

CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)
NORTHERN ZONE JOINT EXAMINATIONS SYNDICATE (NZ-JES)



FORM FOUR PRE-NATIONAL EXAMINATION 2026

031/2B

PHYSICS 2B

MARKING SCHEME

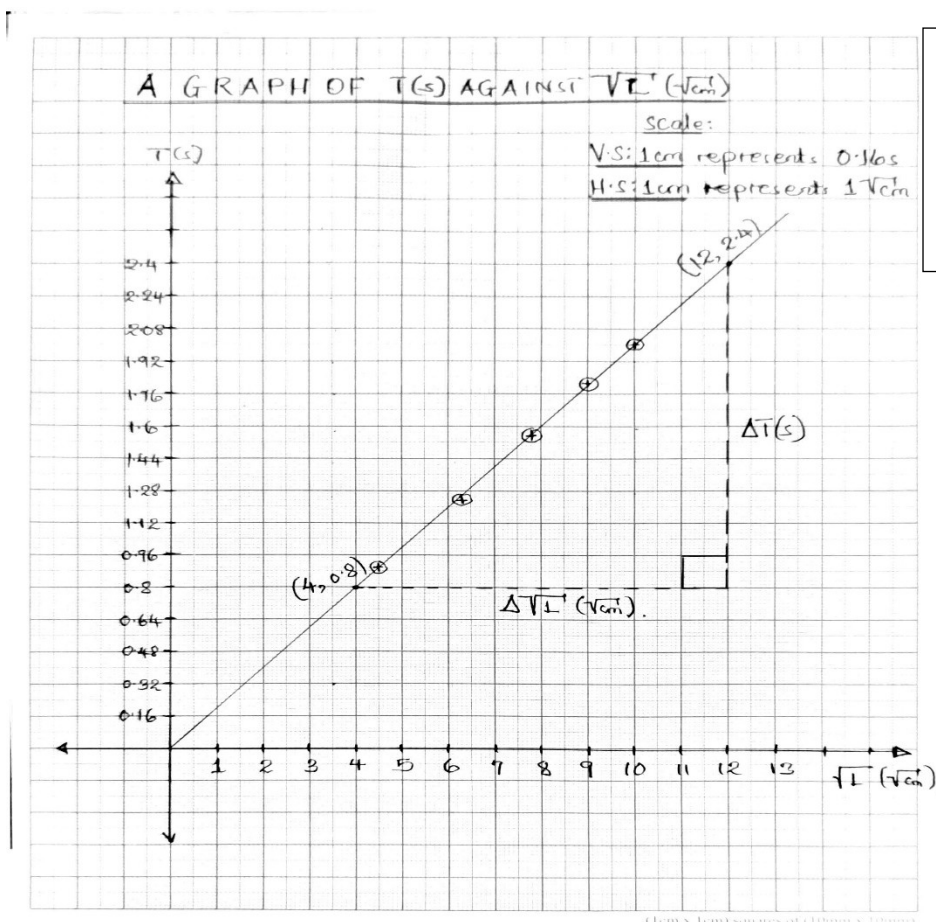
❖ QUESTION 1:

(d) Table of results:

L (cm)	$\sqrt{L}(\sqrt{cm})$	t(s) $\pm 0.5s$	T(s)
100	10.00	40.00	2.00
80	8.94	36.00	1.80
60	7.75	31.00	1.55
40	6.32	25.00	1.25
20	4.47	18.00	0.90

(3marks) (3marks) (3marks)

- (i) A graph of $T(s)$ against $\sqrt{L}(\sqrt{cm})$



T = 01 Mark Sc
= @ 0.5Mark Ax
= @ 0.5Mark SI
= 01 Mark BL =
01 Mark TP =
2.5 Marks **Total**
= 7.5 Marks

- (ii) **Slope (m) of the graph.**

$$\text{Slope (m)} = \frac{\Delta T(s)}{\Delta \sqrt{L}(\sqrt{cm})} \text{ (0.5 mark)}$$

$$\text{Slope (m)} = \frac{2.4 - 0.8}{12 - 4} \text{ (0.5 mark)}$$

$$\therefore \text{Slope (m)} = 0.2 \text{ s}/\sqrt{cm} \text{ (01 mark)}$$

- (iii) Equation of the graph.

$$T = 2\pi \sqrt{\frac{L}{g}}$$

$$T = \left(\frac{2\pi}{\sqrt{g}}\right) \sqrt{L} + 0 \text{ (1 mark)} \rightarrow \text{Equation}$$

$$Y = mX + c$$

$$\text{Slope (m)} = \frac{2\pi}{\sqrt{g}}$$

$$0.2 \text{ s}/\sqrt{cm} = \frac{2\pi}{\sqrt{g}} \text{ (0.5 mark)}$$

$$g = \left(\frac{2\pi}{0.2}\right)^2 \text{ cm/s}^2 \text{ (0.5 mark)}$$

$$g = 986.96 \text{ cm/s}^2$$

$$\therefore \text{The acceleration due to gravity (g)} = 986.96 \text{ cm/s}^2 \text{ (01 mark)}$$

- (iv) When 50g mass is replaced by pendulum bob it will not affect the periodic time (T) of the oscillations performed since the periodic time does not depend on mass of the bob but depends on the length of the pendulum. **(02 mark)**
- (v) The aim of this experiment was to determine the acceleration due to gravity **(1.5 mark)**

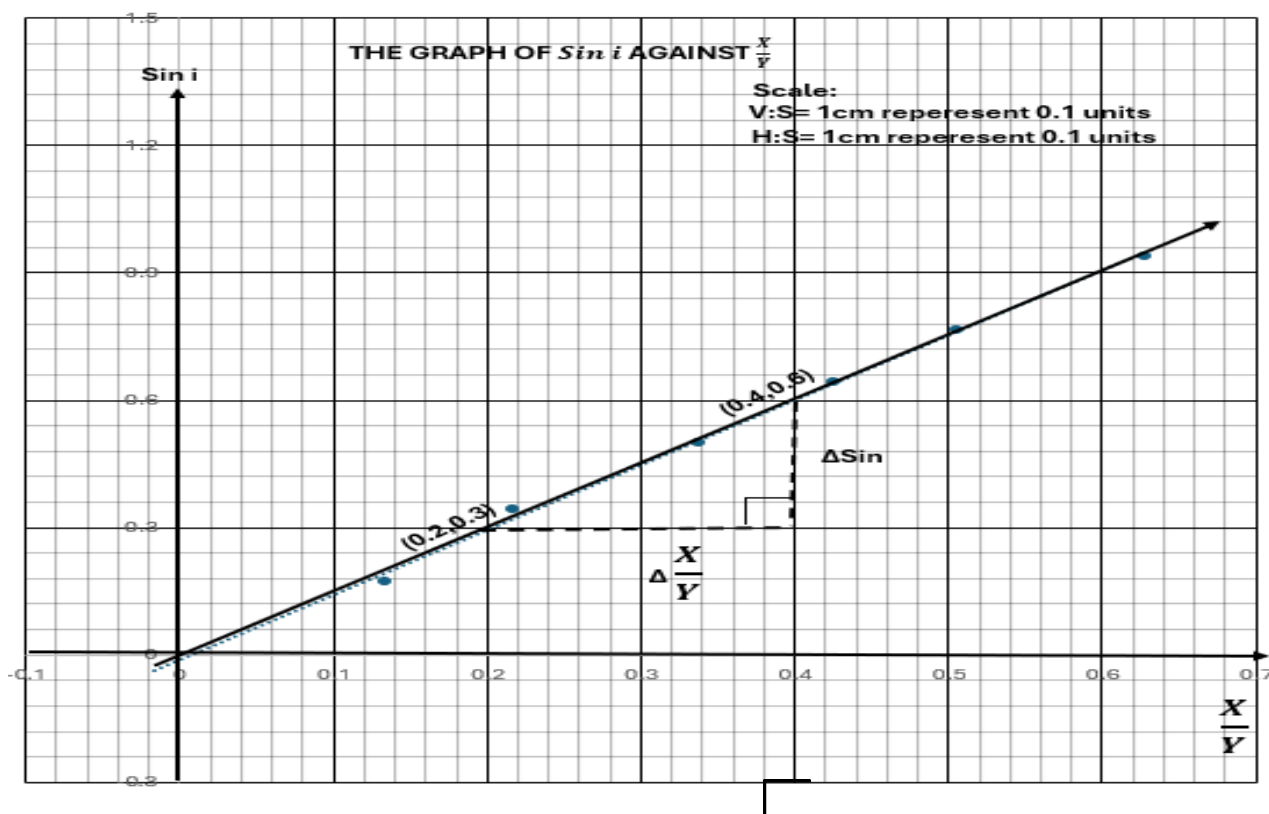
QUESTION NUMBER 2

i. Table of results

i°	X(cm)	Y(cm)	$\sin i$	$\frac{X}{Y}$
10	0.9	6.7	0.174	0.134
20	1.5	6.9	0.342	0.217
30	2.4	7.1	0.500	0.338
40	3.2	7.5	0.642	0.426
50	4	7.9	0.766	0.506
70	5.4	8.6	0.940	0.628

12 marks @ $\frac{1}{2}$

(ii) The graph of $\sin i$ against $\frac{X}{Y}$



(iii) Slope of the graph,

From the graph,

$$\text{slope} = \frac{\Delta \sin i}{\Delta x} \dots\dots\dots \mathbf{1\text{mark}}$$

$$\text{slope} = \frac{0.6-0.3}{0.4-0.2} = \frac{0.3}{0.2} = 1.5 \dots\dots\dots \mathbf{1\text{mark}}$$

$$\text{slope} = 1.5$$

Therefore, the slope of the graph is 1.5..... 1/2 mark

(iv) Sources of error (**1 1/2 mark**)

- ❖ Insufficient of light during conducting experiment.
- ❖ Angle measurement.
- ❖ Parallax error during observing pin in glass block.

Precaution (1 1/2 mark)

- ❖ It is minimized by ensuring the window and doors open to allow light to pass through it.
- ❖ It is minimized by taking proper angle during measuring and collecting data
- ❖ It is minimized by looking(observing) pin with high accuracy.