

PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
DARES SALAAM REGION
FORM FOUR - MOCK EXAMINATION 2025
CHEMISTRY
CODE: 032/A
TIME 3:00 hours
Friday 18th July 2025 A.M.

INSTRUCTIONS

1. This paper consists of section **A, B** and **C** with total of **eleven (11)** questions.
2. Answer **all** questions in section A and B and two (2) questions from section C.
3. Non – programmable calculators are allowed in the examination room.
4. Cellular phones and any unauthorized materials are **not** allowed in examination room.
5. Write your **Examination Number** on every page of your answer booklet(s)
6. The following constant may be used.
Atomic masses
H = 1, C = 12, Al = 27, Cl = 35.5, Mg = 24, S = 32, O = 16, Ca = 40
Avogadro's number = 6.02×10^{23}
G.M.V at S.T.P = 22.4 dm^3
1 faraday = 96500 coulombs
Standard pressure = 760mmHg
Standard Temperature = 273 K
1 litre = $1 \text{ dm}^3 = 1000 \text{ cm}^3$

the carbon	percentage
%	86%

This paper consists of 4 printed pages

SECTION A (Carries 16 Marks)

Answer all questions from this section

1. For each of the following I – x choose the most correct answer from among the given alternatives and write its letter in the answer sheet provided.

- i. Desiccator is mainly used for
A. Gliding solid substances
B. Separating liquids
C. Dry solid substances
D. Storing reactive metals
E. Hydrating solid substances.
- ii. Which of the following chemicals is used to apply on burns?
A. Petroleum jelly
B. Gentian violet solution
C. Antibiotic solution
D. Soap
E. Ethanol
- iii. 17g of ammonia gas at S.T.P occupies the same volume as:
A. 1g of hydrogen gas
B. 16g of oxygen gas
C. 88g of carbondioxide
D. 64g of Sulphur dioxide
E. 14g of nitrogen gas
- iv. A few substances were grouped in increasing order of their particles intermolecular forces of attraction. Using knowledge of kinetic theory of matter, which of the following is the correct order
A. Water, oxygen, chalk
B. Salt, juice, chalk
C. Nitrogen, carbon, water
D. Air, salt, oil
E. Hydrogen, dilute hydrochloric acid and stone
- v. When colourless compound was heated a brown fumes of gas were evolved. The colourless gas is mostly likely to be from which of the following compound?
A. Ferrous sulphate
B. Silver chloride
C. Lead nitrate
D. Magnesium sulphate
E. Sodium hydroxide *NaOH*
- vi. Element found in a periodic table tends to show different behavior. When these elements loos or gain electrons, they tend to form
A. Ions
B. Allotropes
C. Molecules
D. Radical
E. Isotopes
- vii. A certain compound reacts with sodium to give hydrogen gas and it also reacts with acidified potassium dichromate to give a green solution. The compound is most likely to be
A. An alkane
B. An alcohol
C. Alkyne
D. A carboxylic acid
E. Alkene
- viii. How many moles of oxygen gas are required for the complete combustion of 4g of methane gas (CH_4) to form carbon dioxide and water
A. 0.05 moles
B. 0.50 moles
C. 0.25 moles
D. 0.025 mole
E. 0.225 moles

- ix. A solution is prepared by diluting 25cm³ of 1.20M aluminium chloride solution to 250.00 cm³. What is the molarity of the solution
- A. 0.2 60M
 B. 0.12 M
 C. 6.50M
 D. 1.20M
 E. 0.10M
- x. One of the following is not an electrolyte
- A. Molten aluminium oxide
 B. Concentrated sulphuric acid
 C. Copper sulphate solution
 D. Sodium chloride solution
 E. Hard water.

2. Match the item in **List A** with the response in **List B** by writing the letter of the correct response beside the item number in the answer sheet provided

LIST A		LIST B	
i.	Polyester <i>a</i>	A.	Used in electrical and thermal insulators
ii.	Polyvinyl cyanide <i>b</i>	B.	Used as substitute for natural rubber
iii.	Perspex <i>A</i>	C.	Making cloth items
iv.	Polyvinyl chloride <i>I</i>	D.	Making cloth items and carpets
v.	Polythene <i>F</i>	E.	Used to make water pipes, crates, electrical appliances and a substitute for leather
vi.	Neoprene	F.	Making packaging materials, basket, cups, bowls and a wide range of kitchen ware.
		G.	Used to treat water
		H.	Used to make table salt
		I.	Used as substitute for glass in furniture design, signal displays and lighting

SECTION B (54 Marks)

Answer **all** questions in this section

3. (a) (i) Explain how the separation of mixture so significance. (At least two points)
 (ii) Why are liquids and gases categorized as a fluids?
 (iii) What are the conditions for a substance to be called matter
- (b) A piece of potassium metal was put in a beaker containing cold water and piece of blue and red litmus papers.
 (i) Write a balanced chemical equation for the reaction
 (ii) List down any two changes observed during the course of the reaction
4. (a) Give the name and draw the safety signs which represented with the following chemical substance
 (i) Rat poison
 (ii) Ethanol
- (b) Briefly explain why it is not advised to use wood ashes for cleaning aluminium utensils
 (c) Give four (4) laboratory apparatuses that are made up of iron (steel) materials.
 (d) Give three differences when both solid ice and solid piece of paper are heated.
5. (a) Chemistry teacher prepare carbon dioxide by using 20g of grinded limestone by mixing with dilute nitric acid, he collected 200cm³ of the gas. His students did the same experiments with 20g of ungrounded limestone where they collected 10cm³ of the gas. With reasons explain the different in the volume of carbon dioxide collected.
- (b) The decomposition of gaseous dinitrogen tetroxide (N₂O₄) to form nitrogen dioxide (NO₂) is an endothermic process and can be represented by the following equilibrium?
- $$\text{N}_2\text{O}_4(g) \rightleftharpoons 2\text{NO}_2(g)$$
- Colourless Reddish brown

- (i) Explain how could the pressure be adjusted so as to increase the intensity of reddish brown colour?
- (ii) Does the reaction cease when the mixture becomes reddish brown? Explain
- (iii) State and explain the colour change observed on cooling the reaction mixture
- (iv) Mention two ways reversing the change caused by cooling the reaction
6. (a) (i) Acid rain caused by the emission of acidic gases into the atmosphere from industries and vehicles. Briefly explain how acid – base neutralization can help to minimize this problem
- (ii) Using electron diagrams illustrate the formation of a molecule of ammonia gas.
- (iii) State two differences between a molecule of ammonia and sodium chloride
- (b) In neutralization reaction between sodium hydroxide and hydrochloric acid it form compound Q and water only. What are the four (4) uses of compounds Q in our everyday lives.

7. (a) Metal are extracted from their ores. Using two important metals in the table below, identify the substance (s) a part from their ores which are added during extraction process and final suggest their functions.

Name of the metal Extracted	Substances (s) added during extraction	Function of the substances
Sodium		
Iron		

- (b) Both sodium and iron are extracted by different methods. Explain reasons for this differences in their methods of extractions.
- (c) A gaseous compound consists of 86% carbon and 14% hydrogen by mass. At S.T.P 3.2 dm³ of the compounds had a mass of 6g. calculate its
- (i) Empirical formula
- (ii) Molecular formula
8. (a) What is the relative molecular mass of a hypothetical gas Y if the mass of 560cm³ of it measured at S.T.P is 1.10g?
- (b) With the aid of balances chemical equations explain how scum and lime are scale formed and state one disadvantages of each.
- (c) Compound A (C₄H₁₀O) is oxidized with acidified potassium dichromate to give compound B. When it is dehydrated with Conc.H₂SO₄, compound A gives compound C which undergoes hydrogenation to give compound D, that is capable of undergoing a substitution reaction. Identify the compounds B, C and D and write their structures.

SECTION C (30 Marks)

Answer only **two** questions from this section

9. (a) (i) State faraday's first law of electrolysis
- (ii) Explain the three (3) industrial applications of electrolysis in our daily life
- (b) Dilute sulphuric acid was electrolyzed using carbon electrodes by passing a current of 0.2 amperes for half an hours.
- (i) Write down the electrode half reaction equations for the chemical reactions which occurred at both electrodes.
- (ii) Calculate the volume of the gas produced at each electrode
- (c) State two uses of each gas produced in the above electrolysis
- (d) How can you identify the presence of each gas produced at each electrode.
10. Explain the six (6) outcome of the greenhouse effect.
11. Managing soil fertility is very crucial for farmer to have high yield season after season. If soil is not well managed losses its sufficient nutrients for proper plant growth and therefore plant and their yields are affected. Using six (6) points describe on how nutrients lose.