

MAKUENI COUNTY CLUSTER PREPARATORY EXAMINATION 2016

232/3

PHYSICS PRACTICAL

Paper 3

JULY/ AUGUST 2016

TIME: 2 ½ HOURS

Q1. You are provided with the following:

- ✓ A plain white paper fixed on the softboard
- ✓ Four optical pins
- ✓ 30cm transparent ruler
- ✓ Protractor
- ✓ Rectangular glass block

Proceed as follows:

- (a) On the white sheet of paper fixed on the softboard, draw a line XY, 25cm long at the middle of the paper. Mark its point at Q.
- ✓ At Q draw a normal, QN.
 - ✓ Draw a line PQ such that the angle, i , between PQ and QN is 15° .
- (b) Place the glass block, largest face down, on the paper such that the mid-point of the edge AB of the block coincides with the mid-point Q of the line XY as shown in figure 1. Draw the outline ABCD, of the glass block.
- ✓ Fix two pins O_1 and O_2 on the line PQ in such a way that they are vertical and about 5cm from each other.
 - ✓ Looking through the glass block through face AB, fix two pins S_1 and S_2 , so that they are exactly in line with O_1 and O_2 as shown in figure 1.
 - ✓ Mark the positions of S_1 and S_2 .
 - ✓ Remove the block, joint points S_1 and S_2 and produce the line to meet face AB of the block at R.
 - ✓ Join Q to R.
 - ✓ Measure the length, QR, let its length be $L = \underline{\hspace{2cm}}$ cm
- (c) Repeat part (b) for other values of angle $i = 25^\circ, 35^\circ, 45^\circ$ and 55° and complete table 1.

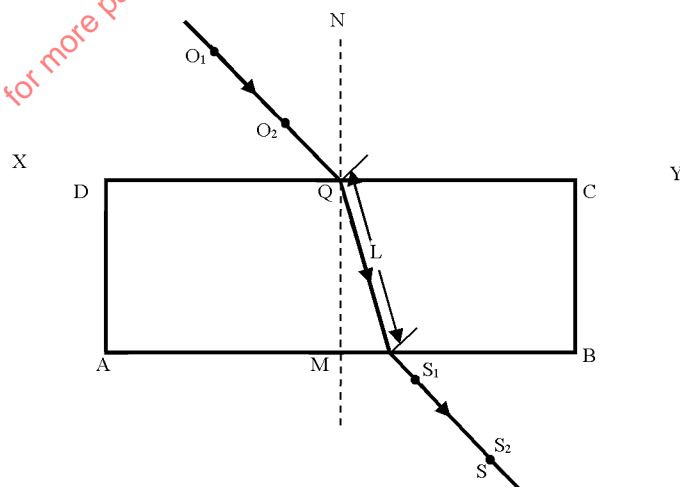


Figure 1

NB: Attach the sheet of paper to the question paper for marking.

(1 mark)

Table 1

$i (^{\circ})$	$L(\text{cm})$	$L^2 (\text{cm}^2)$	$\frac{1}{L^2} (\text{cm}^{-2})$	$\sin i$	$\sin^2 i$
15					
25					
35					
45					
55					

(d) On the grid provided, plot a graph of $\frac{1}{L^2}$ (vertical axis) against $\sin^2 i$

(5 marks)

(e) Determine the slope of the graph

(2 marks)

(f) Given that,

$$\frac{1}{L^2} = \frac{1}{b^2} - \frac{1}{n^2 b^2} \sin^2 i$$

Use the graph for find;

(i) b

(marks)

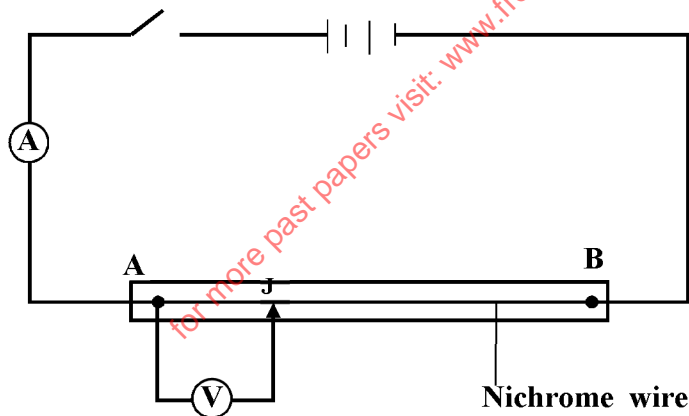
(ii) n

(3 marks)

Q2. You are provided with the following

- ✓ A wire AB mounted on a mm scale.
- ✓ A voltmeter screw gauge
- ✓ A switch
- ✓ 2 cells
- ✓ A cell holder
- ✓ 8 connecting wires

(a) (i) Arrange the apparatus and then connect the circuit as shown in the diagram.



(ii) Close the switch and record the value of current, I, flowing.

$$I = \underline{\hspace{2cm}} \text{ A}$$

(1 mark)

(b) Place the sliding contact J at a distance of 10cm from A. Read the p.d across the wire. Increase the length AJ to the values shown each time obtain the p.d across the wire.

(c) Enter these values in the table below.

(5

marks)

Length L (cm)	10	20	30	40	50	60
P.d across AJ (V)						

- (d) Plot a graph of p.d (v) (y-axis) against length L (5 marks)
- (e) Determine the slope S, of your graph. (3 marks)
- (f) Determine the diameter of the wire AB at two different points hence calculate the average. (2 marks)
- (g) Determine the cross-section area, A, of the wire in cm^2 (2 marks)
- (h) Given that $V = \frac{KL}{A}$, determine the value of k. (2 marks)

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