

# PRESIDENT'S OFFICE

## REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

### DARES SALAAM REGION

#### FORM FOUR - MOCK EXAMINATION 2024

### CHEMISTRY - 1

CODE 0327

TIME 3.00 HOURS

Thursday 11<sup>th</sup> July, 2024 A.M

#### INSTRUCTIONS

1. This paper consists of sections **A, B** and **C** with a total of **eleven (11)** questions
2. Answer **all** questions in sections A and B and two (2) questions from section C
3. Section A carries **sixteen (16)** marks, section B carries **fifty four (54)** marks and section C carries **thirty (30)** marks
4. All writings must be in blue or black ink with exception of diagrams which must be in pencil
5. Non - programmable calculators and mathematical tables may be used
5. Write your **Examination Number** on every page of your answer booklet (s)
6. The following constant's may be used:-  
1 faraday = 96500c  
1 litre = 1dm<sup>3</sup> = 1000cm<sup>3</sup>  
Atomic masses  
H = 1, C = 12, O = 16, Na = 23, Al = 27, S = 32  
Cu = 64, Ag = 108, Zn = 65

*This paper consists of 4 printed pages*

### SECTION A: (16 marks)

Answer **all** questions in this section

1. For each of the items (i) - (x), choose the correct answer from the given alternative and write its letter in the answer booklet provided

- i) A form one student saw the 'toxic' sign on a box and made the following possible interpretations. Which one is the most correct?  
A. The box contained spirit used in lamps  
B. The box contained radio active materials  
C. The box contained poisonous substances  
D. The box contained hazardous materials  
E. The box contained oxidising materials
- ii) Equal volume of water from different sources boiled in a dish until no water left. Which of the following will leave out with no deposit?  
A. Spring water  
B. Rain water  
C. Lake water  
D. Pound water  
E. Tap water
- iii) On the syrup medicine bottle is written "shake well before use" this confirm that the syrup is an example of  
A. Solution  
B. Suspension  
C. Solute  
D. Alloy  
E. Solvent
- iv) Which of the following statement is not true about hydrogen gas?  
A. Is a reducing agent  
B. Burns in air to form steam  
C. Is a neutral gas, almost insoluble in water  
D. Diffuses more rapidly than carbondioxide  
E. Is prepared by action of dilute nitric acid on zinc metal
- v) Which among the given list of metals arranged in order of decreasing reactivity is correct?  
A. Magnesium, Calcium, copper and zinc  
B. Zinc, magnesium, copper and calcium  
C. Calcium, magnesium, zinc and copper  
D. Calcium, zinc, magnesium and copper  
E. Calcium, magnesium, copper and zinc
- vi) Which of the following transforms a mechanical energy to an electric energy?  
A. Hydroelectric power plant  
B. Solar pannel  
C. An electric motor  
D. An electric cooker  
E. A motorcycle wheel
- vii) The periodic table not only shows the relationship between elements in one group but also the variations of the elements across the periods. Choose the best general explanation about the elements in the periodic table out of the following  
A. Ionization energy decreases a cross a period and increases down a group  
B. Elements in the same group have similar chemical compound  
C. Electronegativity increase across the period and down the group  
D. The properties of elements are the periodic function of their atomic numbers  
E. Atomic size increases across the period and decreases down the group
- viii) Which sub - atomic particles are in equal number with protons in a neutral atom?  
A. Neutrons  
B. Electrons of its ion  
C. Neutrons of its ion  
D. Electrons  
E. Nucleons
- ix) Mrs Robson wanted to transfers some chemicals from wincher bottle for her students to do experiments. The smaller bottles are called  
A. Storing bottles  
B. Wash bottles  
C. Reagent bottles  
D. Chemical container  
E. Drop per bottles
- x) How many structural formulae can be obtained from a hydrocarbon of molecular formula  $C_5H_{12}$ ?  
A. 5  
B. 4  
C. 2  
D. 1  
E. 3

2. Match the items in list A with the responses in list B by writing the letter of the correct responses beside the item number

| LIST 'A' |   | LIST 'B' |                                |
|----------|---|----------|--------------------------------|
| i)       | Yellow when hot white when cold                 | A:       | FeO                            |
| ii)      | Black when hot, black when cold                 | B:       | CaO                            |
| iii)     | Reddish brown when hot, yellow when cold        | C:       | Na <sub>2</sub> O              |
| iv)      | Brown when hot, brown when cold                 | D:       | Cu <sub>2</sub> O              |
| v)       | White when hot, white when cold                 | E:       | ZnO                            |
| vi)      | Burns in excess air to give blight yellow solid | F:       | Fe <sub>2</sub> O <sub>3</sub> |
|          |   | G:       | PbO                            |
|          |   | H:       | CuO                            |

**SECTION B: (54 marks)**

Answer **all** questions in this section

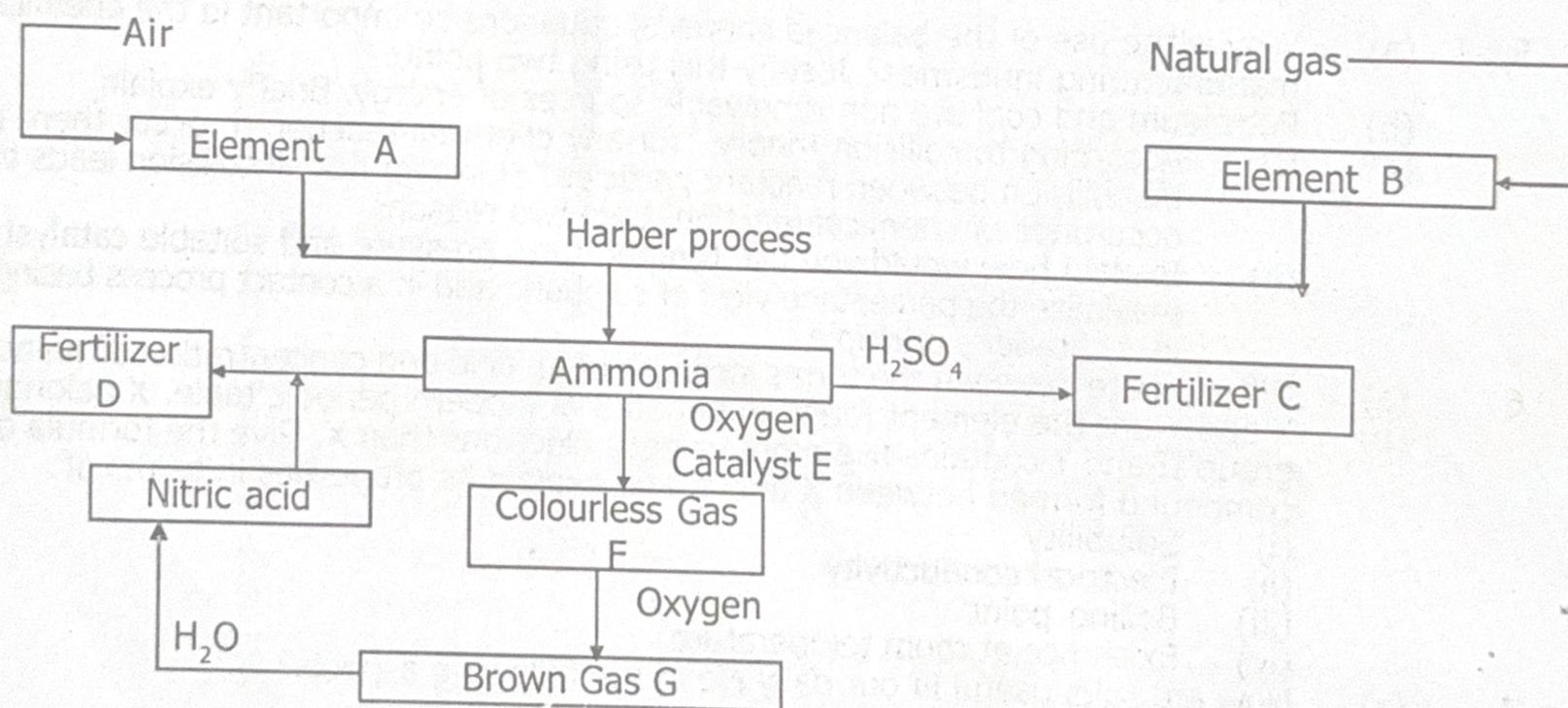
- 3 (a) Explain the meaning of the following terms
- Controlled variable
  - Independent variable
  - Dependent variable
- (b) Account on the following phenomenon
- Luminous flame is used for lighting in everyday life
  - Water is not suitable for extinguishing class E fire
  - Iron is not preferred to be used for construction of steam pipes and boilers
- (c) Sodium hydroxide is said to be a compound. Justify this statement giving three (3) points
- 4 (a) What changes or vents do we encounter in our daily lives that are good examples of chemical changes? Give four (4) points
- (b) Concentrated sulphuric acid is not preferred to be used as primary standard reagent used for standardization of standard basic solution. Explain
- (c) Calculate the number of molecules of water of crystallization in ethanedioic (oxalic) acid crystals (COOH)<sub>2</sub> · X H<sub>2</sub>O from the following data 5g of the crystals were made up to 250cm<sup>3</sup> of aqueous solution and 25cm<sup>3</sup> of this solution required 15.9cm<sup>3</sup> of 0.5M sodium hydroxide solution to neutralize it.
- 5 (a) Why is the use of the balanced chemical equations so important in the chemical manufacturing industries? Justify this using two points
- (b) Petroleum and coal are non renewable sources of energy. Briefly explain
- (c) (i) According to collision theory, "for any chemical reaction to occur there must be collision between reactant particles." However not all collision leads to the occurrence of chemical reaction. Give two reasons
- (ii) Explain how would you use temperature, pressure and suitable catalyst to maximize the percentage yield of sulphuric acid in a contact process basing on le- chatelier's principle
- 6 (a) Differentiate between the terms strength of an acid and concentration of an acid
- (b) X and Y are the element found in period 3 of modern periodic table. X belongs to group II and Y contains five more valence electrons than X. Give the formula of the compound formed between X and Y, and explain its properties in terms of
- Solubility
  - Electrical conductivity
  - Boiling point
  - Existance at room temperature
- 7 (a) How are salts useful in our daily life in the following aspects?
- Foods
  - Agriculture
  - Medicines
- (b) Account on the following
- In the preparation of hydrogen gas the first few bubbles are always not collected
  - Hydrogen peroxide is more preferred in the preparation of oxygen gas over potassium chlorate

- (c) Extraction of metal is essentially reduction process. Justify this using two reasons
- 8 (a) Define the following terms  
 (i) Soil reaction  
 (ii) Leaching  
 (iii) Potential soil acidity  
 (b) A fertile soil is not necessary productive soil. Explain (Give three points )  
 (c) Write the open structural formula of the following organic compounds  
 (i) 3 - methyl pentane  
 (ii) Pent - 2 - ene  
 (iii) 1, 3, 3 - tribromo prop - 1 - yne

### SECTION C (30 marks)

Answer **two (2)** questions in this section

- 9 (a) Name three factors which will determine the production of substance released in the electrodes during electrolysis  
 (b) Without electrolytic cell explain the chemical preference of electrical precipitation of copper necklace with silver metal  
 (c) Three electrolytic cell A, B and C containing electrolyte of zinc sulphate, silver nitrate and copper (II) sulphate respectively were connected in series. A steady current of 1.5A was passed through them until 1.45g of silver were deposited at the cathode of cell B.  
 (i) How long did the current flow?  
 (ii) If oxygen gas was liberated in one of the cell, calculate its volume collected at S.T.P
10. Global warming is one of the most important aspect of climatic change caused by various human activities. Describe global warming basing on the following guidelines  
 - The concept and causes of global warming in one paragraphy  
 - Five (5) human activities which are likely to accelerate global warming  
 - Good conclusion
11. Study carefully the scheme below and answer the question that follows:-



- (a) Identify substances A, B, C, D, E and F  
 (b) Write the equation for the formation of fertilizer C  
 (c) Gas G was dissolved in water without excess air . State the product formed with the aid of balanced chemical equation.  
 (d) Explain two uses of ammonia gas as shown in the scheme above.  
 (e) How element A would be obtained from the air?  
 (f) Explain the reaction involved in the conversion of ammonia to nitric acid.