

**THE PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
FORM IV LAKE ZONE EXAMINATION
PHYSICS 2A
MARKING SCHEME**

011

CODE 031/2A

PHYSICS 2A

ACTUAL PRACTICAL A

TIME: 2:30 HOURS

JULY, 2024

MARKING SCHEME

QUESTION NO 1

i. Table of result

05 marks

Length "L" (cm)	Time "t" for 20 oscillations (sec)	Period "T" obtained by $\frac{t}{20}$ (sec)	T ² (sec ²)
100	40	2.00	4.00
80	36	1.80	3.24
60	31	1.55	2.40
40	26	1.30	1.69
20	19	0.95	0.90

ii. Given that

02 marks

$$T = 2\pi \sqrt{\frac{l}{g}} \quad \text{squaring both sides, we have}$$

$$T^2 = \frac{4\pi^2 l}{g}$$

iii.

$$\text{Slope} = \frac{\Delta T^2}{\Delta l} = \frac{2.0 - 0.4}{50 - 10} = \frac{1.6}{40} = 0.04 \text{ sec}^2/\text{cm}$$

02 marks

$$\text{Slope} = 0.04 \text{ sec}^2/\text{cm}$$

01 mark

$$\text{Since } T^2 = \frac{4\pi^2 l}{g} \quad \text{then taking the coefficient of L as slope, we have}$$

$$\frac{4\pi^2}{g} = \text{slope}$$

02 marks

$$\frac{4\pi^2}{g} = 0.04 \text{sec}^2 / \text{cm}$$

01 marks

$$g = \frac{4\pi^2}{0.04 \text{sec}^2 / \text{cm}} = \frac{4 \times 9.8506}{0.04} = 985.06 \text{cm} / \text{sec}^2 = 9.85 \text{m} / \text{s}^2$$

02 mark

Acceleration due to gravity (g) = 9.85m/sec²

01 mark

iv. Sources of errors

Failure to start both the bob and the stop watch at once **01mark**

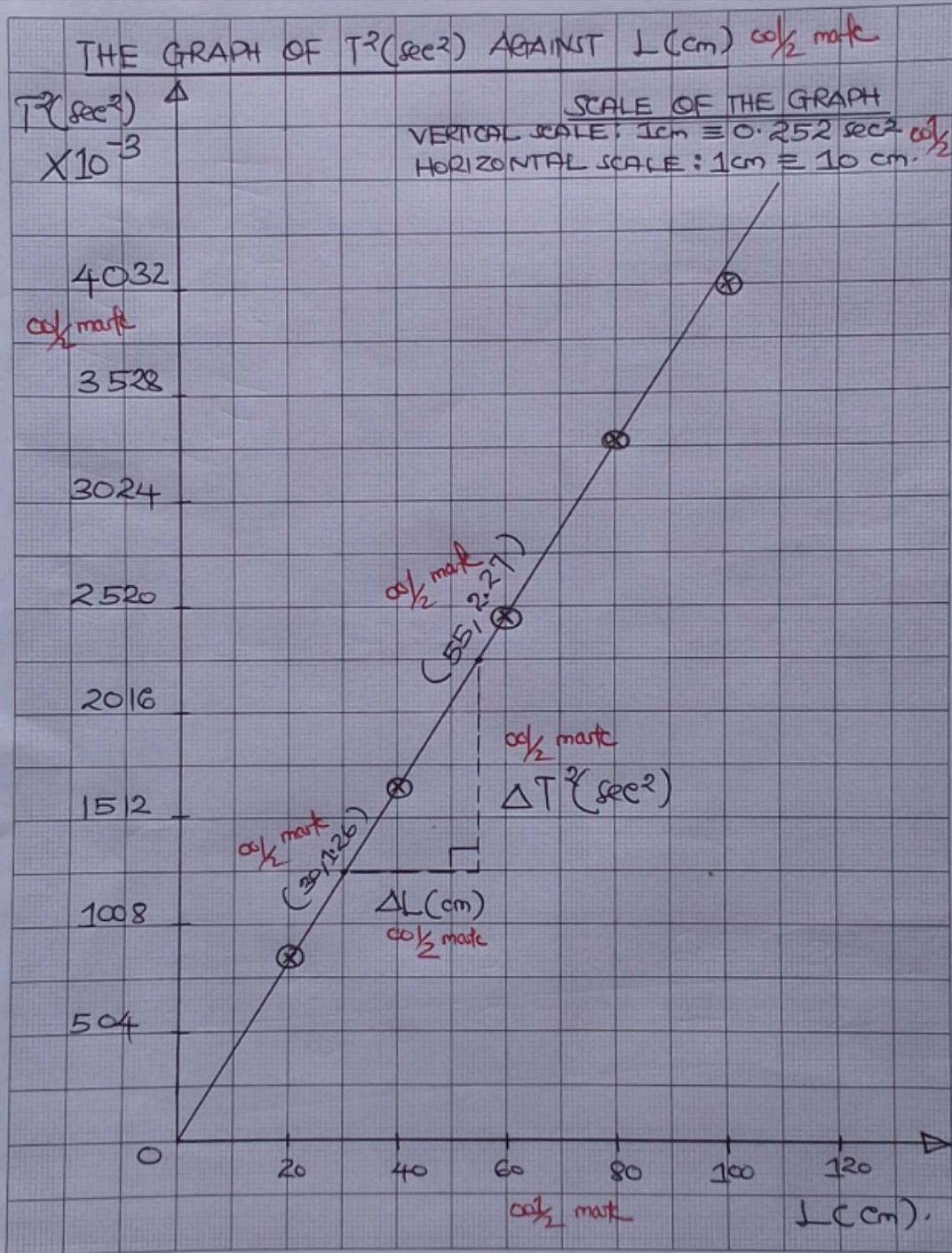
Parallax error in obtaining the length of pendulum **01 mark**

We can minimize the above errors by

Making sure that both the bob and the stop watch are started at once **01mark**

Fix your eyes perpendicular to the reading on the meter rule **01 mark**

Displace a pendulum gently in a small angle



QUESTION NO 2
question 2.

(a) Name of symbols (03marks)

E-Batteries, K-switch, Rh-rheostat, A-Ammeter, V-voltmeter, R-resistance

(b) (iii) The table of results. (05 MARKS)

Current I(A)	0.1	0.2	0.3	0.4	0.5
Potential difference V(volts)	0.2	0.4	0.6	0.8	1.0

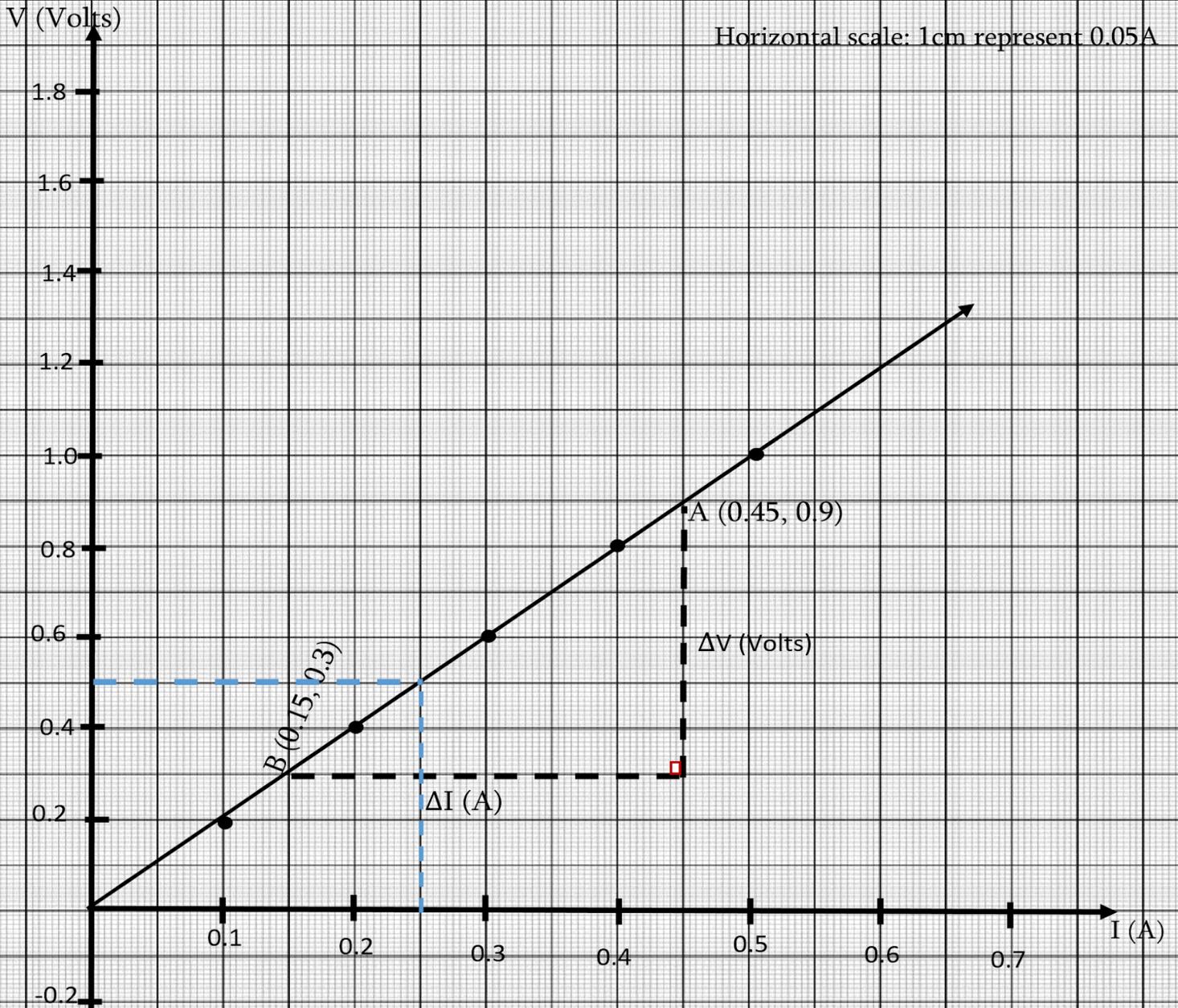
(c) (i) The graph of V against I

THE GRAPH OF "V" (Volts) AGAINST "I" (A)

SCALE

Vertical scale: 1cm represent 0.1V

Horizontal scale: 1cm represent 0.05A



(ii) The shape of the graph was straight line pass the origin.

(iii) From the graph, the slope $S = \frac{\Delta V(\text{Volts})}{\Delta I(\text{A})}$

Point to from the graph A (0.45, 0.9) and B (0.15, 0.3)

$$S = \frac{0.9 - 0.3}{0.45 - 0.15} \frac{(\text{V})}{(\text{A})} = \frac{0.6}{0.3} = 2\Omega$$

(NB; Graph 07 Marks, (ii) 01 marks, (iii) 01 marks)

The Slope, S, of the graph is 2Ω

(iv) The physical meaning of slope of the graph was the resistance of a conductor. (01 marks)

(v) For value of potential difference was 0.5V when current was 0.25A. (01 marks)

(vi) The relationship between I and V directly proportional. (01 mark)

(vii) ohm's law is not an accurate method of calculating resistance because it is an approximately due to the fact that, voltmeter offer additional parallel resistance and ammeter additional series resistance in a circuit, also the circuit is vulnerable to temperature change. (01mark)

(viii) The law that governed in this experiment was ohm's law, which states that 'at constant temperature and other physical factor the current pass through a conductor is directly proportional to the potential difference across its end' (01mark)

(d) The aim of experiment was to verify ohm's law. (01mark)

(e) Sources of error and its precaution.

* Loosing connection which could affect the value of current, this can be reduced by ensuring all connection were well secured. (01mark)

* Parallax error due to reading scale of voltmeter and ammeter and this can be reduced by being familiar with the scale of ammeter and voltmeter before recording data. (01mark)