

MINISTRY OF EDUCATION AND VOCATIONAL TRAINING

CERTIFICATE OF SECONDARY EDUCATION EXAMINATION

URBAN WEST REGION ZANZIBAR

FORM FOUR (IV) MOCK EXAMINATION 2025

PHYSICS 2A

(ACTUAL PRACTICAL)

(For Both School and Private Candidates)

03/1/2A

TIME: 2:30 HOURS

JUNE 2025

INSTRUCTIONS:

1. This paper consists of **two (2)** questions. Answer **all** questions.
2. Where calculations are involved show your work clearly.
3. Mathematical tables and non-programmable calculators **may be used**
4. Marks for questions are indicated at the end of question
5. Cellular phones and unauthorised materials are **not allowed** in the examination room
6. Write your **Examination Number** on every page of your answer booklet(s)
7. Use $\pi = 3.14$

0001

1. The aim of this experiment is to determine the acceleration due to gravity, g at your school.

Proceed as follows:

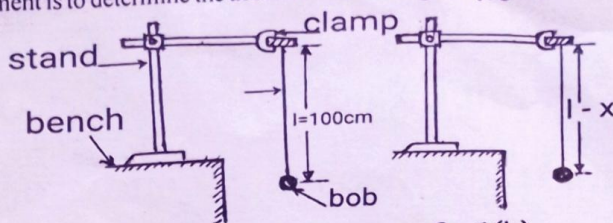


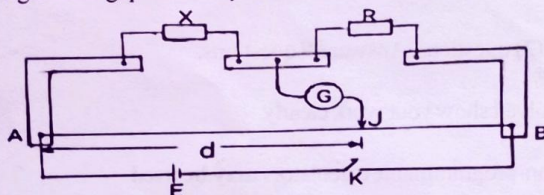
fig 1(a)

fig 1(b)

- (a)
 - (i) Suspend the pendulum as shown in the fig. 1 (a). Measure the length $\ell = 100\text{cm}$ of the thread.
 - (ii) Displace the bob through a small angle and allow it to perform oscillations in vertical plane.
 - (iii) Read and record the time t_1 for 20 complete oscillations. Calculate the period T_1 and T_1^2
 - (b)
 - (i) Shorten the length ℓ of the thread by a length $x = 10\text{cm}$ (Refers fig. 1 (b)). Displace the bob and record the time t_2 for 20 complete oscillations. Calculate the period T_2 and T_2^2
 - (ii) Repeat procedures (b) (i) above for $x = 20, 30, 40$, and 50cm .
 - (c) Tabulate your results in a suitable table and include a column for $T_1^2 - T_2^2$.
 - (d)
 - (i) Plot a graph of $T_1^2 - T_2^2$ (Vertical axis) against x (horizontal axis).
 - (ii) Calculate the gradient G of your graph.
 - (iii) How is $T_1^2 - T_2^2$ related to x ?
 - (iv) Determine the acceleration due to gravity, g .
 - (e) State any two sources of errors and its precautions taken (25marks)
2. You are provided with a dry cell E , switch K , Galvanometer G , resistance box R , A standard resistor X , jockey J , A metre bridge and several pieces of connecting wires.

Proceed as follows:

- (a) Connect the resistance X in the left hand gap of the metre bridge. Connect the resistance box R in the right hand gap and complete the circuit as shown below.



Note: The length 'd' should be in cm.

- (b) With $R = 1\Omega$ in the resistance box, Obtain a balance length $AJ = d$ and record its value.
- (c) Increase R in steps of 2Ω and obtain a total of five (5) readings, each time record the value of AJ corresponding to each value of R
- (d) Tabulate your results and include a column for R , d and $1/d$.
- (e)
 - (i) Plot a graph of R against $1/d$ (horizontal axis)
 - (ii) Calculate the slope S , of your graph.
 - (iii) Using your graph, find the value of R for which $1/d = 0.02$
- (f) Read and record the intercept ' R_0 ' on R -axis.
- (g) Given that; $R = \frac{100x}{d} - x$
- (h) Use the graph to find the value of x .
- (i) Comment on your results in (e)(iii), (f) and (h) above.
- (j) Suggest the suitable title for this experiment
- (k) State one source of error and its precaution taken. (25marks)