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535/3
PHYSICS
PRACTICAL
Paper 3
2 ¼ hours

UCE MOCK 1 EXAMINATIONS 2016
PHYSICS PRACTICAL
Paper 3
2 hours 15 minutes

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 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. Wherever possible, candidates should put their observations in a suitable table drawn in advance.

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

Squared papers are provided.

Mathematical tables and non programmable scientific calculators may be used.

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1. **In this experiment you will determine the force constant, *K* of the Nuffield spring provided.**

(a) Clamp the spring and the scale provided vertically with the zero mark at the top and the graduated face towards the spring.
(b) Suspend the metre rule horizontally from the knife edge a distance L = 5.0 cm from the zero end and the other end is supported by a thread attached to the free end of the spring as shown in the figure.

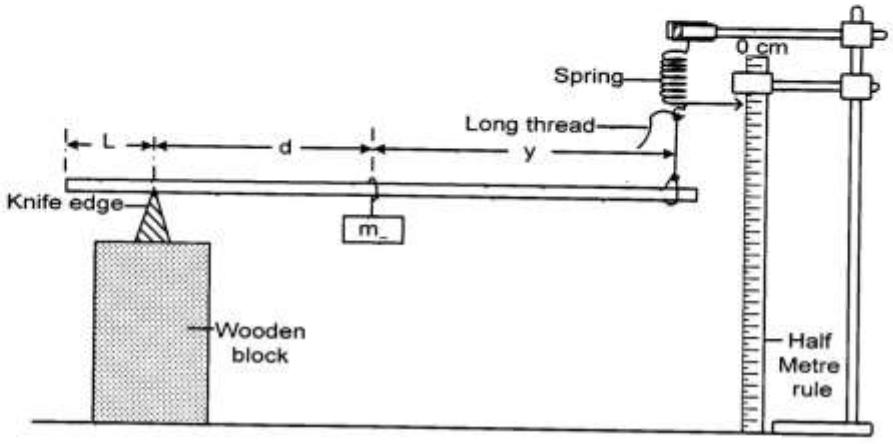

Fig.1

(c) Adjust the position of the spring until the beam balances horizontally, so that distance (d + y) is 0.950 m.
(d) Read and record the initial position P_o of the pointer on the scale.

(e) Suspend a mass m_2 = 0.200 kg from the metre rule using a shorter piece of thread at a distance d = 10.0 cm from the knife edge.
(f) Read and record the new position P_1 of the pointer on the scale.
(g) Determine the extension e, of the spring in metres.
(h) Measure and record distance, y.
(i) Repeat procedures (f) to (i) for values of d = 20.0, 30.0, 40.0, 50.0 and 60.0 cm.
(j) Tabulate your results in a suitable table including values of $\frac{d}{(d+y)}$
(k) Plot a graph of e against $\frac{d}{(d+y)}$
(l) Determine the slope S of the graph.
(m) Calculate K from the expression, $K = \frac{mg}{S}$ where g = ***10.0*** m s^{-2}

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

(a) Arrange the apparatus as shown in figure below.

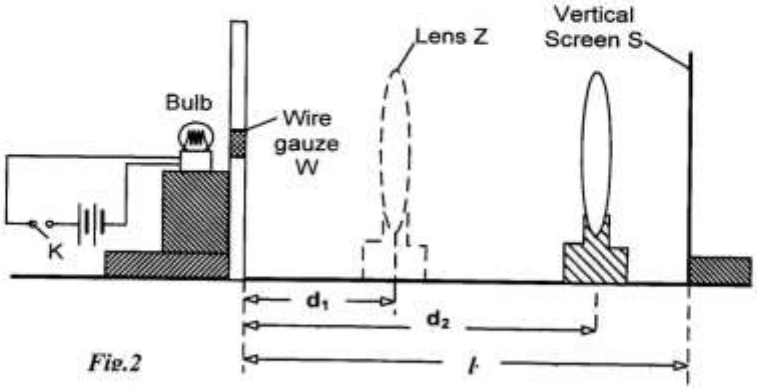

Fig.2

(b) Adjust the screen to a distance $l = 90.0$ cm from the wire gauze.

(c) Close switch K to illuminate the wire gauze.

(d) Starting with a position of Z nearer the wire gauze W, adjust the position of the lens Z, until a sharp clear and magnified image of W is formed on the screen.

(e) Measure and record distance d_1 of the lens from W.

(f) Keeping W and the screen S in their same fixed positions, move the lens Z towards the screen until a sharp diminished image of W is formed on it.

(g) Measure and record distance d_2 of the lens Z from W.

(h) Open switch K.

(i) Determine the distance $d = (d_2 - d_1)$.

(j) Repeat procedures (b) to (i) for values of $l = 85.0, 80.0, 75.0, 70.0$ and 65.0 cm.

(k) Record your results in a suitable table, including values of $(l^2 - d^2)$.

(l) Plot a graph of $(l^2 - d^2)$ against l.

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

(n) Determine the focal length f of the lens from $f_2 = \frac{1}{4} S$

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3. **In this experiment you will determine the resistance per metre ρ of the bare wire provided.**

(a) Fix the bare wire **W** on a bench using pieces of cello tape.

(b) Connect the dry cells, a torch bulb, a voltmeter V, and the ammeter A, a switch K and the bare wire **W** as shown below.

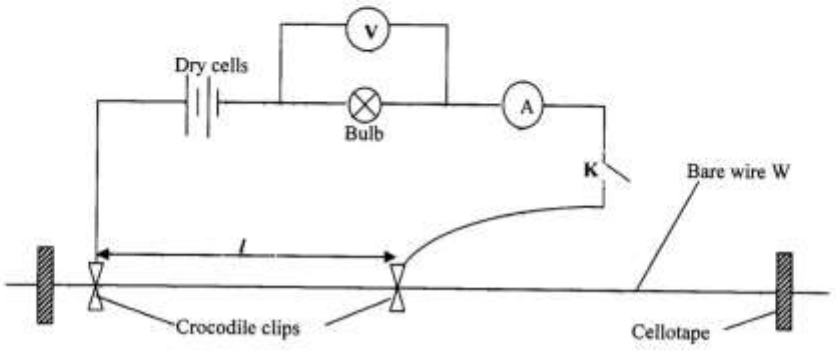

Fig.3

(c) Starting with length l = 1.000m, close the switch **K**.

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

(e) Repeat the procedures (c) and (d) for l = 0.800, 0.600, 0.400 and 0.200m.

(f) Tabulate your results, including values of $x_o = Il$.

(g) Plot a graph of **V** against x_o.

(h) Determine the slope, **S**, of the graph.

(i) Find $\rho = -S$.

DISMANTLE THE SET UP

END

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