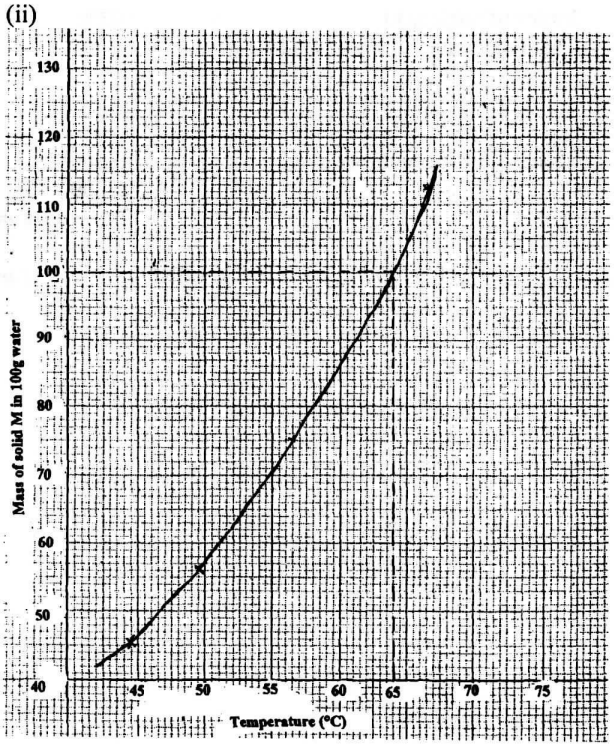
24.6.3 Chemistry Paper 3 (233/3)

1. (a), (b), (c) and (d) (i)

Volume of water in the boiling tube (cm^3)	Temperature at which crystals of solid A first appear (°C)	Solubility of solid A (g/100g water)
4	66 - 67	112.5
6	56 - 57	75
8	49 - 50	56
10	44 - 45	45

(6 marks)

(ii)



(3 marks)

(iii) 63 ± 0.5 °C ***(1 mark)***

(e) (i)

	I	II	III
Final burette reading	24.40	48.60	26.20
Initial burette reading	0.00	24.40	2.00
Volume of solution B used (cm^3)	24.40	24.20	24.20

(3 marks)

(ii)

I Average $\frac{24.20 + 24.20 + 23.4}{3}$

$= 24.20cm^3$ ***(1 mark)***

II $\frac{0.06x24.20}{1000}$

$=1.45 \times 10^{-3}$ moles ***(1 mark)***

III $\frac{1.45 \times 10^{-3} \times 5}{2}$

$= 3.63 \times 10^{-3}$ moles *(1 mark)*

IV $3.63 \times 10^{-3} \times 10$

$= 3.63 \times 10^{-2}$ moles

$\frac{4.5}{3.63x10^{-2}}$

$= 124$ *(3 marks)*

(iii) $Dx\ H_20$

$90 + 18x = 124$

$x = \frac{34}{18}$

$= 1.9$

≈ 2 *(2 marks)*

		Observations	Inferences	
2. (a)		Colourless liquid condenses on cool parts of test-tube White solid remains	Probably Hydrated Salt/compound present	*(2 marks)*
(b)		Colourless filtrate White residue	Compound sparingly soluble	*(2 marks)*
	(i)	Solution turns pink	Compound is basic: OH^-, HCO^-_3 or CO_3^{2-} present	*(2 marks)*
	(ii)	No effervescence	OH^- Present or HCO_3 or CO_3^{2-} Absent	*(2 marks)*
	(iii)	White PPt formed	$Ca^{2+}, Ba^{2+}, Pb^{2+}$ present	*(3 marks)*
	(iv)	No white PPt	Ba^{2+} Present or Ca^{2+} or pb^{2+} Absent.	*(2 marks)*
3 (a)		Burns with luminous (yellow, smoky) flame	Unsaturated compound OR long chain hydrocarbon	*(2 marks)*
(b)		Potassium manganate (VII) is decolourised (changes from purple to colourless)	Alkene or alcohol present	*(2 marks)*
(c)		Bromine water is decolourised (changes from red to colourless)	Alkene present	*(2 marks)*