SERIES 30 EXAMS
CHEMISTRY 233/3 PRACTICAL MARKING SCHEME

1. (a) Table I – 5mks

    Complete table –   2mks
    Penalties / conditions
    Incomplete tale with at least 8 readings   1mk
    Incomplete table with 5 readings   ½mk
    Less than 5 readings   zero
    Trend   – 1mk
    Significant figures and decimals   – 1mk
    Accuracy   – 1mk
                                          05

(b) (a) Labelling – ½ mk
    Penalties
    (i)   Penalize fully if the axes are inverted
    (ii)   Penalize fully if wrong units are given otherwise ignore units if not given
    (iii)   Penalize fully if only one axes is labeled

(b) Scale – ½mk
    (i) Area covered by the plots should be more than ½ the page
        Scale intervals mus be consistent
        Scale chosen should be able to accommodate all the points

(c) Plotting – 2mks
    (i) At least 4 pts correctly – 1mk
        3 correctly – 1mk
                Les than 3 – zero
    (ii) Accept plots given if axes are inverted

    (d) –shape (1mk)
        Straight line
        With +ve or –ve gradient
        Reject curve – zero

    (c) (i) Accept correct reading with or without showing from the graph …….1mk
        (ii) If it s is hown on the graph correctly and the reading is absent or wrong, award ½mk for showing

        (iii) Penalize ½mk for wrong units used otherwise ignore if units are not used or shown or given

        (iv) Reject readings and showing from a wrong graph

        (v) Accept reading if correct even if axes are inverted.

    (d) Decrease in concentration decreases rate of reaction due to dilution

2.   Table :II Treat temperature value initial temperature of 40ºC and 10ºC as unrealistic

        (a) (i) Enthalpy change = mass x S.H.C x ΔT = ans. (2mks)

            Mass = mass of water used 50.0g

                ΔT = from table (II)

$$= 50 \times 4.2 \times \Delta T = \text{ans (2mks)}$$

(ii) CT – 4mks)
Penalties
(i) Wrong arithmetic tied to 1st, 2nd and 3rd rows only
(ii) Inverted table
(iii) Penalize ½mk once for each for a maximum of 2mks
Accuracy – 1mk
Upto ±0.1 (1mk) ; ±0.2 (½mk) with or compared to school mk

(b) Moles of R = $\dfrac{1 \times \text{average volume from table III}}{1000}$ = ans.(1)

(iv) Equation – $2HCl_{(aq)} + Na_2CO_{3(aq)} \quad\quad 2NaCl_{(aq)} + CO_{2(g)} + H_2O_{(l)}$

Mole ratio
Q : R
1 : 2
$\dfrac{\text{ans(1)}}{2}$ ans(1)

∴Moles of Q which reacted with solution R = $\dfrac{\text{ans (1)}}{2}$ = ans (2) in 25cm³ of solution

(d) Moles of Q in procedure 1
$\dfrac{\text{Mass of Q}}{\text{R.M.M}} = \dfrac{2.65}{102}$ = 0.025

(e)   Actual mole sof Q which reacted
0.025 – ans (2) in d = ans (3) √1mk

Ans (3) moles produce heat in (a) √ 1mk
1 mole of Q will produce $\dfrac{\text{heat in a} \times 1}{\text{Ans. (3) moles}}$ KJ/mole √ 1mk

3.   (a)

Observation	Inferences
(a) Solid **dissolves completely** forming a **colourless** solution√ 1mk	Na^+, K^+, NH_4^+, Ca^{2+}, Mg^{2+}, Zn^{2+}, Al^{3+} and Pb^{2+} ions present. (√1mk) (*penalize if a contradiction is given*)
(i) **White ppt.** √1mk , **soluble**(√½mk) in excess NaOH solution	Al^{3+}, Zn^{2+} and Pb^{2+} present (√1mk)
(ii) **white ppt**(√1mk). **soluble** (√½mk) in excess ammonia	Zn^{2+} ions confirmed (√1mk)
(iii)**White ppt. (**√1mk) **insoluble (**√½mk) in dilute hydrochloric acid	SO_4^{2-} present (√1mk)
(iv) Purple colour of Potassium permanganate is not decolorized (√1mk)	SO_3^{2-} and S^{2-} (√1mk)absent. Absence of reducing agent

Observation	Inferences
(i) Colour changes to red/pink pH of (5-6) (√½mk)	Weak acid present (√1mk)
(ii) Effervescence (√½mk)	H^+, H_3O^+, COOH (√1mk)present (any correct one
(iii) Changes from **orange** to **green** (√1mk)	$COOH^-$ (√1mk)present C = C C = C

2

Download this and other FREE materials from https://teacher.co.ke/notes

| (iv) Colour changes from red/brown to green $(\sqrt{}$1mk) | Fe^{2+} ions present $(\sqrt{}$1mk) |

(b)