SERIES 12 EXAMS

233/3 – CHEMISTRY PAPER 3 - MARKING SCHEME

1.

Experiment No.	(i)	(ii)	(iii)
Final burette reading (cm^3)	19.50	38.90	19.40
Initial burette reading (cm^3)	0.00	19.50	0.00
Volume of R used	19.50	19.40	19.40

Average = $\frac{19.50 + 19.40 + 19.40}{3}$

= $19.43cm^3$

Table
- Complete – 1mk
- Use decimal point – 1mk

Accuracy
- ± 0.1 (1mk)
- ± 0.2 (½)
- Beyond ± 0.2 (0mk)

Principles of average (1mk)
(average consistent value only)
Final accuracy (1mk)

- ± 0.1 of average litre (1mk)
- ± 0.2 of average litre (½ mk)
- Beyond ± 0.1 of average litre (0mk)

Calculations

(b) (i) Moles of R = $\frac{0.07 \times \text{average litre}}{1000}$

= Correct answer

(ii) $2HCl_{(aq)} + Ca(OH)_{2(aq)} \rightarrow CaCl2_{(aq)} + H_2O(aq)$

Moles of $Ca(OH)_2$ = ½ x ans (i) above

= correct answer

(iii) 25cm3 …….. ans(ii) above.

Therefore $90cm^3$ = $\frac{90 \times \text{ans above (ii)}}{25cm}$

= correct ans

(iv) Mass of Ca(OH)2 = ans (iii) x 74

Correct ans.

(c) Ans (iv) …… $90cm^3$

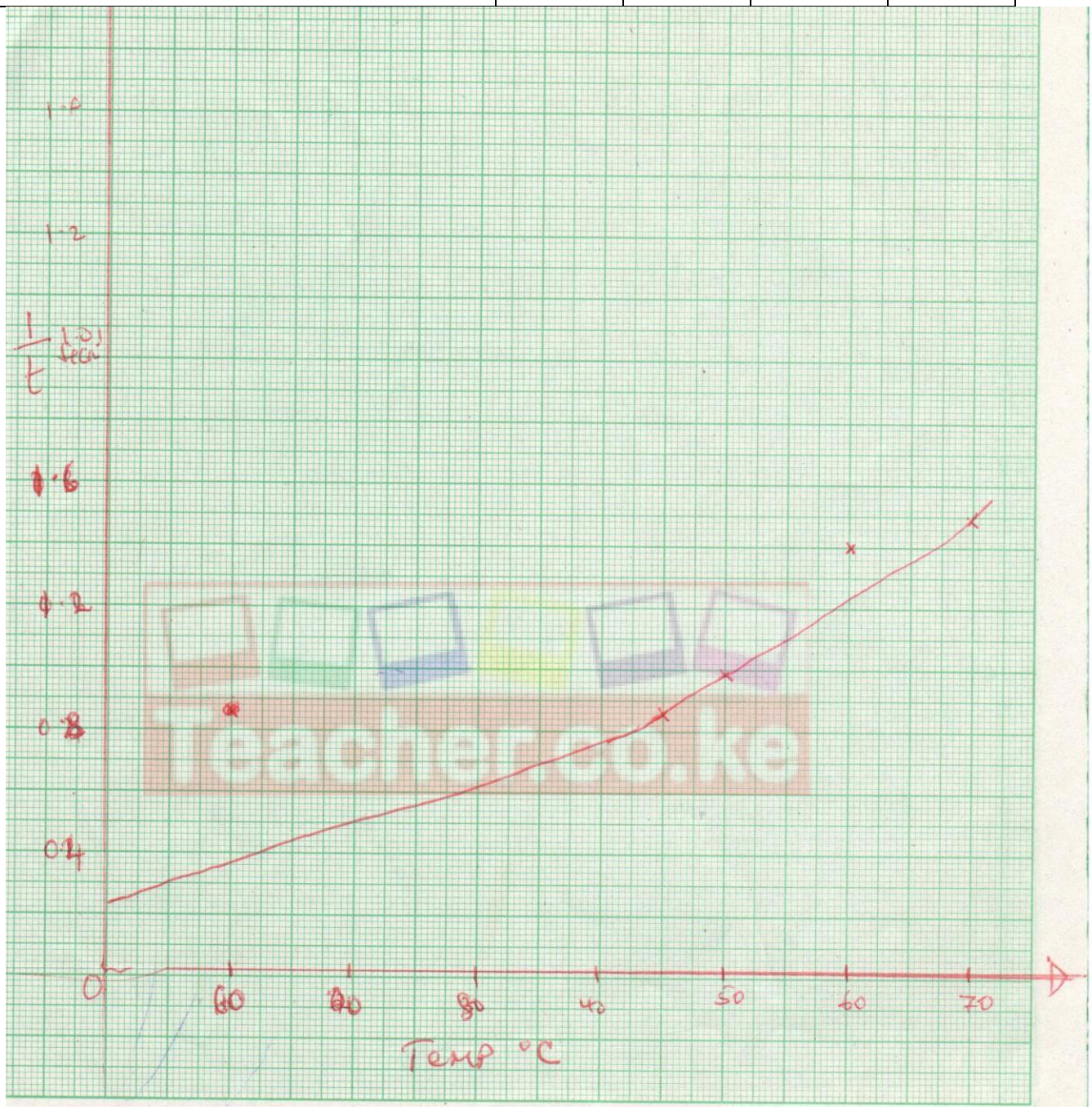
Therefore 100 ……. $\frac{100 \times \text{ans (iv)}}{90cm}$

= correct answer

2. (a)

Temperature before mixing	70	60	50	45
Temperature at which colour disappeared	54	50	47	43

Time at which colour disappeared	66	72	108	120
$^{i}/_{t}$ (s^{-1})	0.01515	0.01388	0.009259	0.00833
10^{-2}	1.515	1.388	0.9259	0.8333



Complete table – 4mks
Decimal place – ½mk
Accuracy – ½mk
Trends – 1mk

(6mks)

(i)

Observation	Inference
No white precipitate	Zn^{2+}, Pb^{2+}, Al^{3+} Ca^{2+} present. Accept Na^{+}, K^{+} present for ½ mk

(ii)

Observation	Inference
White precipitate	SO_4^{2-}, CO_3^{2-} or SO_4^{2-} Present NB: 3 mentioned – 1mk 2 mentioned – ½ mk 1 mentioned 0mk

(iii)

Observation	Inference
White precipitate dissolves	SO_3^{2-} or CO_3^{2-} SO_4^{2-} absent

(iv)

Observation	Inference
Acidified K_2Cr0_7 change from orange to green	SO_3^{2-} present

(b)

(i)

Observation	Inference
Bromine water is decoluorised. Accept Brown solution turns colourless	- C ≡ C - I I - C=C-, C≡C present penalize fully for any contradiction e.g. ROH, RCOOH. Accept Unsaturated organic cpds

(ii)

Observation	Inference
Purple acidified KMnO4 is decoloursied Reject: Colourless solution formed	I I - C = C - - C ≡ C- ROH present

(iii)

Observation	Inference
Moist blue litmus paper turns red. Red litmus paper remained red.	H+/H_3O present Present or acidic substance Ignore: RCOOH / Carboxylic acid