



# THE PRESIDENT'S OFFICE

## REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

### KILIMANJARO REGIONAL COMMISSIONER'S OFFICE

#### FORM FOUR MOCK EXAMINATION

#### CHEMISTRY

Code: 032/01

Time: 3 Hours

Monday 20<sup>th</sup> May 2024 P.M

- ### INSTRUCTIONS
- This paper consists of sections **A, B** and **C** with a total of **eleven (11)** questions.
  - Answer **all** questions in sections A and B and **two (2)** questions from section C.
  - Sections A carries **sixteen (16)** marks, section B **fifty-four (54)** marks and section C **thirty (30)** marks.
  - Non-programmable calculators may be used.
  - Cellular phones and any unauthorized materials are **not** allowed in the examination room.
  - Write your **Examination Number** on every page of your answer sheets.
  - The following constants may be used.
    - Atomic masses: H=1, C=12, N=14, O= 16 S= 32, Ca= 40 Na=23, Cu = 64
    - 1 Litre = 1 dm<sup>3</sup>= 1000cc
    - 1F = 96500C

*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 correct answer from the given alternatives and write its letter in the answer sheets provided.
- (i) A simple proof that some chemical reactions take place in our bodies is that  
A. We eat a balanced diet  
B. Doctors tell us so in the hospitals  
C. We occasionally fall sick  
D. The waste products from our bodies.  
E. There is no proof.
- (ii) Sort out the list of electronic configurations representing unreactive elements.  
A. 2:5 and 2:8  
B. 2:8:1 and 2:8:6  
C. 2:8:8:2 and 2:8:1  
D. 2:8 and 2:8:8  
E. 2:8:1 and 2:8
- (iii) When methane undergoes substitution reaction with excess chlorine. What is the final product?  
A. Chloromethane  
B. Dichloromethane  
C. Trichloromethane  
D. Tetrachloromethane  
E. Monochloromethane
- (iv) Three elements X, Y and Z are in the same period of the periodic table. The oxide of X is amphoteric, the oxide of Y is basic and the oxide of Z is acidic. Which of the following shows the arrangement of element in order of increasing atomic number.  
A. X, Y, Z  
B. Y, X, Z  
C. Z, X, Y  
D. Y, Z, X  
E. Z, Y, X
- (v) Which of the following sets of processes uses a gas that ignites with a pop sound when a lighted splint is passed through it?  
A. Balloon filling, welding and diving  
B. Hardening oil, balloon filling and welding  
C. Hardening oil, balloon filling and diving  
D. Fueling rocket, diving and welding  
E. Balloon filling, fueling rocket and diving
- (vi) Which state is involved when drying wet clothes?  
A. Liquid to solid  
B. Solid to gas  
C. Gas to liquid  
D. Liquid to gas  
E. Gas to solid
- (vii) The pair of separation technique below is used to separate solid mixtures  
A. Distillation and hand picking  
B. Sieving and chromatography  
C. Winnowing and hand picking  
D. Sieving and evaporation  
E. Decantation and solvent extraction
- (viii) Which of the following relates closely in a kinetic nature of matter  
A. Solids appear to be stationary but their particles keep on vibrating.  
B. At low temperature matter exist in gases form  
C. Particles in gaseous state are very close to each other  
D. Molecules in liquid state can move in all one fixed direction  
E. Particles in solid state are very far compared to gaseous state

- (ix) Kalulu conducted an experiment using marble chips ( $\text{CaCO}_3$ ) and dilute hydrochloric acid. Which factor do you think will effectively affect the rate of that reaction?
- Temperature
  - Time
  - Concentration of the reactants
  - Pressure
  - Surface area
- (x) If the results you obtain from an experiment do not support your hypothesis.
- Change your experiment
  - Leave out the results.
  - Give ideas for further testing to find a solution
  - Identify a new problem
  - Change dependent variable

2. Match the items in **list A** with the correct response in **list B** by writing the letter of the correct response beside the item number in the answer booklet.

LIST A	LIST B
i) A pole through which electrons leave the internal circuit during electrolysis.	A. Electroplating
ii) It is given by mass deposited or liberated divided by a quantity of electricity passed through an electrolyte.	B. $\text{M}^+ + \text{e}^- \rightarrow \text{M}$
iii) The act of covering the corroded material by the unreactive metal.	C. Electrochemical series
iv) Cathode reaction	D. 1 Faraday
v) Arrangement of metal ions which can be reduced.	E. Cathode
vi) Strong electrolyte.	F. Electroplating
	G. $\text{M} \rightarrow \text{M} + \text{e}^-$
	H. Anode
	I. Electrochemical equivalent
	J. Anions
	K. $\text{H}_2\text{C}_2\text{O}_4$
	L. $\text{HNO}_3$

### SECTION B: (54 Marks)

Answer **all** questions in this section.

3. (a) One of the laboratory room at Mimosa secondary school having only the following feature; slippery floor, no water supply and having small windows. Does the room qualify to be used as a chemistry laboratory? Give four points.
- (b) How can you tell the difference between a suspension and a solution by their appearance?
- (c) State two similarities between rusting and combustion.
4. A mixture of iron and Sulphur was gently heated until it started to glow. The mixture continued to glow for some time even after heating had been stopped.
- (a) Write an equation for the reaction between sulphur and iron
- (b) Why did the mixture continue glowing even after heating was stopped?
- (c) The product formed in (a) cannot be attracted by a magnet. Why?
5. (a) The scientific methods are always applied when facing problems in day-to-day life to solve the problems. Name the corresponding scientific procedure in the following improper steps followed in hospital.
- A laboratory technician takes blood for testing
  - A doctor writes some problem to be tested
  - A doctor asks a patient to go to the pharmacist to get medicines.
  - A doctor asks a patient some questions.
  - A laboratory technician writes results on tested blood.
  - A doctor study result from the laboratory technician.
- (b) Using three points explain the importance of the scientific procedure in daily life.



6. (a) Explain the trend in electrical conductivity across period 3 element  
 (b) Copper undergoes reduction according to the following equation  

$$\text{Cu}^{2+}(\text{aq}) + 2\text{e}^- \longrightarrow \text{Cu}_{(\text{s})}$$
  
 Calculate the quantity of electricity required to deposit 0.32g of copper.  
 (c) It is possible to increase or decrease the rate of chemical reactions by adjusting a number of factors. Explain three factors that affecting the rate of chemical reactions.
7. (a) Mwinja wanted to conduct an experiment that involve the use of heat but she was not aware on how to light a Bunsen burner. As a form four student re arrange the following steps which are sequentially incorrect to help her to light a Bunsen burner. (Re-arrange using number i-vi)  
 i. To extinguish the flame, turn off the gas tap to stop the gas flow.  
 ii. Light the gas at the top of the barrel with a lighted match stick.  
 iii. Turn the collar to close the air hole completely.  
 iv. Keep your face away from the top of the barrel.  
 v. Adjust the gas tap until the supply of gas is enough for a flame.  
 vi. Turn on the gas fully to ensure that plenty of the gas enters the burner.  
 (b) Explain why sea water is not suitable for washing clothes  
 (c) When ammonium nitrate is dissolved in water, the temperature of the resulting solution is more than that of the surroundings. Draw an energy level diagram for the dissolution of ammonium nitrate and on it show the  $\Delta H$ .
8. (a) Why carbon has been given special attention in organic chemistry rather than other elements. Give two reasons.  
 (b) You are provided with the following compounds A, B, C, and D which correspond to the molecular formula  $\text{CH}_4$ ,  $\text{C}_2\text{H}_4$ ,  $\text{C}_2\text{H}_5\text{OH}$ , and  $\text{CH}_3\text{COOH}$  respectively.  
 (i) Give the name of the homology to which each of the compound above belong.  
 (ii) State the name of the reaction when B and hydrogen gas react in presence of Nickel at  $200^\circ\text{C}$   
 (iii) Explain what will happen when A react with chlorine in a dark

### SECTION C (30 Marks)

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

9. Water pollution is caused by introducing unwanted substances in water. Explain ways in which water pollution can be controlled.
10. Metals play great role in social, economic, cultural and technological development although the way of obtaining them seems to be unfriendly to the environment and the life of organisms. With five points justify the statement above.
11. (a) Explain the concept of safety measure for a chemistry Laboratory.  
 (b) Explain the significance of each of the following.  
 i) A Chemistry laboratory should have safety measure.  
 ii) It is necessary to familiarize yourself with laboratory apparatus.  
 iii) Chemicals in the laboratory must be labeled and stoppered.  
 iv) All people working in the laboratory should wear appropriate protective clothes.  
 v) Refrigerators and freezers used in the laboratory must be labeled, for chemical use only.