**NAME ----------------------------------------------------- CLASS -------------ADM NO ---------------**

**233/1**

**CHEMISTRY FORM 3**

**END OF YEAR EXAM 2014**

**PAPER 1**

**TIME 2 HOURS**

**INSTRUCTIONS**

* Write your name class and Adm. No
* Answer all questions on the spaces provided
* Mathematical tables and silent electronic calculators may be used
* All working must be clearly shown where necessary.

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| **QUESTION**  | **MAXIMUM SCORE** | **CANDIDATES SCORE** |
|  |  80 |  |

1. Name the following apparatus (1mk)

2.a) State Graham’s law of diffusion. (2mks)

b) The time taken for a certain volume of gas R to diffuse through a small hole is 6 minutes. Under similar conditions on equal volume of oxygen took 7.5minutes to diffuse through the same hole. Calculate the relative molecular mass of R. (O = 16) (2mks)

3. The diagram below represents an apparatus used to separate two liquids X and Y.

a)Which two physical properties of the liquids are used in this method. (2mks)

b) Give the name of the apparatus drawn above. (1mk)

4. Hydrogen gas is passed over heated copper (II) oxide in a combustion tube. Hydrogen gas is a reducing agent.

1. Write the chemical equation that takes place when hydrogen gas is passed over heated copper (II) oxide. (1mk)

b) Draw a simple set up to show how hydrogen gas is passed over heated copper (II) oxide in a combustion tube. (2mks)

5. Using dots and crosses diagrams draw the structure of the following molecules.

1. Hydrogen sulphide (H2S) (1mk)
2. Ethane (C2H6) (1mk)

c) Magnesium Chloride (1mk)

6. Calculate the oxidation state of Nitrogen in the following. (2mks)

i)NH4+

ii)HNO3

7. What two conditions make it necessary to extract sulphur by the frasch process. (2mks)

b) Hot air at about 15 atmospheres is forced down through the smallest of the three concentric pipes in the frasch process. State two roles of the hot compressor air. (2mks)

8. The diagram below represents a set up that can be used to prepare and collect Nitrogen (iv) oxide.

1. Write the chemical equation for the reaction that takes place in Heating Pb (NO3)2.

(1mk)

b) Name Gas X. (1mk)

c) What observations would be made in the boiling tube. (1mk)

d) In the u-tube on cooling. (1mk)

9. Calculate the volume of oxygen liberated at the anode when current of 3 amperes is passed through magnesium sulphate solution for 45 minutes and 30 seconds?

Molar gas volume at r.t.p = 24 litres Faraday constant = 96500c. (3mks)

10.7.36 g of a compound of Hydrogen and Oxygen decomposed to produce 6.93 g of oxygen and the rest hydrogen. If the molecular mass of the compound is 34 grams determine the molecular formular of the compound. (3mks)

11. The following diagram represents non-luminous flame of the Bunsen burner.

1. Name parts (2mks)

A

B

b) Which of the parts in a above is the hottest. (1mk)

12. The sketch below shows variation of temperature and physical state of sulphur.

a)Name allotrope A and B (1mk)

b)What name is given to 96oC (1mk)

c) Define allotropy (1mk)

13. Draw a well labeled diagram for the preparation of dry chlorine using manganese iv oxide.

 (3mks)

14. The flow chart below shows nitrogen and oxygen can be obtained from air on large scale. Study and answer the questions that follow. (3mks)

15. Name the following compounds

1. CH3C H2 CH2 OH
2. CH3 CHCl CHBrCH3
3. CH3 CH2 COOH (3mks)

16. Use oxidation numbers to show that the above reaction is redox. (3mks)

2H2S(g) + SO2(g) -------------------------- 3S (s) + 2H2O(l)

17. The incomplete diagram below is set up for the laboratory preparation of oxygen.

i)Complete the diagram (2mks)

ii) Write an equation for the reaction that takes place in the flask. (1mk)

iii) Give two commercial use of oxygen (2mks)

18. Describe how the PH of anti-aid (actual) powder can be determined in the laboratory (3mks)

19. Draw and name of isomers of the butane (2mks)

20. With reference to iodine, distinguish between covalent bonds and van der waals. (3mks)

b)Draw a diagram to show bonding is an ammonium ion. 9N = 7, H 1 ) (1mk)

21. State the difference between the bleaching activity of chlorine and sulphur (iv) oxide. (2mks)

22. Study the flow chart below and answer the questions that follow.

i) Identify substances (2mks)

Y

V

ii) Write a chemical equation that lead to formation of solution X. (1mk)

23. Describe a chemical test that can be used to distinguish between ethanol and ethanoic acid. (2mks)

24. A solution was made by dissolving 15g of impure sodium hydroxide in water and making it to 500cm3 solution. If 40cm3 of this solution neutralized exactly 26cm3 of 1.0 M nitric (iv) acid, calculate the percentage purity of sodium hydroxide. (Na = 23, O = 16, H = 1 Cl = 35.5) (3mks)

25. Isaac carried out the following experiment to study electrolysis of copper sulphate. Study it and answer the question t hat follow.

Write ionic equations taking place at

1. Anode (1mk)
2. Cathode (1mk)

Comment of the PH of the solution after sometimes. (1mk

26. Element K ( not actual symbol) has isotope composition as follows. (2mks)

Isotope Abundance %

10k 18.69

5k 81.31

27.a) Study the sign below and answer the questions that follow.



i) In which chamber will the reaction take place first. Explain. (2mks)

ii)What observation will be made in both chamber A and B after sometime. (1mk)

b)Taking Boyle’s law into account sketch a graph of pressure against volume. (2mks)

28. You are provided with iron wire of uniform cross section 100cm length of wire weighs 0.28g. If 0.001 mole iron is needed, calculate the length of the wire required. (3mks)

29. You are provided with Lead oxide dilute suphuric (iv) acid and dilute Nitric (iv) and describe how pure salt of Lead II sulphate can be prepared. (3mks)