SERIES 41 EXAMS

233/3
CHEMISTRY
Paper 3
PRACTICAL

1.

	I	II	III
Final burette reading	20.0	20.0	20.0
Initial burette reading	0.0	0.0	0.0
Volume of solution K used (cm³)	20.0	20.0	20.0

Award 5 marks on the table distributed as follows:

    a)   Complete table   1mk
    b)   Decimal places   1mk
    c)   Accuracy (tied to.S.V)   1mk
    d)   Principle s of averaging   1mk
    e)   Final Answer (tied to S.V)   1mk

i)   Average volume = ✓ ½ $\dfrac{20.0 + 20.0 + 20.0}{3} = 20.0\,cm^3$ ✓ ½

ii)   Number of moles of HCL in 25.0 cm³ = $\dfrac{25 \times 0.1}{1000} = 2.5 \times 10^{-3}\,Moles$ ✓ ½

iii)   Moles of NaOH rated = 2.5 x 10^{-3} (mole ratio 1:1)   I

iv)   2.5 x 10 -3 moles   20 cm³

         $\dfrac{2.5 \times 10 - 3 \times 1000}{20}$ ✓ ½   1000 cm³

            = 0.125 moles ✓ ½
            = 0.125 x 40 g (RFM of NaOH = 40 ✓ ½)
            = 5 g ✓ ½

    Percentage purity of NaOH = 5/6 x 100 ✓ ½
           = 83 .33 ✓ ½

2.   Table 2

Temperature before mixing (⁰C)	60	55	50	45
Temperature when the solution becomes colours (⁰C)	53	49	45	41
Time (Seconds)	14	20	34	50
1/time (Sec -1)	0.07	0.05	0.03	0.02

a)
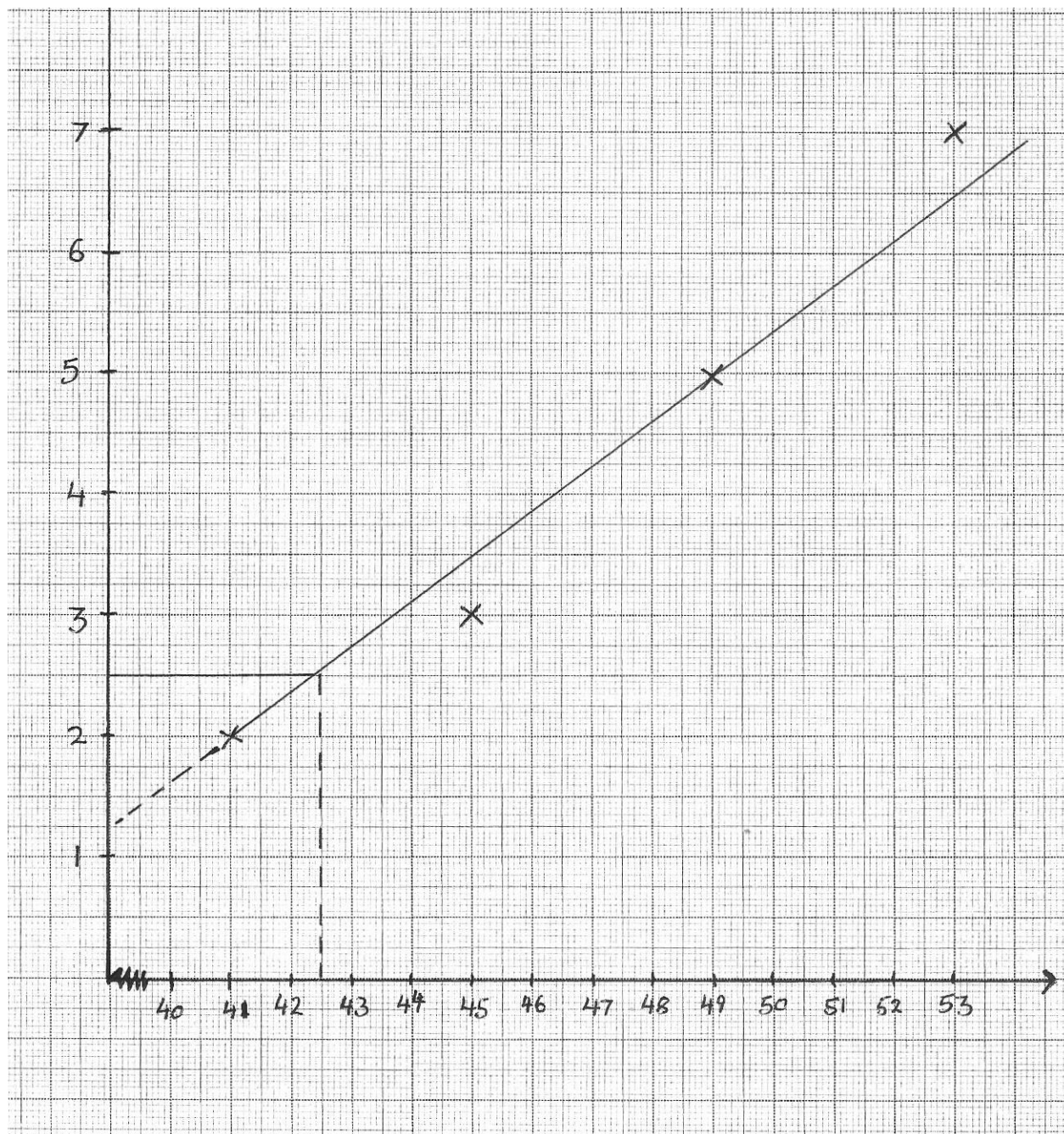
b)   R xn rate at 42.5^0 c $= 2.6$ x $10^{-2 \ sec}$-1

i.e $^1/_t = 2.6$ x 10^{-2} Sec $^{-1}$

$$\therefore t = \frac{1}{2.6 \, x \, 10}^{-2} = 38.46 \, sec$$

c)   The graph is a straight line as the rate of reaction increases with increase in temperature.

N.B: Award 6mks of or table 2, distributed as follows.

a)   Complete table   4mks

i)   Row 1   1mk

ii)   Row 2   1mk

iii)   Row 3   2mks (@ ½ mk)

2

b)   Decimal places (tied to row 1)   ½ mk

c)   Accuracy (tied to Row 2 column 1)   1mk

d)   Trend (tied to both Row 1 & 2)   ½ mk

   i.e Values in row 1 are decreasing while those in Row 2 are increasing.

3.   a)   i)

Observations	Inferences
- Blue litmus paper turns ✓ ½ red	Gas produced ✓ ½ acidic
- Red litmus paper remains red✓ ½	
- Colourless gas with a choking and irritating smell✓ ½	
- Colourless liquid forms on the cooler parts of the test tube✓ ½	- Hydrated solid ✓ ½ / solid contains water of crystallisation
- Solid formed is yellow when hot, white when cold✓ ½	@ ½ mak x 2 = 1
@ ½ mk to max. of 2 marks	

ii)

Observations	Inferences
White ppt formed ✓1 or	Mg^{2+}, Ca^{2+} , Pb^{2+},Zn^{2+} May be present
No effervescente	Award 1mk if at least 3 correct ions are mentioned

II

Observations	Inferences
White ppt ✓ ½ Soluble ✓ ½ in excess	Zn^{2+} present
	Award the mark for the inference if the observation is scored fully.

3

III

Observations	Inferences
White PPT✓ ½ formed	SO_3^{2-}, SO_4^{2-}, CO_3^{2-} + may be present
	Award 1mk iff all the three ions are correctly mentioned

IV)

Observations	Inferences
- White ppt persist / remains does not dissolve✓1	SO_4^{2-} Present
	Award only if mentioned in III

NB: In all cases, penalize fully if letters of ions are joined, Wrong charges are given, wrong symbols of elements etc.

- Penalise fully incase of contradicting ions mentioned

3. b) i)

Observations	Inferences
Solid burns with a sooty / smoky, luminous flame✓1	Unsaturated hydrocarbon✓1 an organic cpd with a high C:H ratio

Accept

$$\begin{array}{c} \diagdown \\ \diagup \end{array} C = C \begin{array}{c} \diagup \\ \diagdown \end{array} \text{Or } C \equiv C -$$

As present
But Reject C = C or C $\underline{\equiv}$ C

ii) I)

Observations	Inferences
- Colour of gadified KMn₄ Changes from purple to colourless✓1	$\begin{array}{c} \diagdown \\ \diagup \end{array} C = C \begin{array}{c} \diagup \\ \diagdown \end{array} \text{Or } C \equiv C -$

May be present

II

Observations	Inferences
Effervescence / bubbles/ fizzing occur✓1	H^+, H_3O^r ✓ 1 present Accept R COOH

III

Observations	Inferences
PH 5✓ ½	Soln is weakily acidic✓ ½