

REGISTRATION CENTRE NUMBER		CENTRE NAME
CANDIDATE'S FULL NAMES GCE REVISION		
CANDIDATE IDENTIFICATION NUMBER	SUBJECT 0515	PAPER NUMBER 2
FOR OFFICIAL USE ONLY		
CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD ORDINARY LEVEL EXAMINATION		
SUBJECT TITLE CHEMISTRY	SUBJECT CODE 0515	PAPER NUMBER 2
http://www.gcerevision.com		EXAMINATION DATE: JUNE 2020

Two and a half hours

Enter the information required in the boxes above

This paper is arranged in three sections, A, B and C.

Section A. **ATTEMPT ALL 5** questions. You will be graded for the best 4 questions answered

Section B: **ANSWER BOTH** questions in this section.

Section C: **ANSWER 2 QUESTIONS OUT OF 3.**

In calculations, you are advised to show all the steps in your working, giving your answer at each stage
Non-programmable calculators are allowed.

You are reminded of the necessity for good English and orderly presentation in your answers.

USEFUL DATA:

Relative Atomic Masses

- Hydrogen (H) = 1.0
- Carbon (C) = 12.0
- Oxygen (O) = 16.0
- Copper (Cu) = 64.0

1 Faraday = 96000 coulombs.

Molar volume of a gas at r.t.p. = 24000cm³,

Specific heat Capacity of water = 4.2J/g°C

Avogadro Number = 6.02x10²³

0°C = 273K

Turn Over

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Marked by.....	<u>SCORE</u>
Signature of Examiner:Date:.....	
Checked by.....	
Signature:.....Date:.....	

SECTION A: Answer ALL questions in this section.

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

Atoms	Atomic Number	Mass Number
W	6	12
X	9	19
Y	11	23
Z	16	32

(a) How many electrons and neutrons are found in the atom X

Electrons.....

Neutrons.....

(2 mark)

(b) Identify an atom of a metal from W, X, Y, Z.....

(1 mark)

(c) Write the electronic configuration of Z.....

(1 mark)

(d) Identify the bond type and formula of a compound formed between W and X.

Bond type.....

Formula.....

(2 marks)

(e) Y forms a basic oxide.

(i) Write the formula of the oxide.....

(ii) Write an equation to show the reaction of the oxide with water

.....

(2 marks)

(f) To Which group of the periodic table would the element Z be classified?

Give an explanation.

Group.....

Explanation.....

(2 marks)

(Total = 10 marks)

2. The elements sodium (Na), Lithium (Li), Potassium (K) and Caesium (Cs) are found in Group I of the Periodic Table.

(a) (i) State the common name given to this group of elements.....
 (1 mark)

(ii) Why are the elements placed in the same group?

(b) (i) How are they stored in the Laboratory?

(ii) Explain.....
 (2 marks)

(c) (i) Arrange the elements in order of reactivity starting with the least reactive

 (1 mark)

(ii) State one similarity in the reactivity of Sodium and Potassium with water

(d) (i) How is sodium extracted? State one large scale use of sodium metal

Method of extraction.....
 Use: (1 mark)

(2 marks)

(e) Write balanced equations to show the effect of heat on the following substances.

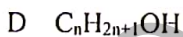
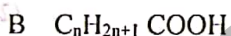
(i) KNO_3

(ii) Na_2CO_3

(2 marks)

(Total = 10 marks)

3. Organic Compounds can be represented using the following general formula



(a) Identify the homologous series to which A and D belong

A.....

D.....

(1 mark)

(b) Give the formula of the third member of B and C

B.....

C.....

(2 marks)

Turn Over

(c) Give the reagent and the reaction condition for the conversion of A to C.

Reagent.....
 Condition.....

(2 marks)

(d) Name the type of reaction that occurs in the conversion of D to B

.....

(1 mark)

(e) The second member of B reacts with the third member of D to produce a compound

(i) Name the compound

.....

(ii) How can you easily identify this compound?

.....

(iii) Identify the catalyst for this reaction

.....

(3 marks)

(f) Give a reagent that can be used to distinguish between A and C

.....

(1 mark)

(Total = 10 marks)

4. Acids and Bases are common in our daily life.

(a) Classify the following substances into acids and Bases: Vinegar, Soapy water, Lemon juice, Bitter leaf juice.

Acid	Base

(2 mark)

(b) State two physical properties of acids.

.....

(2 marks)

(c) State the effect of lemon juice and soapy water on red Litmus paper.

Lemon juice:

.....

Soapy water:

.....

(2 marks)

(d) Sodium hydroxide reacts with sulphuric acid to form a salt and water only.

- (i) Name the reaction type:.....
- (ii) Identify the salt formed:.....
- (iii) Write an equation for the reaction:.....
- (iv) State how the salt crystals can be obtained from the salt solution:.....
.....

(4 marks)
(Total = 10 marks)

5. A dilute solution of sodium chloride is electrolysed using copper electrodes.

(a) State one common observation at the cathode and anode.

.....
.....

(1 mark)

(b) Write an equation for the reaction at each electrode

Cathode:

.....

Anode:

.....

(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.?

.....
.....
.....

(3 marks)
(Total = 10 marks)

Turn Over

SECTION B

ANSWER ALL QUESTIONS IN THIS SECTION

6. In order to determine the concentration of a dilute acid solution, a student is provided with the following solutions and equipment:
0.25M NaOH, dilute HCl, Pipette, Burette, Conical flask, phenolphthalein indicator, clamp and stand.

(a) Draw the experimental set up you would use.

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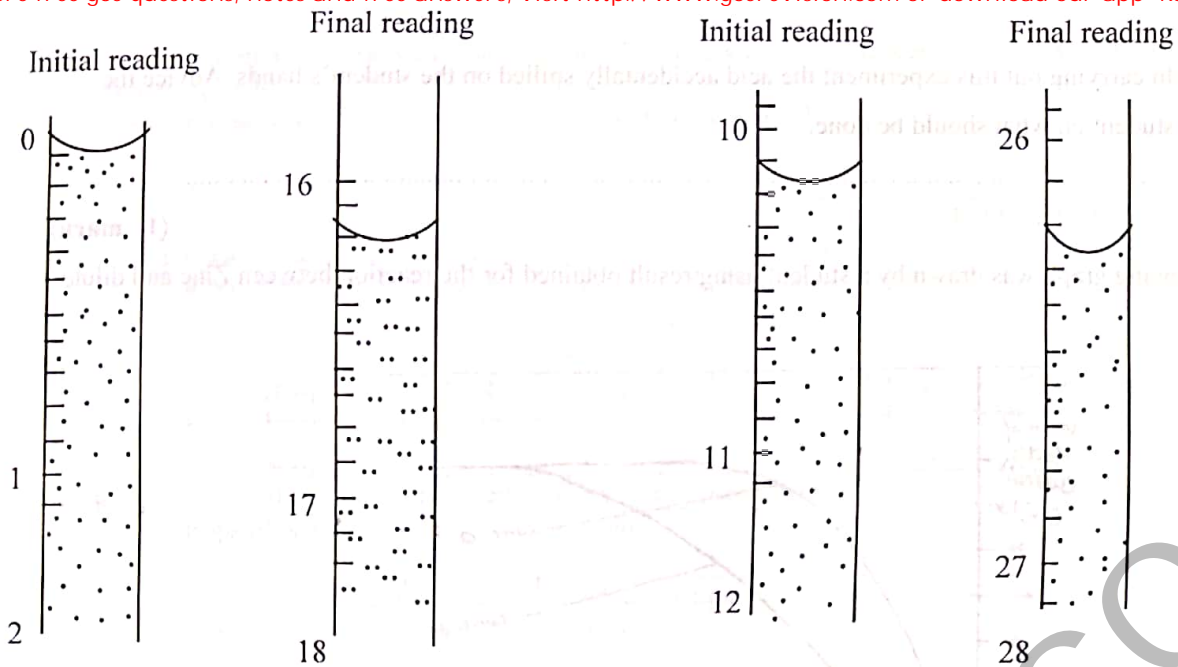
(4 marks)

(b) 25 cm³ of 0.25M NaOH was transferred into a conical flask and 3 drops of phenolphthalein indicator were added.

(i) Name the apparatus used to transfer the NaOH solution.

(ii) State the colour change in the conical flask

(c) The dilute acid was run from the burette and two accurate results were recorded as shown on the following diagrams:



Experiment 1

Experiment 2

(i) Read and record the results of experiment 1 and 2 on the following table.

	Experiment 1	Experiment 2
final reading		
initial reading		
Titre		

(3 mark)

(ii) Determine the mean titre of the dilute hydrochloride acid used.

.....

(1 mark)

(iii) What will be the colour change to indicate the end of the experiment?

.....

(1 mark)

(iv) Calculate the concentration of the dilute HCl(aq) solution if 25cm³ of 0.25M NaOH was required.

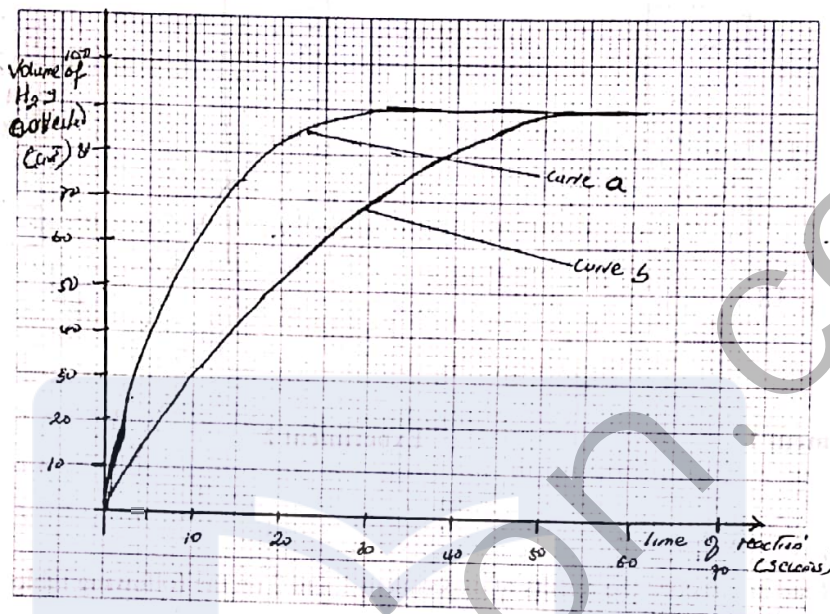
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Turn Over

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

(1 mark)

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



- (i) In two separate experiments Zinc granules and powdered zinc were used simultaneously. Which curve represents result from the use of granulated zinc?.....

Powdered zinc.....

- (ii) Using your graph, determine the total volume of hydrogen gas collected at the end of the reaction.....

(2 marks)

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

Mixture	Techniques of separation
Ethanol and water	
	Hand picking

(2 marks)

(Total = 20 marks)

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.

No	TEST PROCEDURE	OBERVATION	INFERENCE	
(i)	To 2cm ³ of solution A is added 5 drops of NaOH(aq) warmed	A colourless pungent gas is evolved. The gas turns damp red litmus paper blue		(2 marks)
(ii)	To 2cm ³ of solution A is added 2 drops of BaCl ₂ (aq) followed by dil HCl(aq)		Presence of SO ₄ ²⁻ ions	(2 marks)
(iii)	To 2cm ³ of solution B is added 2 drops of NaOH(aq)	Dirty- green precipitate is formed		(1 mark)
(iv)	To 2cm ³ of solution B is added a few drops of AgNO ₃ followed by dil HNO ₃	A white precipitate is formed		(1 mark)
(v)		X gives a brick red flame colour		(3 marks)
(vi)	A solid sample of X strongly heated in a test tube	A brown gas is evolved		(2 marks)

(b) Give the chemical identity of A, B, and X

A.....

B.....

X..... (3 marks)

(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 = 14.4g

Mass of boat and of copper oxide sample before heating = 18.4g

Mass of boat + sample at the end of experiment = 17.6

Determine the Empirical formula of the oxide of copper

.....

(5 marks)

(d) Why is it advisable to wear eye goggles when working in the laboratory?

.....

(1 mark)

(Total =20 marks)

Turn Over

SECTION C

Answer **ANY TWO** questions. All questions carry equal marks. Where appropriate, equations and diagrams should be used to illustrate your answer. Write your answer on the sheets that follow.

8. With the help of suitable examples and/or equations, explain the following concepts in chemistry:

- (a) Isomerism
- (b) Esterification
- (c) Polymorphism
- (d) Thermal Decomposition
- (e) Addition polymerisation

(4, 4, 4, 4, 4 marks)

9. Chemical and electrolytic reduction are used in the extraction of metals. For each method, choose a suitable example and describe how the metal is extracted from its ore.

Give two large scale uses of each metal.

(8, 8, 4 marks)

10. You are given the following substances:

Magnesium chloride, Copper, Methane

(d) For each substance identify the chemical bond holding the particles and describe how the bond is formed.

(e) Give one physical property of each substance.

(17, 3 marks)