NAME.....INDEX No.....

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545/2
Chemistry
Paper 2
AUGUST 2017
2 HOURS

KAYUNGA SECONDARY SCHOOLS HEAD TEACHERS AND PRINCIPALS
(KASSHPA)
UGANDA CERTIFICATE OF EDUCATION
JOINT MOCK EXAMS
JULY / AUGUST 2017
CHEMISTRY
PAPER TWO
2 HOURS

INSTRUCTION TO CANDIDATES

- Answer all questions in section A in the spaces provided and any two question from section B

FOR EXAMINERS USE ONLY

1	2	3	4	5	6	7	8	9	10	11	12	13	14

SECTION A (50 MARKS)

1. The table below shows some of the physical properties of solids and gases.

Property	Solid	Gas
Shape	fixed	not fixed
Volume	fixed	not fixed

(a) (i) State one other difference between gases and solids (1 mark)

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.....

(ii) Explain why a solid has a fixed shape while a gas has no fixed shape.(2marks)

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(b) Name one alloy that contain copper and state one use of it (1 mark)

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(c) Give one reason why alloys are preferred to pure metals (1 mark)

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2. Oxygen can be prepared in the laboratory by the action of water on sodium peroxide.

(a) Write an equation for the reaction (1 ½ marks)

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.....

(b) State another method by which oxygen can be prepared in the laboratory at room temperature. .....

(1 mark)

(c) Write an equation for the reaction in which oxygen is produced in (b) above

(1 ½ marks)

.....

.....

3. The table below shows part of the periodic table but the letters used are not the true symbols. Use it to answer the questions that follow.

Group → / period ↓	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	o
1								L
2	Q		E	G	J	Z	M	
3	R							
5	T							

(a) Write the electronic configuration of elements

(i) G ..... (½ mark)

(ii) T ..... (½ mark)

(b) (i) Give the formula of the compound formed between elements E and Z (1mark)

.....

.....

(ii) Using outer most energy levels only, show how bonding occurs between E and Z. (2 marks)

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.....

(c) Which of the elements in the periodic table above is

(i) most reactivenon metal (½ mark)

.....

.....

(ii) unreactive (½ mark)

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.....

4. Copper(ii) oxide was heated in a stream of hydrogen gas in a boiling tube

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

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(ii) Write the equation for the reaction that occurred (1 ½ mark)

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(b) An oxide of metal M was found to contain 1.92g of metal and 0.48g of oxygen. (O = 16, H = 1, M = 64) Determine the empirical formula of the oxide (3 ½ marks)

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5. When excess dilute hydrochloric acid was added to 7.8g of a mixture of calcium carbonate and calcium sulphate, 896cm^3 of carbondioxide measured at s.t.p was evolved.

(a) Write an equation for the reaction that took place (1 ½ marks)

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(b) Determine the

(i) mass of calcium carbonate in the mixture. (3 marks)

.....

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.....

(ii) Percentage of calcium carbonate in the mixture (1 mark)

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6.(a) Car exhaust fumes contain gases including carbondioxide, carbon monoxide and nitrogen.

(i) Which of the gases above, contributes to acidic rain and how? (1 ½ marks)

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.....

(ii) Describe how you would come to conclude that rain water is acidic? (1 mark)

.....

.....

(b) (i) Which of CO, N_2 (producer gas) and CO, H_2 (water gas) is a hotter (½ mark)

.....

.....

(ii) Explain your answer above (1 mark)

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.....

(c) Explain why it is necessary to keep containers of producer and water gas tightly sealed.

(1 mark)

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7.(a) Define the term rate of reaction (1 mark)

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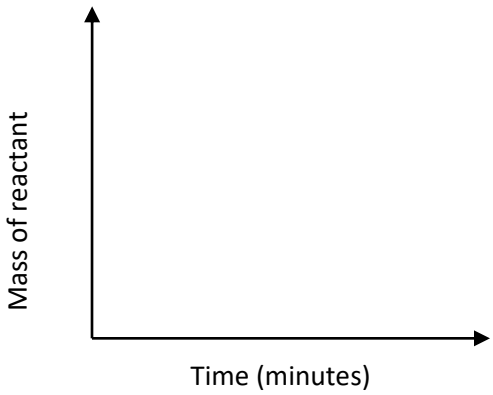
(b) On the axes below, sketch a graph to show variation of mass of reactant with time in a given reaction. (1 mark)



(c) (i) State two factors that can affect rates of reactions (2 marks)

.....

.....

(ii) Explain why the rate of a reaction increases in the presence of a catalyst.

.....

.....

(1 mark)

8. A mixture of iron filings and sulphur was heated in a test tube and a red glow spread through the mixture.

(a) (i) What did the red glow indicate? (1 mark)

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.....

(ii) Write the equation for the reaction that took place. (1 ½ marks)

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.....

(iii) State any other observation made as the reaction took place

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.....

(b) The residue from the reaction above was cooled and treated with dilute hydrochloric acid.

(i) State what was observed

.....

.....

(1 mark)

(ii) Write the equation for the reaction that occurred

.....

.....

(1 ½ marks)

9. Use hydrocarbons CH_4 , C_2H_4 and C_3H_8 to answer the following questions.

(a) (i) Why are they refered to as hydrocarbons (1 mark)

.....

.....

(ii) State the homologous series for the hydrocarbons below.

CH_4 ..... (1 mark)

C_2H_4 ..... (1 mark)

(b) Explain why ethene can decolourise bromine water yet ethane can not (1 mark)

.....

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(c) Ethene undergoes the following reaction $nH_2C = CH_2 \longrightarrow \{CH_2\ C_2\}_n$

(i) Name the type of chemical reaction above. (1 mark)

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.....

(ii) Name the product formed by the reaction (1 mark)

.....

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10. When a concentrated solution of sodium chloride was electrolyzed using graphite electrodes, some products were obtained.

(a) (i) Name the product(s) at the cathode (1 mark)

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(ii) Write the equation for the reaction at the cathode (1 ½ marks)

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(b) (i) State the effect of the remaining solution after the electrolysis above on litmus paper. (1 mark)

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(ii) Explain your answer in (i) above (2 marks)

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SECTION B (30 MARKS)
Attempt any two questions

11.(a) (i) Give the difference between exothermic and endothermic reactions. (1 mark)
(ii) Give one example of exothermic and endothermic reactions (1 mark)

(b) Explain each of the following observations
(i) Some experiments are carried out in vacuum flasks. (1 mark)
(ii) Some reactions need to be heated before they start. (1 mark)
(iii) A catalyst speeds up a reaction. (1 mark)

(c) (i) Describe how you would determine the standard heat of neutralization of hydrochloric acid. (5 marks)
(ii) $50cm^3$ of 1M sodium hydroxide solution required $25cm^3$ of 1M sulphuric acid and the temperature changed from 30^0C to 32.5^0C. (Given that S.H.C of solution is $4.18Jcm^{-1}C^{o-1}$). Calculate the standard heat of neutralization. (3 marks)
(d) Describe how you would test for chloride ions in solution. (2 marks)

12.(a) (i) What do you understand by water pollution? (1 mark)
(ii) State two causes of water pollution. (2 marks)

(b) Drinking water is treated before it is used. However, calcium and nitrate ions are not removed by the treatment.
(i) Describe briefly how water from a river flowing through a forest area can be treated for drinking. (7 marks)
(ii) How would you test for nitrate ions in water. (3 marks)
(iii) How is water rich in calcium ions important for a poultry farm. (2 marks)

13.(a) (i) Define the term ore. (1 mark)
(ii) Mention four methods used in separating richer ores from earthly materials. (4 marks)
(b) The richer ores containing sulphide or carbonate of the metal are heated in air as the second step of extraction. Explain the role of this treatment using zinc as an example. (4 marks)
(c) In the extraction of aluminium from bauxite, aluminium oxide is electrolysed in molten state mixed with molten cryolite using carbon electrodes.
(i) Explain the role of cryolite material in this process. (1 mark)
(ii) Why should aluminium oxide be in molten state but not in solid state? (2marks)
(iii) Write chemical equations for the reactions at the anode and cathode. (3 marks)
(iv) Explain why aluminium made cooking utensils donot contaminate food. (1 mark)

14.(a) What do you understand by the term normal salt? (1 mark)

(b) A student had dilute sulphuric acid as one of the materials to prepare a dry sample of calcium sulphate. Describe the steps that must have been taken to achieve the objective. (6 marks)

(c) Water samples containing calcium sulphate were treated as follows before being used in washing clothes.

(i) Mixed with washing soda

(ii) Boiled

Explain what would be observed during the washing processes using the two water samples. (6 marks)

(d) Describe how you would test for sulphate ions in water (2 marks)

END