535/3

PHYSICS

PRACTICAL

July 2022

2¼ Hours

MWALIMU EXAMINATIONS BUREAU

UCE POST-MOCK RESOURCE EXAMINATIONS 2022

S.4 PHYSICS PRATICAL

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 the apparatus for the **first quarter** of an hour.

Marks are given mainly for a **clear** record of observations actually made, for their **suitability, 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 up during the **first quarter of an hour.**

An account of the method of carrying out the experiments is not required.

Squared papers are provided.

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

Qn1.

In this experiment you will determine the acceleration, g, due to gravity.

a) Suspend the pendulum bob from a retort stand.

b) Adjust the length of the pendulum to 1.20m

c) Adjust the clamp such that the height h of the bob from the floor is 0.100m as shown in figure1.

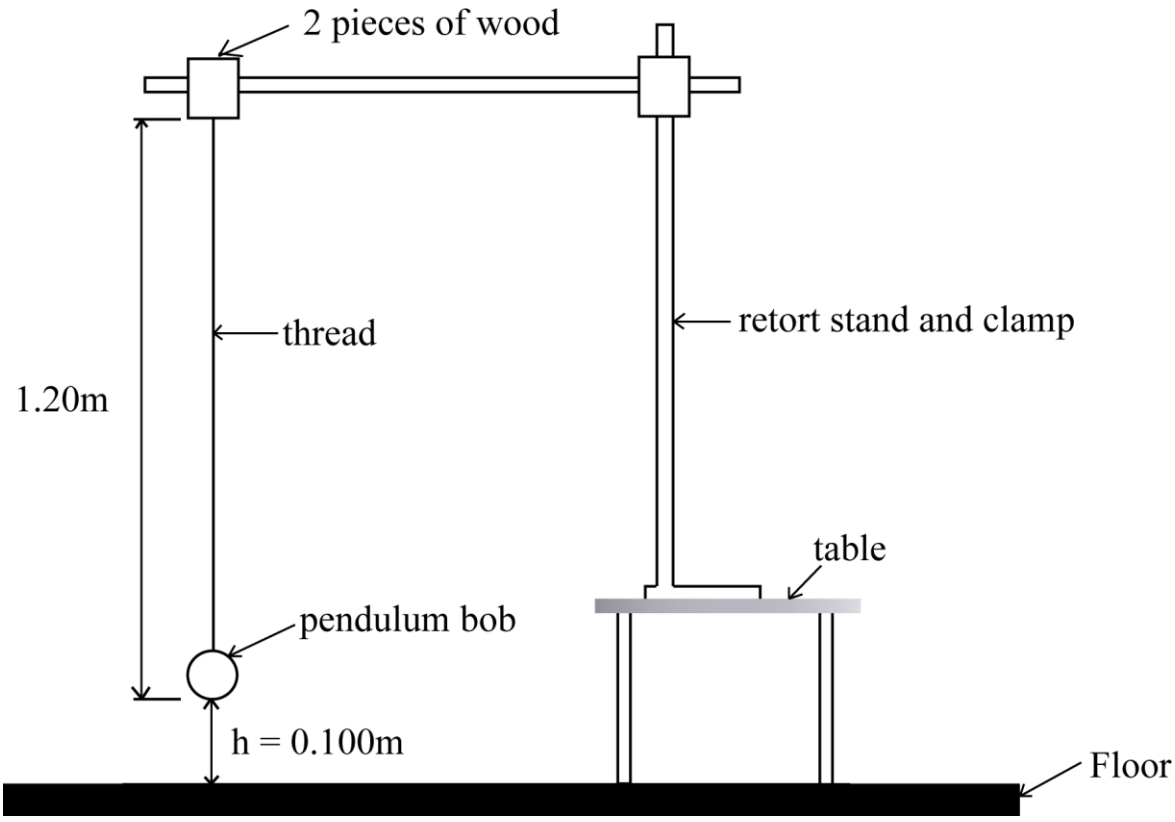

Fig.1

d) Displace the pendulum bob through a small angle and release it to oscillate in a vertical plane.

e) Determine the time for 20 oscillations.

f) Find the period, T, for one oscillation.

g) Raise the pendulum bob (by reducing the length of the pendulum) such that the height h = 0.200, 0.300, 0.400, 0.500 and 0.600m and in each case repeat procedures (d) to (f).

h) Record your results in a suitable table including values of T^2.

i) Plot a graph of h (along the vertical axis) against T^2 (along the horizontal axis).

j) Read and record the intercept **C** on the h- axis.

k) Find the slope **S** of the graph.

l) Calculate the acceleration, g, due to gravity from the expression:

$g = -4\pi^2 S$, where $\pi = 3.14$

Qn2.

In this experiment you will determine the refractive index n of the glass block provided.

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

b) Place the glass block in the middle of the plain sheet of the paper with the largest face top most and draw its outline.

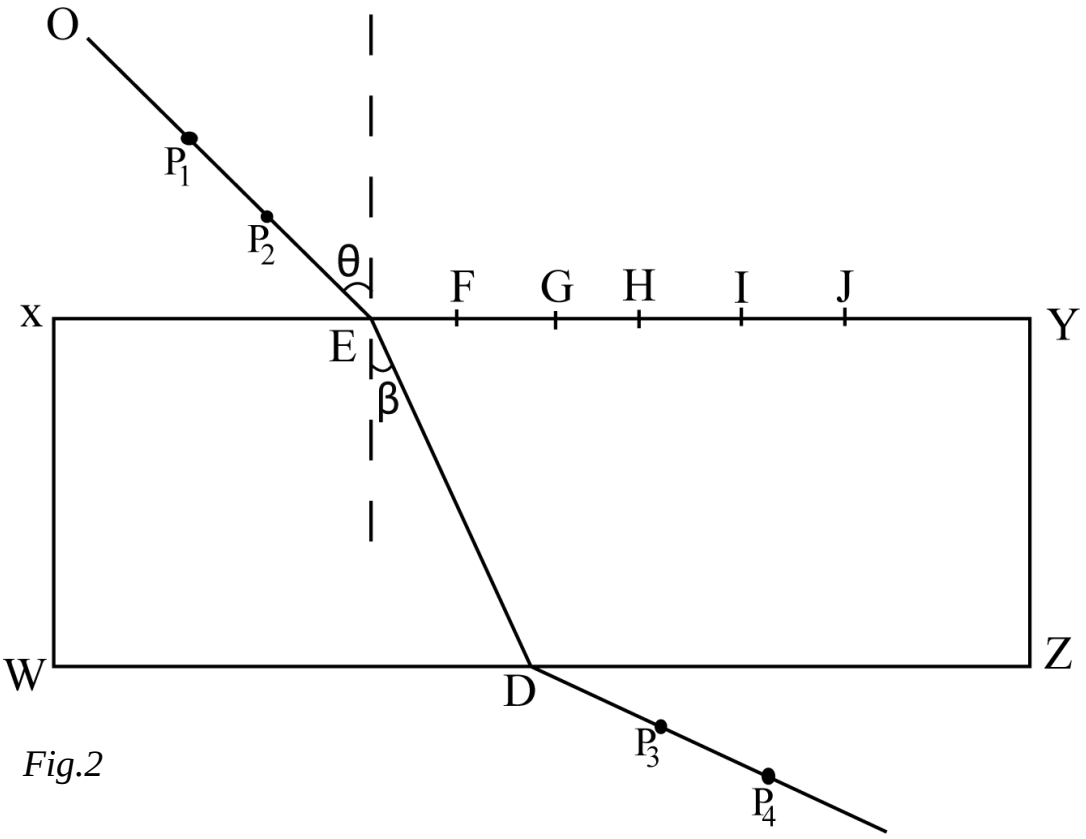

Fig.2

c) Remove the glass block and label the outline XYZW as shown in figure 2.

d) Mark points E, F, G, H, I, J, on side XY such that they are 1.5cm, 3.0cm, 4.5cm, 6.0cm, 7.5cm, and 9.0cm respectively from X.

e) Draw normals at each of the points E, F, G, H, I, J.

f) Draw lines OE, PF, QG, RH, SI, TJ making angles Θ of 60^0, 50^0, 40^0, 30^0, 20^0, 10^0 with the normals at E, F, G, H, I, J, respectively.

g) Replace the glass block.

h) Fix two optical pins P_1 and P_2 on the line OE.

i) While looking through the glass block from side ZW, fix two optical 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 the pins.

k) Draw a line through P_3 and P_4 to meet ZW at D.

l) Join D to E.

m) Measure and record angle β.

n) Repeat procedures (g) to (m) for each of the lines: PF, QG, RH, SI, and TJ.

o) Record your results in a suitable table including values of sinΘ and sinβ.

p) Plot a graph of sinΘ (along the vertical axis) against sinβ (along the horizontal axis).

q) Find the slope **n** of the graph.

NB: HAND IN THE TRACING PAPER USED IN THE EXPERIMENT TOGETHER WITH YOUR RESULT

Qn3.

In this experiment you will determine the resistance per metre of the bare wire provided.

a) Connect the circuit shown in figure 3

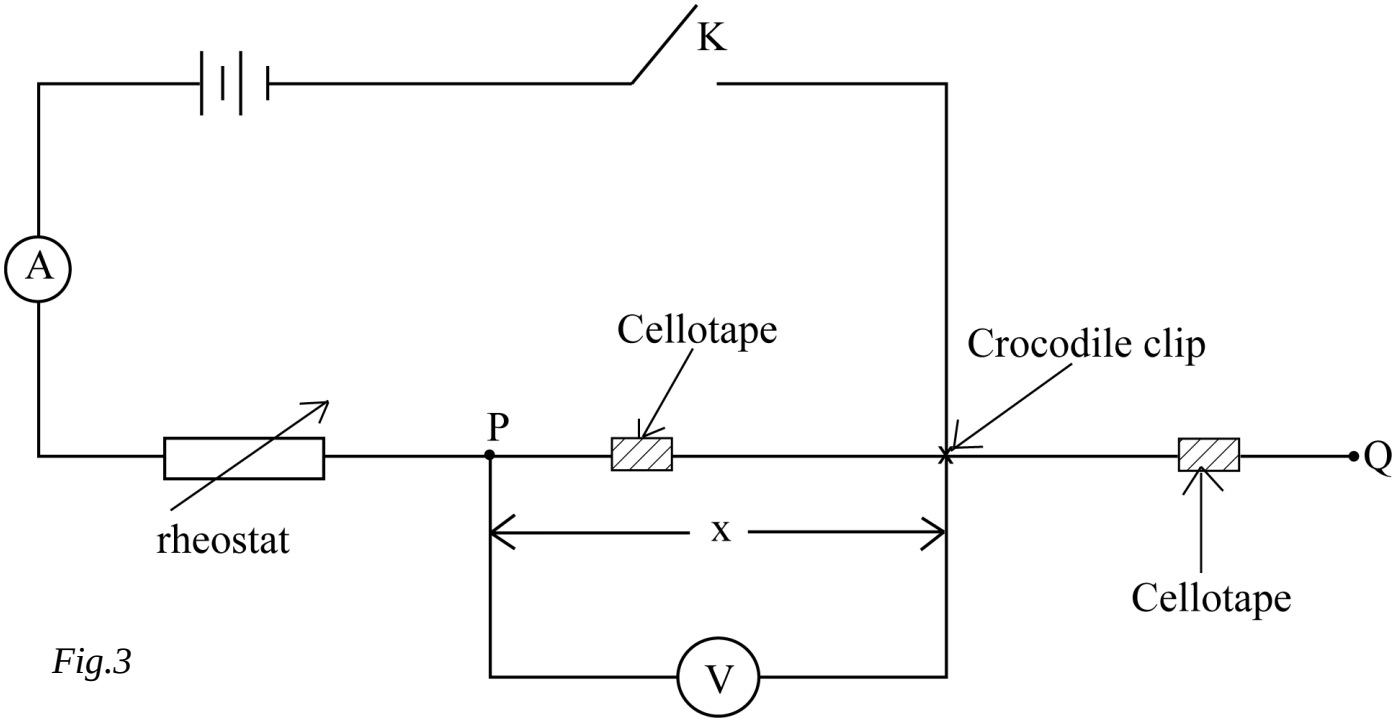

Fig.3

b) Adjust the crocodile clip such that the length of the bare wire x = 0.100m.

c) Close the switch K and adjust the rheostat until the ammeter reading I is 0.20A.

d) Read and record the voltmeter reading V.

e) Open switch K.

f) Repeat procedures (b) to (e) for values of x = 0.200, 0.300, 0.400, 0.500 and 0.600m.

g) Record you results in a suitable table including values of $\frac{V}{I}$

h) Plot a graph of $\frac{V}{I}$(along the vertical axis) against x (along the horizontal axis).

i) Find the slope **r** of the graph

END