

FORM FOUR JOINT EXAMINATION – 2017
CHEMISTRY PAPER 3 MARKING SCHEME

MARKING SCHEME

TABLE 1

Mass of P in grams	Volume of water in the Boiling tube (cm ³)	Temperature at which crystal of P appear °c	Solubility	
			g/100g water	Mole c/m ³
4	5	50	80.0	6.0
4	8	38	50.0	4.0
4	11	30	36.4	209
4	14	28	28.6	2.3
4	17	26	23.5	1.9

a) Complete table 5 marks

Conditions

- i. Complete table with 15 entries (5mks)
- ii. Incomplete table with 5 temperature and 5 solubility in g/100g water with 3-5 correct solubility in mole per c/m³ (4 ½ marks)
- iii. Incomplete table with 5 temperature and two correct solubility in g/100g water and mole c/m³ (4 marks)
- iv. Incomplete table with 5 temperature and less than 2 solubility in g/100g water entries (3mks)
- v. Incomplete table with 3 – 4 temperature reading and 3 correct solubility (2 ½ marks)
- vi. Incomplete table with one or no entry (0 zero)

PENALTIES

- i. Penalize ½ mark one for wrong arithmetic in working out of solubility.
- ii. If no temperature readings are given penalize 1 mark
- iii. Penalize half mark one for unrealistic temperature readings either below 10⁰c or above 40⁰c at volume 17cm³

Decimal.....1 mark

Tied to temperature and solubility column

- 1) Accept temperature readings only if given consistently as either whole or to 1 decimal place of either 0 or 5 or two decimal places either 0.00 or 0.25 or 0.50 or 0.75 otherwise penalize (½ mark.)
- 2) Accept whole numbers or 1 or 2 decimal places used consistently for solubility columns otherwise penalize (½ mark)

Accuracy.....1 mark

Tied to temperature column

Compared the candidate temperature reading for experiment one with the school value ... with $\pm 2.0^{\circ}\text{C}$ award 1 mark otherwise penalize fully.

Trend..... 1mark

Tied to the column of temperature award 1 mark

If temperature reading decrease continuously otherwise penalize fully award zero.

$$\text{CT} = 5$$

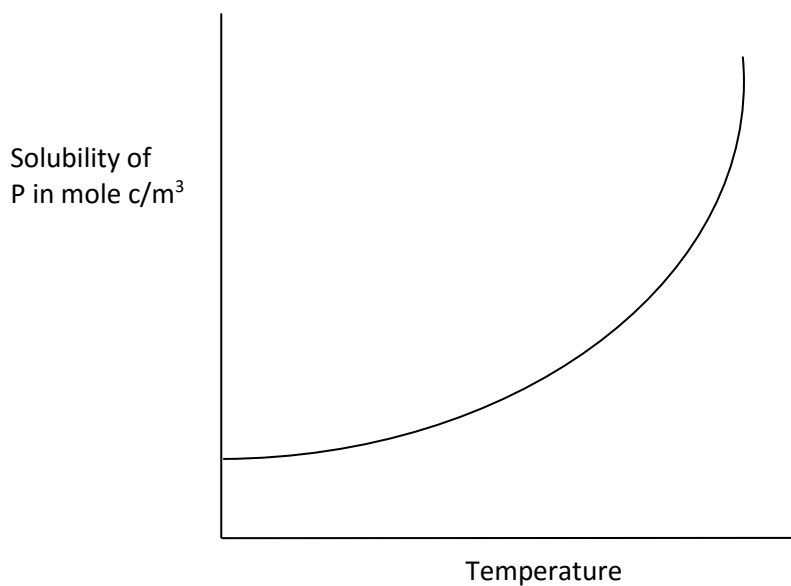
$$\text{D} = 1$$

$$\text{A} = 1$$

$$\text{T} = 1$$

8

GRAPH



Labeling of axes	1/2
Scale	1/2
Plotting	1
Freehand	
Smooth curve	

Showing other graph correctly 1 mark

Correct calculation 1 mark

Shown correctly on the graph 1 mark
It is used to measure accurate volume

Q2

i.

Table II

	i	ii	iii
Final burette reading (cm ³)	27.00	27.00	27.00
Burette ready cm ³	0.00	0.00	0.00
Volume of solution D used cm ³	27.00	27.00	27.00

Complete table	1 mark
Decimal	1 mark
Accuracy	1 mark
Principle of arranging	1 mark
Final accuracy	1 mark

ii. $\frac{25 \times 0.1}{1000} \quad \frac{1}{2}$
 $= 0.0025 \quad \frac{1}{2}$

iii. Acid Base
 Mol ratio 2 : 1 $\quad \frac{1}{2}$
 $\frac{0.0025 \times 2}{1} \quad \frac{1}{2}$
 $= 0.005 \quad \frac{1}{2}$

iv. $\frac{1000 \times 0.005}{\text{Average litre}} \quad \frac{1}{2}$
 Correct answer $\frac{1}{2}$

v. $\frac{\text{Answer in vi above} \times 1000}{100} \quad \frac{1}{2}$
 Correct answer $\frac{1}{2}$

Q 3 a)

	Observation	Inference
i)	Cracking sound colourless liquid on the cover parts of the test tube. Blue litmus remain blue Red litmus changes to blue 2 marks	Hydrated salt/contain water of crystallization NH_4^+ present
ii)	Dissolve to form colourless solution $\frac{1}{2}$ marks	Coloured ... absent 1
iii)	White ppt soluble in excess	Zn^{2+} pb^{2+} Al^{3+} present 2
iv)	White ppt soluble in excess	Zn^{2+} 2
	White ppt Does not dissolve in acid	SO_4^{2-}

3b

i)	Burns with yellow sooty flame. 1	High C:H ratio. 1
ii)	Dissolve to form a colourless solution $\frac{1}{2}$	A poor organic compound. $\frac{1}{2}$
iii)	Yellow Brownish water does not change to colour	C=C absent
	Bubbles	$\text{H}^+/\text{H}_3\text{O}^+$