, slide rulers and silent non-programmable calculators may be used.

1. In this experiment you will determine the density, of the steel rod provided.

(30 marks)

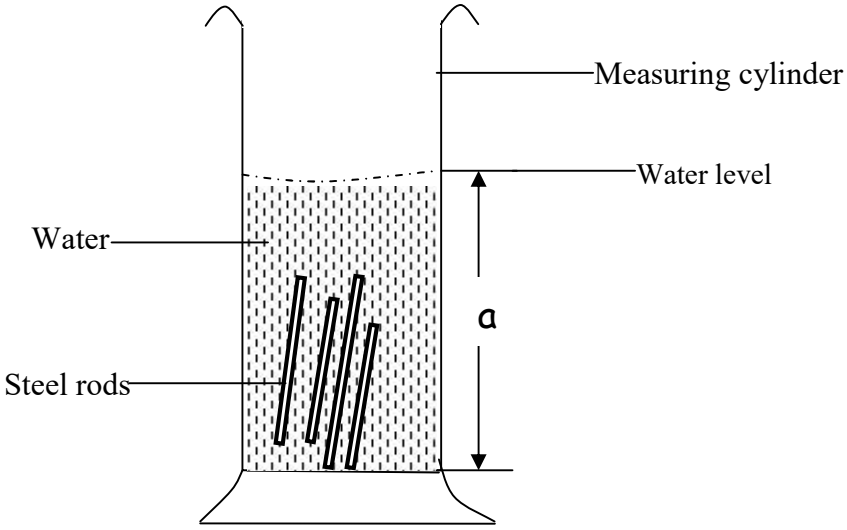
Part I

(a) Measure and record the mass, M of the bundle of steel rods provided.
(b) Pour water into the measuring cylinder up to the 60ml mark.
(c) Read and record the volume, P_o of the water level.
(d) Carefully place a total number of steel rods n = 6 into the cylinder.
(e) Read and record the new volume, P of the water level
(f) Calculate the density, ℓ of the steel rod ,

$$from\ \ell = \frac{m}{P - P_0}$$

Remove the steel rods and dry them.

Part II



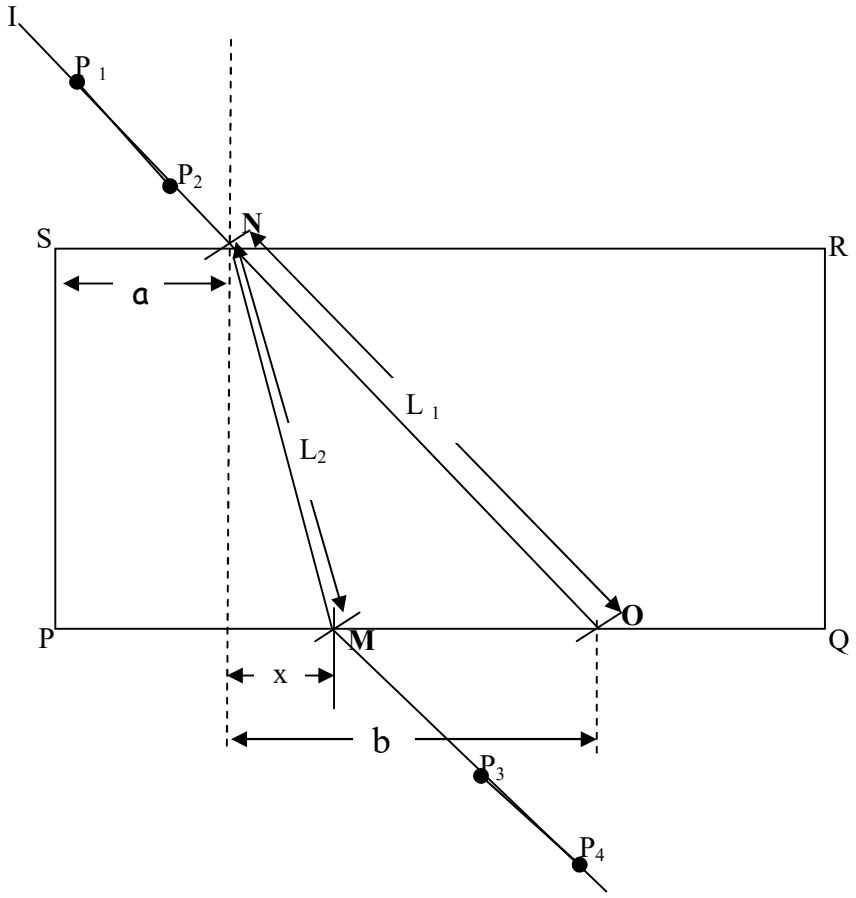
(a) While maintaining the level of water as in part I, measure and record the height, a_o of the water in the cylinder.
(b) Gently place a rod, n = 1, into the cylinder.
(c) Measure the new height, a of the water in the cylinder.
(d) Repeat procedures (b) and (c) for n = N = 2, 3, 4, 5 and 6 rods.
(e) Tabulate your results in a suitable table including values of $(a - a_o)$
(f) Plot a graph of n (along the vertical axis) against $(a - a_o)$ (along the vertical axis)
(g) Find the slope, λ of the graph.

(n) Calculate the volume **V** of the steel rod from, $\lambda V = 5.7$.

Hence determine the density, ρ_2 of the rod from $6\rho_2 V = m$.

2. In this experiment, you will determine the refractive index, n of the material of the glass block. (30 marks)

(a) Place the glass block on a plain sheet of paper and trace its outline PQRS.



(b) Construct a normal N, on SR such that a = 1.5cm.
(c) Mark another point O on PQ such that b = 1.0cm.
(d) Join O to N and extend it to I
(e) Replace the glass block. Fix pins P_1 and P_2 on the line IN. Use two other pins P_3 and P_4 to trace the ray of light through the glass block.
(f) Remove the glass block, Join P_3 and P_4 and extend it to M. Join M to N.
(g) Measure and record distances L_1, L_2 and X.
(h) Repeat procedures (c) to (g) for values of b = 2.0, 3.5, 5.0, 7.0 and 9.0cm.
(i) Tabulate your results including values of;

$$\frac{L_1}{L_2} \text{ and } \frac{b}{x}$$

(j) Plot a graph of $\frac{L_1}{L_2}$ $against$ $\frac{b}{x}$

(k) Find the slope, S of your graph.

(l) Calculate N, from Sn = 1.

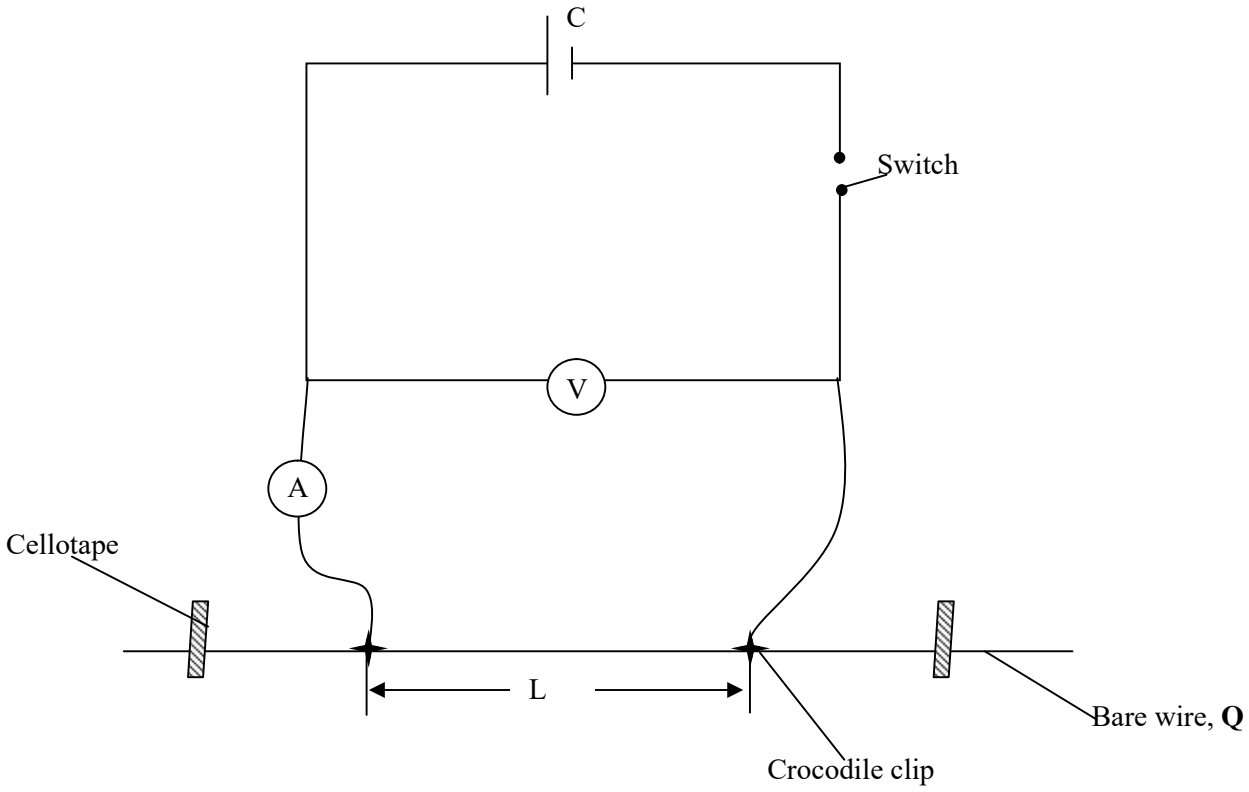
(m) Comment on your answer.

HAND IN YOUR TRACE PAPER.

3. In this experiment you will determine the internal resistance, **r** of the dry cell. (30 marks)

Part I

(a) Connect the circuit as shown in figure 3.



(b) Keep **I** = 0.20A, by adjusting the crocodile clip along the wire.

(c) Read and record the voltmeter reading, V_1 and distance, **L** between the clips.

(d) Determine the value of, **K** from

$$K = \frac{5V_1}{L}$$

Part II

(e) Adjust the length, **L** to 70.0cm between the crocodile clips.

(f) Read the ammeter reading, **I**

(g) Repeat the procedures (e) to (f) for values of L = 60.0, 50.0, 40.0, 30.0 and 20.0cm.

(h) Dismantle the set up and connect the voltmeter across the cell.

(i) Read and record the voltmeter reading, V_o.

(j) Tabulate your results including values of $\frac{V_o}{I}$ and KL.

(k) Plot a graph of $\frac{V_o}{I}$ against KL

(l) Read and record the value, r, on the vertical axis when the horizontal axis reads, 0.

END