THE UNITED REPUBLIC OF TANZANIA

DODOMA REGION

FORM FOUR MOCK EXAMINATION-2023

031/2A **PHYSICS 2A-ACTUAL PRACTICAL**

MARKING SCHEME

1. (i) Table of results

$x(cm)$	$d_1(\pm 0.5cm)$	$d_2(cm)$		$d_2(\pm 0.5cm)$	$d_1 - d_2(cm)$
		Brass	Steel		
5	10	8.8	8.7	8.75	1.25
10	20	17.6	17.5	17.65	2.35
15	30	26.5	26.2	26.35	3.65
20	40	35.3	34.9	35.15	4.85

(@ Column 03 marks **Total 09 marks**)

(ii) A graph of $d_1 - d_2$ against d_1 is shown on a graph paper

(iii) From the graph;- Slope $= \dfrac{\Delta(d_1 - d_2)(cm)}{\Delta d_1(cm)}$ **(01 mark)**

$= \dfrac{2.88 - 1.5}{23.75 - 12.5}$ **(01 mark)**

$= 0.123$ **(01 mark)**

(iv) Given $R.D = \dfrac{d_1}{d_1 - d_2}$

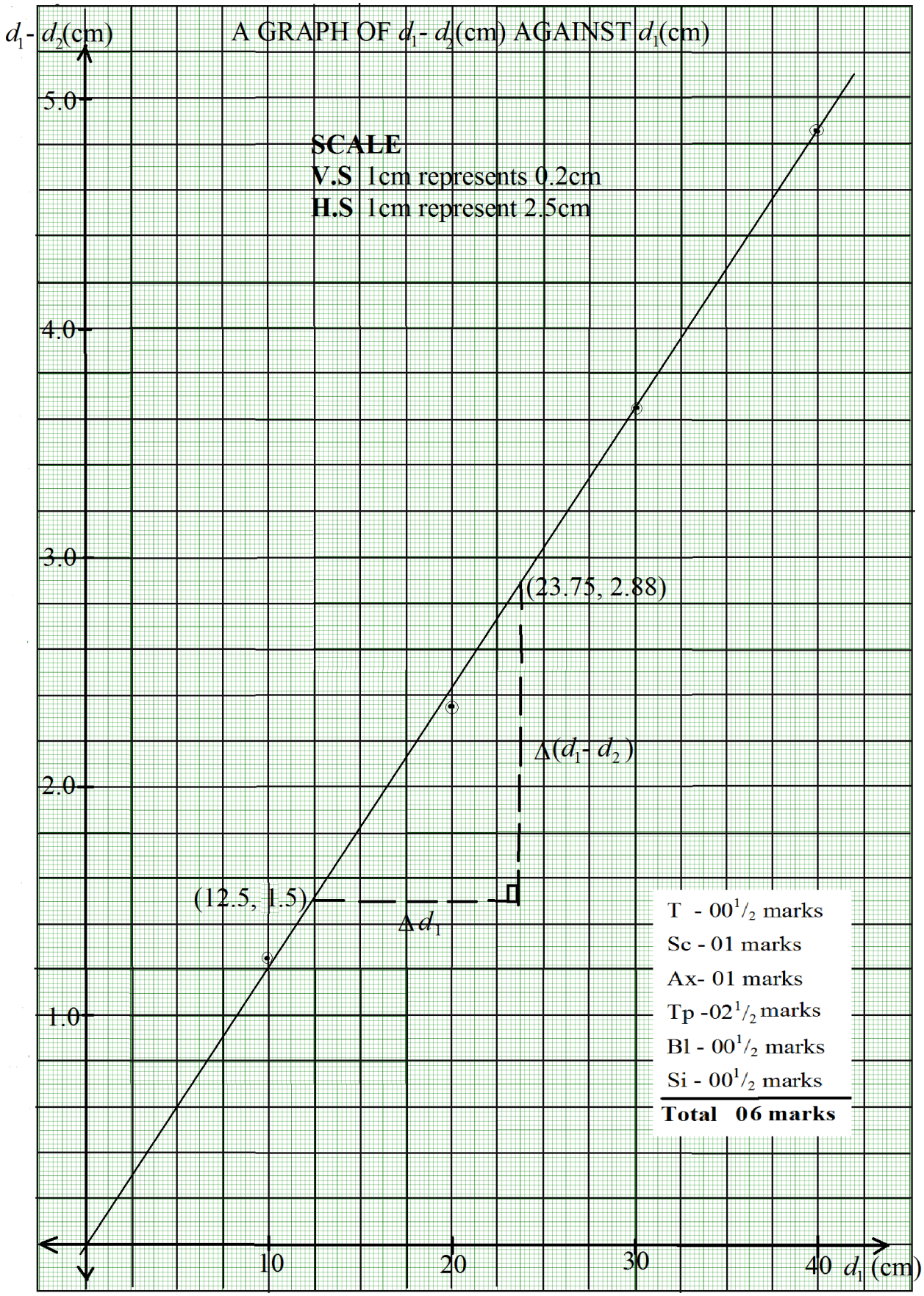
Then $Slope = \dfrac{d_1 - d_2}{d_1} = \dfrac{1}{R.D}$ **(01 mark)**

$RD = \dfrac{1}{Slope} = \dfrac{1}{0.123} = 8.15 \pm 0.7$ **(02 marks)**

(v) Since $RD = \dfrac{\rho_{mass}}{\rho_{water}}$ **(01 mark)**

$\rho_{mass} = RD \times \rho_{water} = 8.15 \times 1000 kg/m^3 = 8150 kg/m^3$ **(01 mark)**

(vi) The mass will float in mercury since its density is less than that of mercury **(02 marks)**


A GRAPH OF d_1- d_2(cm) AGAINST d_1(cm)
d_1- d_2(cm)
5.0
4.0
3.0
2.0
1.0
SCALE
V.S 1cm represents 0.2cm
H.S 1cm represent 2.5cm
(23.75, 2.88)
$\Delta(d_1 - d_2)$
(12.5, 1.5)
Δd_1
10
20
30
40
d_1 (cm)
T - 00½ marks
Sc - 01 marks
Ax- 01 marks
Tp -02½ marks
Bl - 00½ marks
Si - 00½ marks
Total 06 marks

2. (i) Table of results

$R(\Omega)$	$V(V)$	$\frac{1}{R}(\Omega^{-1})$	$\frac{1}{V}(V^{-1})$
1	0.90	1.00	1.11
2	1.20	0.50	0.83
4	1.35	0.25	0.74
5	1.40	0.20	0.71
8	1.45	0.10	0.68

(@ Column 03 marks **Total 09 marks**)

(ii) A graph of $\frac{1}{V}(V^{-1})$ against $\frac{1}{R}(\Omega^{-1})$ is shown on a graph paper.

(iii) From the graph, Slope $= \frac{\Delta \frac{1}{V}(V^{-1})}{\Delta \frac{1}{R}(A^{-1})}$ **(01 mark)**

$$= \frac{0.945 - 0.8}{0.8 - 0.4}$$ **(01 mark)**

$$= 0.36 \Omega V^{-1}$$ **(01 mark)**

The value of $\frac{1}{V}$ - intercept is 0.35 V^{-1} **(01 mark)**

(iv) The physical meaning of the slope is the ratio of internal resistance to the e.m.f of a cell $\left(\frac{r}{E}\right)$

(01 mark)

The physical meaning of $\frac{1}{V}$ - intercept is the reciprocal of e.m.f of the cell **(01 mark)**

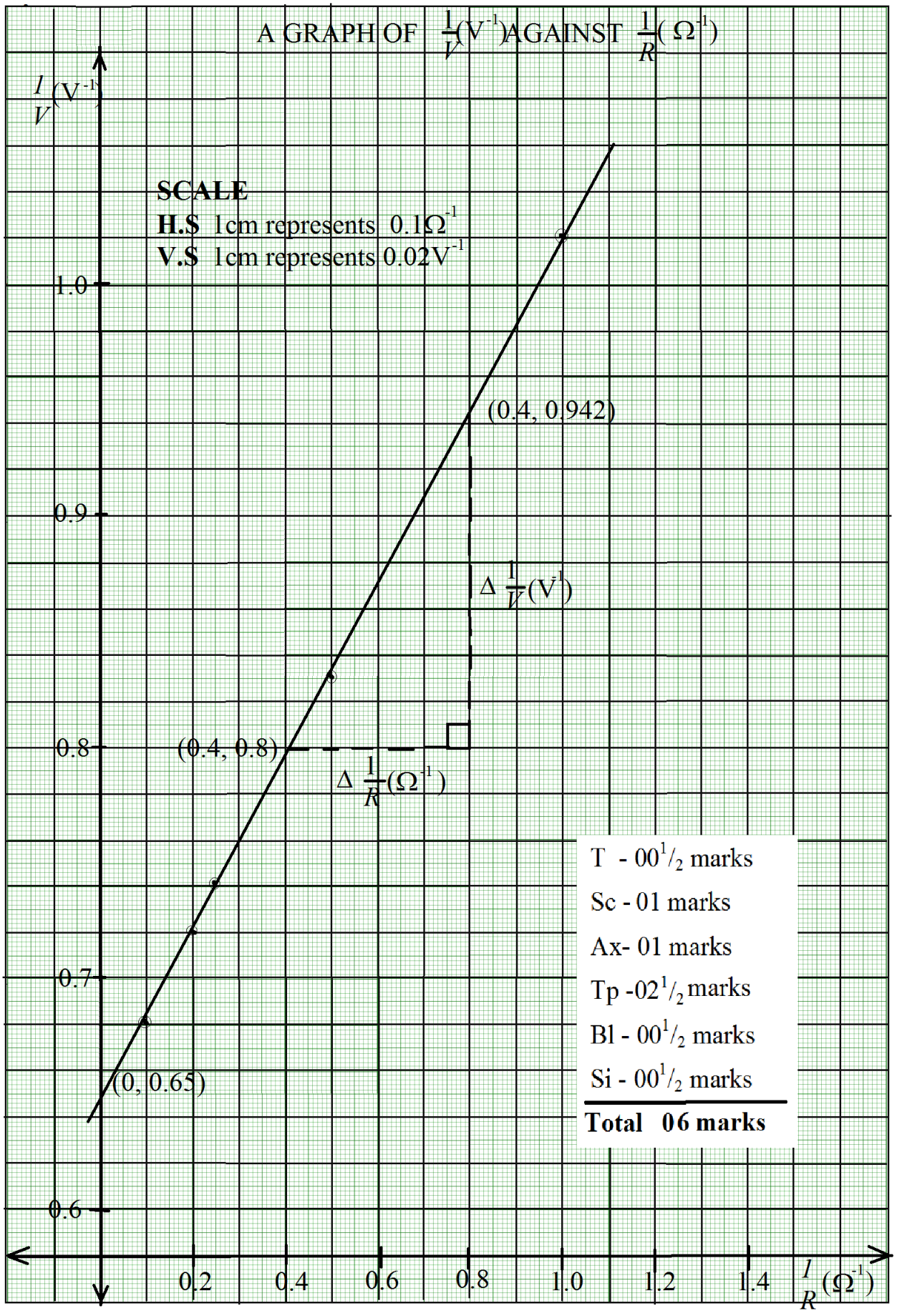
(v) Possible aims of this experiment

(i) To study the variation of resistance and p.d across the resistor R

(ii) To determine the ratio of internal resistance and e.m.f of a cell.

(iii) To determine the reciprocal of the e.m.f of a cell (to determine the e.m.f of the cell)

(Any two @ 02 marks)



T	$00^{1}/_{2}$ marks
Sc	01 marks
Ax	01 marks
Tp	$02^{1}/_{2}$ marks
Bl	$00^{1}/_{2}$ marks
Si	$00^{1}/_{2}$ marks
Total	**06 marks**