Name……………………………………………………………………………….

Index No ………………………………………………………………………

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535/3

PHYSICS
PAPER 3
2 hours 15 minutes

MOCK EXAMINATIONS 2019
UGANDA CERTIFICATE OF EDUCATION
PHYSICS
PAPER 3
TIME: 2 HOURS 15 MINUTES

Instructions to candidates:

Answer question **one** 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 end for the use made of them.

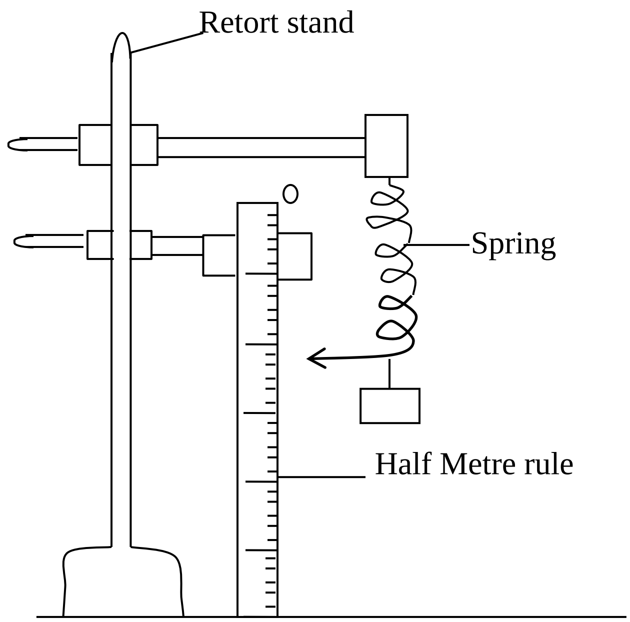
Candidates are reminded to record their observations as soon as they are made whenever possible, candidates should put their observations and calculations in a suitable table drawn.

Squared papers are provided.

Mathematical table and silent non programmable calculators may be used.

Qn.1 An experiment to determine the effective mass Mo of a spring

(a) Attach a pointer to one end of the spring to act as a pointer
(b) Clamp the spring vertically using two pieces of wood as shown in the figure 1.

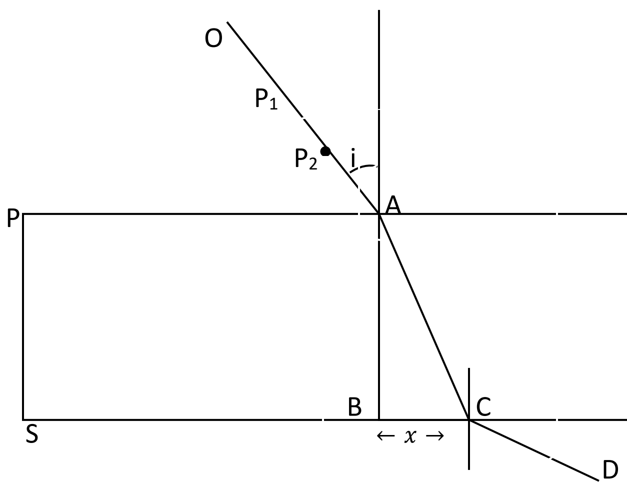


(c) Clamp the half metre rule vertically besides the spring.
(d) Read and record the position P_o of the pointer on the metre rule.
(e) Suspend Q mass M = 0.200kg from the free end of the spring.
(f) Read and record the new position of the pointer P
(g) Find the extension $X = P - P_o$ of the spring in metres.
(h) Remove the half metre rule, displace the mass slightly downwards and release it to oscillate.

(i) Measure and record the time, t, for 20 oscillations.
(j) Calculate the time T for one oscillation T
(k) Repeat the procedure (h) to (j) for values of M = 0.300, 0.400, 0.500, 0.600 , 0.700kg
(l) Record your results in a suitable table including values of T^2
(m) Plot a graph of T^2 against M.
(n) Find the value of T^2 when M = 0, let the value be C
(o) Calculate the effective mass, Mo of the spring from $M_o = \frac{Cg}{40\pi^2 x}$
(where $g = 9.81Ms^{-2}$ and $\pi = 3.14$)

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

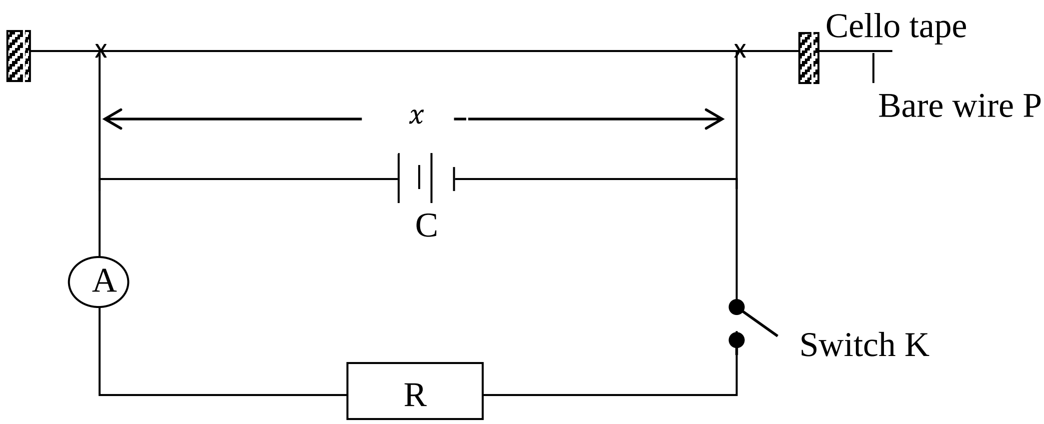
(a) Using the drawing pins provided, fix the plane white sheet of paper on a soft board.
(b) Place the glass block in the middle of the paper and mark the outline PQRS
(c) Remove the glass block, draw a perpendicular to PQ at point A about 2.0cm from P to meet SR at B



(d) Measure the distance AB and record it as W.
(e) Draw a line OA such that the angle i = 20°
(f) Fix two pins P_1 and P_2 along OA and replace the glass block onto the white sheet of paper.
(g) Looking through the glass block from the opposite face SR, stick two other pins P_3 and P_4 such that they appear to be in straight line with the images P_1 and P_2.
(h) Remove the glass block and the pins from the soft board.
(i) Draw a line DC through the points P_3 and P_4 to meet SR at C.
(j) Measure and record the distance x
(k) Repeat procedures (e) to (N) for values of i = 30°, 40°, 50° and 60°
(l) Enter your results in a suitable table including values of $1/_{Sin^2x}$ $against$ $1/_{x^2}$
(m) Plot a graph of $1/_{Sin^2x}$ $against$ $1/_{x^2}$
(n) Find the slope S, of the graph
(o) Calculate the refractive index, n of the glass block from the relation $\left(\frac{w^2}{4S}\right)^{\frac{1}{2}}$
(The tracing paper must be attached).

Qn 3. In this experiment, you will determine the internal resistance r of the cells provided.

(a) Record the resistance R of the given resistor Rs
(b) Connect the two dry cells in series across the voltmeter and record the reading Vo of the voltmeter.
(c) Fix the bare wire provided on the bench using cell tape



(d) Connect the circuit as shown in the figure 3 above starting with a length x = 0.200m.
(e) Close switch K
(f) Read and record the ammeter reading I
(g) Open the switch K
(h) Repeat the procedures (c) to (f) for values of x = 0.300, 0.400, 0.500, 0.600 and 0.700m
(i) Record your results in a suitable table including the value of $1/I$
(j) Plot a graph of $1/I$ against $\frac{1}{x}$.
(k) Find the intercept C on the $1/I$ axis
(l) Calculate the internal resistance r from the expression $r = V_oC - R_s$

END