

WAKISSHA JOINT MOCK EXAMINATIONS 2015
UGANDA ADVANCED CERTIFICATE OF EDUCATION
MARKING GUIDE
P525/3
CHEMISTRY PRACTICAL
PAPER 3
JULY/AUGUST 2015



Q1	Q2	Q3	TOTAL
26 ¹ / ₂	28 ¹ / ₂	15	70

1. Volume of pipette used 25.0 cm³ 1/2 marks

FBR/cm ³	23.10	46.00	32.80
IBR/cm ³	0.00	23.10	10.00
Value of GA2 used/cm ³	23.10	22.90	22.80

3 marks

22.90 and 22.80 cm³

$$\text{Average. } \frac{22.90 + 22.80}{2} = 22.85 \text{ cm}^3$$

2 1/2 marks

- (a) RFN. of (NH₄)₂.SO₄.6H₂O.FeSO₄

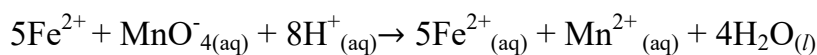
$$56 + 96 + (14 \times 2) + (1 \times 8) + 32 + 16 + 4 + (6 \times 18) = 392$$

392g of GA2 contain 1 mole.

$$9.8 \text{ g of GA2 contain } \left(\frac{1}{392} \times 9.8 \right) \text{ moles.}$$

$$250 \text{ cm}^3 \text{ of GA2 contain } \frac{9.8}{392} \text{ moles.}$$

$$250 \text{ cm}^3 \text{ of GA2 contain } \left(\frac{9.8 \times 25}{392 \times 250} \right) \text{ moles.}$$



But mole ratio is 5:1

$$\text{Moles of MnO}_4^- \frac{1}{5} \times \frac{9.8 \times 25}{392 \times 250} \text{ that reacted.}$$

$$22.85 \text{ cm}^3 \text{ of MnO}_4^- \text{ contain } \frac{1}{5} \times \frac{9.8 \times 25}{392 \times 250}$$

$$1000 \text{ cm}^3 \text{ GA}^2 \text{ contain } \frac{1 \times 9.8 \times 25 \times 1000}{5 \times 392 \times 250 \times 22.85}$$

$$= 0.02 \text{ M}$$

5 1/2 marks

PART BVolume of pipette used 25.0 cm³¹/₂mark

FBR/cm ³	26.00	36.10	26.00
IBR/cm ³	0.00	10.00	00.00
Value of GA2 used/cm ³	26.00	26.10	26.00

03marks

26.00, and 26.10cm³. ¹/₂mark

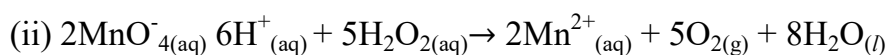
$$\text{Average. } \frac{26.00 + 26.10}{2} = 26.05 \text{ cm}^3$$

2¹/₂marks(c) (i). 1000cm³ of GA2 contain 0.02moles.

$$26.05 \text{ cm}^3 \text{ of GA2 contain } \left(\frac{0.02}{1000} \times 26.05 \right) \text{ moles}$$

$$= 5.21 \times 10^{-4} \text{ moles}$$

01marks



$$\text{Moles of H}_2\text{O}_2 = \frac{5}{2} \times 5.21 \times 10^{-4} = 1.3 \times 10^{-3} \text{ moles.}$$

$$25 \text{ cm}^3 \text{ of H}_2\text{O}_2 \text{ in GA4 contain } 1.3 \times 10^{-3} \text{ moles.}$$

$$1000 \text{ cm}^3 \text{ of H}_2\text{O}_2 \text{ in GA}_4 \text{ contain } \left(\frac{1.3 \times 10^{-3}}{25} \times 1000 \right) \text{ moles} = 0.053 \text{ M.}$$

$$\text{FM of H}_2\text{O}_2 = (1 \times 2) + (16 \times 2) = 34$$

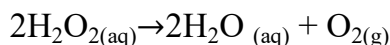
$$1 \text{ mole of H}_2\text{O}_2 \text{ weighs } 34 \text{ g}$$

$$0.053 \text{ moles of H}_2\text{O}_2 \text{ weighs } 34 \times 0.053$$

$$= 1.768 \text{ g/l}$$

5¹/₂marks

(d) Volume strength

2moles of H₂O₂ produce 1mole of oxygen.

1 mole of a gas at RT occupies 22.4L

2moles of H₂O₂ produce 22.4L

$$1 \text{ mole of H}_2\text{O}_2 \text{ produce } \left(\frac{22.4}{2} \right) \text{ l.}$$

$$1.768 \text{ g of H}_2\text{O}_2 \text{ produce } \left(\frac{22.4}{2} \times 1.768 \right)$$

$$= 19.8 \text{ vol.}$$

02marks

TESTS	OBSERVATION	DEDUCTIONS
a)	Colourless liquid turns anhydrous CuSO_4 blue, colourless gas turns litmus red and blue water milky Residue is yellow hot and white when cold.	Hydrated Cpd. H_2O of crystallization. CO_2 , CO_3^{2-} , HCO_3^- , $\text{C}_2\text{O}_4^{2-}$, ZnO . <i>05marks</i>
b)	Effervescence of a colourless gas turns litmus red and leave water milky colourless solution.	CO_2 , CO_3^{2-} , HCO_3^- Rej. HCO_3^- <i>03 1/2 marks</i>
c)	White ppt, insoluble/ white residue Colourless filtrate.	Ba^{2+} , Ca^{2+} , Mg^{2+} Al^{3+} , Zn^{2+} , Pb^{2+} , Sn^{2+} <i>03 1/2 marks</i>
d) (i)	White ppt soluble Pale yellow ppt. insoluble.	Al^{3+} , Zn^{2+} , Pb^{2+} , Sn^{2+} . I^- or Br^- <i>02marks</i>
(ii)	White ppt Brown yellow ppt formed on addition of $\text{Na}_2\text{S}_2\text{O}_3$	Iodine formed I^- ion present. <i>1 1/2 marks</i>
(iii)	No observable change.	Yellow ppt I^- compound, <i>1mark</i>
(iv)	White ppt soluble.	Zn^{2+} , Pb^{2+} , Al^{3+} , Sn^{2+} , Sn^{4+} <i>1mark</i>
(v)	White ppt insoluble.	Al^{3+} , Pb^{2+} <i>1mark</i>
(vi)	No observable change/ No yellow ppt.	Pb^{2+} absent. $\therefore \text{Al}^{3+}$ present. <i>1mark</i>
(vii)	Added schops of litmus solution followed by dilute ammonia solution drop wise until in excess.	Al^{3+} confirmed. <i>1mark</i>
e)	Soluble giving a colourless solution.	Ba^{2+} , Mg^{2+} , Ca^{2+} <i>1 1/2 mark</i>
(i)	White ppt insoluble	Ba^{2+} , Mg^{2+} , Ca^{2+} <i>1mark</i>
(ii)	White ppt insoluble.	Ba^{2+} , Mg^{2+} <i>1mark</i>
(iii)	No yellow ppt.	Ba^{2+} , absent Mg^{2+} Present <i>1mark</i>

(iv)	To the forth part added a little of ammonium chloride solid followed by 2 drops of disodium hydrogen phosphate and then excess ammonia solution.	White ppt formed slowly	Mg ²⁺ confirmed present. <i>1¹/₂mark</i>
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(f) CO₃²⁻
Al³⁺

I⁻
Mg²⁺

04¹/₂ marks.

(3)

TEST	OBSERVATION	DEDUCTION.
a)	Burns with a blue non-sooty flame.	Aliphatic saturated cpd. <i>1¹/₂mark</i>
b)	Misable/soluble giving a colourless solution, neutral to litmus.	Probably alcohol/carboxyl/ester. <i>1¹/₂mark</i>
(i)	No effervescence/bubble of gas.	Carboxylic acid absent. <i>1¹/₂mark</i>
(ii)	No- observable change.	Phenol absent. <i>1¹/₂mark</i>
(iii)	No observable change.	Carbony/cpd absent. <i>1¹/₂mark</i>
(iv)	Purple acidified K ₂ Cr ₂ O ₇ turn to colourless.	Probably/or secondary alcohol oxidised. <i>1¹/₂mark</i>
-	Yellow/orange ppt	Primary or secondary alcohol oxidised to carbony(cpd) <i>1¹/₂mark</i>
-	Silvery mirror deposit/grey ppt.	Primary alcohol. <i>1¹/₂mark</i>
(v)	Sweet funny smell pleasant.	Ester/esletiar alcohol confirmed. <i>2marks</i>
(vi)	No yellow ppt.	CH ₃ CH- R OH absent.



(c) K is aliphatic primary alcohol. Without CH₃ CH₂- R

1mark

15marks

END