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SUBJECT TITLE	SUBJECT CODE	PAPER NUMBER
CHEMISTRY	0515	2
http://www.gcerevision.com	EXAMINATION	DATE: JUNE 2020
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ter the information required in the boxes above		•
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is paper is arranged in three sections, A, B and C. ction A. ATTEMPT ALL 5 questions. You will be gr ction B: ANSWER BOTH questions in this section. etion C: ANSWER 2 QUESTIONS OUT OF 3. calculations, you are advised to show all the steps on-programmable calculators are allowed. and are reminded of the necessity for good English and EFUL DATA: lative Atomic Masses Hydrogen (H) = 1.0 Carbon (C) = 12.0 Oxygen (O) = 16.0 Copper (Cu) = 64.0 FOR EXAMINE	raded for the best 4 quest a in your working, givit antiaccontracted of toplat d orderly presentation in = 96000 coulombs. me of a gas at r.t.p. = 240 at Capacity of water = 4.2 Number = 6.02×10^{23} C	tions answered (a), iter synchronol Y (a), ng your answer at each st up no of) (7 (ii), your answers. 10 (iii), 10 (iii),
his paper is arranged in three sections, A, B and C. ction A. ATTEMPT ALL 5 questions. You will be greated by a section and the section of	raded for the best 4 quest s in your working, givit not according to not a lorderly presentation in a choice cider chance eth = 96000 coulombs. me of a gas at r.t.p. = 240 at Capacity of water = 4.2 Number = 6.02×10^{23} C	tions answered 68.
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SECTION A: Answer ALL questions in this section.

Atoms		Atomic Number	Mass Number
) W		6	12
Х		9	19
Y		11	23
Z		16	32
 A 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1			All states and set of the set of
	aliane entrette vete	ζ, Υ, Ζ	(2 ma
(c) Write the electronic		Another that the	_(1 ma
			(1 ma
		a compound formed between W	
Formula			
			(2 mar
(e) Y forms a basic oxid			
(ii) Write an eq	uation to show the	reaction of the oxide with wate	r
(f) To Which group of	the periodic table	would the element Z be classifi	(2 mar
Give an explanatio			11/A (p 10.1
			1 I.
Group			
	n n A		
	-,1 s (π,) -		
			(2 mar) (Total = 10 mar)

1. This question concerns the following table showing the composition of some atoms

2020/0515/2/C/Q

Table. Or a Society of A to C.	(c) first the related and the reaction com
(a) (i) State the common name given to this group of elements	S
	(1 mark)
(ii) Why are the elements placed in the same group?	
in the conversion of D to B	(d) reacted to by pe of reaction that occurs
(b) (i) How are they stored in the Laboratory?	
hats ()	MMF
(ii) Explain Divide and a second s	(6) Ung.sociol.in.minim.inc.social.
	bauogam odłoganik (2 marks)
(c) (i) Arrange the elements in order of reactivity starting with	
(ii) State and similarity in the second in the second	(1 mark)
(ii) State one similarity in the reactivity of Sodium and Pota	
(d) (i) How is sodium extracted? State one large seets use of se	
(d) (i) How is sodium extracted? State one large seale use of so Method of extraction	
Method of extraction	(1~nK)
	(2 marks)
sham 1) why (e) Write balanced equations to show the effect of heat on the f	
(i) KNO3	
wine and the state of the state	
action and paces. Cantegat, Scapy water, Lemon Juice, Ruter lent	(2 marks)
Base	(Total = 10 marks)
. Organic Compounds can be represented using the following gene	eral formula
A C _n H _{2n}	
B C _n H _{2n+1} COOH	
$C C_n H_{2n+2}$	(b) State (we physical properties of acids.
$D C_n H_{2n+1} O H$	1 - Para - 1
(a) Identify the homologous series to which A and D belong	
A	
by water on red Librars paper.	ist state the cilcer of lettion (rice and seap
(b) Give the formula of the third member of B and C	(1 mark)
(-) Show to the difference of D and C	
В	boaps valve:
ВС	
B C	(2 marks)

(c)	Give the reagent and the reaction condition for the conversion of A to C.	
	Reagent	
	Condition	
		(2 mar
(d)	Name the type of reaction that occurs in the conversion of D to B	•• • • • • •
		1-
(e)	The second member of B reacts with the third member of D to produce a c	compound (1 ma
	(i) Name the compound	
	(ii) How can you easily identify this compound?	
	(iii) Identify the catalyst for this reaction and body of a constant in	
	tracted — one large verte ust of sodium metal .	
(f)	Give a reagent that can be used to distinguish between A and C	Mation of extraction
		102U-14
		• • • • • • • • • • • • • • • • • • • •
(akat)		
	terral construction and a second of the construction of the level of the second of the	(1 mar http://www.com/arter (Total = 10 mark
4. Acid	s and Bases are common in our daily life. Classify the following substances into acids and Bases: Vinegar, Soapy wate	(1 mar معرف مربعیا (10 mar) محمد مربعیا (11 میلی محمد مربعیا
4. Acid	s and Bases are common in our daily life. Classify the following substances into acids and Bases: Vinegar, Soapy wate	(1 mar (Total = 10 mar) (1) (Total = 10 mar) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1
4. Acid	s and Bases are common in our daily life. Classify the following substances into acids and Bases: Vinegar, Soapy wate juice.	(1 mar (Total = 10 mar) r, Lemon juice, Bitter leaf Base
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4. Acid	s and Bases are common in our daily life. Classify the following substances into acids and Bases: Vinegar, Soapy wate juice.	(1 mar (Total = 10 mark r, Lemon juice, Bitter leaf Base (2 mark HOO) (2 mark
4. Acid (a) (drem (b)	s and Bases are common in our daily life. Classify the following substances into acids and Bases: Vinegar, Soapy wate juice. Acid State two physical properties of acids.	(1 mar (Total = 10 mar) r, Lemon juice, Bitter leaf Base (2 mar) (2 mar)
4. Acid (a)	s and Bases are common in our daily life. Classify the following substances into acids and Bases: Vinegar, Soapy wate juice. Acid State two physical properties of acids. State the effect of lemon juice and soapy water on red Litmus paper.	(1 mar (Total = 10 mar) r, Lemon juice, Bitter leaf Base (2 mar) (2 mar)
4. Acid (a)	s and Bases are common in our daily life. Classify the following substances into acids and Bases: Vinegar, Soapy wate juice. Acid State two physical properties of acids.	(1 mar (Total = 10 mar) r, Lemon juice, Bitter leaf Base (2 mar) (2 marks
4. Acid (a) (b) (c)	s and Bases are common in our daily life. Classify the following substances into acids and Bases: Vinegar, Soapy wate juice. Acid State two physical properties of acids. State the effect of lemon juice and soapy water on red Litmus paper. Lemon juice:	(1 mar (Total = 10 mar) r, Lemon juice, Bitter leaf Base (2 marks (2 marks
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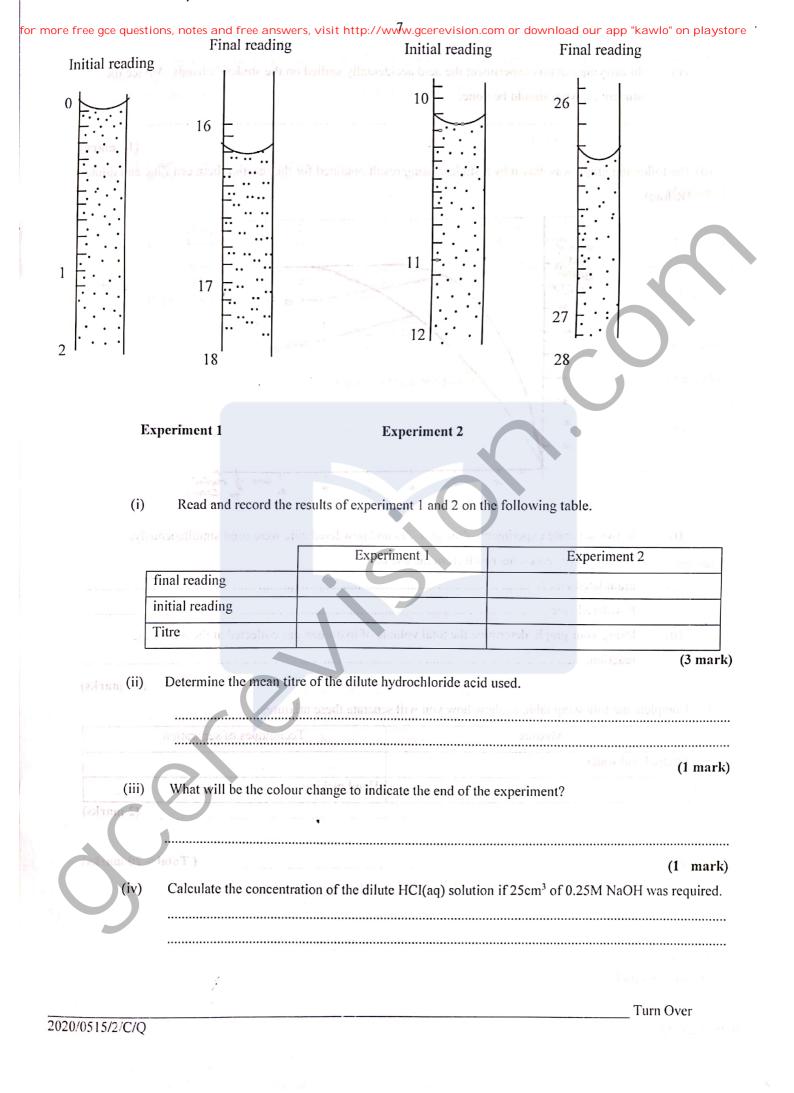
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(d)	Sodium hydroxide reacts with sulphuric acid to form a salt and water only.	
	(i) Name the reaction type	
	(ii) Identify the salt formed:	
garve	(iii) Write an equation for the reaction:	
- Dira	(iv) State how the salt crystals can be obtained from the salt solution:	o ban kookseloz UHONM INSE 0
	seg incatal set up you would use.	(4 marks) (Total = 10 marks)
5. A dil	lute solution of sodium chloride is electrolysed using copper electodes.	
(a)	State one common observation at the cathode and anode.	
(b)	Write an equation for the reaction at each electrode	(1 mark)
	Cathode:	
	Anode:	
(4 marks		
) 15 M. NaOH Stoven as been insure usual flask and 3 drops of phenolphillalein in	(2 marks)
(c)	A steady current of 2A is passed through the electrolyte for 1 hour 16 minutes.	
	(i) Calculate the quantity of electricity in Coulombs.	
		(2 marks)
	(ii) Calculate the number of Faradays of electricity used.	
		(2 marks)
	(iii) What volume of the gas will be liberated at the cathode at r.t.p.?	
(
\bigcirc	(a) (a) (a) (b) (b) (b) (b) (b) (b) (b) (b) (b) (b	(3 marks) (Total = 10 marks)
	s id was this from the burette and two accurate results were recorded as shown only	(Ittal It marks)

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	and the set SECTION B multiples drive states of the objections	
	ANSWER ALL QUESTIONS IN THIS SECTION	
6.	In order to determine the concentration of a dilute acid solution, a student is provided with the foll solutions and equipment: 0.25M NaOH, dilute HCI, Pipette, Burette, Conical flask, phenolphthalein indicator, clamp and sta	
	(a) Draw the experimental set up you would use.	
	ing a dimensional and international and a second and a second as a she had been	liha/a
	() () () () () () () () () () () () () (
(stanue)		
		-/d)
(zánam	(b) 25 cm ³ of 0.25M NaOH was transferred into a conjugat flash and 2 drame of show the left $1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 $	(4 m
, marks) ((b) 25 cm³ of 0.25M NaOH was transferred into a conical flask and 3 drops of phenolphthalein in added. (i) Name the apparatus used to transfer the NaOH solution. 	•
, (alarin ((b) 25 cm³ of 0.25M NaOH was transferred into a conical flask and 3 drops of phenolphthalein in added. (i) Name the apparatus used to transfer the NaOH solution. 	dicator
	 (b) 25 cm³ of 0.25M NaOH was transferred into a conical flask and 3 drops of phenolphthalein in added. (i) Name the apparatus used to transfer the NaOH solution. (ii) State the colour change in the conical flask 	dicator
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2020/0515/2/C/Q



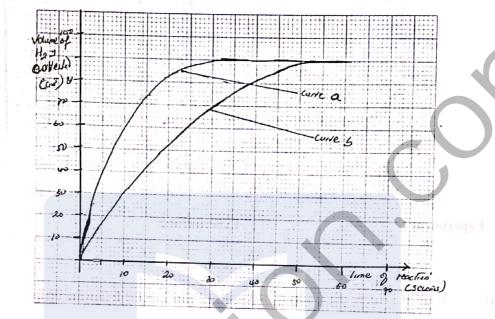
(v) In carrying out this experiment the acid accidentally spilled on the student's hands. Advice the student on what should be done.

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(d) The following graph was drawn by a student using result obtained for the reaction between Zinc and dilute HCI(aq)

(1 mark)

(2 marks)



(i	i)	In two separate experiments Zinc granules and powdered zinc were use	d simultaneously.
		Which curve represents result from the use of	
	.1	granulated zinc?	na such hende
	1	Powdered zinc	en and hat e
(i	ii) I	Using your graph, determine the total volume of hydrogen gas collected	at the end of the
(3 mark	1	reaction	

(e) Complete the following table to show how you will separate these mixtures.

in the second	Mixture	Techniques of separation	
Ethanol and water			
	ac the end of the experiment?	Hand picking and a pott of the nation	1.1
\mathcal{C}		1	(2 marks)
etense ()			= 20 marks)
- · · · · · · · · · · · · · · · · · · ·	HCI(aq) solution IF 25cm ² of ¹¹	latoT).	= 20 marks)
	HCl(nq) solution If 25cm ¹ of 9	(declare the concentration of the diffute	= 20 marks)
		(declare the concentration of the diffute	= 20 marks)

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7. In order to determine the chemical composition of three unknown substances A, B and X, a student carried out the following tests.

(a) Study the following table and complete the information needed.

OBERVATION INFERENCE TEST PROCEDURE No To 2cm³ of solution A is added A colourless pungent gas (i) 5 drops of NaOH(aq) warmed is evolved. The gas turns damp red litmus paper (2 marks) blue Presence of SO42- ions To 2cm³ of solution A is added (ii) (2 marks) 2 drops of BaCl₂(aq) followed by dil HCI(aq) To 2cm³ of solution B is added (iii) Dirty- green precipitate is (1 mark) 2 drops of NaOH(aq) formed To 2cm³ of solution B is added a A white precipitate is (iv)(1 mark) few drops of AgNO3 followed formed by dil HNO3 X gives a brick red flame (3 marks) (v) colour (2 marks) A solid sample of X strongly A brown gas is evolved (vi) heated in a test tube Give the chemical identity of A, B, and X (b) A..... В..... (3 marks) X..... (c) In order to determine the chemical formula of an oxide of copper, a student passed dry hydrogen gas through copper oxide in a porcelain boat in a hard glass tube. The following results were obtained: Mass of empty boat = 14.4gMass of boat and of copper oxide sample before heating = 18.4g Mass of boat + sample at the end of experiment = 17.6Determine the Empirical formula of the oxide of copper Why is it advisable to wear eye goggles when working in the laboratory? (d) (1 mark) (Total =20 marks) Turn Over

2020/0515/2/C/Q

		SECTION C	
		hu pan nodarne in an	notalgen og ander er som som er s NVL som er so
			s. Where appropriate, equations and diagrams
S	hould be used to illustrate yo	our answer. Write your answer on	the sheets that follow.
			ban az na Sich " Si gin "
8. (******) (?	(ith the help of suitable exar a) Isomerism	mples and/or equations, explain th	ne following concepts in chemistry:
	b) Esterification	aca (1 p.a.t. 17 manufer in mp2 of
) arks)			Burelle's grantfaith Surgarb (
((d) Thermal Decomposite) Addition polymerisat	tion	· · · · · · · · · · · · · · · · · · ·
mark)		Conservation and the second and the second sec	(4, 4, 4, 4, 4 mark
). (Juni, C	hemical and electrolytic red	luction are used in the extraction o	of metals. For each method, choose a suitable
e	xample and describe how the	e metal is extracted from its ore.	
(altra)	nve two large scale uses of e	each metal.	(8, 8, 4 mark
10. Y	ou are given the following s	substances:	Addition of the optimized of the second s
	Magnesium chloride,		 The contract statistic statistic statistics
(
	d) For each substance identi	ify the chemical bond holding the	particles and describe how the bond is formed
	a) Chus and the tool		Provide the second second is related.
(e) Give one physical proper	rty of each substance.	
	den en en state en state de t	rty of each substance .	(17, 3 mark
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