535/3

PHYSICS

PRACTICAL

Paper 3

Jul/Aug 2019

 2¼ hours

MUKONO EXAMINATIONS COUNCIL

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.*

- *Candidates should, however, record any special precautions that they have taken and any particular features of their method of going about the experiment.*

- *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.*

1. In this experiment, you will determine the constant, R, of the spring provided and the property, Z, of the nails provided.
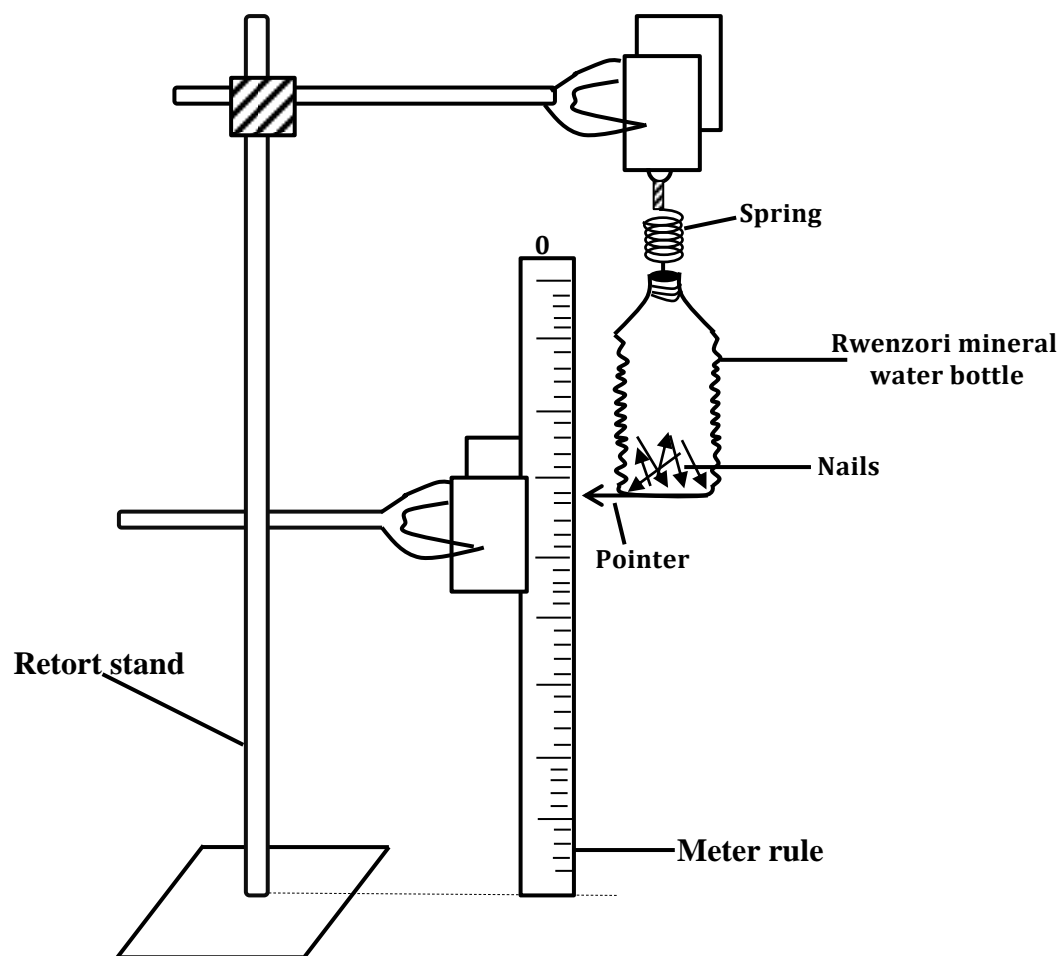
(a) Suspend the spring provided from the retort stand

(b) Clamp a metre rule vertically close to the spring

(c) Suspend the empty plastic numeral water bottle vertically from the free end of the spring.

(d) Attach a pointer using cell tape at the bottom of the plastic bottle provided as shown in figure1.

(e) Read and record the position, P_o of the pointer on the metre rule.

(f) Place all nails provided inside the plastic bottle.

(g) Pour a volume, V = 60.0cm^3 of water into the bottle containing the nails.

(h) Read and record the new positions, P_1 of the pointer on the metre rule

(i) Calculate the extension, e = (P_1 –P_0) of the spacing.

(j) Repeat procedure (g) to (i) for values of V = 120.0, 180.0, 240.0, 300.0, and 360.0 cm³

(k) Record your results in a suitable table.

(l) Plot as graph of e against V

(m)   Find the slope S of the graph.

(n) Calculate the spacing constant, R, using the expression.

$$R = \frac{9.8}{5}$$

(o) Read and record the intercept, C, on the e – axis.

(p) Find the property, Z, using the expression.

$$Z = \frac{C}{5X5}$$

2. In his experiment, you are required to determine the refractive index, n, of the glass using a glass prism.

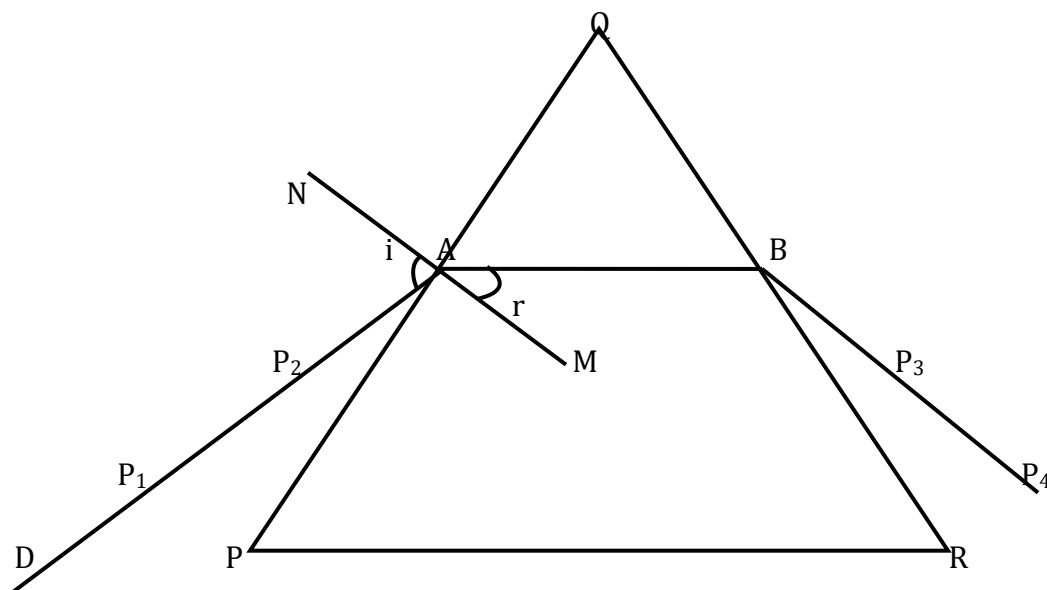(a) Fix a white sheet of paper on a soft board using drawing pins provided.

Fig 2

(b) Place the prism on the white sheet of paper and trace its outline PQR as seen in figure 2.

(c) Remove the glass prism and mark a point A, 2cm from the vertex Q and draw a normal NM to line PQ at A.

(d) Draw a line DA at an angle i = 20° with the normal and stick pins P_1 and P_2 about 4cm apart on the line DA.

(e) Replace the glass prism on its outline such that its vertices match those on the outline.

(f) Looking from side QR, stick pins P_3 and P_4 such that they appear to be in line with the images of P_1 and P_2 as seen through the glass prism.

(g) Remove the pins and the prism and draw a line through the positions of the pins P_3 and P_4 to meet RQ at B.

(h) Join B to A. Measure and record angle r.

(i) Repeat procedures (d) to (h) for values of i= 30°, 40°, 50°, 60° and 70°.

(j) Enter your results in a suitable table including values of sin I and sin r.

(k) Plot a graph of sin i against sin r.

(l) Find the slope n of your graph.

HAND IN YOUR TRACING PAPER.

3. In this experiment, you will determine the diameter, d, of the bare wire provided.
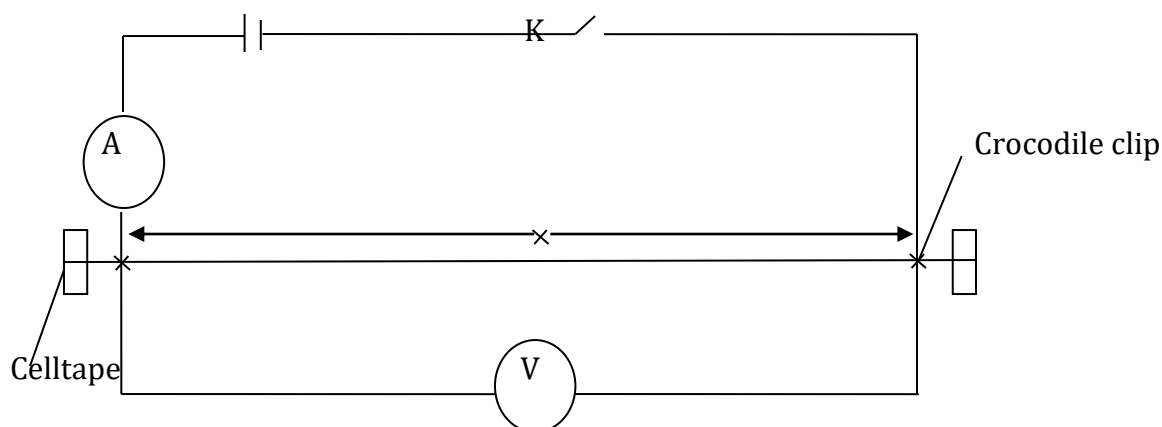
(a) Fix the bare wire on the table using sell tape.

(b) Connect the circuit as shown in fig.3 above.

(c) Adjust the position of the crocodile clips such that the length x = 0.900m.

(d) Close the switch K

(e) Read and record the ammeter reading I and Voltmeter reading V

(f) Open switch K

(g) Repeat procedures (c) and (f) above for values of x = 0.800, 0.700, 0.600, 0.500 and 0.400m.

(h) Enter your results in a suitable table including values of Ix.

(i) Plot a graph of V against Ix

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

(k) Calculate the diameter, d (metres) of the bare wire, from the expression.

$d\sqrt{5} = 7.9 \times 10^{-4}$

End -