P510/2
Physics
Paper 2 (practical)
July/August 2026
2hours

BUGANDA EXAMINATIONS COUNCIL MOCKS

Uganda Advanced Certificate of Education

Paper 2 (Practical)

3hours

INSTRUCTIONS TO CANDIDATES

- This examination paper consists of two compulsory items.
- Use blue or black ink. Any work down in pencil except graphs and diagrams will not be scored.
- Scores are awarded mainly for a clear record of the observations actually made, for their suitability accuracy and for the use made of them.
- Details on the question paper should not be repeated in the responses.
- Graph paper is provided.
- Silent, non-programmable scientific calculators may be used.

Scanned with CamScanner

Item 1

A laboratory technician requested for rolls of constantan wire for use in a Physics practical examination. The bare wires needed for the examination were expected to have a resistance per unit length of about$5\Omega m^{-1}$. The supplier delivered several rolls of the bare wire but none of them were labelled. To determine whether the wires met the required specification using two methods so as to obtain reliable results and determine the average resistance per metre of the wires.

In the first method a piece of bare wire would be connected in the circuit with an ammeter and a voltmeter and a voltmeter taking the measurement once. In the second method, a metre bridge circuit would be used together with a standard resistor while pieces of the bare wire of different length would be connected in one gap of the bridge. However, before carrying out the investigation the technician was unable to report to school in time.

The head of Physics department has now requested you to verify the specification of the rolls of bare wires supplied before they are arranged for the practical examination.

Task

Carry out an investigation using two methods to enable the head of department to establish whether the supplied rolls of bare wire are suitable for the Physics practical examination.

Item 2

Senior four students were playing football near a classroom block that had glass windows. During the game, one student kicked the ball and accidentally broke one of the window panes. The student was instructed to buy a replacement glass with a refractive index between 1.4 and 1.6.

At a hard ware shop, the student was given a sample of glass with similar appearance but its refractive index was unknown.

The student does not know how to determine the property of the glass sample before deciding whether to buy the glass.

He has approached you with the sample in the form of glass block, along with the other apparatus required for the investigation.

Task

Follow the instructions provided and use the result obtained to give feed back to the S. 4 student.

Part 1

(a) Measure and record the length, $x$of the glass block.
(b) Draw a line on the plain sheet of paper.
(c) Place the glass block with its smallest area over the line.
(d) Hold the pin horizontally so that its pointed end is adjacent to the glass block as shown in figure 1.

Scanned with CamScanner

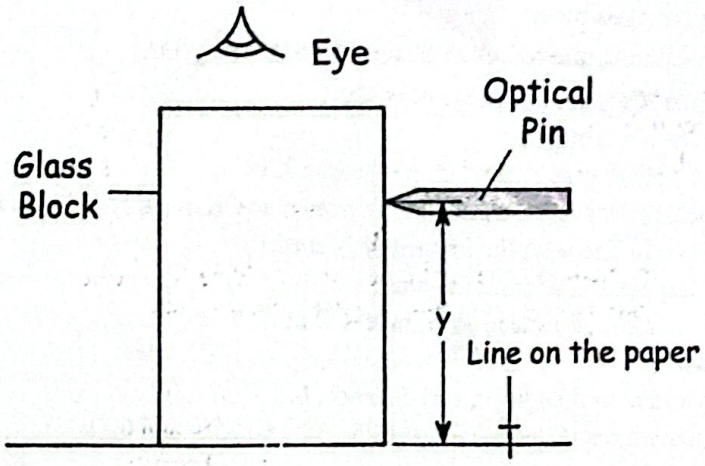


Fig. 1

(e) Adjust the position of the optical pin until it appears to coincide with the image of the line as seen through the glass block.

(f) Measure and record the height, y, of the pin from the line on the sheet of paper.

(g) Determine the property, n_1 *of the* glass block from the expression.

$$x = n_1(x - y)$$

Part II

(a) Measure and record the width, w, of the glass block.

(b) Fix the plain sheet of paper on the soft board using drawing pins.

(c) Place the glass block in the middle of the plain sheet of paper with the largest face top most, and draw its outline ABCD as shown in figure 2.

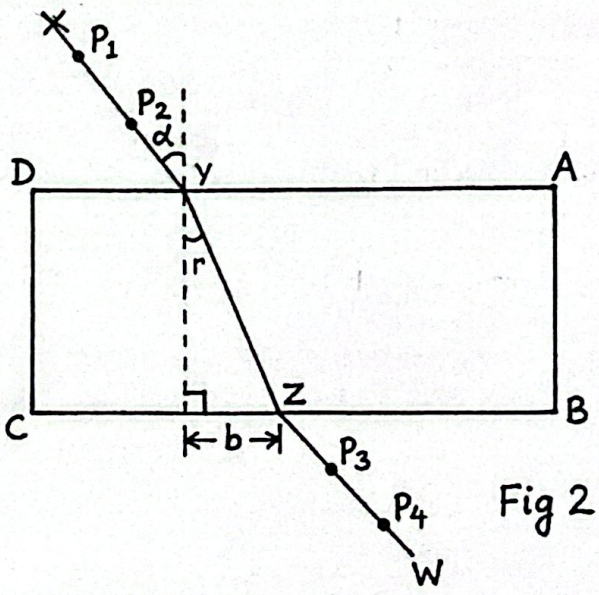


Fig 2

Fig. 2

(d) Remove the glass block
(e) Draw a perpendicular to DA at Y such that DY = $^1/_4$(DA)
(f) Draw a line XY such that angle $\propto = 20^o$.
(g) Replace the glass block
(h) Stick two optical pins P_1 *and* P_2 on the line XY.
(i) While looking through the glass block from side CB, stick pins P_3 *and* P_4 such that they appear to be in line with the images of P_1 *and* P_2
(j) Remove the glass block and the pins.
(k) Draw a line through P_3 *and* P_4 to meet CB at Z.
(l) Joint Z to Y
(m) Measure and record angle, **r**, and distance, **b**.
(n) Repeat procedures (f) to (m) for $\propto$ =25°, 30°, 40°, 50° and 60°.
(o) Tabulate your results, including values of sin$\propto$ and $\frac{bcosr}{w}$
(p) State the sources of errors and their corresponding precautions.
(q) Plot a graph of sin$\propto$ against $\frac{bcosr}{w}$
(r) Find the slope n_2 of the graph.
(s) Obtain the property, **n** of the glass block using an appropriate expression containing **n**, n_1 *and* n_2.
(t) Provide feedback to the S. 4 students based on your finding.

END

Scanned with CamScanner