

**THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATION COUNCIL
DIPLOMA IN SECONDARY EDUCATION EXAMINATION**

731/2C

**PHYSICS 2C
ACTUAL PRACTICAL C**

Time: 3 Hours.

SOLUTIONS

Year: 2022

Instructions

1. This paper consists of **three (3)** questions.
2. Answer **all** questions.
4. Mathematical tables and non-programmable calculators may be used
4. Cellular phones are **not** allowed inside the examination room.
5. Write your **Examination Number** on every page of your answer booklet

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1. (i) TABLE OF RESULTS:

Mass (g)	Mass (kg)	h (m)	t (s)	T (s)	T ² (s ²)
150	0.15	0.08	11.40	0.57	0.32
200	0.20	0.11	13.20	0.66	0.44
250	0.25	0.13	14.40	0.72	0.52
300	0.30	0.30	21.80	1.09	1.20
350	0.35	0.35	23.60	1.18	1.40
400	0.40	0.40	25.20	1.26	1.60

(iii) Solution

From the graph drawn on the graph paper then

$$\text{Slope} = \frac{\text{change in } h (\Delta h)}{\text{change in } T^2 (\Delta T^2)}$$

Let slope = M

Then

$$M = \frac{\Delta h}{\Delta T^2}$$

$$M = \frac{(0.35 - 0.21) \text{ m s}^{-2}}{(1.32 - 0.88)}$$

$$M = 0.35 \text{ or } 0.31 \text{ m s}^{-2}$$

∴ The slope of the graph was 0.35 m s^{-2}

The intercept of the graph was -0.06 m

(iv) from Solution

from the graph equation

$$T^2 = \frac{4\pi^2 h}{g} + \frac{4\pi^2 x}{g}$$

$$h = (1/4)T^2 - 4x$$

Means h and T^2 was directly proportional and increase with increase in T^2 .

(v) Solution

– Data given

– height of (H) = 1 m or 100 cm

– Intercept of the graph = -0.06 m

From,

$$\text{Ratio} = \frac{H}{\text{Intercept}}$$

$$\text{Ratio} = \frac{1 \text{ m}}{-0.06 \text{ m}}$$

$$\text{Ratio} = (1 / -0.06) \text{ m/m}$$

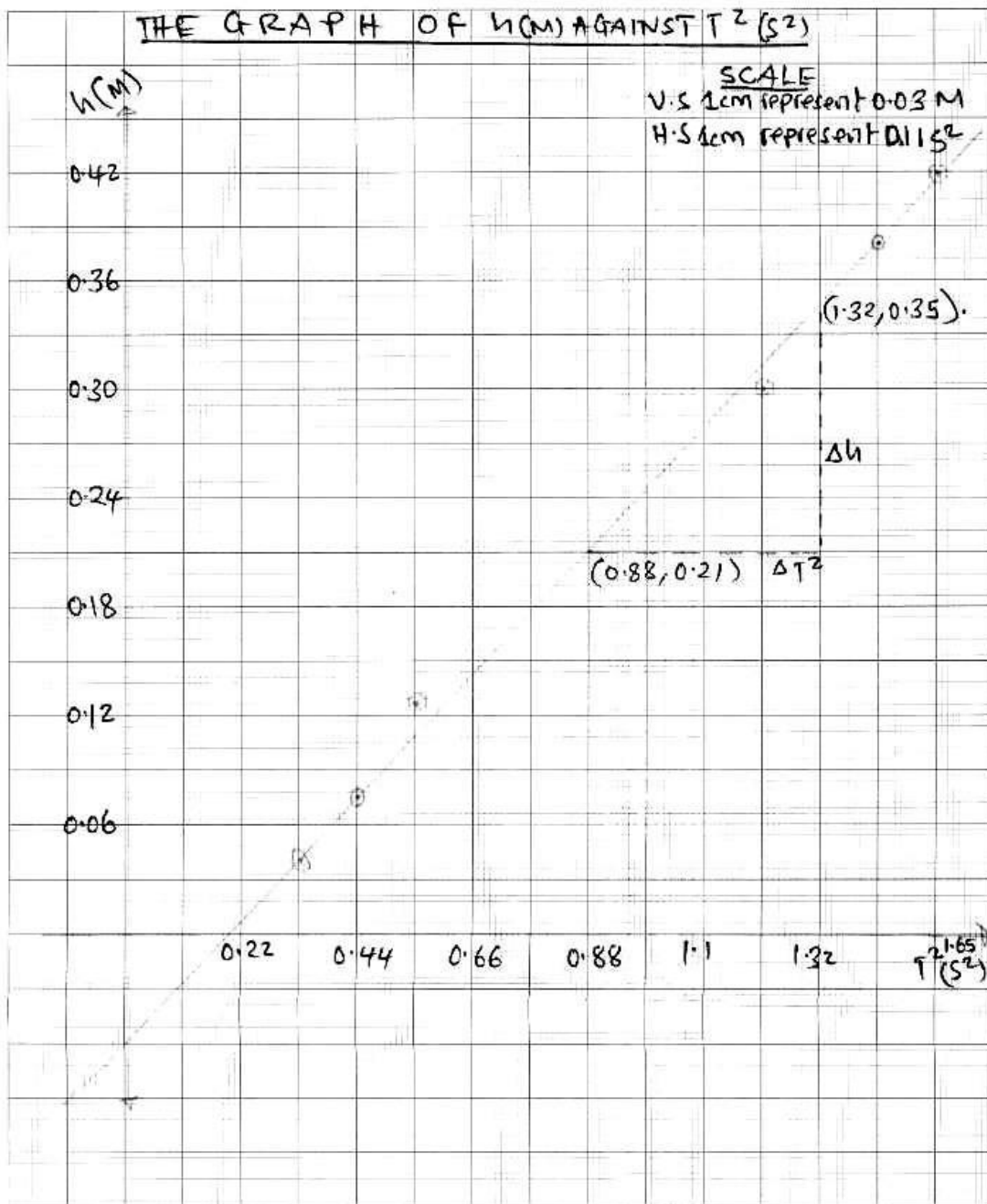
$$\text{Ratio} = -16.67$$

∴ The ratio was -16.67

(vi) The sources of error are:

(i) Timing error when starting and stopping the stopwatch.

– Air resistance like wind during experiment.



2. Solution

Table of values

Temp (°C) A	Temp (°C) B	t (min)
80	80	0
78	76	1
77	75	2
76	74	3
75	73	4
74	71	5
73	70	6
72	70	7
70	68	8
69	67	9
68	66	10
67	65	11
67	65	12
66	64	13
65	63	14
64	62	15

Volume = 6 cm³

Volume = 4.5 cm³

(iii)

$R_a = 75^\circ\text{C}$ and 65°C .

R_β

= 75°C

65°C

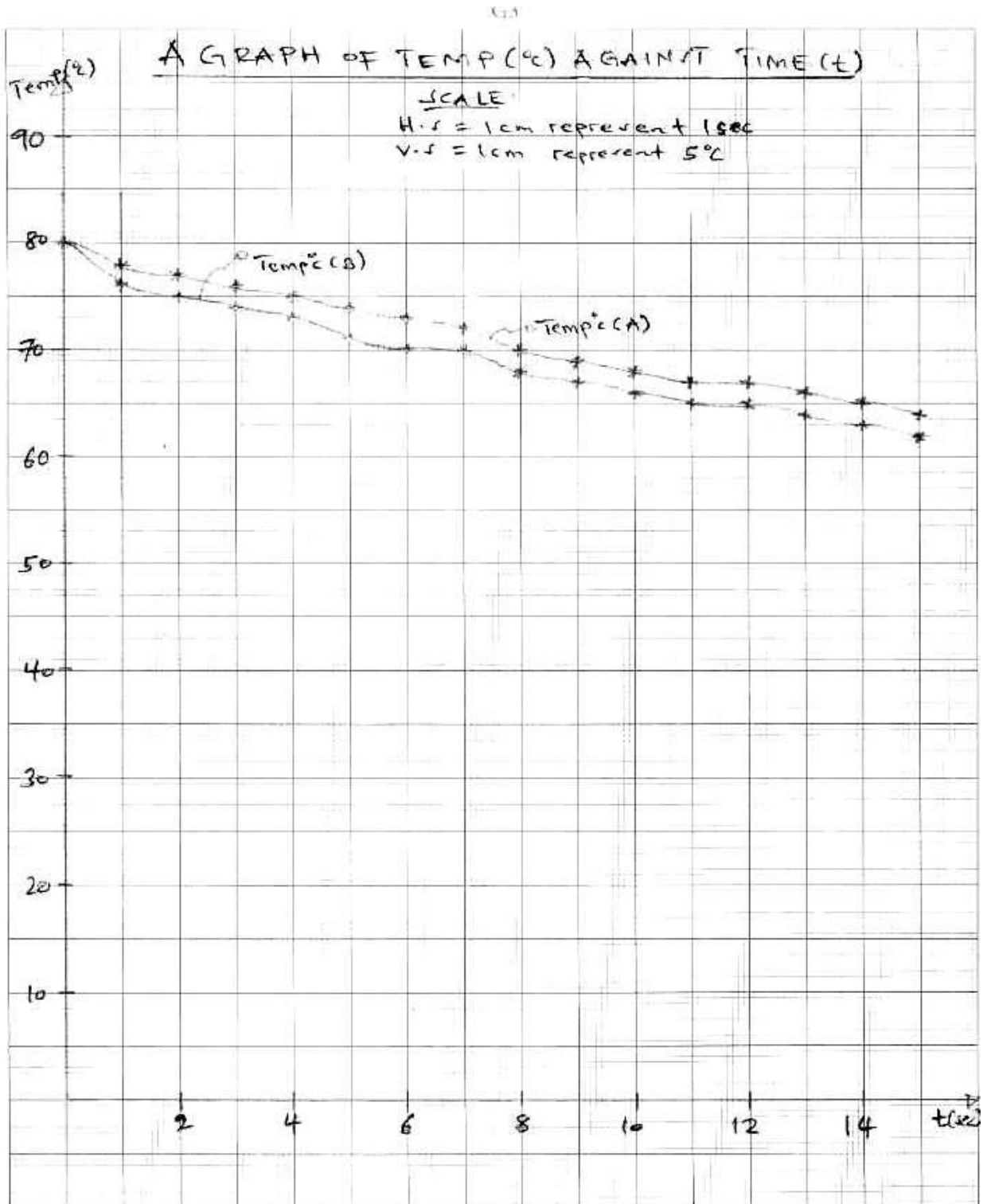
= 1.15

∴ Ratio of R_a

$R_\beta = 1.15$

(iv) – Calorimeter represented by A is the calorimeter that filled with foil in order to reduce heat loss from the calorimeter.

(v) – Because cup A is filled with foil so that there is less amount of heat loss compared to cup B which have not filled with foil so that there is loss of heat in high amount than cup A.



3. Solution

Table of values

I (A)	V (V)
0.2	0.12
0.4	0.20
0.6	0.34
0.8	0.50
1.0	0.54

(ii) Diagram set up:

A circuit consisting of an ammeter A connected in series with a variable resistor R_h , a dry cell, and a key K.

A voltmeter V is connected in parallel across the dry cell.

(iv) From the graph,

$$\text{Slope} = \frac{\Delta V}{\Delta I}$$

$$\Delta I$$

$$\text{Slope} = \frac{1.3 - 1.1}{0.8 - 0.4}$$

$$0.8 - 0.4$$

$$\text{Slope} = \frac{0.2}{0.4}$$

$$0.4$$

$$\text{Slope} = 0.5 \Omega$$

