

PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
JOIN THE REVOLUTION PROGRAM
FORM FOUR PRE-NATIONAL I EXAMINATION

031 / 2B

PHYSICS ACTUAL PRACTICAL 2B

TIME: 3 HOURS

Year, 2023

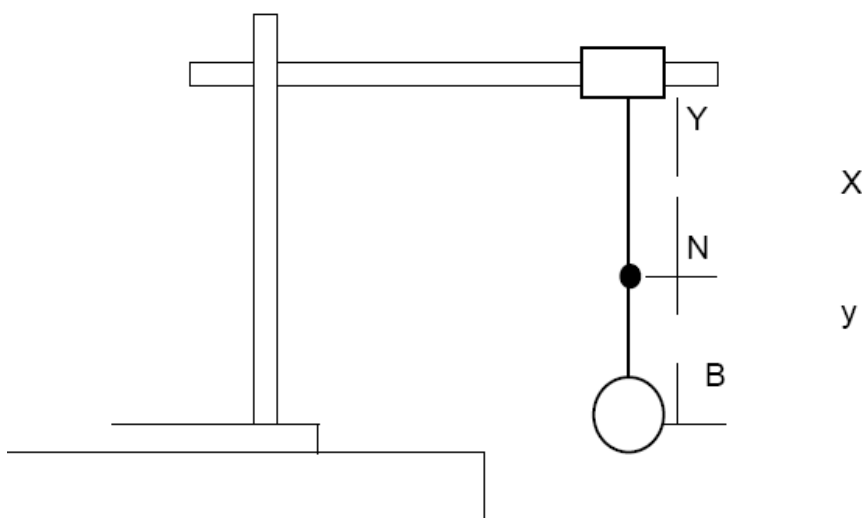
Instructions

1. This paper consists of total of **two (2)** questions
2. Answer **all** questions
3. Marks for each question thereof indicated
4. Non-programmable calculators may be used
5. Cellular phones are **not** allowed in the examination room
6. Write your **examination number** on every page of your answer booklets
7. The following constants may be used
Acceleration due to gravity, $g = 10\text{m/s}^2$ or 10N/kg

The aim of this experiment is to determine the acceleration due to gravity “g” of pendulum bob “B”.

- a) Tie a thread to a given pendulum bob. Make a knot at a short distance from the bob. This distance should be of the orders of 10 cm.

Pie $\pi = 3.14$



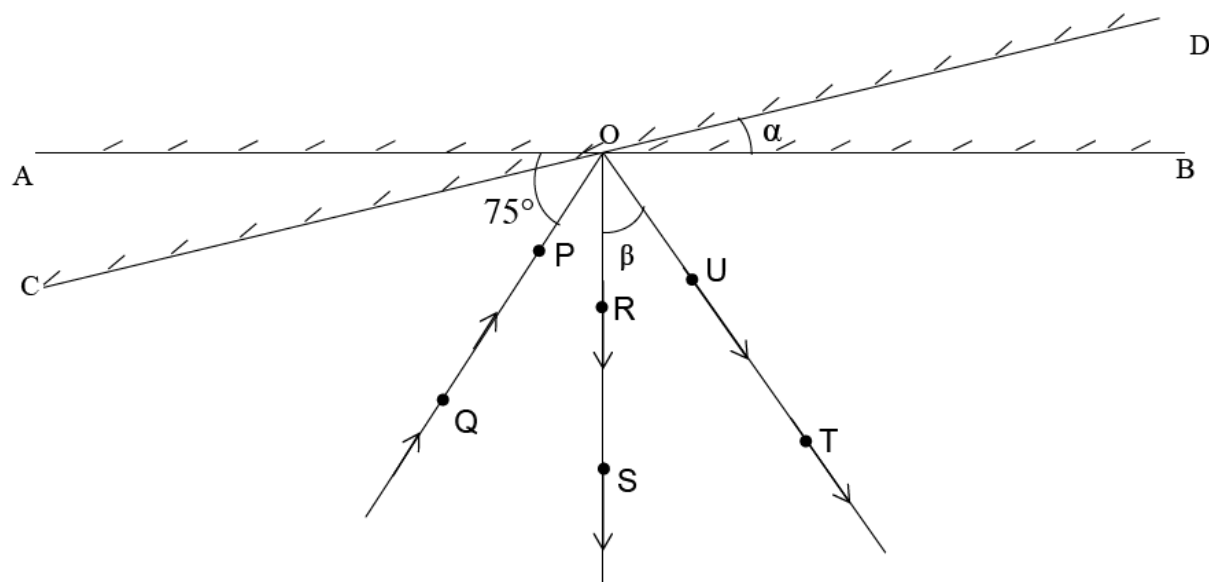
- b) The distance between the knot “N” and point of suspension is denoted by “X” as indicated in the figure above. Measure the distance $x = 10\text{ cm}$. Displace the pendulum bob through small amplitude of vibration. Find the line “t” for 30 oscillations and hence determine the periodic time (t) for one

oscillations repeat this process for value of $x = 30\text{ cm}, 50\text{ cm}, 70\text{ cm}$ and 90 cm . Tabulate the value of x , T , and T^2 the periodic time T is related to x by the equation $T = 2\pi\sqrt{x+bg}$

- c) Plot the graph of T^2 against x
- d) Find the slope of your graph
- e) Calculate the value of acceleration due to gravity from graph
- f) Read and record the value of x - intercept
- g) What is the physical significance of x - intercept?
- h) Read and record the T^2 -intercept
- i) Show how the x - intercept is related to “ b ”
- j) List down two possible sources of errors.

2. You are provided with white sheets, of paper drawing board, plane mirror with holders, transparent ruler protractors, optical pins thumb and office pins
Proceed as follows

a) Plot the white sheets on the drawing board using thumb and draw two straight lines AB and CD to enclose an angle of $\alpha=10^\circ$, Draw the line through O making 75° with AB. Then insert two pins Q and Q on this line (figure 2)



b) Place reflecting surface of the mirror along AB place other optical pins R and S to appear in straight line with image of P and Q. Remove the pins P and S and join the line ORS .

c) Turn the mirror through an angle of $\alpha=10^\circ$ so that the reflecting surface lies along CD. Sticks pins T and U to appear in line with image of P and Q. join the line OUT. Record the angle "B" formed by RS and UT.

d) Repeat the experiment for $\alpha =15^\circ, 20^\circ, 25^\circ$ and 30° .

e) Tabulate your results

f) Plot a graph of β and α

g) Determine slope of your graph

h) Find the reciprocal of the slope

i) What does the answer in 2 (h) represents?

j) From your graph, deduce the relationship between α and β