

THE SUCCESS PATH EXAMINATION COUNCIL (SPEC)

Paving the Way to Success

232/3 PHYSICS (Practical)

PRE-MOCK EXAMINATIONS 2026

MARCH 2026

Time: 2½ hours



Paper 3

**232/3
4992104**

Name **MARKING SCHEME** Admission Number

School Class

Candidate's Signature Date

Instructions to candidates

- (a) Write your name and admission number in the spaces provided above.
- (b) Sign and write the date of examination in the spaces provided above.
- (c) Answer ALL questions in the spaces provided in the question paper.
- (d) You are supposed to spend the first 15 minutes of the 2 ½ hours allowed for this paper reading the whole paper carefully before commencing your work.
- (e) Marks are given for a clear record of the observations actually made, their suitability, accuracy and the use made of them.
- (f) Candidates are advised to record their observations as soon as they are made.
- (g) Non-programmable silent electronic calculators and KNEC mathematical tables may be used except where stated otherwise.
- (h) This paper consists of 8 printed pages.
- (i) Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

For Examiner's Use Only

Question 1	c	d	g	h	i	(j)	(k)		TOTAL	
Maximum Score	1	1	8	5	2	2	1		20	
Candidate's Score										
Question 2		c	e	f	g	h	i	j	k	TOTAL
Maximum Score		1	6			5	3	3	2	20
Candidate's Score										40

GRAND TOTAL

**Question one
4992104**

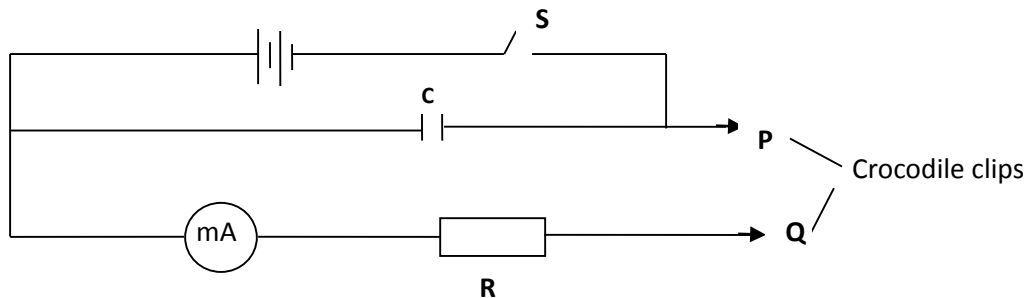


You are provided with the following:

- 2 new dry cells size D
- A cell holder
- A switch
- A milliammeter of range 0 to 1 mA
- A capacitor labeled C
- 8 connecting wires; at least four with crocodile clips on one end
- A stopwatch
- A carbon resistor labeled **R**

Proceed as follows

- (a) Connect the circuit as shown in the **figure 1** below, where **P** and **Q** are crocodile clips.



- (b) Close the switch **S**
- (c) Name the process which takes place when the switch **S** is closed

Charging

(1 mark)

- (d) Connect the crocodile clips **P** and **Q**. Observe and record the highest reading of the millimeter **I₀**

$$I_0 = 0.62 \pm 0.02 \text{ mA}$$

(1 mark)

- (e) Open the switch **S** and at the same time start the stopwatch to measure the time taken for the current to decrease to **four fifth** the value of **I₀** i.e. $\frac{4}{5} I_0$. Record your value in the **table 1**.
- (f) Close the switch **S** for a second time and observe the deflection in the millimeter. (*the pointer should rise back to the same initial value I₀*)

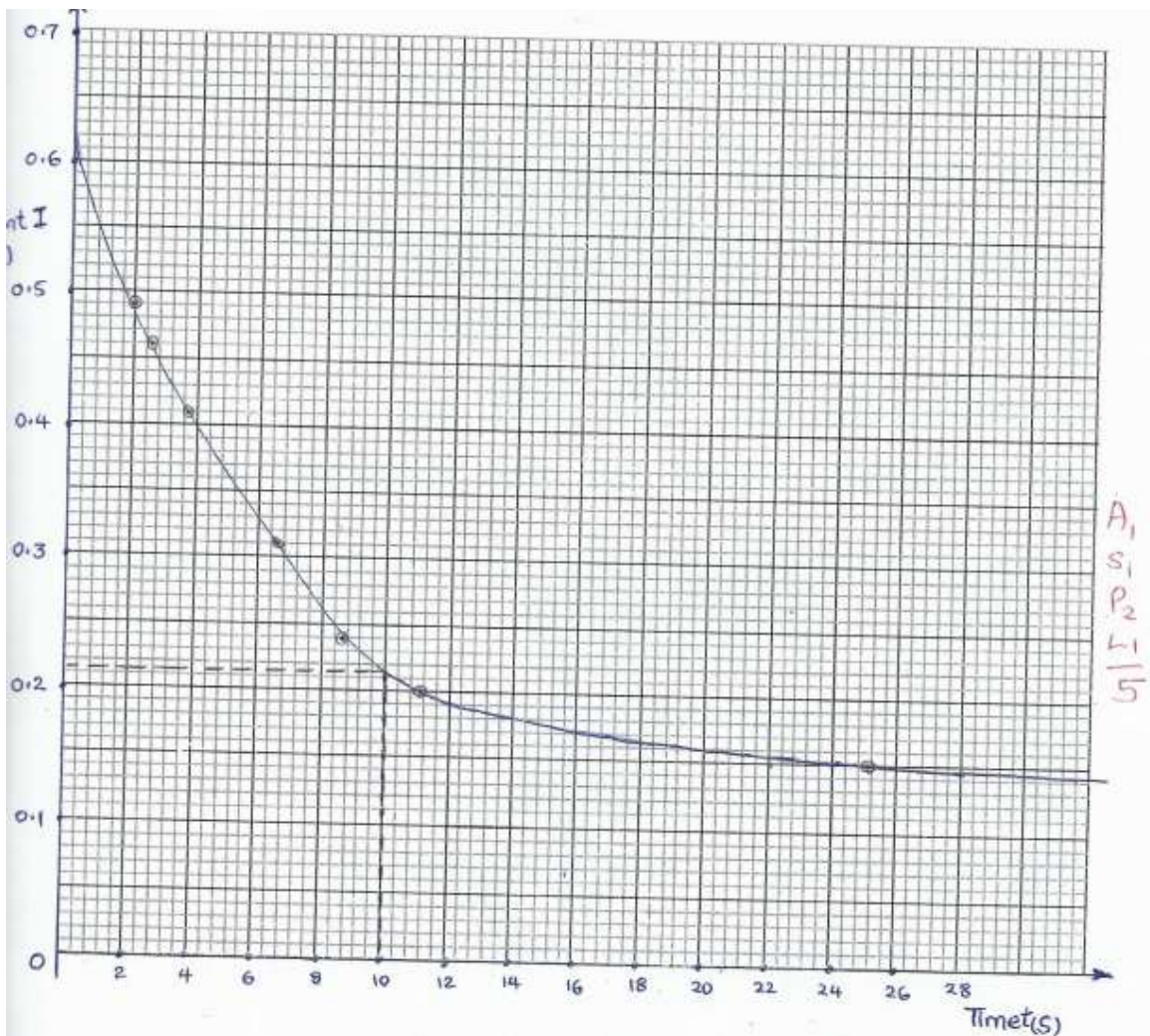
(g) Repeat part (b) for other values of current as shown in the **table 1** below. (8 marks)

Current I (mA)	$\frac{4}{5} I_0$	$\frac{3}{4} I_0$	$\frac{2}{3} I_0$	$\frac{1}{2} I_0$	$\frac{2}{5} I_0$	$\frac{1}{3} I_0$	$\frac{1}{4} I_0$
Your calculated fraction of I_0 (mA)	0.49	0.46	0.41	0.31	0.24	0.20	0.15
Time t (s)	0.20 1mark	0.26 1mark	3.70 1mark	6.58 1mark	8.64 1mark	11.04 1mark	25.50 1mark

\pm
1 mark

± 0.5

(h) Plot a graph of Current I (y – axis)(mA) against time t (s) (5 marks)



(i) From your graph, find **W** the value of I when $t = 10s$. (2 marks)

$$W=0.23 \text{ mA}$$

(Confirm this value from the graph)

- (j) Given that $\mathbf{A} = 10\mathbf{W}$, determine the value of \mathbf{A} . (2 marks)

$$\mathbf{A} = 10 \times 0.23 \times 10^{-3}$$

$$= 2.3 \times 10^{-3} \text{c}$$

- (k) Determine the voltage across \mathbf{R} at $\mathbf{t} = 10\mathbf{s}$ given that $\mathbf{R} = 4.7\mathbf{k}\Omega$ (1 mark)

$$\mathbf{V} = \mathbf{IR}$$

$$= 2.3 \times 10^{-4} \times 4.7 \times 10^3$$

$$= 1.081\mathbf{V}$$

Question Two

4992104

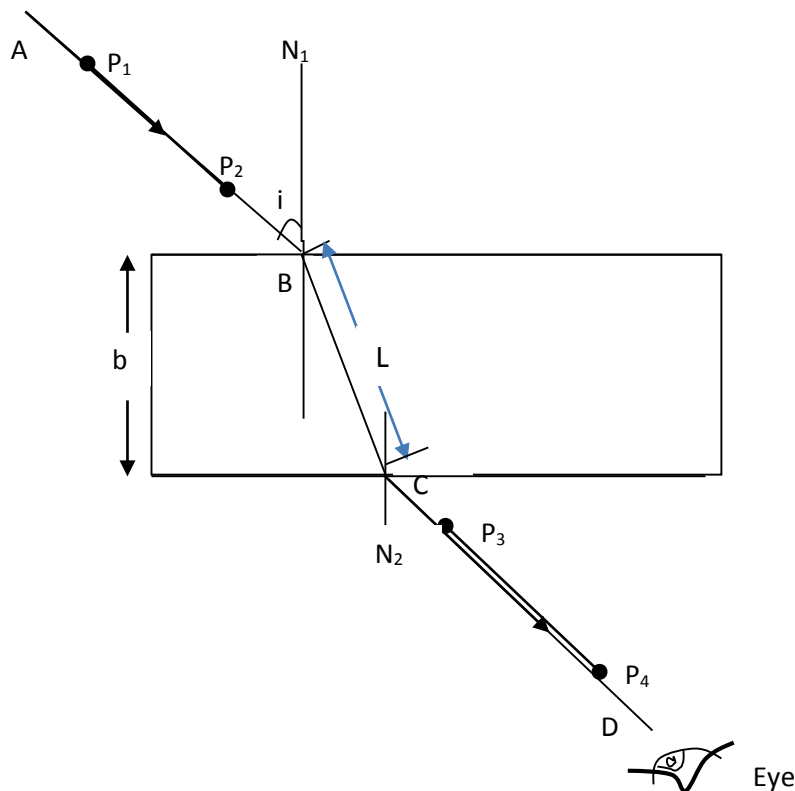


You are provided with the following;

- a rectangular glass block
- 4 optical pins
- 2 thumb pins
- a soft board
- a plain paper

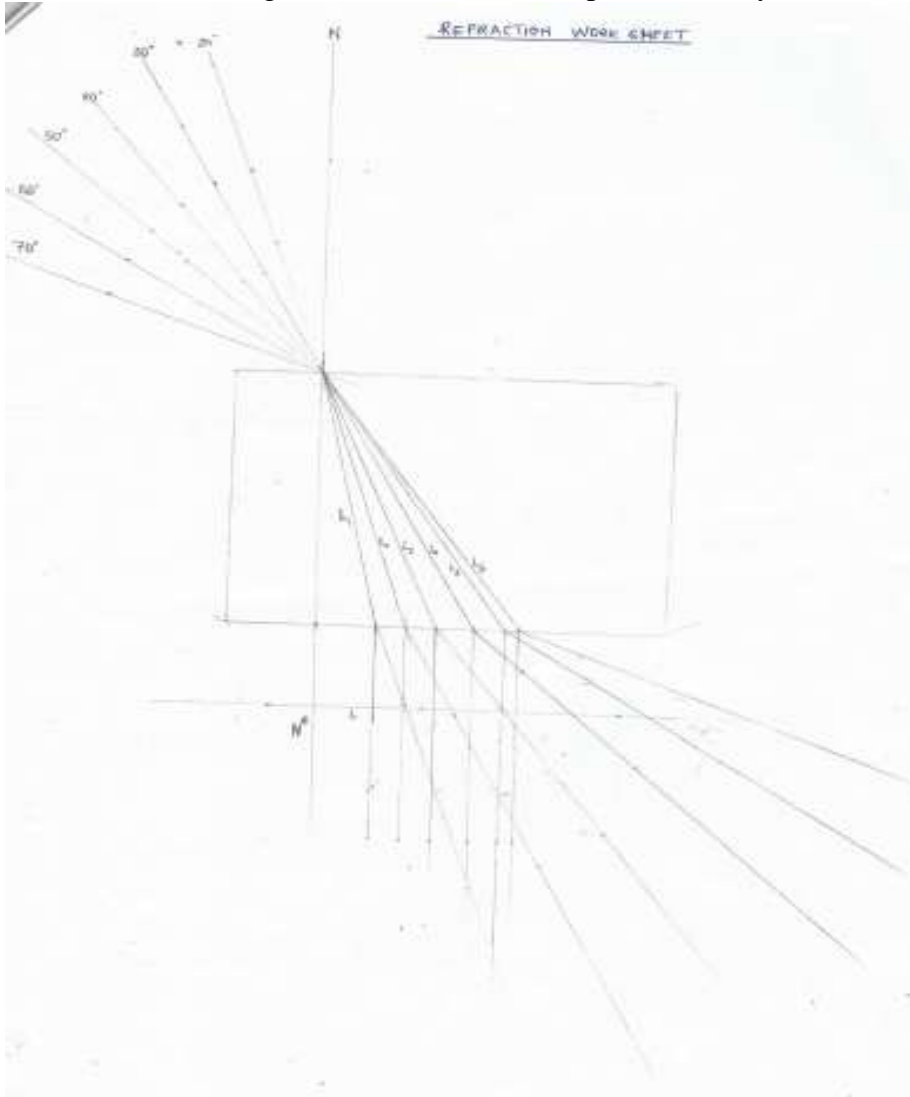
Proceed as follows:

- (a) Place the glass block on the plain paper with one of the largest face upper most. Trace round the glass block using a pencil as shown below.



- (b) Remove the glass block and construct a normal at B. Construct an incident ray AB of angle of incidence, $i = 20^\circ$.
- (c) Measure the breadth **b** of the glass block breadth **b = 6.0cm ±0.02** (1 mark)

- (c) Replace the glass block and trace the ray ABCD using the optical pins.
- (d) Remove the glass block and draw the path of the ray ABCD using a pencil.



- (e) Measure the length L and record it in the table below

Angle i°	L (cm)	L^2 (cm) 2	$\frac{1}{L^2}$ (cm $^{-2}$)	$\text{Sin}^2 i$
20	6.2 ✓	38.44	0.0260	0.1170
30	6.4 ✓	40.96	0.0244	0.25
40	6.7 ✓	44.89	0.0223	0.4132
50	7.1 ✓	50.41	0.0198	0.5868
60	7.4 ✓	54.76	0.0183	0.75
70	7.6 ✓	57.76	0.0173	0.8830

(6 marks)

(f) Repeat the procedure above for the angles of incidence given.

(g) Calculate the values of $\frac{1}{L^2}$ and record in the table above.

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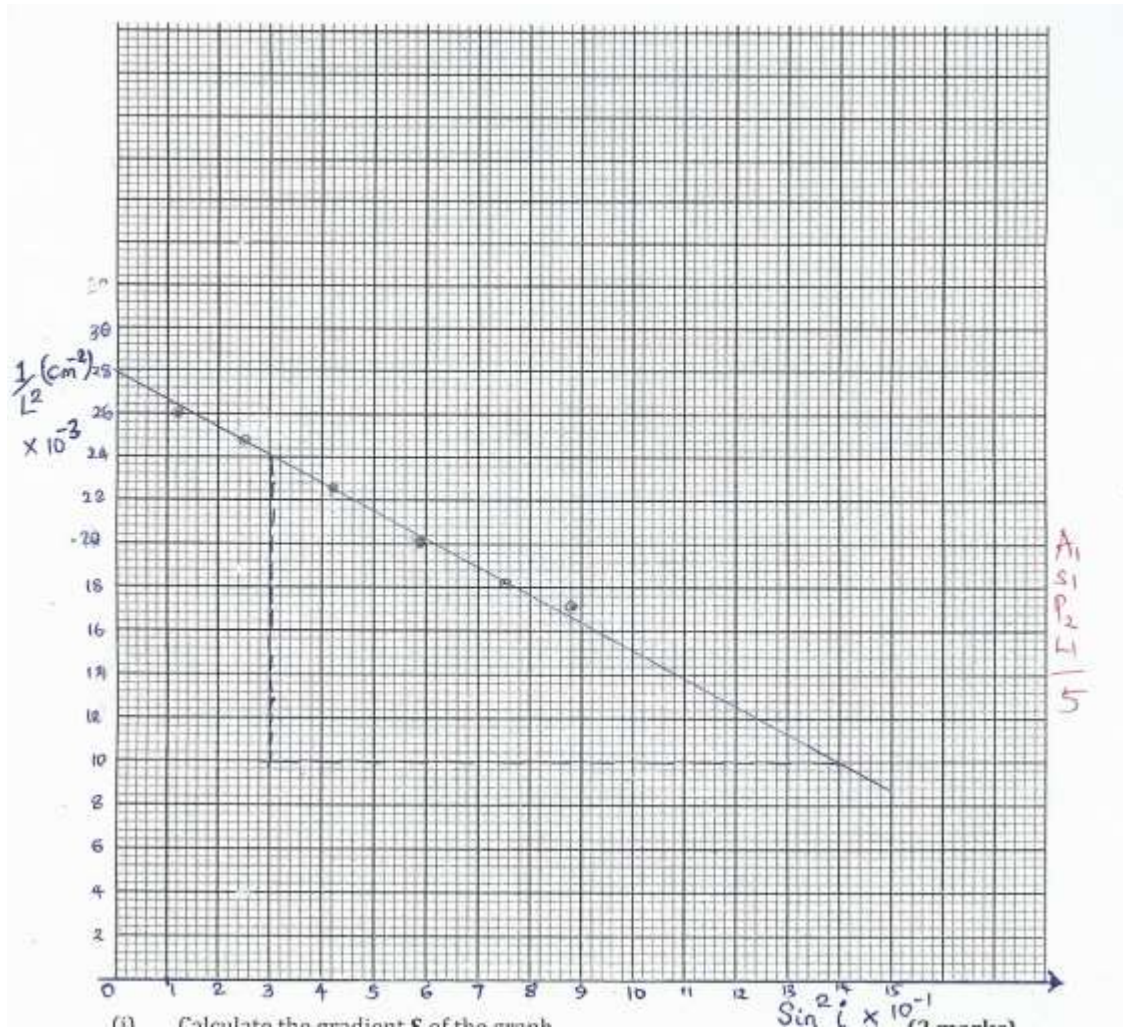
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(h) Plot a graph of $\frac{1}{L^2}$ (y-axis) against $\text{Sin}^2 i$.

(5 marks)



- (i) Calculate the gradient S of the graph. (3 marks)

$$\text{Slope} = \frac{\Delta \frac{1}{L^2}}{\Delta \sin^2 i} = \frac{(24 - 10) \times 10^{-3}}{(14 - 3) \times 10^{-1}} = \frac{0.14}{1.1}$$

$$= 0.0127272 \text{ cm}^{-2}$$

- (j) Determine the value of n . Given that the equation of that graph is; $\frac{1}{L^2} = - \left(\frac{1}{n^2 b^2} \right) \sin^2 i + \frac{1}{b^2}$ (3 marks)

$$\text{Gradient} = 0.0127272 = \frac{1}{n^2 b^2}$$

$$\text{but } b = 6.0 \text{ cm}$$

$$\therefore 0.0127272 = \frac{1}{n^2 \times 36}$$

$$\frac{1}{n^2} = 0.0127272 \times 36$$

$$\frac{1}{n^2} = 0.4581812$$

$$n^2 = 2.18254$$

$$n = \sqrt{2.18254} = \underline{1.47734}$$

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(k) Present your work sheet; attached to the exam paper

(2 marks)

Confirm that the student Presents a correctly worked diagram.

