535/3
Physics Practical
Paper 3
July/Aug 2023
2 ¼ hours

KAMSSA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

PHYSICS

PAPER 3

2hours 15minutes

INSTRUCTIONS TO CANDIDATES:

- Answer **question 1** and one other question. 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 for the use made of them.
- Candidates are reminded to record their observation as soon as they are made. Whenever possible, candidates should put their observation and calculations in a suitable table drawn in advance.
- An account of the method of carrying out the experiment is not required.
- Squared paper is provided.
- Mathematical tables and silent non programmable calculator may be used

 Turn Over

1. In this experiment you will determine the acceleration due to gravity, g

(a). Attach a pointer to one end of the spring provided using a thread.

(b). Suspend the spring from the free end by tying it on the rod of the retort stand clamp.

(c). Clamp the half-metre rule vertically as shown in figure below.

(d). Fix a pointer at the free end of the spring using a little plasticine

(e). Read and record the position, y_0, of the pointer against a metre rule

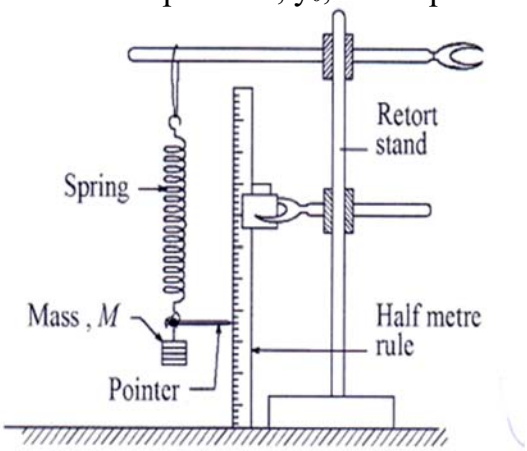


Figure 1

(f). Suspend a mass M of 0.100kg from the free end of the spring.

(g). Note the new position, y of the pointer on the meter ruler.

(h). Calculate the extension d from $d = (y - y_o)$ in metres,

(i). Displace the mass, M through a small vertical distance and release it to oscillate.

(j). Measure and record the time for 20 oscillations.

(k). Calculate the period, T

(l). Repeat procedure (f) to (k) above for values of

M= 0.200,0.300, 0.400, 0.500 and 0.600kg.

(m). Tabulate your values in a suitable table including values of T^2.

(n). Plot a graph of T^2 against d

(0). Find slope, S of your graph.

(p). Calculate the value of acceleration due to gravity **g** from $\boldsymbol{g} = \frac{4\pi^2}{S}$

2. In this experiment you will be required to determine the focal length, f of the convex lens provided.

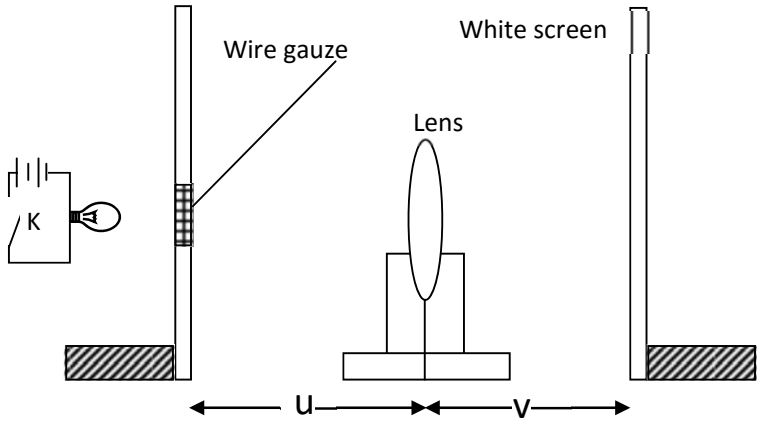


Figure 2

(a). Set up the apparatus as shown below.

(b). Estimate the focal length, f_0 of the lens by focusing the image of a distant object outside the window on the screen. The image distance of this distant object is equal to the approximate focal length, f_0

(c). Place an illuminated object at a distance u=1.5 f_0 from the lens.

(d). Adjust the position of the screen until a sharp image of the wire gauze is obtained on the white screen.

(e) Measure and record the image distance v.

(f). Repeat procedures (c) to (e) for object distance u= 2.0 f_0, 2.5 f_0, 3.0 f_0 3.5 f_0 and 4.0 f_0

(g). Tabulate your results in a suitable table including values of $\frac{1}{u}$ and $\frac{1}{v}$

(h). Plot a graph of $\frac{1}{u}$ against $\frac{1}{v}$

(i). Find the value of y_0 of $\frac{1}{u}$-axis when $\frac{1}{v}$ = 0

(j). Find the value of x_0 of $\frac{1}{v}$-axis when $\frac{1}{u}$ = 0

(k). Calculate mean focal length of the lens from the expression

$$f = \left(\frac{1}{x_0} + \frac{1}{y_0}\right).$$

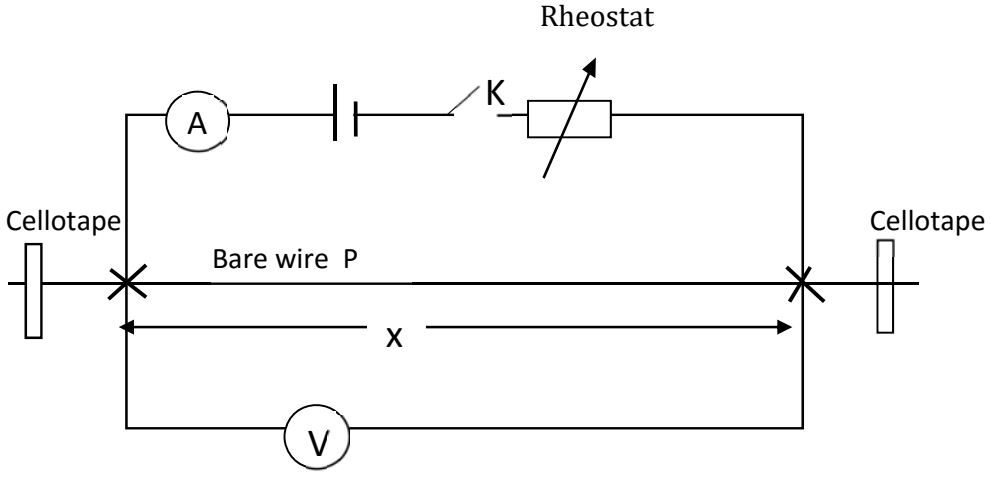
3. In this experiment, you will determine the internal resistance, r, of the dry cell provided.

PART I

(a). Fix the bare wire marked, P on the table using sellotape

(b). Connect the circuit shown in the figure. with x = 1.000m

Figure 3



(c). Close switch, K

(d). Adjust the rheostat so that the ammeter, A, indicates a current I = 0.10 A

(e). Read and record the voltmeter reading, V_1

(f). Calculate the resistance per metre, $\boldsymbol{\beta}$ of wire P from $\boldsymbol{\beta} = \frac{V_1}{I\,x}$

PART II

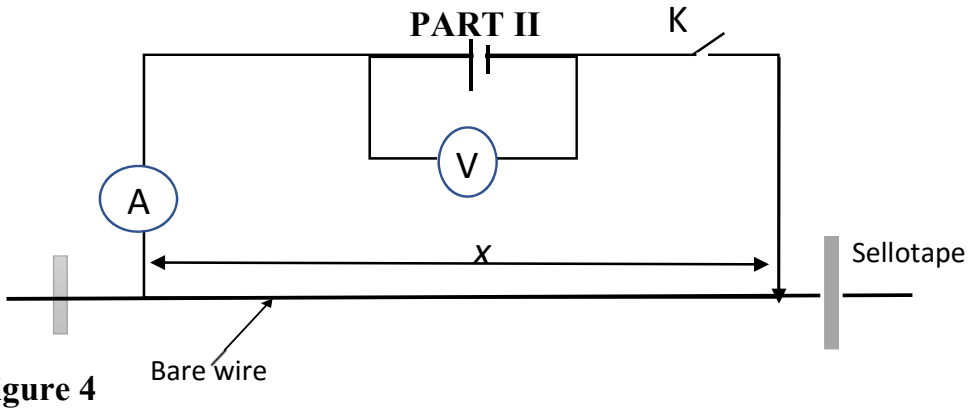


Figure 4

(a). Connect the circuit as shown in the Figure above

(b). With the switch, K, open read and record the voltmeter reading, V_0

(c). Adjust the length, *x* to 0.300m

(d). Close switch K.

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

(f). Open switch, K

(g). Repeat the procedure from (e) to (f) for values of *x* = 0.400, 0.500, 0.600 and 0.700m

(h). Tabulate your results including values of $\frac{V_o}{I}$ and $\boldsymbol{\beta}$x.

(i). Plot a graph of $\frac{V_o}{I}$ **(along the vertical axis)** against $\boldsymbol{\beta}x$ **(along the horizontal axis**

(j). Find the intercept, r, on the $\frac{V_o}{I}$ - axis.

END