SERIES 37 EXAMS

233/3 – CHEMISTRY PAPER 3
MARKING SCHEME
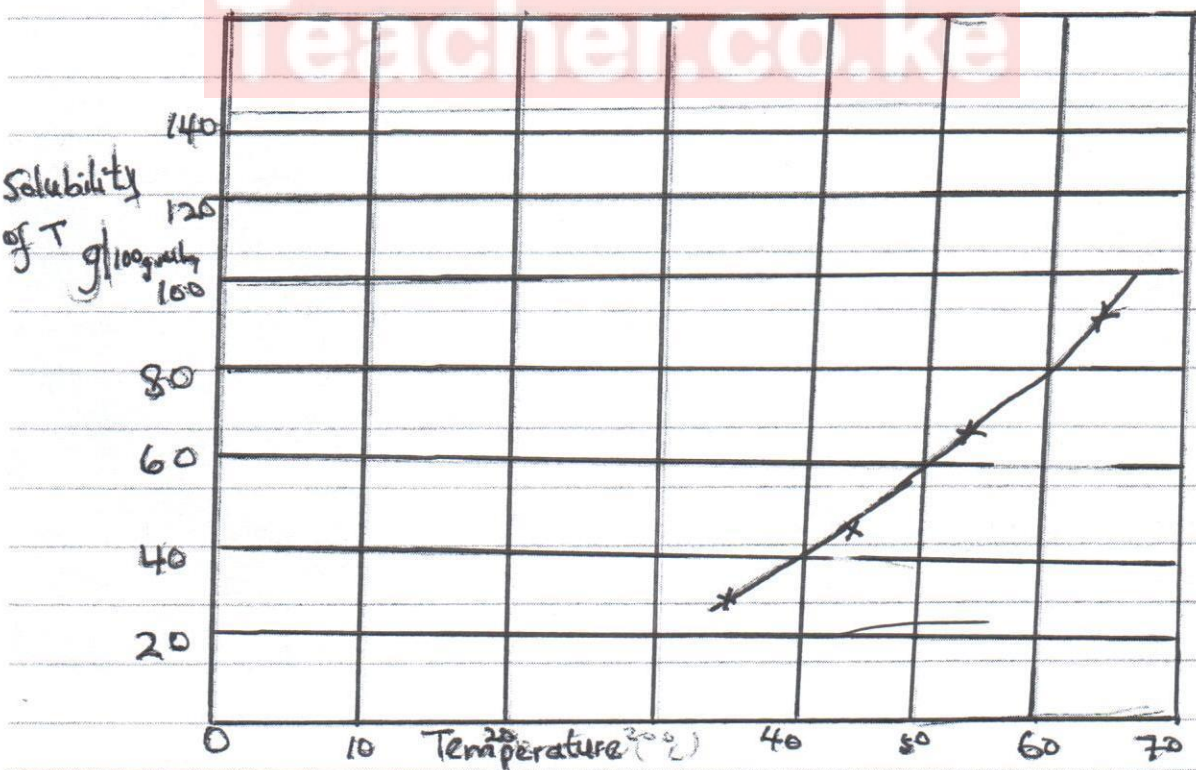
1. TABLE I

Volume of distilled water in boiling tube	Crystallization temperature	Stability of solid T in 100g / water
4	70.0	100
6	56.0	66.67
8	49.0	50.00
12	35.0	33.33

Complete table   (4mks)
Decimal place   (½ mk)
Accuracy   (½ mk)
Trend   (1mk)
              Total   6mks

GRAPH

(i)   Solubility at 55^0
       Showing √½
       Correct value √½

(ii)　　Temperature – 80g / 100g of water
　　　　Showing $\sqrt{}$½
　　　　Correct value $\sqrt{}$½

Procedure II

	I	II	III
Final burette reading cm^3	19.8	37.5	19.6
Initial burette reading cm^3	0.0	19.8	0.0
Volume of T used cm^3	19.8	19.7	19.6

Average volume = $19.70cm^2$ $\sqrt{}$1

TABLE II
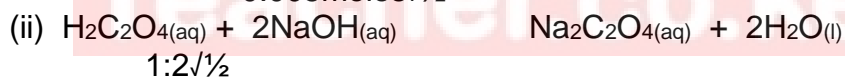Complete table　　　　　　(1mk)
Decimal place　　　　　　 (1mk)
Accuracy　　　　　　　　 (1mk)
Principles of averaging　　(1mk)
Final answer　　　　　　　(1mk)

Calculations

(b) (i) Moles of Q

$$n = \frac{cxv}{1000} = \frac{(0.2 \times 25)}{1000} \sqrt{}½$$

$$= 0.005 moles \sqrt{}½$$

(ii) $H_2C_2O_{4(aq)} + 2NaOH_{(aq)} \longrightarrow Na_2C_2O_{4(aq)} + 2H_2O_{(l)}$
　　　1:2$\sqrt{}$½

Moles of T　=　(½ X 0.005) $\sqrt{}$1
　　　　　　=　0.0025mols. $\sqrt{}$1

(iii) Molarity of T
　　　$M = \frac{16}{1}$

(iv) $C = \frac{n \times 1000}{V}$

$$= \frac{(0.0025 \times 1000)}{19.7} \sqrt{}½$$

$$= 0.1269M \sqrt{}½$$

(c) RFM $= \frac{Mass \ per \ litre}{Molanli}$

$$= \frac{16}{0.1267} = 126.08 \sqrt{}½$$

$H_2C_2O_4.nH_2 = 126.08$
$90 + 18n = 126 \sqrt{}½$
$18n = 36 \sqrt{}½$
$n = \underline{2} \sqrt{}½$

2. (a)
　　(i)

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Observation	Inference
Yellow ppt√½	Pb^{2+}√½
Soluble on warming √½	

(ii)

Observation	Inference
Yellow ppt / residue / solid	Pb^{2+}√½
Blue Green filtrate	Cu^{2+} / Fe^{2+} present√½

Observation	Inference
Blue ppt. √½	Cu^{2+} √½
Insoluble in excess√½	

Observation	Inference
Blue ppt. √½	Cu^{2+} √½
Deep blue solution in excess√½	

Observation	Inference
Brown deposit√½	Cu^{2+} displaced from solution √1
Green colour fades√½	

3. (i)

Observation	Inference
Burns with a yellow sooty / smoky flame.	Long chain hydrocarbon - unsaturated organic cpd - = c = c = or − c = c -

(ii)

Observation	Inference
- Dissolve to form colourless solution or - Forms colourless solution	Polar organic compound / polar cpd Accept Soluble salt / cpd

Observation	Inference
Effervescence / bubble / fizzling Reject; Hissing	COOH / H^- / H_3O^+√1 Acidic cpd; organic acid; carbonic acid; acidic solution

Observation	Inference
Orange colour persists / remains the same OR√1 Orange colour does not turn green Reject: yellow colour persists.	Absence of R-OH√1

Observation	Inference
KMnO$_4$ decolourized or KMnO$_4$ changes√1 from purple to colourless. Reject: solution remains colourless.	= c = c = / - c = c – Present Accept: Unsaturated organic cpd √½

Observation	Inference

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