Name..... Signature.....

School..... Index No.....

545/2
CHEMISTRY
Paper 2
July/August
2 hours

WAKISSHA JOINT MOCK EXAMINATIONS

Uganda Certificate of Education

CHEMISTRY

Paper 2

2 hours

INSTRUCTIONS TO CANDIDATES;

- *Section* **A** *consists of* **10** *structured questions. Answer* **all** *questions in this section.*

  Answers to these questions **must** *be written in the spaces provided.*

- *Section* **B** *consists of* **4** *semi – structured questions. Answer any* **two** *questions from this section.*

- *Answers to section* **B** *must be written in the answer booklet/sheets provided and stapled at the back of the question paper.*

- *Show all your working clearly in both sections.*
  Where necessary use;
  [Ca = 40, K=39, C = 12, O = 16, H = 1, Molar gas volume at s.t.p = 22.4dm^3]

For examiner's use only														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total

SECTION A

*Answer **all** questions in this section.*

1. Impure Aluminium is light and soft but can be strengthened by alloying.

(a) What is meant by the term alloy? (1 mark)

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(b) State the elements that make up the following alloys,

(i) Duralumin. (1½marks)

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(ii) Brass. (1 mark)

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(c) (i) Identify the element that is common in both brass and duralumin. (1 mark)

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(ii) State **one** use of duralumin. (½mark)

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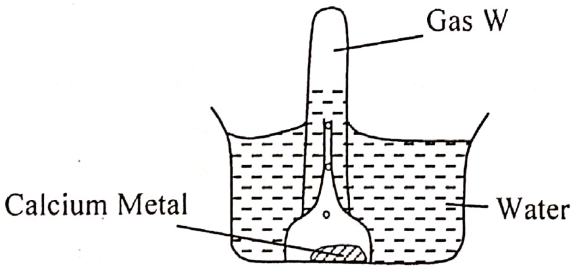
2. The diagram below shows a setup of apparatus used to prepare gas W.



(a) State how gas W can be identified in the laboratory. (1½marks)

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(b) Write equation of reaction leading to the formation of gas W (1½marks)

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.....

(c) State **one** use of gas W in the food industry. (1mark)

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3. (a) An organic compound X has a molecular formula C_2H_4.

(i) Write the name and structure formula of X. (2 marks)

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(b) Compound X was bubbled through bromine liquid.

(i) Write the structure of the compound. (1 mark)

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(ii) What is the role of bromine liquid in the experiment? (1 mark)

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(iii) Name **one** other compound can be used instead of bromine liquid. (1 mark)

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4. When strongly heated magnesium ribbon was treated with dry nitrogen gas, solid W was formed

(a) (i) Determine the empirical formula of solid W given that 0.72g of magnesium produce 1.0g of solid W (Mg = 24 N=14) (2½ marks)

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(ii) Write equation for reaction between magnesium and nitrogen. (1½marks)

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(b) Solid W when reacted with water produced gas Y and Solid X.

(i) State how the gaseous product in (b) can be identified in the laboratory.(1½marks)

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(ii) Identify solid X. (1½marks)

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5. A boiling tube was filled with Chlorine water and then inverted over a beaker containing a similar solution. The set up was then exposed to sunlight.

(a) (i) State what was observed. (1mark)

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.....

(ii) Write equation for the reaction that took place in the boiling tube. (1½mark)

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.....

Turn Over

(b) The resultant solution in (a) was added to a beaker containing Marble chips.

(i) State what was observed in the beaker. (1 mark)

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(ii) Write ionic equation for the reaction that took place. (1½marks)

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6. (a) Name **two** compounds that can be used to prepare sulphur dioxide in the laboratory. (2marks)

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(b) (i) Write equation of reaction that takes place when a mixture of the two compounds named in (a) above is heated. (1½marks)

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(ii) State how the gas can be dried in the laboratory. (1 mark)

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7. Water can be transformed from one state to another through the water cycle.

(a) (i) Name **two** processes involved in the water cycle. (2 marks)

.....

.....

(ii) Write equation to show how hydrogen reacts with oxygen to form water.(1½marks)

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.....

(b) Drops of water were added to anhydrous copper (II) Sulphate in a test tube.
State what was observed after adding 3-4 drops of water. (1 mark)

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(c) When Sodium Chloride Crystals were placed on a petri dish and exposed for two days, they appeared wet.

(i) Which word describes the behavior of the Sodium Chloride Crystals? (1 mark)

.....

(ii) Name **one** other substance that can behave like sodium chloride when exposed. (½marks)

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8. (a) What is meant by the term **rate of chemical reaction**? (1 mark)

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(b) State **two** factors that can affect the rate of chemical reaction. (2 marks)

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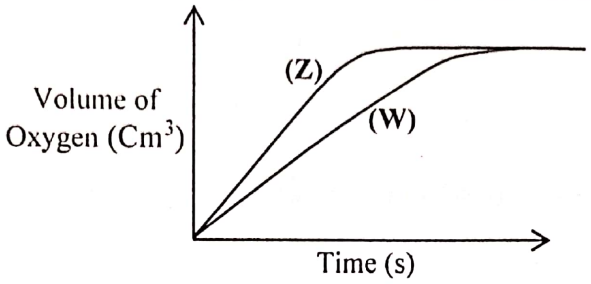
(c) Hydrogen peroxide was decomposed under different conditions as shown in the figure below.



(i) Which curve represents a reaction to which Manganese (IV) oxide was added? (1 mark)

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(ii) State the role manganese (IV) oxide in above reaction. (1 mark)

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9. Rusting is an exothermic reaction that weakens garden tools when stored in places that are moist.

(a) (i) State what is meant by the term exothermic reaction. (1 mark)

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(ii) State **one** domestic application of exothermic reactions. (1 mark)

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(b) (i) State **one** other factor apart from moisture that supports rusting. (1 mark)

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(c) Galvanizing is one of the methods used to prevent rusting.

(i) Name the metal used to galvanize iron. (1 mark)

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(ii) State the principle behind the use you have named in c(i) above.

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(1 mark)

10. During the electrolysis of molten sodium chloride in the Down's cell, a calcium salt X is added to the electrolyte.

(a) State the role of salt X in the process. (1 mark)

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(b) Name the substances used as the anode and give a reason for your answer.

(i) Substance used as a node. (1 mark)

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Turn Over

(ii) Reason for your answer in b (i) above. (1 mark)

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(c) Write the equation of reaction that takes place at the anode. (1½ marks)

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SECTION B

Answer any two questions from this section.

11. When hard water is treated with soap, scum is formed.

(a) State the chemical names for;

(i) Soap. (1 mark)

(ii) Scum. (1 mark)

(b) (i) Identify **two** ions that lead to the formation of scum when soap is used to clean fabric. (2 marks)

(ii) Write equation of reaction leading to the formation of scum. (1½marks)

(c) (i) Identify **one** compound that can be used to break the hardness in water. (1 mark)

(ii) Write equation to show how the compound named in (c) (i) breaks down the hardness in water. (1½marks)

(d) Describe the cleaning action of soap on fabric stained with clease. (5 marks)

(c) State one;

(i) Advantage. (1 mark)

(ii) Disadvantage of using hard water. (1 mark)

12. (a) Describe the industrial manufacture of ammonia gas. (5½marks)

(b) Ammonia burns in a plentiful supply of oxygen,

(i) Draw a setup of apparatus that can be used to burn ammonia. (3 marks)

(ii) Write equation for the combustion of ammonia. (1½ marks)

(c) You are provided with copper (II) sulphate Crystals, briefly describe how you can test for the presence of copper (II) and sulphate ions. (5 marks)

13. (a) Define the term **heat of neutralization**. (1 mark)

(b) The table below shows results of an experiment in which seven portions of 25cm^3 of 2M sodium hydroxide were reacted with various quantities of hydroxide acid. The heat change in each case was calculated and results recorded.

Experiment No	1	2	3	4	5	6	7
Volume of NaOH(cm^3)	50	50	50	50	50	50	50
Volume of HCL(cm^3)	10	20	30	40	50	60	70
Heat evolved (KJ)	1.1	2.2	3.4	4.5	5.6	5.6	5.6

(i) Plot a graph of heat change (y- axis) against the volume of hydrochloric acid. (4½ marks)

(ii) Determine the number of moles of Sodium hydroxide in the $50cm^3$ of Sodium hydroxide. (2½ marks)

(iii) From the graph determine the volume of hydrochloric acid required to completely neutralize the 2M Sodium hydroxide. (1 mark)

(c) Calculate the concentration of hydrochloric acid in moles $/dm^3$ and hence determine the molar heat of neutralization of the reaction. (6 marks)

14. (a) Describe the laboratory preparation of Chlorine gas using Potassium manganite (VII) *(Diagram not required)* (5 marks)

(b) Write equation(s) of reaction and in each state what was observed when chlorine gas Was;

(i) Bubbled through a solution of Potassium bromide. (2½ marks)

(ii) Reacted with water and to the resultant solution a blue flower was dipped for 24 hours. (5 marks)

(iii) Passed over strongly heated iron wire in a combustion tubes. (2½ marks)

END