535/3
PHYSICS
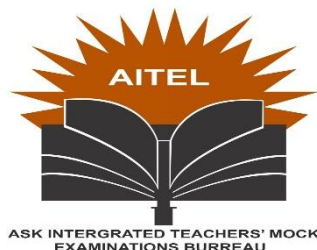**(Practical)**
Paper 3
July/Aug. 2022
2 ½ hours

AITEL JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

PHYSICS

(PRACTICAL)

Paper 3

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES

Answer **question 1** *and* **one** *other question.*
Any additional question answered will **not** *be marked.*
You are **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 the observations actually made, for their suitability and 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 observation and calculated values in a suitable table drawn in advance.

Squared papers are provided.

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

1. In this experiment, you will determine the constant, **g,** using a pendulum bob.
   (a) Clamp the metre rule horizontally
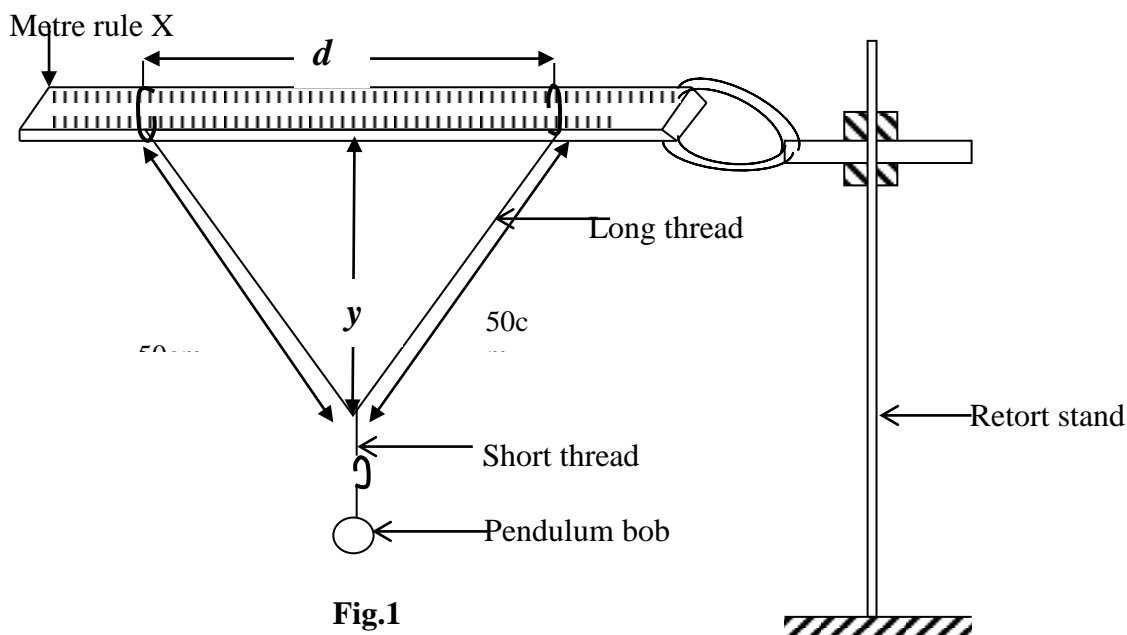   (b) Tie the longer piece of thread at 10 cm and 80 cm marks so that the distance, **d**, between them is 0.70 cm.

Fig.1

   (c) Using the shorter thread, suspend the pendulum bob at the midpoint of the longer piece of thread as shown in figure 1.
   (d) Measure and record the distance, y, of the midpoint of the longer piece of thread below the metre rule X.
   (e) Set the bob into oscillation. Measure and record the time t for 20 oscillations.
   (f) Determine the period T, for one oscillation.
   (g) Repeat procedures (b) to (f), for values of d = 0.600, 0.500, 0.400, 0.300 and 0.200m.
   (h) Record your results in a suitable table including values of T^2.
   (i) Plot a graph of T^2 (along the vertical axis) against y (along the horizontal axis)
   (j) Find the slope, S, of the graph.
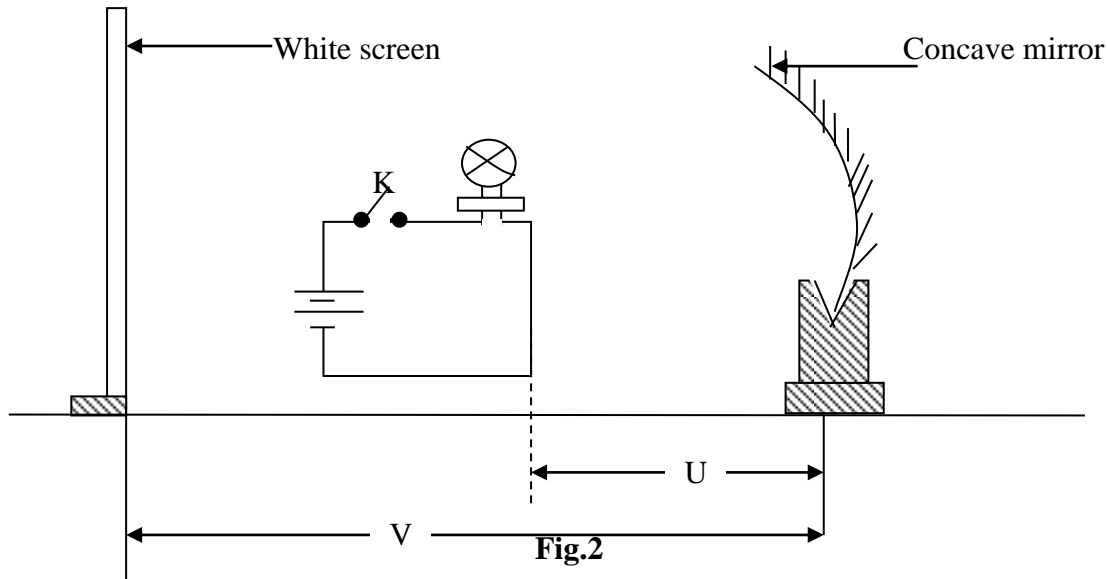   (k) Calculate the constant, g, from the expression

   $$\mathbf{g} = \frac{4\pi^2}{S}$$

   DISMANTLE THE SET UP

2. In the experiment, you will determine the focal length, **f**, of the mirror provided. (20 marks)

PART I

(a) Fix the mirror provided into the holder.
(b) Focus a distant object onto a white screen.
(c) Measure and record the distance, X, between the mirror and the screen.

White screen   Concave mirror

K

U

V   **Fig.2**

PART II

(a) Arrange the torch bulb, the mirror, the dry cells, the switch and the white screen as shown in figure 2.
(b) Adjust the distance U = 15.0 cm of the torch bulb from the mirror.
(c) Close switch.
(d) Move the white screen to obtain a sharp image of the filament of the bulb, on it.
(e) Measure and record the distance, v, of the white screen from the mirror.
(f) Open switch K.
(g) Repeat procedures (b) to (f) for values of U =20.0, 25.0, 30.0, 35.0 and 40.0 cm.

(h) Record your results in a suitable table including $\dfrac{V}{U}$

(i) Plot a graph of V (along the vertical axis) against $\dfrac{V}{U}$ (along the horizontal axis)

(j) Find the slope, S, of the graph.

(k) Calculate the average value of f from $f = \left(\dfrac{S + X}{2} \right)$

DISMANTLE THE SET UP

3

3. In this experiment, you will determine the internal resistance of the dry cell
   provided.   (20 marks)
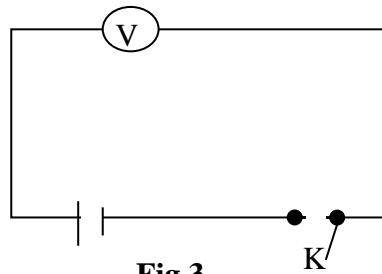
PART I

(a) Connect the circuit as shown in figure 3.

Fig.3

(b) Close switch, K.
(c) Read the value ,E, of the voltmeter reading.

PART II

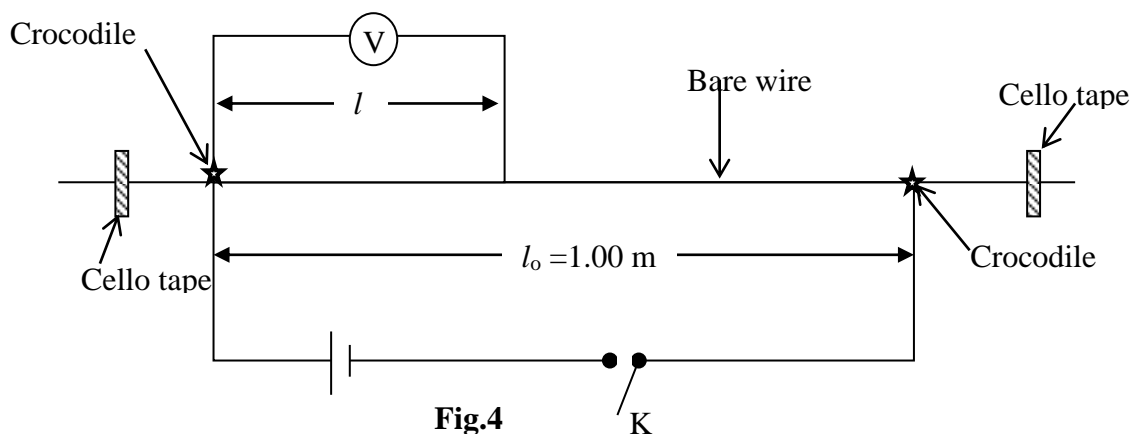(a) Disconnect the circuit in part 1, and connect it as shown in figure 4.
With $l_o = 1.00$m.

Fig.4

(b) Starting with length l = 0.100 m, close the switch, K
(c) Read and record the voltmeter reading V,
(d) Open switch, K.
(e) Repeat the procedures from (b) to (d) for values of l =0.200, 0.300, 0.400,
    0.500, 0.600 and 0.700.
(f) Record your results in a suitable table.
(g) Plot a graph of V (along the vertical axis) against l (along the horizontal
    axis)
(h) Find the slope, S, of the graph.
(i) Calculate the internal resistance, r, of the cell from the expression,

$r = 3.7 \left(\dfrac{E}{S} - l_0 \right)$ **DISMANTLE THE SET UP**

END