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School	Signature

P525/3 **CHEMISTRY** (PRACTICAL) Paper 3 July/August 2023 3¹/₄ hours



WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Advanced Certificate of Education

CHEMISTRY ros di impo fara ora Litter da PRACTICAL

Paper 3

3 hours 15 minutes

Instructions to Candidates:

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- Answer all questions.
- Record your answers on this question paper in the spaces provided.
- Mathematical tables and silent non-programmable calculators may be used.
- Reference books (i.e, textbooks, books on qualitative analysis etc.) should not be used.
- Candidates are not allowed to start working with the apparatus for the first 15 minutes. This time is to enable candidates to read the question paper and make sure they have all apparatus and chemicals that they may need.
- Where necessary use (Na = 32, N = 14, H = 1, O = 16)

For Examiners' Use Only				
	Q.1	Q.2	Q.3	Total
			to extend to redmi	Mesons (d) tacheste den vic katama

You are provided with the followard GA ₁ , which is a solution made GA ₂ , which is a solution of pot GA ₃ , which is 2.0 M sulphuric Solid Z which is an acid of a form	by dissolving 0.4 g tassium permangana acid.	sodium nitrite te of unknown	in 250 cm ³ of diagonal concentration.	istilled water.
You are required to determine i) the concentration of pota ii) find the value of n in T.n	assium permanganat	e in GA_2 in mo	bles per litre.	
Theory Potassium permanganate reacts	s with sodium nitrite	according to t	he equation	
$2MnO_4^{(aq)} + 5NO_2^{(aq)} + 6H^+_{(aq)}$	(aq) 5N0	$O_3^{-}_{(aq)} + 2Mn^{2+}$	$(aq) + 3H_2O_{(l)}$	
The ratio of reaction between M	MnO_4^- : T.nH ₂ O is 2	:5.	H + M.	
Procedure 1	Programme Programs	and a since		4.2
Titrate the resultant solution wing Repeat the titration until you of Record your results in the table. Volume of pipette used	btain consistent results below.	lts.	cı	
Experiment Number	1	2	3	
Final burette reading (cm) ³			Deir Ray Administration	
Initial burette reading (cm ³)				
Volume of GA ₂ used (cm ³)	nettekken alimit di si	2 No. 10 Year 1		
sin C. valus in according	· Wanter in	Company Company	r is	」 (4½ marks,
Titre values used for calculating	g average volume.			(01 mark)
Calculate the average volume of				(2½ marks)
	0.4-0.4			
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Onestions				······································
Questions (a) Calculate the number of n	noles of	· · · · · · · · · · · · · · · · · · ·		
	noles of			(2½ marks)
(a) Calculate the number of n	noles of			(2½ marks)

(ii)	Potassium permangana		icica.	in a second seco	(01ma

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100	m Till		ydanomininymu		
Det	ermine the concentration of	of potassium pern	nanganate in GA	12 in moles pe	(01ma)
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	and the second s		kag masingpan mil nife 8		
	ili. 2000. j. n. n. angaran sagar, nanasan sa sanasan sa				
, the	afragiud. To 691 sa		Taladaga n 40 s		
			, and stated a secondar		
271		entres of the State of the Stat		. 136., 11. 11.	
Weigh distille	lure 2 accurately 0.6 g of Z into d water and stir to dissolve up to the mark with distille	e. Transfer the co	ntent into a 250	cm ³ volumetr	
distille make u Mass o	accurately $0.6 g$ of Z into d water and stir to dissolve up to the mark with distilled of container $+ Z = \dots$	e. Transfer the co	ntent into a 250 dis solution GA ₄ .	cm ³ volumetr	
Weigh distille make u Mass o	accurately $0.6 g$ of Z into d water and stir to dissolve up to the mark with distilled of container $+ Z = \dots$	e. Transfer the co ed water. Label th	is solution GA ₄ .	em ³ volumetr	ic flask and
Weigh distille make u Mass o Mass o	accurately 0.6 g of Z into d water and stir to dissolve up to the mark with distilled of container + Z = of container alone =	e. Transfer the co	is solution GA ₄ .	em ³ volumetr	ic flask and
Weigh distille make used Mass of Mass of Mass of Pipette mixtur reaches table be	accurately 0.6 g of \mathbf{Z} into d water and stir to dissolve up to the mark with distilled of container $+\mathbf{Z} = \dots$ of container alone $= \dots$ of solid $\mathbf{Z} = \dots$ at $\mathbf{Z} = \mathbf{Z}$ or \mathbf{Z}	e. Transfer the cond water. Label the control of a conical flash not solution with a control of the control of	is solution GA ₄ . g g g g g	ume of GA_3	(½ man (½ man (½ man and Heat
Weigh distille make used Mass of Mass of Mass of Pipette mixtur reaches table be	accurately 0.6 g of \mathbf{Z} into d water and stir to dissolve up to the mark with distilled of container $+\mathbf{Z} = \dots$ of container alone $= \dots$ of solid $\mathbf{Z} = \dots$ at $\mathbf{Z} = \mathbf{Z}$ or $\mathbf{Z} = \mathbf{Z}$ of \mathbf{G} or $\mathbf{Z} = \mathbf{Z}$ of \mathbf{G} or $\mathbf{Z} = \mathbf{Z}$ of \mathbf{G} or $\mathbf{Z} = \mathbf{Z}$ or $\mathbf{Z} = \mathbf$	e. Transfer the cond water. Label the control of a conical flash not solution with a control of the control of	is solution GA ₄ . g g g g g	ume of GA_3	(½ man (½ man (½ man and Heat
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Weigh distille make to Mass of Mass of Pipette mixtur reachestable b Volum Table	accurately 0.6 g of Z into d water and stir to dissolve up to the mark with distilled of container + Z = of container alone = of solid Z = e 20 or 25 cm ³ of GA ₄ in the up to 70 ⁰ C . Titrate the led. Repeat the titrations up the of pipette used =	e. Transfer the cond water. Label the control of a conical flash not solution with a control of the control of	is solution GA ₄ . g g g g g	ume of GA_3	(½ man (½ man (½ man and Heat e end point results in
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Weigh distille make use Mass of Mass o	accurately 0.6 g of Z into d water and stir to dissolve up to the mark with distilled of container + Z = of container alone = of solid Z = e 20 or 25 cm³ of GA₄ in the up to 70°C. Titrate the led. Repeat the titrations up to the distribution of pipette used = II riment Number burette reading (cm³)	e. Transfer the cond water. Label the control of a conical flash not solution with a control of the control of	is solution GA ₄ . g g g g g	ume of GA_3	(½ man (½ man (½ man and Heat e end point results in

estions Calca (i)	ulate the number of moles of potassium permanganate in $\mathbf{GA_2}$ that reacted with $\mathbf{GA_4}$.	(01 mark)
	 United the control of the body where we replace the control of the c	
(ii)	acidic compound of a formula $T. nH_2O$ in GA_4 that reacted.	(01 mark)
12 5		t or deno Addition to the
	these followings are selected to the property of the property of the control of t	, hara ika wa Lisik
	the control of the co	네 얼굴 그렇게 하네 되지 ^
Deter		aragi pina sa para
	mine the;	
Deter		
(i)	mine the; concentration of acidic compound of a formula T. nH₂O in G A litre.	(01 mari
(i)	mine the; concentration of acidic compound of a formula T. nH₂O in G ₂ litre.	(01 mar)
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(i)	mine the; concentration of acidic compound of a formula T. nH₂O in G ₂ litre.	(01 mari
(i)	mine the; concentration of acidic compound of a formula T. nH₂O in G ₂ litre.	(01 mar)
(i)	mine the; concentration of acidic compound of a formula T. nH₂O in G A litre.	(01 mar)
(i)	mine the; concentration of acidic compound of a formula T. nH₂O in G 2 litre.	(01 mar)

(ii)	the value of n in T. nH ₂ O.	(03 marks)
	(T = 90, H = 1, O = 16)	(03 marks)
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2. You are provided with substance **T** which contains **two** cations and **two** anions. Carry out the following tests on **T** to identify the cations and anions present. Identify any gases evolved.

(33 marks)

Tests	Observations	Deductions
(a) Heat one spatula endful of T	bar different	
strongly in a test tube.		lau s di e e celli
	Base State	A ROLL OF THE REAL PROPERTY.
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	VE	
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	a secondaria	conduct sympt
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	bit noi	one interest of this
	38 1 (And	policies intermital
(b) To one spatula end full of T ,		Contact of their
add 3 drops of concentrated		
sulphuric acid and warm.		
		in a print who are in the
		Chang Do #ase a min
(c) Dissolve one spatula endfull of		in has sin netanice.
T in 6 cm ³ of distilled water.		
Divide the resultant solution		
into three portions.		

(i) To the first portion add few drops of Lead(II) nitrate followed by dilute nitric acid and heat.	
(ii) To the second portion add Barium nitrate solution, followed by dilute nitric acid.	
(iii). To the third portion add an equal volume of ethanol followed by 3-4 drops of concentrated sulphuric acid and heat, pour the hot content in a beaker of cold water.	
d) Dissolve two spatula endful of T in 6 cm ³ of distilled water. To the resultant solution add aqueous ammonia solution dropwise until in excess. Filter and keep both the residue and the filtrate.	to the second of
Autrania (MANUAL TO THE PARTY OF THE PART
e) To the filtrate obtained in (d) add dilute nitric acid until it is just acidic. Divide the resultant solution into three portions.	
(i) To the first portion add sodium hydroxide solution dropwise until in excess.	
(ii) To the second portion add ammonia solution dropwise until in excess.	to the first control of the control
(iii) Use the third portion to carry out a test of your choice to confirm the cation in T Test:	to Pullback Same and sylverist to notice the specific to the Same Same fortula a least consult and so

1) Wash the residue with distilled		
water and dissolve it in dilute		
nitric acid. Divide the resultant		
solution into three portions.		
(i) To the first portion, add sodium	m	
hydroxide solution dropwise		
until in excess.		
		SA SULT PLACE MARKET STATE
(ii) To the second portion add		The first is
1 cm ³ of sodium sulphate		graphy-thing is 191
solution.	W. L.	To the latest the latest the latest the latest the latest
	= 1	te de la companya de
iii) Use the third portion to carry		
out a test of your own choice to		a compared to
confirm the cation in the residue	e.	
		ekgestas apublica
		The solution which is
		. I fall for the state of the s
(ii) Anions in T	and functional group.	dmpound. Carry out the following (18marks)
(i) Cations in T	ce Q which is an organic co	dmpound. Carry out the following
(i) Cations in T	ce Q which is an organic co and functional group.	dmpound. Carry out the following (18marks)
(i) Cations in T	ce Q which is an organic co and functional group.	dmpound. Carry out the following (18marks)
(i) Cations in T	ce Q which is an organic co and functional group.	dmpound. Carry out the following (18marks)
(i) Cations in T	ce Q which is an organic co and functional group.	dmpound. Carry out the following (18marks)
(i) Cations in T	ce Q which is an organic co and functional group.	dmpound. Carry out the following

Turn Over

resultant solution into

eight portions.

(ii) To the second

(i) Test the **first** portion with litmus paper.

portion add four drops of iron (III) chloride solution.

(iii) To the third portion add little solid sodium carbonate.	
(iv) To the fourth portion add 3 drops of acidified potassium permanganate and heat.	distribution of the second sec
(v) To the fifth portion add 1 cm ³ of 2, 4-dinitrophenylhydrazine solution.	
(vi) To the sixth portion of solution add 1 cm ³ of Fehling's solution and heat.	with this side to
(vii) To the seventh portion of solution add acidified solution of potassium dichromate(VI) and heat, cool and then add Brady's reagent.	The month (ii) The month (iii)
(viii) To the eighth portion add Lucas' reagent.	Les Charles Strong Light
(c) Comment on the nat	are of Q

- 1. The description of the reagents and chemicals specified below does not necessarily correspond with the description in the question paper. Candidates must not be informed of the difference.
- 2. Candidates are **not** allowed to use reference books (i.e. textbooks, booklets on qualitative analysis etc.) during the examination.
- 3. On addition to the common reagents and apparatus used in chemistry laboratory, each student should have the following.
 - 1 burette of 50 cm³ capacity
 - 1 pipette (25 cm³ or 20 cm³)
 - 1 filter paper
 - 1 thermometer
 - 2 conical flasks
 - 1 funnel
 - 1 volumetric flask of 250cm³
 - 8 test tubes
 - $100 \text{ cm}^3 \text{ of } GA_1$
 - $200 \text{ cm}^3 \text{ of } GA_2$
 - $200 \text{ cm}^3 \text{ of } GA_3$
 - 1.0g of solid **Z**
 - 2.5g of T
 - 3.0g of solid Q

Easy access to:

- Weighing scale which can weigh to atleast 1dp.
- Heat source
- Reagents used to identify organic functional groups, cations, anions and gases.

GA₁ is made by dissolving 1.6g of sodium nitrite (NaNO₂) in distilled water to make one litre of solution.

 GA_2 is made by dissolving 3.2g of potassium permanganate in distilled water to make one litre of solution.

GA₃ is 2M sulphuric acid

Solid Z is oxalic acid
Substance T is a solid mixture of aluminum sulphate and zinc acetate
(zinc ethanoate) in ratio of 1:1
Solid Q is citric acid