535/3
Pysics
Practical
Paper 3
July- August 2023
2¼ Hours

UGANDA MUSLIM TEACHERS' ASSOCIATION
UMTA JOINT MOCK EXAMINATIONS -2023
UGANDA CERTIFICATE OF EDUCATION
PHYSICS PRACTICAL
PAPER 3
2hours 15minutes

INSTRUCTIONS TO CANDIDATES:

*Answer question **1** and one other question. Any additional question(s) answered will **not** be marked.*

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

*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 reminded to record their observations as soon as they are made. Wherever possible, candidates should put their observations in a suitable table Drawn in advance.

*All your work must be in **blue** or **black** ink. Any work done in pencil will **not** be Marked.*

*Details on the question paper should **not** be repeated in the answer **nor** is the Theory of the experiments required unless specifically asked for. Candidates Should, however record any special precautions they have taken and any Particular feature of the method of going about the experiments.*

Squared papers are provided.

Mathematical tables and non-programmable scientific calculators may be Used.

Turn over

1. In this experiment you will determine the constant, μ. **(30 marks)**

(a) Clamp the metre rule horizontally so that its scale faces you.

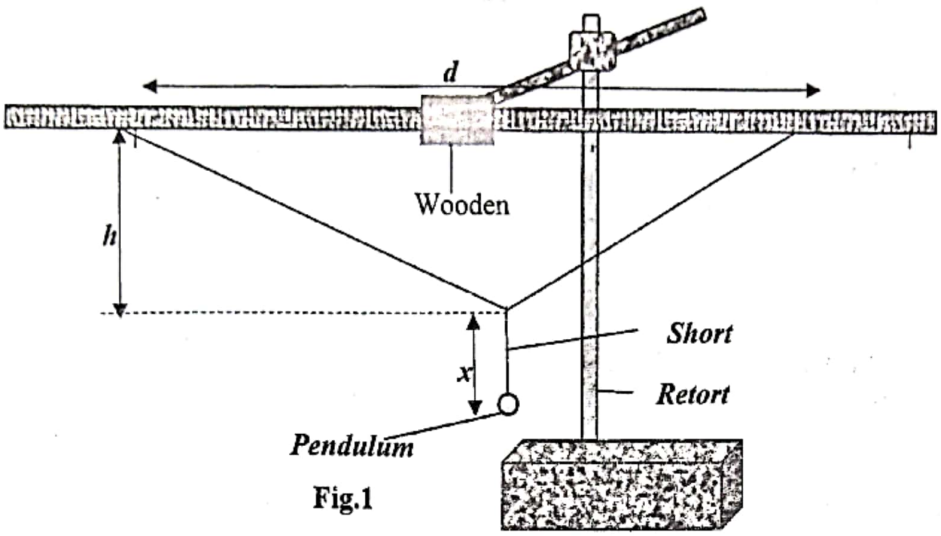

Fig.1

(b) Make a loop at the end of the long piece of thread.

(c) Slide the metre rule through the loop and tighten the loop.

(d) Tie the other end of the thread on the metre rule such that the length of the thread between the two loops is 1.00m.

(e) Tie the pendulum bob at the end of the short piece of thread.

(f) Suspend the pendulum bob at the midpoint of the looping thread such that the length, $x = 0.300$m as shown.

(g) Adjust the two loops such that the distance, d between them is 0.200m.

(h) Measure and record the height, h in metres.

(i) Displace the bob towards you and release it to oscillate.

(j) Measure and record the time for 20 oscillations.

(k) Determine the period, T.

(l) Repeat procedure (g) to (k) for values of $d = 0.300, 0.400, 0.500, 0.600$ and 0.700m.

(m) Tabulate your results including values of T^2.

(n) Plot a graph of T^2 against h.

(o) Find the slope, s of the graph.

(p) Find the constant, μ from $\mu = \frac{4\pi^2}{s}$

(q) State any two sources of error in this experiment.

DISMANTLE THE SET UP

2. In this experiment you will determine the constant, λ of the glass block provided. **(30marks)**

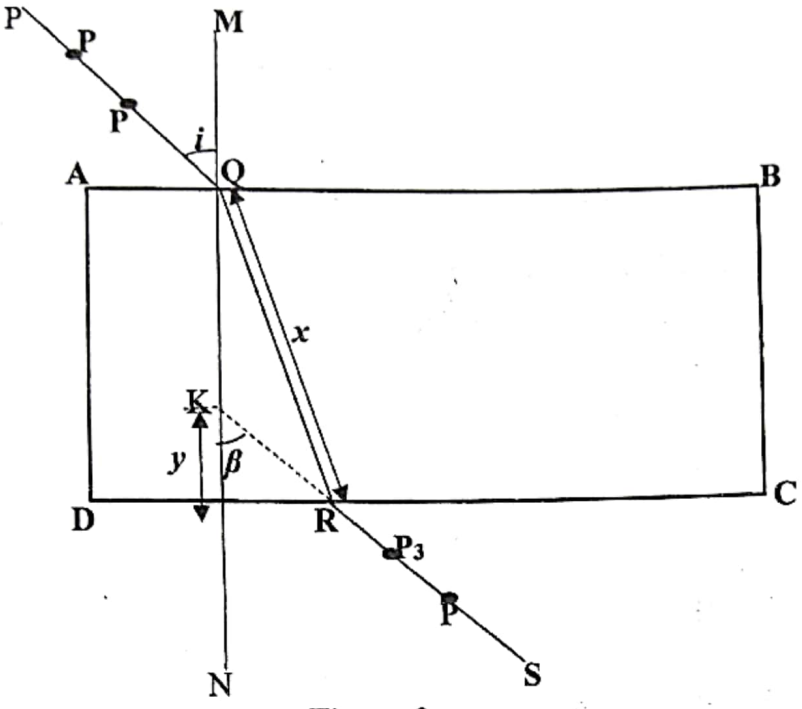

Figure.2

(a) Fix the plain sheet of paper on a soft board.
(b) Place the glass block on the paper with its largest face uppermost.
(c) Trace the outline **ABCD** of the glass block.
(d) Remove the glass block.
(e) Draw a normal **MN** at **Q** about 3cm from A.
(f) Draw a line **PQ** such that angle $i = 10^0$.
(g) Replace the glass block in its outline.
(h) Fix two optical pins P_1 and P_2 vertically along **PQ.**
(i) While viewing through side **CD**, fix pins P_3 and P_4 so that they appear to be in line with the images of P_1 and P_2.
(j) Remove the glass block and the pins.
(k) Draw a line through P_3 and P_4 to meet **CD** at **R** and produce **SR** to meet **MN** at **K.**
(l) Measure and record angle, β and lengths x and y.
(m)Repeat procedures (f) to (l) for values of $i = 20, 30, 40, 50$ and 60^0.
(n) Record your results in a suitable table including values of $\sin i$, $\tan \beta$, $y\tan \beta$ and $\frac{y\tan\beta}{x}$.
(o) Plot a graph of $\sin i$ against $\frac{y\tan\beta}{x}$.
(p) Determine the slope, λ of your graph.
(q) What does the constant, λ represent?
(r) State any two sources of error in this experiment.

HAND IN THE TRACING PAPER TOGETHER WITH YOUR WORK.