Name: ..... Centre/ Index No...../ .....

Signature:..... Stream:.....

545/2
S.4 CHEMISTRY
PAPER 2
June/July 2012
2HOURS

RESOURCE TEAM MOCK EXAMINATION
Uganda Certificate of Education
CHEMISTRY
Paper 2

INSTRUCTIONS TO CANDIDATES:

- Section A consists of 10 structure 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 the questions must be written in the answer booklets provided.
- In both sections all working must be clearly shown.

(Cu=64, 0=16, Zn=65, N=14, Na=23, C=12
1 mole of gas occupies 24l at room temperature
1 mole of gas occupies 22.4dm^3 at s.t.p

FOR EXAMINER'S USE ONLY														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total

SECTION A (50 MARKS)

1 (a)(i) State the approximate percentage of oxygen in the atmosphere. (½ mark)

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(ii) Name one natural process by which oxygen is used up from the atmosphere. (½ mark)

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(b) Sodium metal was burnt in excess oxygen

(i) State what was observed. (½ mark)

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(ii) Write an equation for the reaction in (b)(i) above. (1½ marks)

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(c) The product in b(i) was dissolved in water.

(i) State what was observed. (½ mark)

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(ii) Write an equation for the reaction that took place. (½ mark)

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2. A mixture of ammonium carbonate and lead (ii) chloride was shaken with excess water, filtered and the residues kept.

a) Identify the anion that was present in the:

i) Residue (½ mark)

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ii) Filtrate (½ mark)

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b) (i) Briefly state how the anion in the residue can be confirmed when present in solution. (1marks)

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(ii) Write ionic equation for the reaction that takes place in b(i) above. (1½ marks)

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3. 0.22g of anhydrous sodium carbonate reacted completely with excess dilute hydrochloric acid. $50cm^3$ of carbondioxide measured at 800cm temperature and pressure was formed.

a) Write an equation for the reaction between sodium carbonate and dilute hydrochloric acid

(1½ marks)

b) Calculate the;

i) Moles of sodium carbonate that reacted. (1½ marks)

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ii) Moles of carbondioxide evolved. (1mark)

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4. (a) (i) Write an equation for the reaction between Zinc and dilute hydrochloric acid in presence of Copper (ii) sulphate. (1½ marks)

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(ii) What is the purpose of adding Copper (ii) sulphate in the reaction above? (1mark)

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(b) Calculate the volume o f hydrogen which can be obtained at s.t.p by heating dilute hydrochloric acid with 5g of Zinc. (2½ marks)

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5 (a) Write the structural formula of ethene. (1½ marks)

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(b) (i) Name two compounds that can be used to prepare ethene in the laboratory. (1mark)

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(ii) State the conditions for the reaction in b(i) above. (1mark)

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(c) Ethene was bubble through bromine water.

i) State what was observed (1mark)

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ii) Write an equation for the reaction that took place in (c)(i). (1½ marks)

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6 (a) Element M and N have atomic numbers 6 and 17 respectively.

i) Write the electronic configuration of element N. (1mark)

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ii) Write the ion formed by element N. (1mark)

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b) (i) Write formula of the compound formed between M and N. (1mark)

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(ii) What type of bond exists in the compound formed in (b)(i) above.
Give a reason for your answer? (1mark)

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c) State whether the compound formed between M and N conducts electricity or not.
Give a reason for the answer. (1mark)

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7. When excess carbon monoxide was passed over 4.0g if a strongly heated oxide of an element X, 2.8g X was formed.

a) Determine the molecular of the oxide of X. (X=56, RFM of the oxide of X=160)
(3½ marks)

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b) Write an equation for the reaction between the oxide of X and carbon monoxide.
(1½ marks)

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8. 2.0g of ammonium nitrate was dissolved in 100cm^3 of water, and the temperature of the water dropped from 28.0^{0}c to 22.0^{0}c.

a) Give a reason why there was a drop in the temperature of the water. (1mark)

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b) Calculate the molar enthalpy of solution of ammonium nitrate.
(H=1, N=14, 0=16, density of water = 1gcm^3 and the heat capacity of water =4.2Jg^{-1}0c^{-1}.
(4 marks)

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9. A concentrated solution of sodium chloride was electrolyzed using platinum electrodes.

a) Write ionic equations for the reaction that took place at the

i) anode (½ mark)

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ii) Cathode (1½ mark)

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b) State what was observed at each electrode.

i) anode (½ mark)

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ii) Cathode (1½ marks)

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c) State and explain the effect on litmus of the resultant solution formed after the electrolysis of concentrated sodium chloride solution. (1mark)

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10. State the methods used to separate the following mixtures. (5marks)

i). Iron and sulphur

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ii). Sodium chloride and sodium chlorate

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iii). Water and prepanol

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iv). Ammonium chloride and sodium chloride

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v). Chlorophyll in a green leaf

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SECTION B (30 MARKS)

11 (a) What is meant by the terms

i) Soap

ii)Saponification

(b) Outline the steps taken to prepare a dry sample of soap in the laboratory (No equations is required) (6½ marks).

(c) Briefly explain how soap can remove dirt from your shirt when washed. (3marks)

d) When soap is used for washing in hard water, lathering does not occur immediately but when a detergent is used for washing in the same water, there is immediate lathering. Explain this observation. (3½ marks)

12(a) Define the term rate of a chemical reaction. (2 marks)

(b) Explain How the following factors affect the rate of a chemical reaction

i) Temperature (2 marks)

ii) Concentration (2 marks)

(c) The table below shows variations in the concentration of hydrogen peroxide with time when hydrogen peroxide reacted to produce oxygen.

Concentration of H_2O_2 ($Modm^{-3}$)	1.15	0.64	0.36	0.24	0.15
Time (Min)	0	10	20	30	40

i) Plot a graph of concentration of hydrogen peroxide against time. (4 marks)

ii) Explain briefly the shape of your graph. (2 marks)

d) Determine from the graph the rate of reaction at
i) 10 minutes (1½ marks)
ii) 30minutes (1½ marks)

13 (a) What is meant by the term enthalpy of neutralization? (2marks)

(b) Describe an experiment that can be carried out to determine the enthalpy of neutralization of hydrochloric acid by sodium hydroxide (show your working). (06marks)

(c) When 50cm^3 of 1M H_2SO_4 acid was added to 50cm^3 of 2M NaOH, the temperature of the resultant solution rose by 13.6°C.

i). Write an ionic equation for the reaction that took place. (1½mark)

ii). Calculate the enthalpy of neutralization of NaOH. (4½ marks)

(S.H.C of solution = 4.2Jg^{-1}k^{-1}, density of solution =1gkm^3)

(d) Explain why plastic wares are used in neutralization experiments instead of glass wares. (1mark)

14 (a) Outline with the help of equations how you would prepare a dry sample of hydrogen gas in the laboratory (No diagram is required). (5½ marks)

(b)(i) Draw a labeled diagram of the set up of apparatus that can be used to show that hydrogen gas burns in oxygen to form water. (5marks)

(c) Calculate the maximum volume of hydrogen measured at s.t.p that can react with 8g of Copper (ii) oxide. (2mks)

$CuO_{(s)} + H2_{(s)} \longrightarrow Cu_{(s)} + H_2O_{(l)}$

(Cu =64, O=16, 1 mole of a gas occupies 22.4dm^3 at s.t.p)

d) State two large scale uses of hydrogen gas. (1mark)

END