535/3
PHYSICS
PRACTICAL
Paper 3
Jul./Aug. 2022
2¼ hours

WAKISO-KAMPALA TEACHERS' ASSOCIATION (WAKATA)

WAKATA MOCK EXAMINATIONS 2022

Uganda Certificate of Education

PHYSICS PRACTICAL

Paper 3

2 hours 15minutes

INSTRUCTIONS TO CANDIDATES:

Answer Question **1** *and* **one** *other question. Any additional question answered will* **not** *be marked*

For each question candidates will be required to select suitable apparatus from the equipment provided

You will **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 observation actually made, for their suitability and accuracy, and the use made of them.

Candidates are reminded to record their observations as soon as they are made. Where possible, candidates should put their observations and calculations in a suitable table drawn in advance

All your work must be in **blue** *or* **black** *ink. Any work done in pencil will* **not** *be marked.*

An account of the method of carrying out the experiment is **not** *required.*

Graph paper is provided.

Mathematical tables and silent non-programmable calculator may be used.

Turn Over

1. In this experiment, you will determine the constant, k of the spring provided. *(30 marks)*

(a) Suspend the spring from a clamp.

(b) Suspend one end of the metre rule from a spring using a piece of thread attached at the 90.0cm mark as shown in figure **1**.

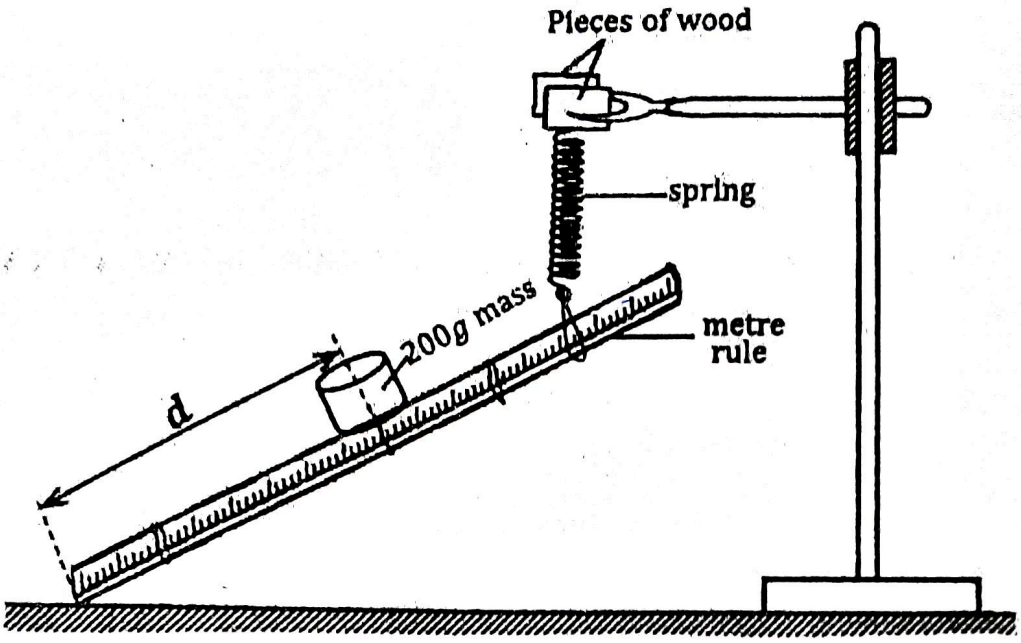

Fig. 1

(c) Place a mass of $200g$ at a distance $d = 20.0cm$ on the metre rule and fasten it with a piece of sellotape.

(d) Pull the metre rule at the point of suspension of the spring vertically down wards through a small distance and release it to oscillate.

(e) Record the time, t, for 10 oscillations.

(f) Calculate the frequency, $f = \frac{10}{t}$.

(g) Repeat procedures (c) to (f) for $200g$ mass placed at distances, $d = 40.0, 50.0, 60.0, 70.0$ and $80.0cm$.

(h) Record your results in a suitable table, including values of $\frac{1}{f}$.

(i) Plot a graph of d **(along the vertical axis)** against $\frac{1}{f}$ **(along the horizontal axis)**.

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

(k) Read and record the value of C of $\frac{1}{f}$ when $d = 55.0$cm.

(l) Calculate the constant, k of the spring from the expression:

$$k = \frac{27}{CS}.$$

DISMANTLE THE SET UP OF THE APPARATUS

2. In this experiment, you will determine the focal length, f of the concave mirror provided. *(30 marks)*

(a) Focus a distant object onto the screen

(b) Measure and record the distance, f_1 between the mirror and the screen.

(c) Arrange the apparatus as shown in figure 2.

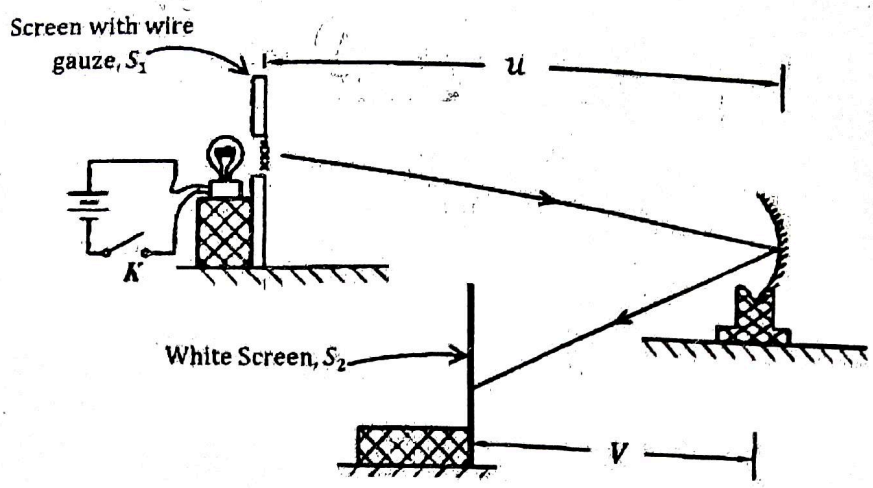

Fig. 2

(d) Adjust the position of the mirror so that its distance from the object $u = 30.0cm$.

(e) Close switch K.

(f) Adjust the position of the white screen, S_2 until a sharply focused image of the wire gauze appears on it. Open switch K.

(g) Measure and record the distance, V of the screen S_2 from the mirror.

(h) Calculate the values of $y = V - f_1$ and $x = u - f_1$.

(i) Repeat procedures (f) to (h) for values of $u = 35.0, 40.0, 45.0, 50.0$ and $55.0cm$.

(j) Tabulate your results including values of $\frac{1}{x}$.

(k) Plot a graph of y **(along the vertical axis)** against $\frac{1}{x}$ **(along the horizontal axis)**.

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

(m) Calculate the value of f_2 from $f_2 = \sqrt{S}$.

(n) Determine the value of the constant, f of the concave mirror using $f = \frac{1}{2}(f_1 + f_2)$

HAND IN YOUR TRACINGS TOGETHER WITH YOUR ANSWER SHEETS

Turn Over

3. In this experiment, you will determine the internal resistance, R, of the fixed resistor in a circuit. *(30marks)*

(a) Fix the bare wire, W on the bench using pieces of sellotape.

(b) Connect the circuit shown in figure 3.

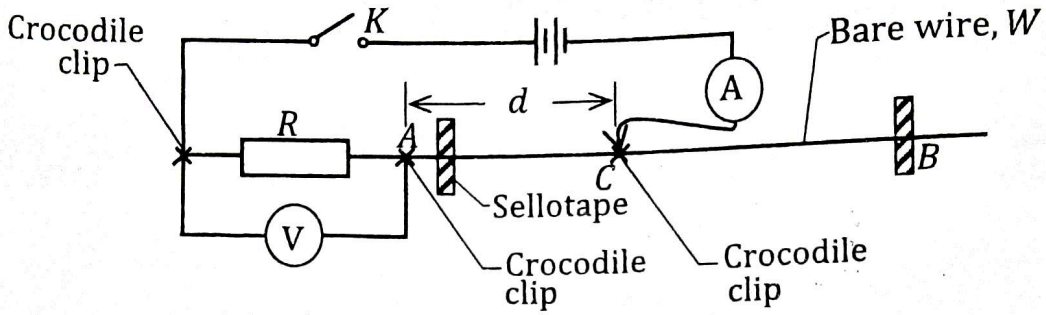

Fig. 3

(c) Adjust the length d of the bare wire to 20.0cm.

(d) Close switch, K.

(e) Read and record the ammeter reading I, and voltmeter reading, V.

(f) Open switch, K.

(g) Repeat procedures (c) to (f) for values of d = 30.0, 50.0, 60.0, 70.0 and 90.0cm.

(h) Record your results in a suitable table.

(i) Plot a graph of V **(along the vertical axis)** against I **(along the horizontal axis)**.

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

DISCONNECT THE CIRCUIT

END