

535/4
Physics
Practical
Paper 3

2 ¼ hours

Internal EXAMINATION MOCKS – 2019

Uganda Certificate of Education

Physics

Paper 3

2hours 15minutes

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.

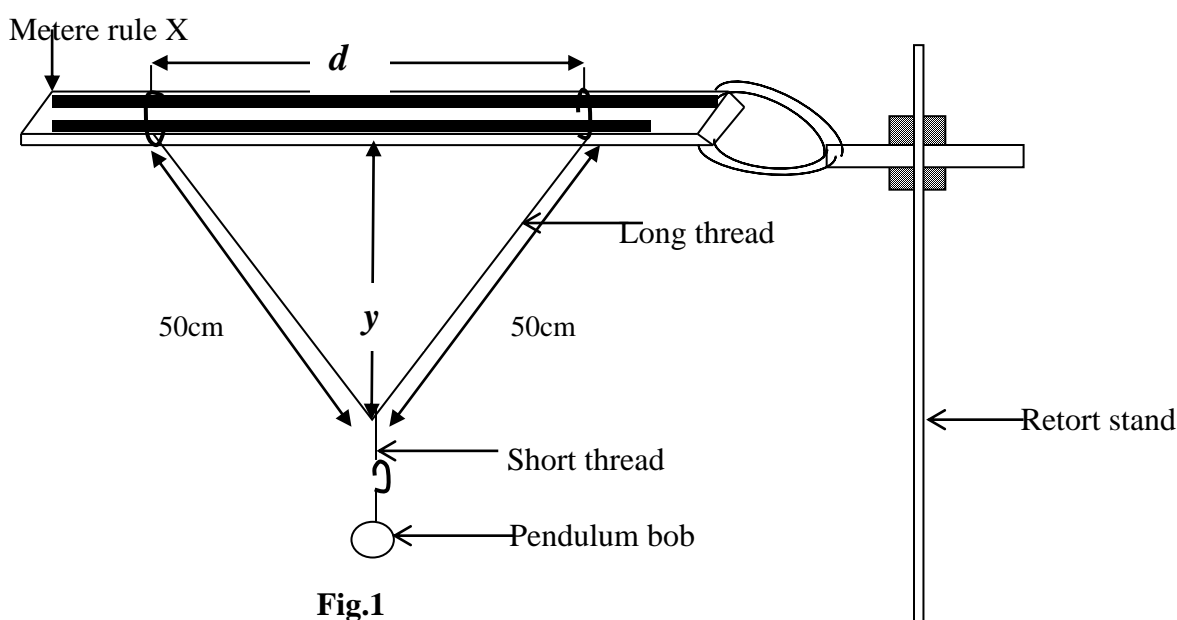


Fig.1

- 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 0.200 m.
- 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

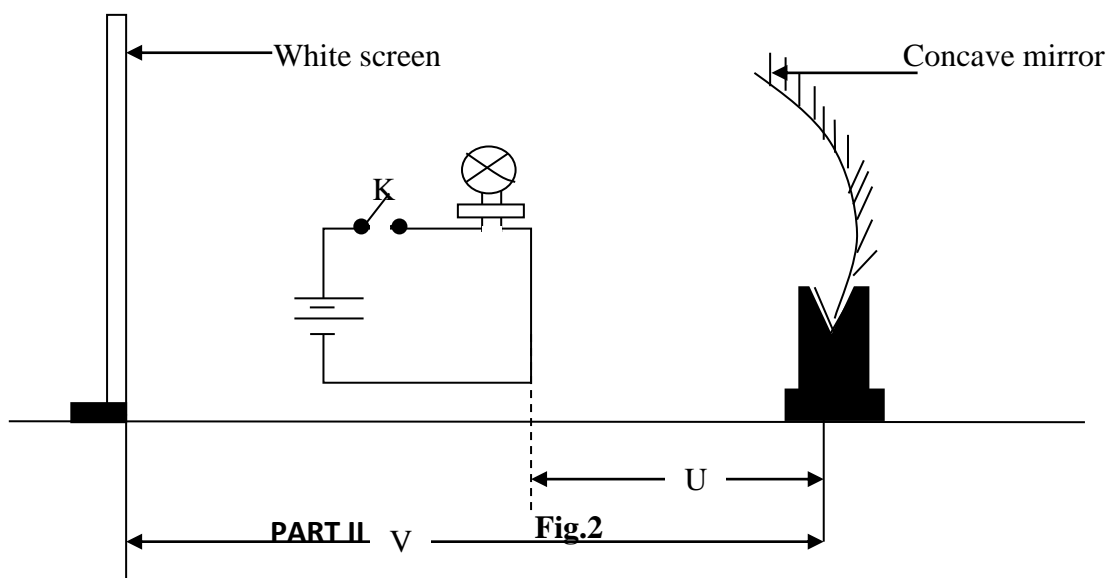
$$g = \frac{4\pi^2}{S}$$

DISMANTLE THE SET UP

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

PART 1

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



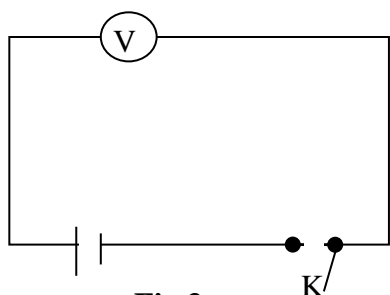
- Arrange the torch bulb, the mirror, the dry cells, the switch and the white screen as shown in figure 2.
- Adjust the distance $U = 15.0$ cm of the torch bulb from the mirror.
- Close switch.
- Move the white screen to obtain a sharp image of the filament of the bulb, on it.
- Measure and record the distance, v , of the white screen from the mirror.
- Open switch K .
- Repeat procedures (b) to (f) for values of $U = 20.0, 25.0, 30.0, 35.0$ and 40.0 cm.
- Record your results in a suitable table including $\frac{V}{U}$
- Plot a graph of V (along the vertical axis) against $\frac{V}{U}$ (along the horizontal axis)
- Find the slope, S , of the graph.
- Calculate the average value of f from $f = \left(\frac{S + X}{2} \right)$

DISMANTLE THE SET UP

- 3) In this experiment, you will determine the internal resistance of the dry cell provided. (20mks)

PART 1

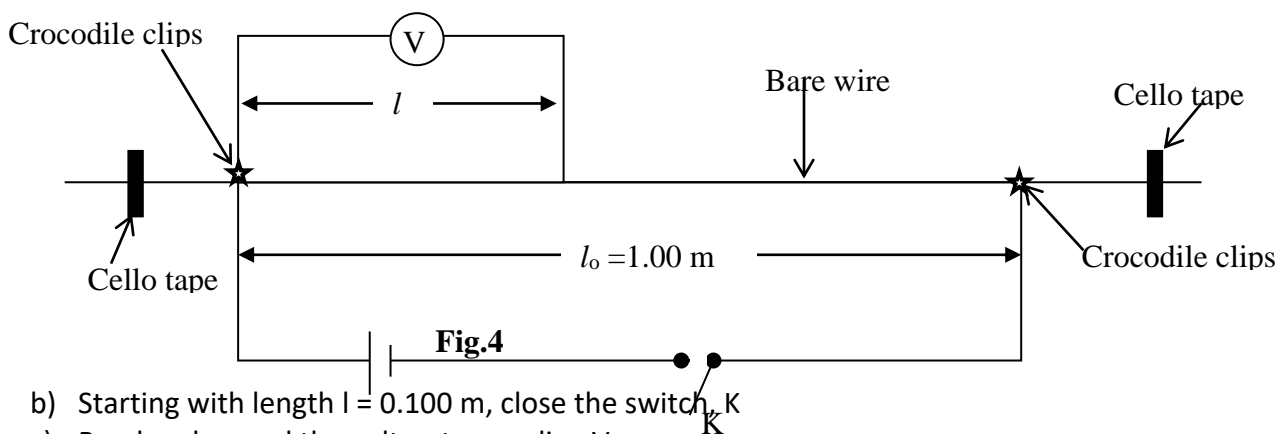
- a) Connect the circuit as shown in figure 3.



- b) Close switch, **Fig.3**
 c) Read the value ϵ , or the voltmeter reading.

PART II

- a) Disconnect the circuit in part 1, and connect it as shown in figure 4. With $l_0 = 1.00\text{m}$.



- b) Starting with length $l = 0.100\text{ m}$, 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)
 a) Find the slope, S, of the graph.
 b) Calculate the internal resistance, r, of the cell from the expression,

$$r = 3.7 \left(\frac{E}{S} - l_0 \right)$$

DISMANTLE THE SET UP

END

Confidential

In addition to the apparatus ordinarily contained in a physics laboratory, candidates will require;

Question 1.

- 1 metre rule
- 1 retort stand with a clamp
- 1 pendulum bob of a known mass
- 1 106 cm long piece of thread
- 1 half metre rule
- 1 Stop clock or stop watch.
- 1 short piece of thread

Questions 2.

- 2 dry cell (size D) in a holder
- 1 torch bulb (2.5V, 3A) in a holder
- 1 concave mirror (focal length 10 cm) in a holder
- 1 white screen
- 1 switch labeled , K
- 1 metre rule
- 1 Wooden block (6cm x 6 cm x 4 cm)
- 3 pieces of connecting wire each about 50cm long.

Question 3

- 1 dry cell (1.5V) in a cell holder
- 1 switch labeled, K.
- 1 voltmeter (0 – 3.0V)
- 1 105 cm long piece of constantan wire (SWG28) fixed on a metre rule using Cellotape.
- 3 Crocodile clips
- 5 pieces of connecting wires.

