

TANZANIA HEADS OF ISLAMIC SCHOOLS COUNCIL
FORM FOUR INTER ISLAMIC MOCK EXAMINATION

PHYSICS 2A

(ACTUAL PRACTICAL)

031/2A

(For Both School and Private Candidates)

TIME: 2:30 HOURS

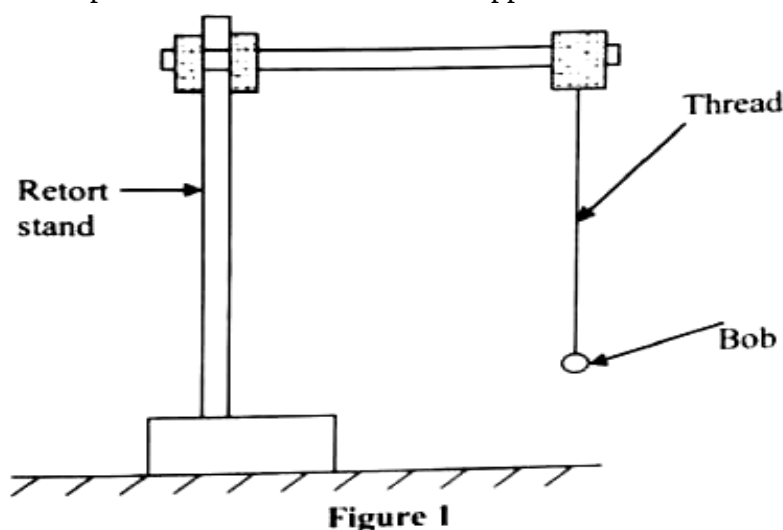
Wednesday, 27th August 2025 a.m.

Instructions

1. This paper consists of two (02) questions.
2. Answer **BOTH** questions.
3. Calculations should be clearly presented.
4. Mathematical tables and desk calculators may be used.
5. Communication devices and unauthorized materials are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s) provided.
7. The following constant (s) may be used:

$$\text{Pie } (\pi) = \frac{22}{7}$$

1. You are provided with a pendulum bob, stop watch clock, thread, metre rule, Retort stand and clamp. Proceed as follows: Set the apparatus as shown in figure 1 below.



- (a) Adjust the thread to length (L) of the pendulum to 140cm. Set the bob oscillations by displacing it to a small angle and releasing it. Record the time (t) taken to complete 10 oscillations.
- (b) Repeat (a) above for the length of the pendulum $L = 120\text{cm}$, 80cm , 60cm and 40cm . Record your results in a suitable table including periodic time T and T^2 .
- (c) Plot a graph of T^2 against L .
- (d) Determine the slope of your graph.
- (e) From the graph, state the relation between T and L .
- (f) Using graph, find the time taken by the bob to oscillate when the length of the pendulum $L=50\text{cm}$.
- (g) Given $\frac{1}{L} = \left(\frac{2\pi}{g^{1/2}T}\right)^2$, calculate the acceleration due to gravity g .
- (h) State the aim of this experiment.
- (i) State any two (2) sources of error.

2. You are provided with a dry cell, an ammeter, voltmeter, key and resistance box. Proceed as follows:
- (a) Connect the apparatus so that you can get reading of ammeter and corresponding reading of voltmeter which are to be connected in parallel to the dry cell labelled D.
 - (b) Set the resistance box to be 1Ω read and record the ammeter and voltmeter readings.
 - (c) Repeat the procedure for resistance $R=2\Omega, 3\Omega, 4\Omega$ and 5 ohms.
 - (d) Draw a graph of V on Y-axis against I on X-axis.
 - (e) Write down the equation which represent the relation between Electromotive force (E.m.f), voltage (V), Current (I) and internal resistance.
 - (f) From your graph find:
 - (i) The values of electromotive force E.
 - (ii) The internal resistance r.
 - (iii) The maximum current the cell can deliver to the circuit.
 - (g) Suggest the aim of this experiment.