535/3
PHYSICS
Paper 3
2¼ hours

DEPARTMENT OF PHYSICS

RESOURCE MOCK EXAMINATIONS, 2016

S.4 PHYSICS PRACTICAL

Paper 3

2 HOURS 15 MINUTES

Instructions to candidates

(i) Answer Questions 1 and one other question. You will not be required to start working with the apparatus for the first 15 minutes.

(ii) Marks are given mainly for a clear record of the observations made for their suitability and accuracy made for use made of them.

(iii) Candidates are required to record their observations as soon as they are made. Whenever possible, candidates should put their observations and calculations in the suitable table drawn in advance.

(iv) Squared papers are provided.

Qn. 1. In this experiment you will determine the mass of the metre rule provided.

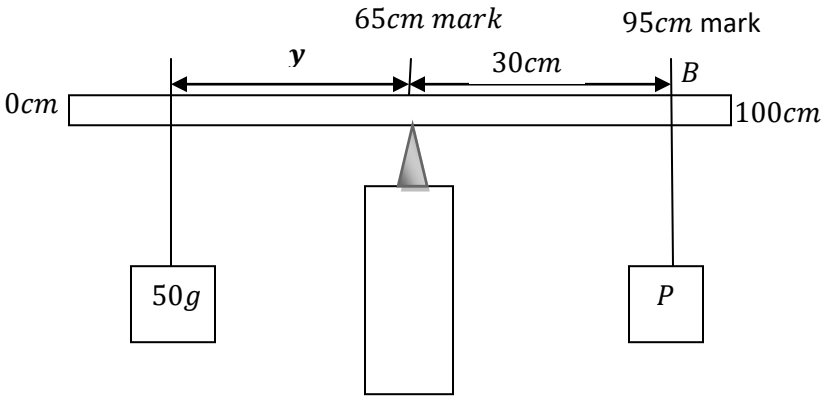
(a) Place the block of wood on the bench so that its longest edge is vertical.

(b) Place a knife edge on top of the block of wood.

(c) Place the metre rule provided on the knife edge at the $65cm$ mark

(d) Suspend the mass $\boldsymbol{P = 100g}$ at a point B, a distance of $5cm$ from the end of the metre rule.

(e) Suspend a mass of $50g$ at a point A such that the metre rule balances as shown in figure below:



(f) Measure and record distance $\boldsymbol{y}$.

(g) Repeat procedures (d) to (f) for values of $\boldsymbol{P = 110, 120, 130}$ *and* $\boldsymbol{140g}$.

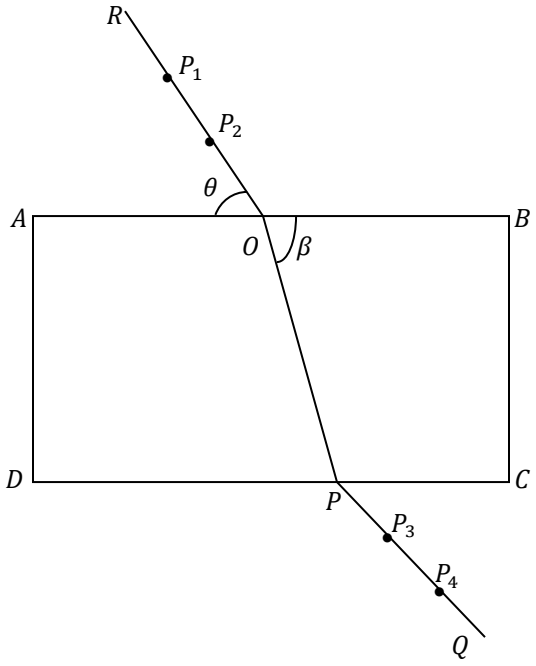
(h) Record your results in a suitable table including values of $\boldsymbol{50y}$ and $\boldsymbol{30P}$.

(i) Plot a graph of $\boldsymbol{30P}$ (along the vertical axis) against $\boldsymbol{50y}$ (along the horizontal axis).

(j) Read and record the intercept, $\boldsymbol{I}$ on the $\boldsymbol{50y}$ axis.

(k) Calculate the mass $\boldsymbol{M}$ of the metre rule from $\boldsymbol{M = \frac{I}{12}}$.

Qn. 2. In this experiment, you will determine the refractive index, n, of the material of the glass block provided.



(a) Fix the plane sheet of paper on a soft board using drawing pins.

(b) Place the glass block on the sheet of paper so that it rests on its broader face and trace its outline $\boldsymbol{ABCD}$.

(c) Remove the glass block.

(d) At point, O, about $2cm$ from A, draw a line RO at an angle $\theta = 80^o \; to \; AB$.

(e) Fix pins P_1 and P_2 along RO and the replace the glass block onto its outline.

(f) Looking through side DC, fix P_3 and P_4 such that they appear to be in a straight line with the images of P_1 and P_2 as shown in the figure above.

(g) Remove the pins and the glass block and draw a line through P_3 and P_4 to meet $DC \; at \; P$.

(h) Join $P \; to \; O$.

(i) Measure angle β.

(j) Repeat procedures (d) to (i) for $\theta = 70^o, 60^o, 50^o, 40^o \; and \; 30^o$.

(k) Record your results in a suitable table including values of $cos\theta \; and \; \cos\beta$.

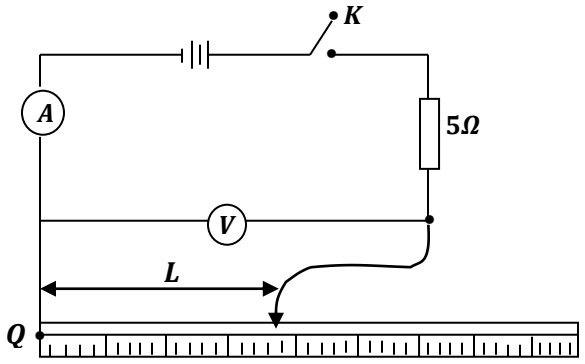
(l) Plot a graph of $cos\theta$ (vertical axis) against $cos\beta$ (horizontal axis).

(m) Find the slope, $\boldsymbol{n}$, of the graph.

Qn: 3. In this experiment you will determine the resistance per metre of the wire provided.

(a) Connect the dry cells provided in series with a $5\ ohm$ resistor, ammeter $\boldsymbol{A}$ and voltmeter $\boldsymbol{V}$ as shown in the figure below.

(b) Connect the end Q of the wire mounted on a metre rule to the circuit as shown.



(c) Connect a length $\boldsymbol{L} = 0.20m$ of the wire across the voltmeter.

(d) Close switch $\boldsymbol{K}$.

(e) Record the voltmeter reading $\boldsymbol{V}$ and the ammeter reading $\boldsymbol{I}$.

(f) Open switch $\boldsymbol{K}$.

(g) Repeat procedures (c) to (f) for values of $\boldsymbol{L} = 0.30, 0.40, 0.50, 0.60\ and\ 0.70\ m.$

(h) Record your results in a suitable table including values of $\boldsymbol{IL}$.

(i) Plot a graph of $\boldsymbol{V}$ (along the vertical axis) against $\boldsymbol{IL}$(along the horizontal axis).

(j) Find the slope, $\boldsymbol{S}$, of the graph.

END