CANDIDATE’S NAME.........................................................STREAM................................................

INDEX NO........................................................SIGNATURE..............................................

545/2

**CHEMISTRY**

**PAPER 2**

APRIL 2018

2HOURS

IBUN MASOOD HIGH SCHOOL

KIBIRI BUSABALA ROAD

**CHEMISTRY**

**PAPER 2**

2HOURS

**INSTRUCTIONS TO CANDIDATES**:

* Section A consists of 10 structured questions, answer **all** questions in this section
* Answers to these questions must be written in spaces provided.
* Section **B** consists of **4** semi-structured questions.Answer **TWO** questions from this section. Answers to the questions **must** be written in the answer sheets provided.
* In both sections all working must be clearly shown.
* Where necessary use: H=1, C=12, O=16, Pb = 207, 1mole of gas occupies 24dm3 at room temperature.

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| **FOR EXAMINER’S USE ONLY** | | | |
| **Questions** | **Marks** | **Questions** | **Marks** |
| Qn1 |  | Qn8 |  |
| Qn2 |  | Qn9 |  |
| Qn3 |  | Qn10 |  |
| Qn4 |  | Qn11 |  |
| Qn5 |  | Qn12 |  |
| Qn6 |  | Qn13 |  |
| Qn7 |  | Qn14 |  |

**SECTION A**

Answer all questions in this section.

1 (a) Name two main gases found in air **1mk**

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(b) An experiment to investigate one of the conditions under which iron rusts was set up as shown below

Oil layer

Boiled water

Clean iron nails

(i) State what was observed after three days **1mk**

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(ii) Explain your answer to b (i) above **1mk**

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(c) State

(i) One disadvantage of rusting **1mk**

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(ii) Two methods of preventing rusting  **1mk**

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2 (a) what is an alloy? **1mk**

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(b) State two reasons why alloys are more useful than pure elements**2mks**

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(c) Name the elements used in making each of the following alloys:

(i) Brass**1mk**

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(ii) Solder **1mk**

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3 An element Q has atomic number 20

(a) Write the electronic configuration of an atom of Q **1mk**

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(b) Identify the group and period to which Q belongs in the periodic table.

(i) Group **½mk**

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(ii) Period **½mk**

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(c) Atoms of another element R with electronic configuration 2, 6 react with Q

(i) Write the formula of the compound formed between Q and R **1mk**

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(ii) State three properties of the compound in C (i) above **1½mks**

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4. 5.6g of iron reacted with 2.4g of oxygen to form an oxide, Y, of formula mass 160.

(a) Determine the

(i) Empirical formula of Y  **2mks**

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(ii) Molecular formula of Y. (O=16, Fe = 56)**1½mks**

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(b) Write the equation for the reaction between the oxide Y and carbon monoxide **1½mks**

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5. A known mass of Zinc granules was reacted with dilute hydrochloric acid at room temperature.

(a) (i) Write an equation for the reaction that took place. **1½mks**

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(ii) Sketch a graph to show how the volume of gaseous product varied with time **1mk**

(b) What would be the effect of;-

(i) Adding copper (II) sulphate to the reaction mixture at room temperature **½mk**

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(ii) Using the same mass of Zinc powder instead of Zinc granules **1mk**

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(c) Explain your answer in b (ii) above **2mks**

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6 (a) What is enthalpy of neutralization?**1mk**

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(b) When 25cm3 of 2.0M potassium hydroxide solution was mixed with 25cm3 of 2.0M nitric acid solution in a plastic cup, a temperature rise of 12.50C was recorded.

(i) State whether the reaction is exothermic or endothermic**½mk**

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(ii) Give a reason for your answer**½mk**

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(c) Calculate the enthalpy of neutralization of sodium hydroxide and indicate the sign of the enthalpy.(Density of solution = 1g cm-3, specific heat capacity of solution = 4.2 Jg-10C-1) **3mks**

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7. Copper (II) sulphate solution was electrolyzed between graphite electrodes

(a) State what was observed at;-

(i) the anode **1mk**

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(ii) the cathode **1mk**

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(b) Write an equation for the reaction that took place at the anode **1½mks**

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(c) Dilute copper (II) sulphate solution was electrolyzed using copper electrodes.

State what was observed at the anode. **1mk**

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8. An enzyme produced by yeast cells converts glucose to ethanol and carbon dioxide

(a) Name the

(i) Process in which glucose is converted to ethanol **½mk**

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(ii) Enzyme in yeast that converts glucose to ethanol **½mk**

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(b) Glucose reacts with sulphuric acid to produce a gas which turns brown bromine water to colourless solution

(i) State the conditions for the reaction. **1mk**

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(ii) Write the equation for the reaction  **1½mk**

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(c) Glucose burns in air according to the equation

C6H12O6(s) + 6O2(g) 6CO2(g) + 6H2O(g). Calculate the mass of glucose that when burnt would produce 2.4dm3 of carbon dioxide at room temperature **1mk**

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9 (a) Name two substances that can be used to prepare soap **1mk**

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(b) Describe briefly how soap is obtained from the substances named (a) above include an equation for the reaction.**3mks**

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(c) Detergents are commonly used in laundry instead of soap. State one

(i) Advantage of using detergents**½mk**

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(ii) Disadvantage of using detergents **½mk**

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10 (a) What is a polymer?**1mk**

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(b) Under suitable conditions ethene molecules H2C = CH2, react forming a polymer.

(i) Write the equation for the formation of the polymer **1mk**

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(ii) Give one use of the polymer in b (i) above **1mk**

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(c) Differentiate between thermoplastic and thermosetting plastics **1mk**

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(d) State one disadvantage of using plastics **1mk**

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**SECTION B**

**Answer any two questions from this section.**

**Additional questions answered will NOT be marked.**

11 (a) Describe with the aid of a labelled drawing how chlorine can be prepared in the laboratory using Magnese (IV) Oxide **6mks**

(b) Chlorine gas was bubbled through aqueous solutions of

(i) dilute sodium hydroxide

(ii) Potassium iodide

State what was observed in each case and write the equation for the reaction.**4mks**

(c) Atesttube filled with chlorine water was inverted into a beaker containing chlorine water and left

Exposed to sunlight for some time.

(i) State what was observed **½mk**

(ii) Using equation(s), explain your observation(s) in c(i) above **2½mks**

(d) Blue litmus paper was placed into chlorine water. State what was observed **1mk**

(e) State two uses of chlorine**1mk**

12 (a) Describe briefly how pure, dry crystals of lead (II) nitrate can be prepared in the laboratory from Lead (II) oxide.**6½mks**

(b) Lead (II) nitrate was heated strongly

(i) State what was observed **1½mks**

(ii) Write the equation for the reaction that took place**1½mks**

(iii) Calculate the total volume of gaseous products formed at room temperature when 3.31g of lead (II) Nitrate is heated strongly. **3mks**

(c)Ammonia solution was added dropwise to lead (ii) nitrate solution in a test tube until in excess

(i) State what was observed **1mk**

(ii) Write the equation for the reaction **1½mks**

13 (a) What is the rate of a chemical reaction? **2mks**

(b) Explain the effect of the increase in each of the following on the rate of reaction.

(i) Concentration **2mks**

(ii) Temperature**2mks**

(c) 10cm3 of 2Mhydrochloric acid was added to sodium thiosulphate solution and time taken for sulphur precipitate to form was noted. The concentration of sodium thiosulphate was varied by adding the volume of water which makes the solution to 60cm3 in each case. The results are shown in the table below

|  |  |  |  |
| --- | --- | --- | --- |
| Volume of thiosulphate (cm3) | Volume of water (cm3) | Time (s) | (s-1) |
| 60 | 0 | 23 |  |
| 50 | 10 | 27 |  |
| 40 | 20 | 34 |  |
| 30 | 30 | 45 |  |
| 20 | 40 | 73 |  |
| 10 | 60 | 143 |  |

(i) Complete the table by filling in the value of **3mks**

(ii) Plot a graph oagainst the concentration of thiosulphate **5½mks**

(iii) Deduce from the graph how the rate of the reaction varies with the concentration **1mk**

14 (a) Haematite, Fe2O3, is one of the ores of iron from which iron can be extracted by reduction in a blast furnace.

(i) What is an ore? **1mk**

(ii) Name two other substances fed into the furnace together with the ore**2mks**

(b) Describe briefly how iron is obtained from the haematite (include equations to illustrate your answer) **7mks**

(c) State what would be observed and write the equation for the reaction when each of the following is passed over heated iron filings.

(i) dry chlorine gas **2½mks**

(ii) Steam **2½mks**

**END**