535/3
PHYSICS PRACTICAL
Paper 3
2022
2 hours 15 minutes

MATIGO MOCK EXAMINATIONS

Uganda Certificate of Education

PHYSICS PRACTICAL

Paper 3

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES:

Answer question 1 and one other question.

You will not be allowed to start working with 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 the use 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.

Squared paper is provided.

Non-programmable calculators may be used.

1. In this experiment you will determine the force constant k, of the spring provided

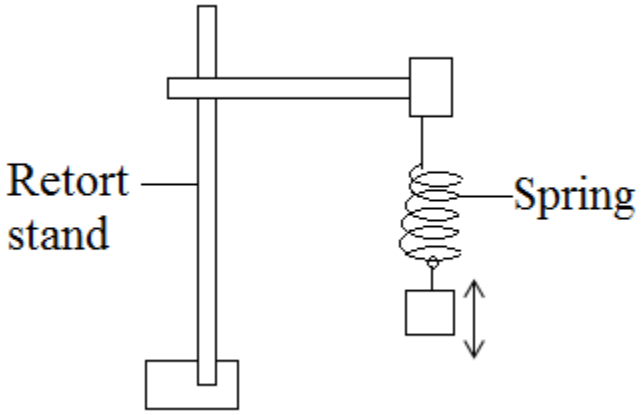

Fig 1

a) Clamp one end of a spring form a retort stand
b) Suspend a mass M=0.10kg from the free end of the spring as shown in figure 1.
c) Pull M vertically downwards through a small distance and release it.
d) Determine the time, t, for 20 oscillations.
e) Calculate the period ,T.
f) Repeat procedures (b) to (e) for *M=0.20, 0.30, 0.40, 0.50* and *0.60kg*.
g) Record your results in a suitable table including values of T^2.
h) Plot a graph of T^2 against *M*.
i) Find the slope S, of your graph.
j) Calculate the force constant *K*, from the expression $K=\frac{4\pi^2}{5}$.

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

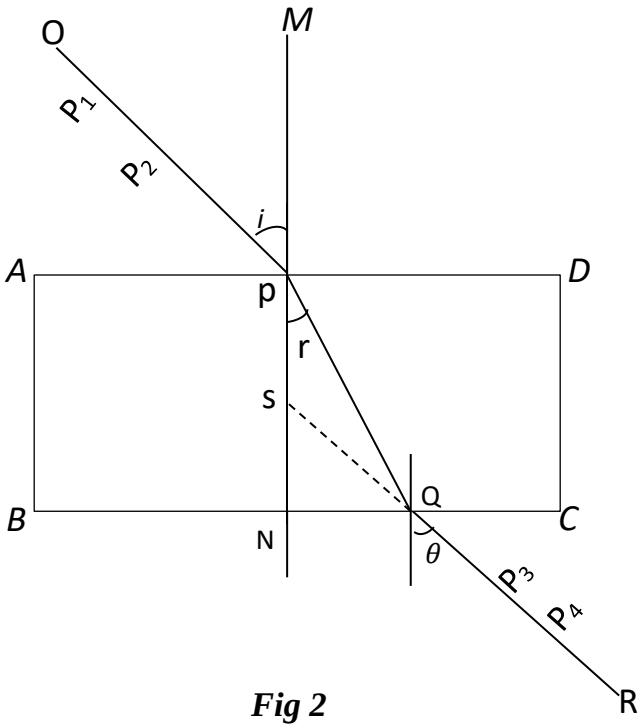

Fig 2

a) Fix the plane sheet of paper on a soft board using drawing pins.
b) Place the glass block on the sheet of paper so that it rests with its broad face and trace its outline *ABCD.*
c) Remove the glass board.
d) Draw a normal *MN* to cut *AD* and *BC* at P and N respectively, such that *AP* is 2.0cm.
e) Draw *OP* such that the angle $i=30^0$
f) Fix pins P_1 and P_2 along *OP.*
g) Replace the glass block onto its outline.
h) While looking from side BC fix P_3 and P_4 so that they appear to be in straight line with the images of P_1 and P_2 as shown in figure 2.
i) Remove the glass block.
j) Draw a line RQ through P_3 and P_4 to meet BC at Q.
k) Join Q to P and measure PQ. Call it y.

l) Produce RQ to meet the normal MN at S.

m) Measure the distance QS, call it, x.

n) Repeat procedures (e) to (m) for values of ι=40^0,50^0,60^0, and 70^0.

o) Record your results in a suitable table.

p) Plot a graph of y (along vertical axis) against (along horizontal axis)

q) Find the slope, n, of the graph.
(HAND IN THE TRACING PAPER)

3. In this experiment you will determine the internal resistance, s, of the dry cell provided.

a) Fix the bare wire provided on a metre rule using cello tape.

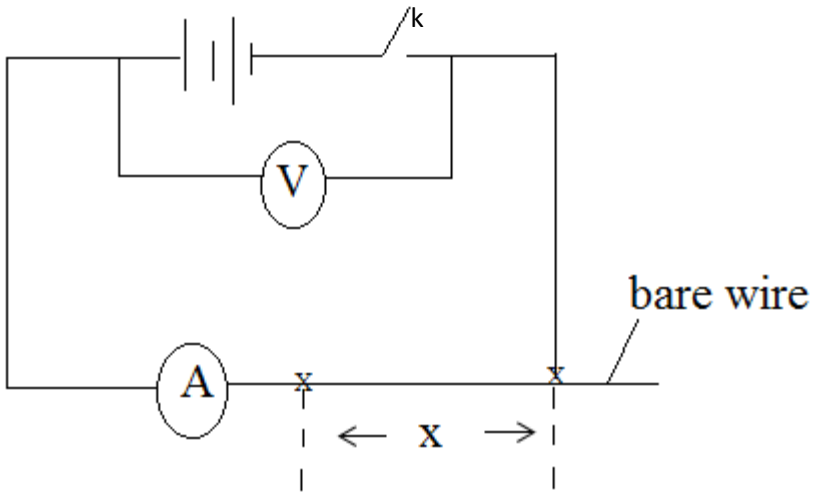

Fig 3

b) Connect the circuit shown in fig 3 starting with x=0.20cm.

c) Close the switch k.

d) Read and record the readings, **I** and **V** on the ammeter and voltmeter respectively.

e) Repeat procedures (b) to (e) for values of x=0.300,0.400, 0.500 and 0.600m.

f) Record your values in a suitable table including values of $\frac{v}{\mathrm{I}}$ and $\frac{1}{\mathrm{I}}$.

g) Plot a graph of $\frac{1}{\mathrm{I}}$ (along the vertical axis) against $\frac{v}{1}$ (along the horizontal axis)

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

i) Calculate the value of, r, from the expression *r=1.5C.*

END