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 (cm^3)	**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 = $\frac{20.0 + 20.0 + 20.0}{3} = 20.0\,cm^3$ ✓ ½

ii) Number of moles of HCL in 25.0 cm^3 = $\frac{25\,x0.1}{1000} = 2.5x10^{-3} Moles$ ✓ ½

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

iv) 2.5 x 10 -3 moles 20 cm^3

$\frac{2.5x10-3\,x1000}{20}$ ✓ ½ 1000 cm^3

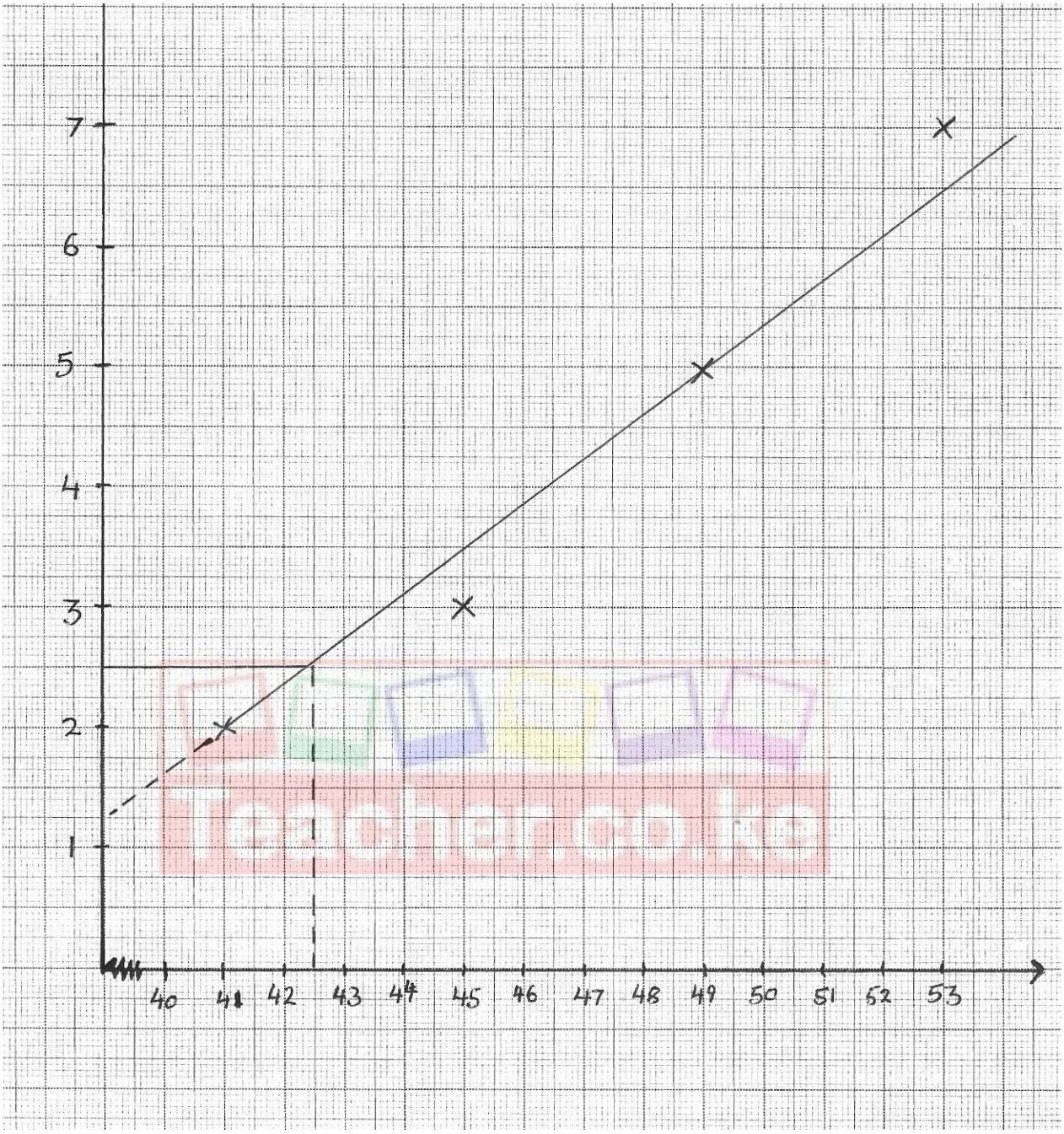
= 0.125 moles ✓ ½
= 0.125 x 40 g (RFM of NaOH = 40✓ ½)
= 5 g ✓ ½

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 = 2.6×10^{-2} ^{sec}-1

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

$\therefore t = {}^{1}\!/_{2.6\,x10^{-2}} = 38.46 \sec$

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)

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

ii)

Observations	**Inferences**
White ppt formed ✓1 or No effervescente	Mg^{2+}, Ca^{2+} , Pb^{2+},Zn^{2+} May be present 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.

III

Observations	Inferences
White PPT✓ ½ formed	2 – SO_3^{2-} , SO^{2-}_4,CO + ^{3} 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^{2-}_4 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 $>C=C<$ Or $C \equiv C$ - As present But Reject C = C or C ≡ C

ii) I)

Observations	Inferences
- Colour of gadified KMn_4 Changes from purple to colourless✓1	$>C=C<$ 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