SERIES 1 EXAMS

233/3 CHEMISTRY PAPER 3 - MARKING SCHEME

TABLE A

1. (a) Complete table – 1 mark
Decimal places – 1 mark (must be used consistently)
Accuracy – 1 mark $\begin{pmatrix} \pm 0.1 \text{ of school value} - 1 \text{ mark} \\ \pm 0.2 \text{ of school value} - \frac{1}{2} \text{ mark} \end{pmatrix}$
Principles of averaging – 1 mark $\begin{pmatrix} \text{Volumes averaged should be within a range} \\ \text{of } 0.2 \text{ of each other} \end{pmatrix}$
Final accuracy – 1 mark $\begin{pmatrix} \text{Average value within} \pm 0.1 \text{ of } S.V - 1 \text{ mark} \\ \text{Average value within} \pm 0.2 \text{ of } S.V - \frac{1}{2} \text{ mark} \end{pmatrix}$

(b) (i) Moles of C used
$\frac{25 \times 0.1}{1000}$ ✓½ = 0.0025 ✓½

(ii) $\frac{1 \times 0.0025}{5}$ ✓½ = 0.0005 ✓½

(iii) $\frac{0.0005 \times 1000}{\text{Average volume of } B}$ ✓½ = ans ✓½

TABLE B

Marking is as per table A above.

(c) (ii) $\frac{\text{Average volume} \times 0.02}{1000}$ ✓½ = ans ✓½ c(ii)

(iii) $\frac{\text{Ans } c(ii) \times 5}{2}$ ✓½ = ans c(iii)

(iv) $\frac{\text{Ans } c(iii) \times 1000}{25}$ ✓½ = ans c(iv)

(v) Same as ans c(iv) ✓1

(vi) Mass of 5salt = 1 × 25 = 25g
Mass of $Na_2C_2O_4$ = Ans (v) × RFM = Ans (A) ✓½
Mass of water (solvent) = 25g – Ans (A) = Ans (B) ✓½
Solubility = $\frac{Ans(A)}{Ans(B)} \times 100$ ✓½
= Final Ans ✓½

2.	(a)	Observation	Inference
		- Colourless liquid formed on cooler parts ✓½ - White residue ✓½ Accept: Colourless vapour condense on cooler upper part of the test tube. Reject: Liquid condensing.	- Hydrated solid ✓½ (tied to idea of condensation) - OH^- ✓½

(b)	(i)	Observation	Inference
		- Colourless filtrate ✓½ - White residue ✓½	- Sparingly soluble ✓1
	(ii)	Observation	Inference
		- Red litmus turns blue ✓½ - Colour of blue litmus remains/persists ✓½	- OH^-, HCO_3^-, CO_3^{2-} **NB**: 3 ions ✓1 2 ions ✓½ 1 ion – 0mk

	(iii)	Observation	Inference
		- No effervescence ✓½ - No white ppt ✓½	- OH^- present ✓½ - Pb^{2+} absent ✓½

	(iv)	Observation	Inference
		- White ppt ✓1	- Ca^{2+} ✓½ Ba^{2+} ✓½

	(v)	Observation	Inference
		- No white ppt ✓1 Accept: - White ppt dissolves Reject: White ppt insoluble	- Ba^{2+} ✓1

3.	(a)	Observation	Inference
		- Burns with a yellow sooty or smoky flame ✓1	Present Accept: Unsaturated organic cpd - Long chain hydrocarbon

(b)	Observation	Inference
	Immiscible/form 2 layers ✓½	- Non-polar compound ✓½

(c)	(i)	Observation	Inference
		- No effervescence/bubbling/fizzing ✓1 - White residue ✓½ Rej: Fizzling/hissing	- H+/RCOOH absent✓1

(ii)	Observation	Inference
	Acidified $K_2Cr_2O_7$ remains orange ✓1 Accept: Acidified dichromate (VI) did not change from orange to green. Reject: Yellow colour for dichromate	- R – OH assent ✓1 Ignore Indicated as absent

(iii)	Observation	Inference
	Bromine water remains orange/yellow//Bromine water not decolourised. ✓1	Absent

		Accept: —C—C— Present | |