SERIES 40 EXAMS
233/3
CHEMISTRY
PAPER 3
MARKING SCHEME

1. a)   For the table 1
          Penalize 1mk for unrealist
          Values of temperature e.g
          Recording temperature teachers
          Temperature by 10 °C
          Values should give at least highest temperature of about 7.5 – 10°C

    b)   i)   Scale – 1mk
                Correct point– 1mk
                Graph - 1mk

          ii)   ½ mk for using graphn (must show dotted line on graph or blocked liner)
                ½ mk for correct answer
                If not shown in graphs penalize fully.

          iii) MCΔT
                = 50 x 4.2 x higher of mixtutr ✓ ½ mk M ≡ 50 x 14.0g/cm ✓ ½ m = 50g
                     50 x 4.2 xΔt ✓ 1mk
                     Penalise ½ mk for omitting units of wrong units in final answer

                Accept J or kJ units
                Penalise ½ mk for omitting –sing for exothermic process or use of (+) sign instead of(-)

          iv)   <u>Value obtain in b(iii)</u> ✓ 1mk Ans ✓ 1mk
                     320

                Penalise ½ mk for omitting moles of use of M for moles

    Tables

	I	II	III
Final burette reading	16.0	32.1	48.1
Initial burette reading	0.0	16.1	32.1
Volume of sodium hydroxide used (cm³)	16.1	16.0	16.0

                CT – 1mk
                Decimal – 1mk
                Precision – 1mk
                Accuracy – 1mk
                    (4mks)

    c)   i)   School volume $\underline{t_1 + t_2 + t_3}$
                                    3
                              V1cm³
                Penalise ½ mk for omitting unit
                - Working should ben clearly showed

          ii)   I : $\underline{V_1 \ x \ 1.25}$ = 0.00025 V1   1mk
                       1000

                                1

II Moles ratio between H_2SO_4 and NaOH = 1 : 2 ✓ 1mk

Moles of H_2SO_4 in $25cm^3$ = ½ x $0.00025V_1$

$= 0.000125V_1$ ✓ 1mk

III $\underline{0.000125V_1}$ x 250 ✓ ½ mk = $\underline{0.00125V_1}$ ✓½ mk

25

d) Moles of part b(iv) + $0.00125V_1$ = ✓ Ans 1mk

e) $\underline{\text{Ans part (d) x 1000}}$ ✓ 1mk= Ans 1mk

50

2. a)

Observation	Inference
- Colourless liquid ✓ 1mk/ forms on cooler part of the test – tube -Red litmus paper change ✓ 1mk of blue and blue litmus paper remain unchanged (2mks)	Hydrate salt ✓ 1 NH^{4+}ions (2mks)

Observation	Inference
b)i) Solid dissolve in water to form a colourless solution ✓ 1mk (2mks)	A soluble salt ✓ 1mk (2mks)

Observation	Inference
ii) White precipitate ✓ 1mk does not dissolve (2mks)	SO_4^{-2} , $Cl^-_{(aq)}$ ions (2mks)

Observation	Inference
iii) White precipitate ✓ ½ mk does not dissolve ✓ 1mk (2mks)	SO_4^{-2} ✓ ½ mk (2mks)

Observation	Inference
iv) Green precipitate does not dissolve ✓ 1mk (2mks)	$Fe^{+2}_{(aq)}$ ions ✓ 1mk (2mks)

2

Observation	Inference
v) Yellow solution formed ✓ 1mk (2mks)	$Fe^{+3}_{(aq)}$ ions 1mk (2mks)