FORM FOUR CLUSTER KCSE MODEL9

CHEMISTRY PAPER 3 ANSWERS

1. T_1

D_1

A_1

$A_v - 1$

$F - 1$ (5 marks)

Complete table..... 1 mark

- 3 titrations..... 1 mark
- 2 titration..... ½ mark
- 1 titration..... 0 mark

Penalties

- Wrong arithmetic
- Inverted table
- Unrealistic value<1.0 or>50cm^3

Penalize ½ mark once

NB: All calculations

Wrong units penalize ½ mark

- Answer in 4 d.p only
- ± *Errors* 0.0002

(b) Reacting ratio

1 mole ⟶ 100cm^3

? ⟶ 25cm^3

$$\frac{1mole \times 25cm^3}{1000cm^3} = 0.025moles$$

(c) Reacting ration NaOH : HCL

1 : 1

Moles of NaOH x1

$$\frac{0.025moles}{1} = 0.025moles$$

(d) $\frac{Ans\ in(c)\ above \times 1000cm^3}{Ans\ in(a)\ above}$ =correct ans

TABLE II

Test tube numbers	1	2	3	4	5
Volume of solution S(cm^3)	10	9	8	7	6
Volume of water cm^3	0	1	2	3	4
Time taken (sec)	35	41	49	61	80

Rate of reaction $\left(\frac{1}{time}\right)^{s-1}$	0.0285	0.0245	0.0205	0.0165	0.0125

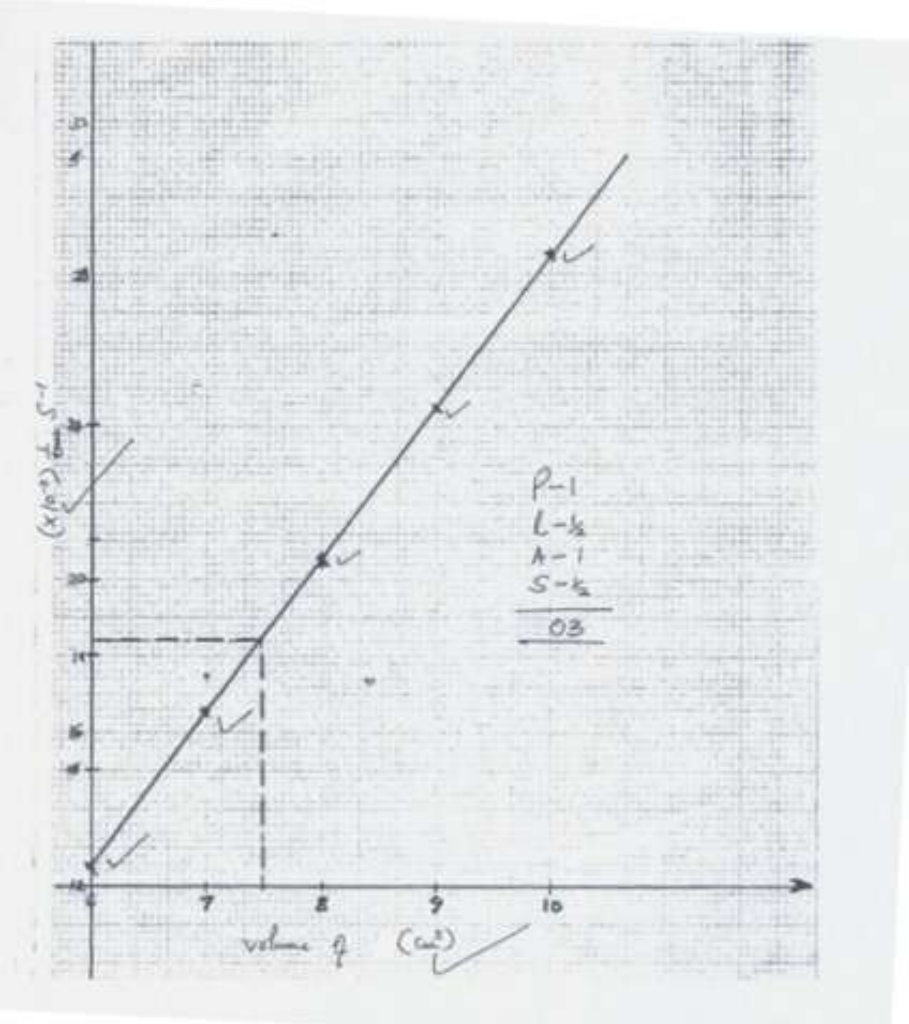
-Complete table - 2 marks

-Accuracy - 1 mark ± 5 seconds

-Trend - 1 mark

-Decimal - 1 mark

a) Graph (3 marks)



-Scale (Sc) -½
-Plots (P) -1
-Lines (L) -½ (straight line passing through at least 3 points)
-Axes labeled -1

b) $\frac{1}{t} = 18.4 \times 10^{-3} = 0.0184$

Time = 54±2 seconds

c) When concentration increases the rate of reaction increases and when the concentration decreases the rate also decreases.

2. a)

i

Observation	Inferences
A colourless liquid condenses on the cooler parts of the test tube½ A white solid /residue /powder √½	Hydrated salt/compound √1 Or the compound contains water of crystallization

ii)

Observation	Inferences
The solid dissolves √½ Forming a clourless solution√½	Soluble compound √½. Fe^{3+} Cu^{2+} or Fe^{2+} absent√½

I

Observation	Inferences
White precipitate insoluble ½√ in excess√½	Pb^{2+}, Al^{3+} and Zn^{2+} present

II

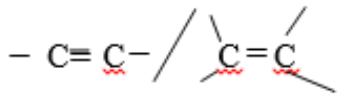
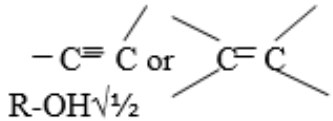
Observation	inferences
White precipitate soluble √ ½ in excess solution √½	Zn^{2+}

III

Observation	Inferences
No white precipitate	Pb^{2+}, Ag^{+}

(10 marks)

b)

Observation	Inferences
i) Burns with yellow flame /sooty flame. Accept luminous for half a mark	Organic compound which is unsaturated with many carbon atoms in the chain or 
ii) Effervescence/bubble of a colourless gas. Reject a hissing sound/fizzling	RCOOH,-COOH Accept a half a mark for H_3O^+, H^+
iii) Potassium manganate (VII) is decolourised	 Present√½ R-OH√½

iv) P^H =5.0 √1	Weakly acidic compound. Reject a weak acid.

(Max 8 marks)