

THE PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
UKEREWE DC FORM FOUR EXAMINATION

031/2A

PHYSICS 2A
ACTUAL PRACTICAL A
(For Both School and Private Candidates)

Time: 2:30 Hours

MAY, 2025

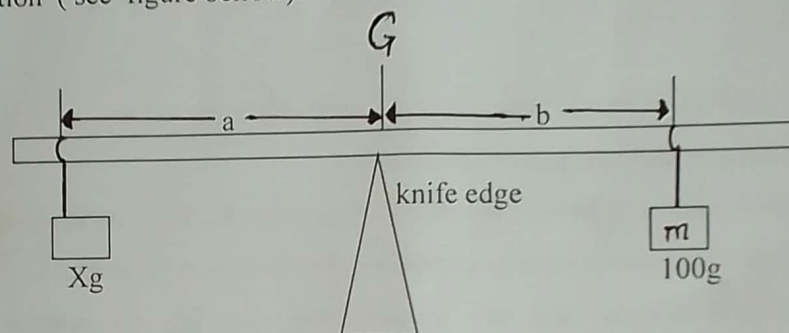
Instructions

1. This paper consists of **two (2)** questions. Answer **all** the questions.
2. Each question carries **twenty-five (25)** marks.
3. All writings should be in **blue** or **black** ink, except for diagrams which must be in pencil.
4. Mathematical tables and non-programmable calculators may be used.
5. Communication devices and any unauthorized materials are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).

1. The aim of this experiment is to determine the mass of object 'x'

Proceed as follows;

- Find the Centre of mass G , of a meter rule by placing it on a knife edge until it balances horizontally using a piece of a chalk put a mark on a balance point of your meter rule.
- Suspend unknown mass x on the left hand side of your metre rule. On the right hand side suspend the mass m of 100g at length b 10cm from the knife edge (i.e. the Centre of the mass). Adjust the position of x until the rule balance in the horizontal position (see figure bellow).



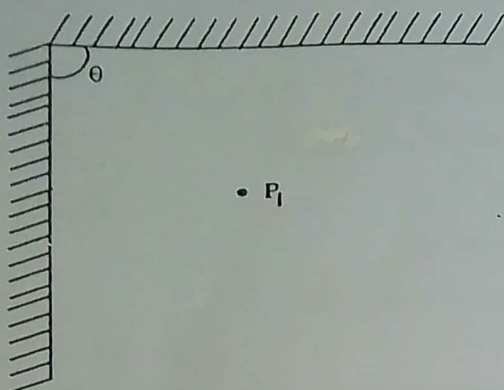
Read and record length "a" and "b" as shown on figure above.

- Move mass m to the right each time a length of 2.5cm, adjust mass x in the left until the metre rule balances, obtain six reading and fill the table bellow.

a(cm)						
b(cm)	10.0	12.5	15.0	17.5	20.0	22.5

- Plot a graph of 'b' against 'a'
- Find the slope s of the graph
- Find the value of $x = sm$ where m is as given above
- What does x represent?
- State the law governing your experiment.

2. In this experiment you are provided with two plane mirrors, an optical pin, a sheet of plane papers, drawing board, and protractor and mirror holders.



Procedures;

- Draw lines at right angles by using your ruler and a protractor on a plane sheet of papers fixed on a drawing board.
- Place one mirror on each of the two lines of the sheet of paper. Fix an optical pin at point P1 and then look on both mirrors and count the number of images for $\theta = 90^\circ, 72^\circ, 60^\circ, 45^\circ$ and 30°

(a) Tabulate the values of θ, η and $1/\theta$ on a suitable table.

(b) Plot graph on η against $1/\theta$

(c) From your graph determine

(i) Slope of your graph, G to nearest tenth

(ii) The η - intercept of the graph, P.

(iii) Equation relation value of G, P and η is given by

$\eta = \frac{G}{\theta} + P$ Re - writes the equation with the value of G and P you have calculated.

(d) (i) What happen to the number of images when $\theta = 0^\circ$?

(ii) Suggest the aim of this experiment