

CSSC SOUTHERN ZONE.  
PHYSICS 2B MARKING SCHEME 2026

1 (d) Table of results

|        |     |      |      |    |      |
|--------|-----|------|------|----|------|
| a (cm) | 5   | 10   | 15   | 20 | 25   |
| b (cm) | 9.8 | 19.5 | 29.3 | 39 | 48.8 |

(2 mark @)  
Total 10 marks

(e) The graph of a (cm) against b (cm)  
(look the graph behind)

~~7~~ Slope (G) =  $\frac{\Delta a(\text{cm})}{\Delta b(\text{cm})}$  (1 mark)

$$= \frac{(22.5 - 6)}{(44 - 12)}$$
$$= 0.516$$

$\therefore$  The slope G is 0.516 (2 mark)

(f) From  $G = \frac{20 + x}{50}$  (1 mark)

$$0.516 = \frac{20 + x}{50}$$

$$0.516 \times 50 = 20 + x$$
 (0.1 mark)

$$x = 25.78 - 20$$

$$= 5.78 \text{ g.}$$
 (2 marks)

$\therefore$  The mass of X is 5.78 g.

(g) The aim of the experiment is to determine  
the mass of dry cell X size (AAA). (2 marks)

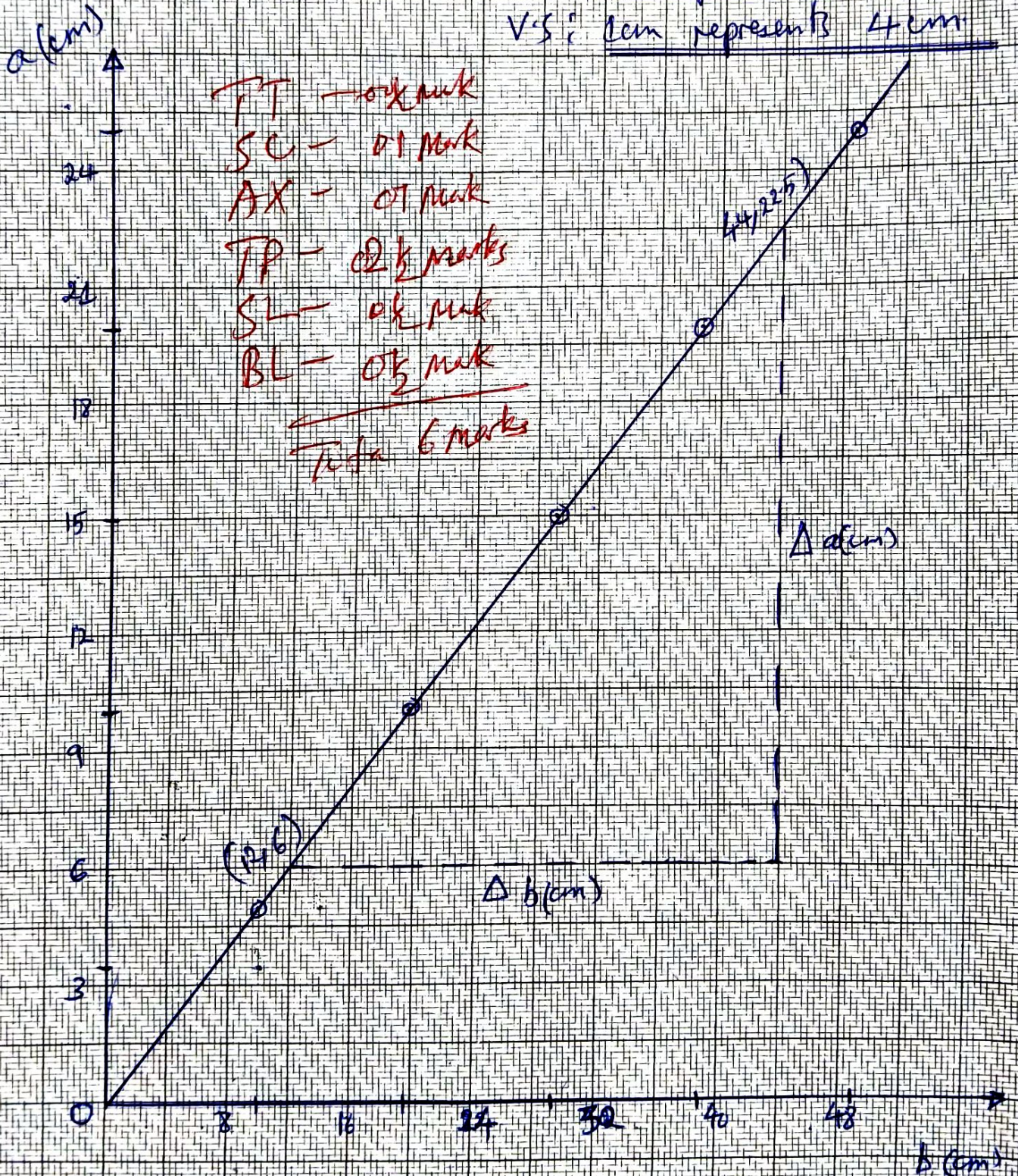
SUBJECT NAME .....

INDEX NUMBER .....

# THE GRAPH OF $a(\text{cm})$ AGAINST $b(\text{cm})$

Scale: H.S: 1cm represents 1.5 cm

V.S: 1cm represents 4 cm



TT - 0.5 mark  
 SC - 0.1 mark  
 AX - 0.1 mark  
 TP - 0.2 marks  
 SL - 0.1 mark  
 BL - 0.5 mark  
Total 6 marks

2

(c)

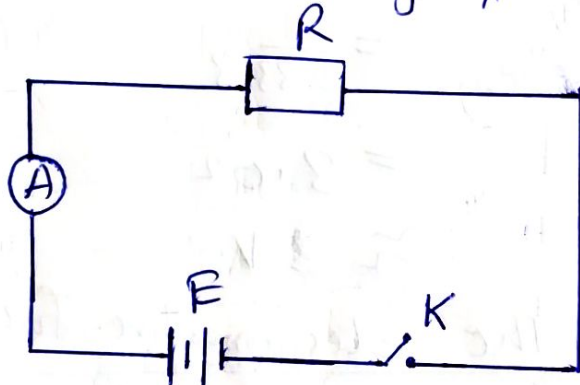
| $R (\Omega)$ | $I (A)$ | $\frac{1}{I} (A^{-1})$ |
|--------------|---------|------------------------|
| 1            | 1.5     | 0.67                   |
| 2            | 1       | 1                      |
| 3            | 0.8     | 1.25                   |
| 4            | 0.6     | 1.67                   |
| 5            | 0.5     | 2                      |

(Other marks @)

(Total 9 marks)

Circuit diagram,

(d)



(01 mark)

(e)

The graph is behind.

(f)

The nature of the graph is straight line with positive  $(\frac{1}{I})$  intercept.

(01 mark)

(g)

From

$$E = I(R + r)$$

$$\frac{1}{I} = \frac{R}{E} + \frac{r}{E}$$

(01 mark)

$$\frac{1}{I} = \frac{1}{E}(R) + \frac{r}{E}$$

$$y = mx + c$$

(01 mark)

$$2 \quad (g) \quad (i) \quad \text{slope} = \frac{\Delta \frac{1}{I} (A^{-1})}{\Delta R (\Omega)} \quad (0\frac{1}{2} \text{ mark})$$

$$= \frac{(1.81 - 0.75)}{(4.5 - 1.3)}$$

$$= 0.3313 \, A^{-1} \Omega \quad (0\frac{1}{2} \text{ mark})$$

$$(ii) \quad \text{slope} = \frac{1}{E}$$

$$E = \frac{1}{\text{slope}} \quad (0\frac{1}{2} \text{ mark})$$

$$= \frac{1}{0.3313}$$

$$= 3.02$$

$$\approx 3 \, V.$$

(0\frac{1}{2} \text{ mark})

\therefore The electromotive force is 3V

(iii) Internal resistance.

$$\frac{1}{I} \text{ intercept} = \frac{r}{E} \quad (0\frac{1}{2} \text{ mark})$$

$$0.33 = \frac{r}{3}$$

$$r = 0.33 \times 3$$

$$= 0.99$$

$$\approx 1 \Omega$$

(0\frac{1}{2} \text{ mark})

\therefore The internal resistance is 1\Omega

2 (h)

### Sources of errors

- loose connections
- Leaving Key on for long time (mark)

### Way of minimizing

- = Make sure that all connections are tight
- = Switch should be off (open) immediately after taking reading (mark)

# THE GRAPH OF $\frac{1}{I} (A^{-1})$ AGAINST $R (\Omega)$

Scale: V's: 1cm represents  $0.025 A^{-1}$

H's: 1cm represents  $0.5 \Omega$

$\frac{1}{I} (A^{-1})$   
 $\times 10^{-2}$

200

75

150

125

100

75

50

25

0

TT — 0.5 mark

SL — 0.5 mark

AX — 0.5 mark

TP — 0.5 mark

SL — 0.5 mark

BL — 0.5 mark

Total 0.6 marks

(45, 131)

(3, 0.75)

$\Delta R (\Omega)$

$\Delta \frac{1}{I} (A^{-1})$

$R (\Omega)$