535/3
PRACTICAL
PHYSICS
(Paper 3)
July / August 2023
2¼ hours

JINJA JOINT EXAMINATIONS BOARD

Uganda Certificate of Education

MOCK EXAMINATIONS

July / August 2023

(PRACTICAL PHYSICS)

Paper 3

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

*Answer **question 1** and **one** other question.*

*Any additional question(s) answered will **not** be marked.*

*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 observations actually made, for their suitability and accuracy, and for the use made of them.

Candidates are required to record their observations as soon as they are made. Wherever 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.

Squared papers are provided.

Mathematical tables and silent non-programmable calculators may be used.

For each question, candidates will be required to select suitable apparatus from the equipment provided.

1. In this experiment, you will determine the constant, p, of the metre rule.

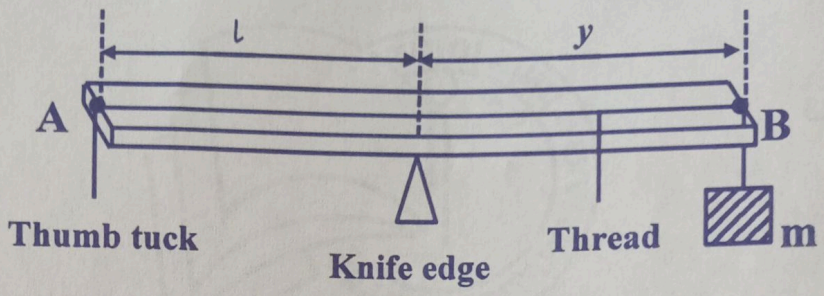

Fig 1

(a) Using a thumb tuck, fix one end of the thread provided firmly at the end, A of the metre rule.

(b) Tie a mass, m = 0.050kg at the end of the thread as shown in figure 1.

(c) Balance the metre rule on the knife edge.

(d) Read and record the balance lengths, l and y in metres.

(e) Repeat the procedure (b) to (d) for the values of m = 0.100, 0.150, 0.200, 0.250 and 0.300 kg.

(f) Record your results in a suitable table including values of 1/y.

(g) Plot a graph of m against 1/y.

(h) Find the slope, S, of the graph.

(i) Calculate the property, P, of the metre rule from the expression: $S = \frac{1}{2}p$

(j) What could be the source of error?

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

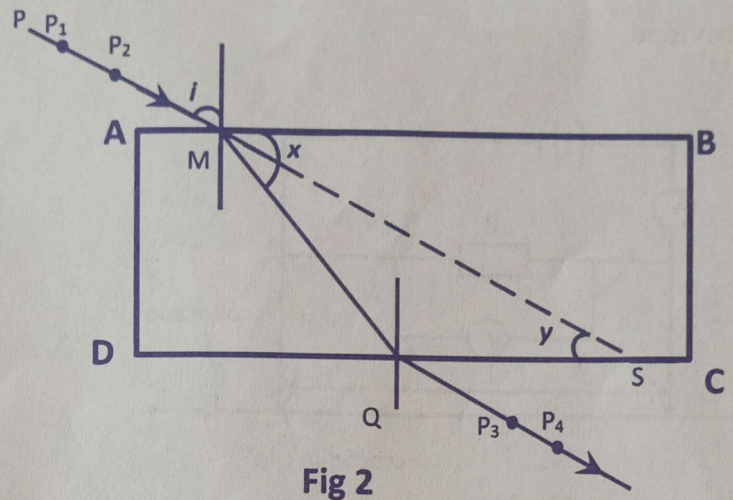

Fig 2

(a) Fix the tracing paper on the soft board using the thumb tucks.
(b) Place the glass block on the tracing paper with the broad face upper most
(c) Trace the outline of the glass block.
(d) Remove the glass block and label the outline as ABCD as in figure 2.
(e) Draw a perpendicular to AB at M such that AM = 3 cm.
(f) Draw a line PM such that angle $i = 60^0$.
(g) Fix pins P_1 and P_2 vertically on the line PM as shown in figure 2.
(h) Replace the glass block on its outline.
(i) Viewing through the glass block from side CD, fix pins P_3 and P_4 such that they appear to be in line with the images of P_1 and P_2.
(j) Remove the glass block and pins.
(k) Draw a line through P_3 and P_4 to meet CD at Q.
(l) Join Q to M.
(m) Measure angle x.
(n) Produce the line PM to meet CD at S.
(o) Measure angle y.
(p) Repeat procedures (f) to (o) for values of i = 50^0, 40^0, 30^0, 20^0 and 10^0.
(q) Record your results in a suitable table including values of $cosx$ and $cosy$.
(r) Plot a graph of $cosx$ against $cosy$.
(s) Find the slope, w of the graph.
(t) Calculate, n, from the expression: $n = \frac{1}{w}$.
(u) State one source of error.

HAND IN YOUR TRACING TOGETHER WITH YOUR ANSWER SHEETS

3. In this experiment, you will determine the resistance R and the constant, α of the bare wire, w provided.

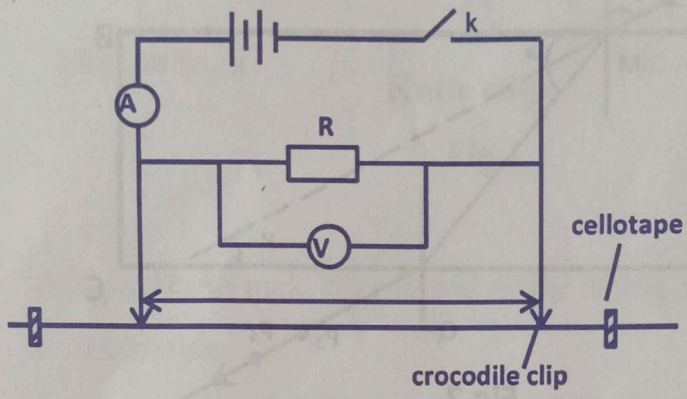

Fig 3

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

(b) Adjust the value of x to 0.900m.

(c) Close switch k.

(d) Read and record the reading, I, of the ammeter and, V, of voltmeter.

(e) Open switch k.

(f) Repeat procedure (b) to (e) for values of x = 0.800, 0.700, 0.600, 0.500 and 0.400 m.

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

(h) Plot a graph of $\frac{I}{V}$ against $\frac{1}{x}$.

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

(j) Read and record the intercept, c, on the $\frac{I}{V}-$ axis.

(k) Calculate, α from the expression: $S = \frac{1}{\alpha}$.

(l) Calculate, R from the expression: $c = \frac{1}{R}$.

(m) State one source of error.

 End