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PHYSICS

PRACTICALS

PAPER 3

July 2022

$2\frac{1}{4}$ hours

KAMOTA MOCK EXAMINATIONS 2022

UGANDA CERTIFICATE OF EDUCATION

Physics practical

Paper 3

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES

- Answer **Question 1**and **one** other question.
- Candidates are not allowed to use the apparatus or write for the first fifteen minutes.
- Graph papers are provided.
- Mathematical tables and non – programmable silent electronic calculators may be used.
- Write on one side of the paper only.
- Candidates are expected to record on their scripts all their observations as these observations are made and to plan the presentation of the records so that it is not necessary to make a fair copy of them. The working of the answers is to be handed in.
- Details on the question paper should **not** be repeated in the answer, nor is the theory of the experiment required unless specifically asked for.
- 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.
- For each of the questions, candidates are required to choose appropriate apparatus from the equipments provided.

1. In this experiment, you will determine the property, η of the bicycle spoke provided.

(30 marks)

(a) Measure and record the height, h of the bicycle spoke provided.

(b) Mark a ring round the midpoint of the bicycle spoke using a marker.

(c) Adjust the position of the clamp to be at a position H = 45.0 cm above the surface of the table.

(d) Clamp a meter rule vertically such that its base rests on the surface of the table and close to the beaker.

(e) Using a piece of thread and the retort stand, suspend the bicycle spoke as shown in figure 1.

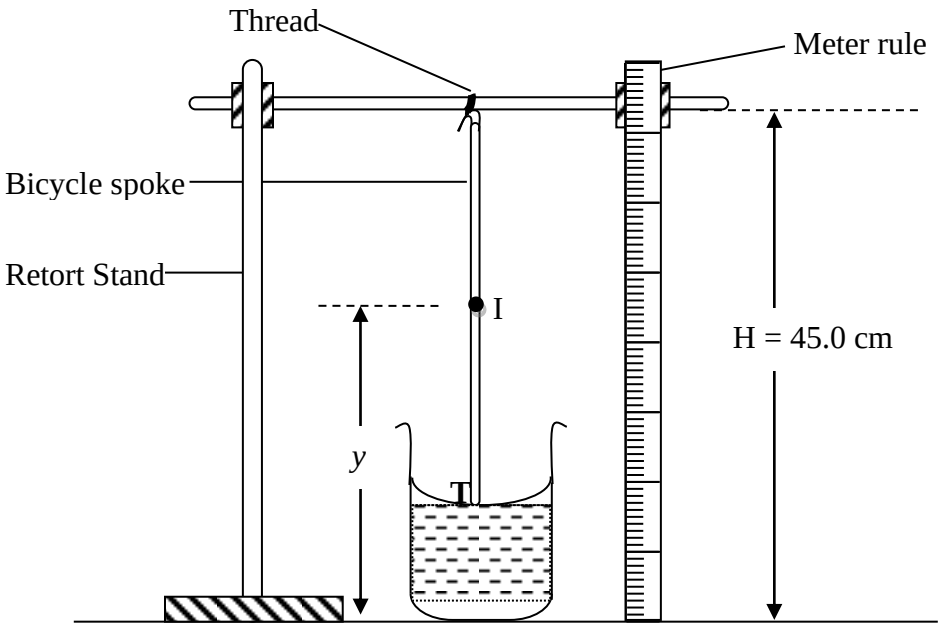


Figure 1

(f) Pour a volume, V = 50cm ^{3} of water into the beaker.

(g) Adjust the free end of the thread until the end; T of the bicycle spoke just touches the surface of the water inside the beaker.

(h) Read and record the height, y of the ink mark, I above the surface of the table.

(i) Repeat procedures (f) to (h) for values of V = 100.0, 150.0, 200.0, 250.0 and 300.0 cm^3

(j) Record your results in a suitable table including values of $\frac{y}{L}$ and $\frac{V}{L}$

(k) Plot a graph of $\frac{y}{L}$ (along the vertical axis)against $\frac{V}{L}$ (along the horizontal axis)

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

(m) Read and record the intercept, C on the $\frac{y}{L}$ – axis

(n) Calculate the property, η of the bicycle spoke using the expression,

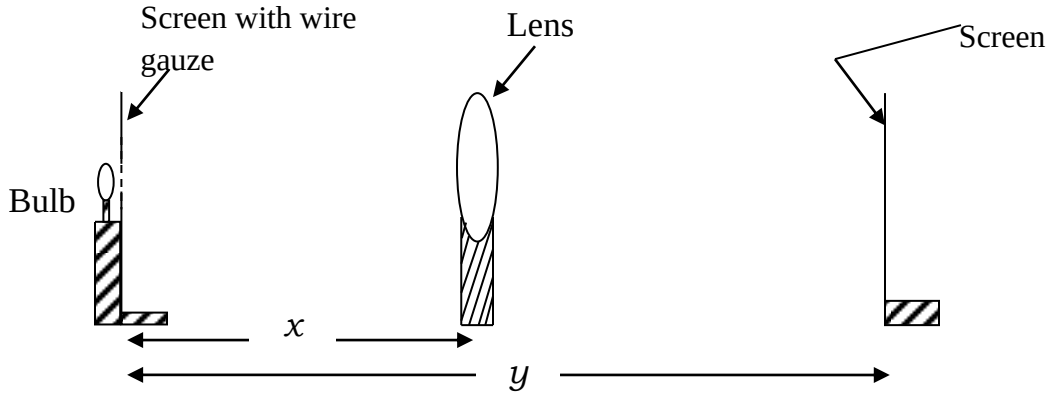
$$\eta = \frac{2LC}{SA} \text{ where A} = 38.5\text{cm}^2$$

2. In this experiment, you will determine the constant, β of the converging lens provided.

(30 marks)

a) Connect the pair of dry cells, a torch bulb and a switch, K in series.

b) Arrange the bulb, screen with wire gauze, lens and the white screen as shown below.



c) Adjust the position of the lens so that the distance, x between the wire gauze and the lens is 20.0 cm.

d) Close the switch.

e) Adjust the position of the white screen until a clear image of the wire gauze is obtained on it.

f) Measure and record the distance, y between the wire gauze and the white screen.

g) Open the switch.

h) Repeat procedures (c) to (g) for x = 25.0, 30.0, 35.0, 40.0 and 45.0cm.

i) Record your results in a suitable table including values of x^2 and $\frac{x^2}{y}$

j) Plot a graph of x against $\frac{x^2}{y}$

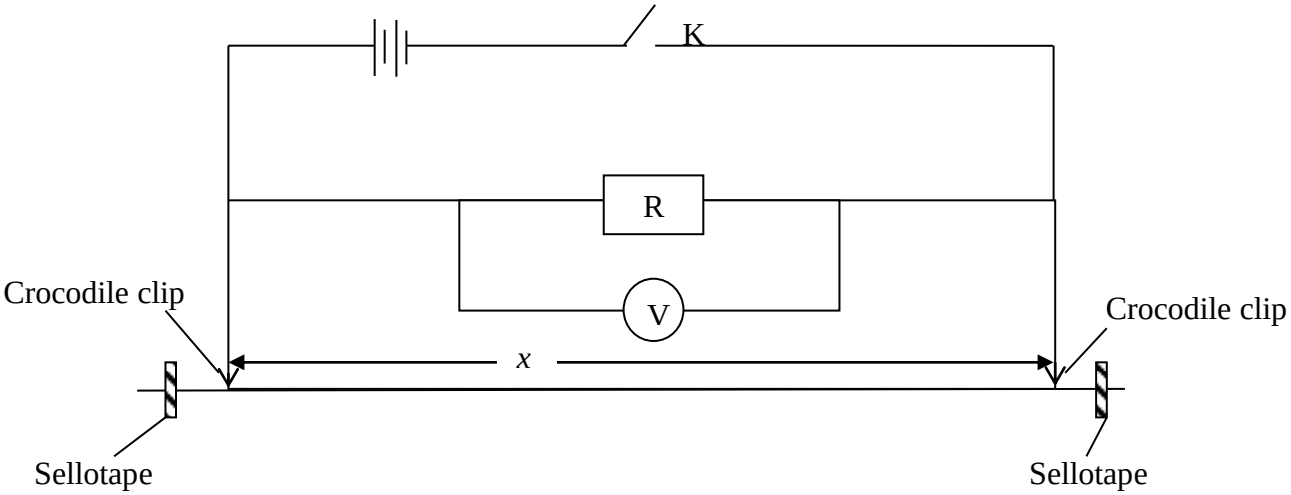
k) Find the slope, S of the graph.

l) Find the intercept, C on the $x - axis$

m) Calculate β using the expression; $\beta = CS$

3. In this experiment, you will determine the resistance, R and the constant, α of the bare wire, W provided. (30 marks)

(a) Connect the circuit as shown below



(b) Adjust the value of x to 0.900m.

(c) Close switch, K

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

(e) Open switch, K

(f) Repeat procedures (b) to (e) for $x = 0.800, 0.700, 0.600, 0.500 \; and \; 0.400m$

(g) Record all your results including values of $\frac{1}{x}$ and $\frac{I}{V}$.

(h) Plot a graph of $\frac{I}{V}$ (along the vertical axis) against $\frac{1}{x}$ (along the horizontal axis)

(i) Find the slope, S of your graph

(j) Read and record the intercept, C on the $\frac{I}{V} - \; axis$

(k) Calculate α from the expression $S = \frac{1}{\alpha}$

(l) Calculate, R, from; $C = \frac{1}{R}$

DISMANTLE THE SET UP OF THE APPARATUS