

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



FORM FOUR PRE-NATIONALEXAMINATION2026

CHEMISTRY 2A
ACTUAL PRACTICAL
MARKING SCHEME

(i) Table of result

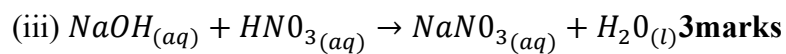
Experiment	Pilot	1	2	3
Final reading (cm^3)	20.40	41.20	30.00	34.80
Initial reading (cm^3)	0.00	21.00	10.00	15.00
Volume used (cm^3)	20.40	20.20	20.00	19.80

(06 Marks)

(ii) Average volume of the acid

$$V_{average} = \frac{V_1 + V_2 + V_3}{3}$$
$$= \frac{20.20 + 20.0 + 19.80}{3}$$

Average volume of the acid used = $20.00cm^3$ **(02 marks)**



(b) (i) Molarity of solution B

$$M_r \text{ of base NaOH} = 40 \text{ g/mol}$$

$$\text{mass} = 2.88 \text{ g}$$

$$\text{Volume} = 1.5 \text{ l}$$

$$\text{Conc} = \frac{\text{mass}}{\text{Volume}}$$

$$\text{Conc} = \frac{3.0 \text{ g}}{1.5 \text{ l}}$$

$$= 2 \text{ g/l}$$

$$\text{Molarity} = \frac{\text{Conc.}}{\text{Molarity}}$$

$$\text{Molarity} = \frac{2 \text{ g/l}}{40 \text{ g/mol}}$$

$\therefore$ Molarity of solution B is 0.05 mol/l **3marks**

(ii) Molarity of solution A

$$M_a = ?$$

$$V_a = 20 \text{ cm}^3$$

$$V_b = 20 \text{ cm}^3$$

$$M_b = 0.05 \text{ M}$$

$$n_a = 1$$

$$n_b = 1$$

From

$$\frac{M_a V_a}{M_b V_b} = \frac{n_a}{n_b}$$

$$\begin{aligned} M_a &= \frac{M_b V_b n_a}{V_a n_b} \\ &= \frac{0.05M \times 20cm^3 \times 1}{20cm^3 \times 1} \\ &= 0.05M \end{aligned}$$

$\therefore$ The molarity of solution A is 0.05M **4mark**

(c) (i) Number of moles present in 20 litres

$$\text{Molarity} = \frac{\text{Moles}}{\text{Volume}}$$

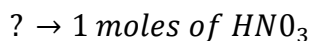
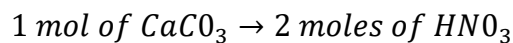
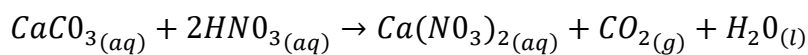
$$\text{Moles} = \text{Molarity} \times \text{Volume}$$

$$\text{Moles} = 0.05\text{mol/dm}^3 \times 20\text{dm}^3$$

$$= 1 \text{ moles}$$

$\therefore$ The number of moles present in 20 litres of waste acid is 1moles **3mark**

(ii) How many grams of marble chips are required to neutralize the waste acidic solution before disposing it.



$$n = \frac{1 \times 1}{2}$$

$$= 0.5 \text{ mole}$$

$$\text{Mole} = \frac{\text{mass}}{\text{molar mass}}$$

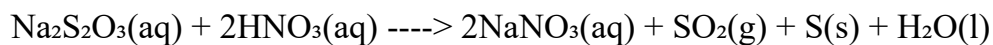
$$\begin{aligned}\text{mass} &= \text{mole} \times \text{molar mass} \\ &= 0.5 \text{ mole} \times 100\text{g/mol} \\ &= 50\text{g}\end{aligned}$$

$\therefore$ Mass of marble chips required for neutralization of waste acid is 50g **4mark**

2. (a) complete the Table **8mark**

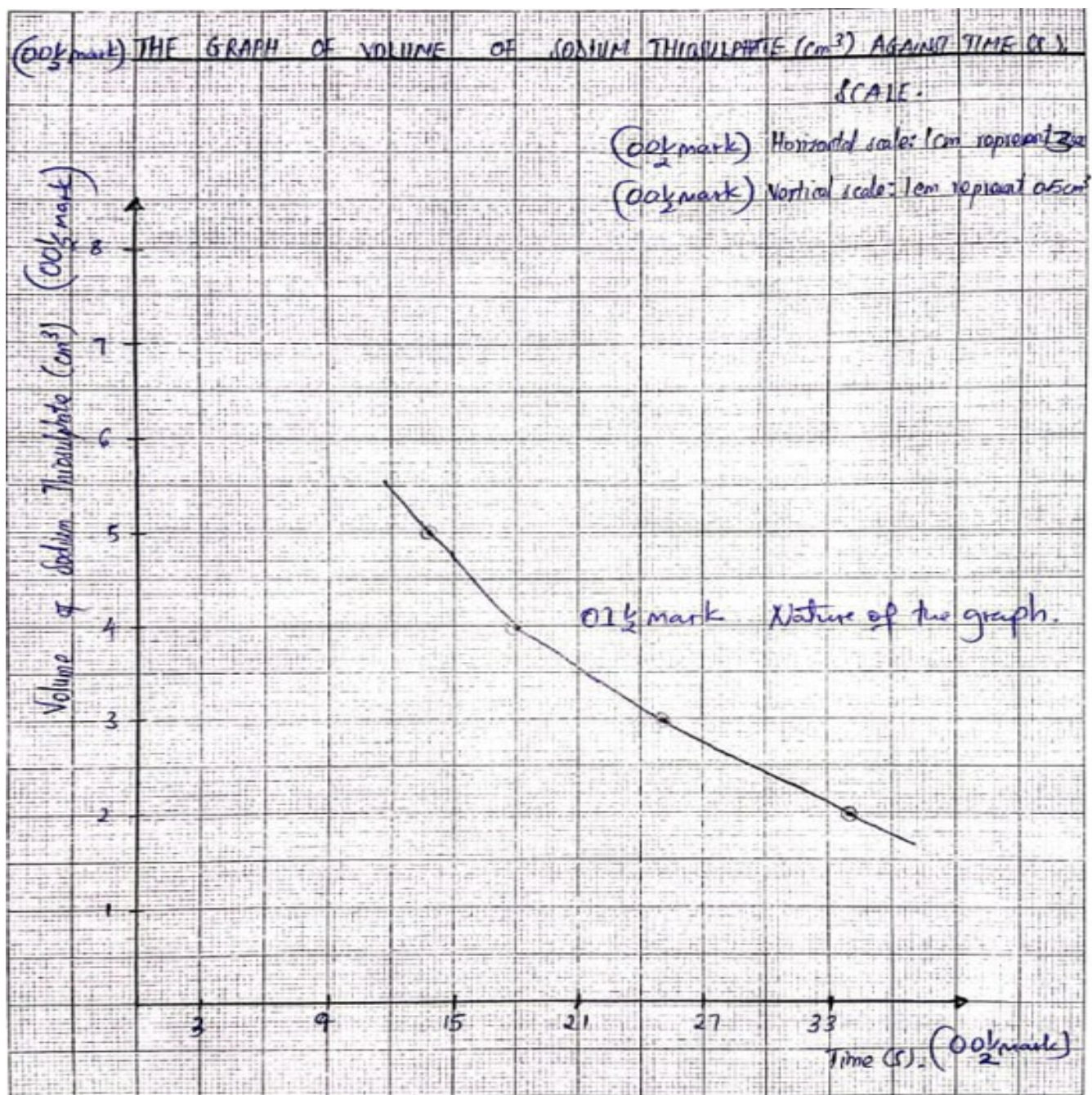
Experiment	Vol. of T (cm ³)	Vol. of Z (cm ³)	Vol. of Distilled Water (cm ³)	Time (s)	Rate
1	5	5	0	14	0.0714
2	5	4	1	18	0.5556
3	5	3	2	25	0.0400
4	5	2	3	34	0.0294

(b) Write a balanced equation for reaction between T and Z. **3mark**



(c) Sulphur (S) was produced, forming a precipitate which clouded the solution. **2mark**

(d) The graph of volume of Sodium Thiosulphate against Time **marks 6**



(e) What conclusion can you draw from this experiment? As the volume (and hence concentration) of sodium thiosulphate decreases, the time taken for the reaction increases. Thus, the rate of reaction decreases with lower concentration of reactants.

3mark

(e) -Temperature

-Catalyst

-Pressure

Concentration

Any of the two explained point 4 marks 2@