Candidate's Examination Number _____

THE REVOLUTIONARY GOVERNMENT OF ZANZIBAR

ZANZIBAR EXAMINATIONS COUNCIL

FORM THREE ENTERANCE EXAMINATION

216 CHEMISTRY

TIME: 2.30 HOURS MONDAY 4TH DECEMBER, 2023 A.M

INSTRUCTIONS TO THE CANDIDATE

1. **This paper consists of THREE (3) sections A, B and C.**
2. **Answer ALL questions in Section A and B, and any TWO (2) questions in section C. Question (9) is compulsory.**
3. **Write your examination number on each page.**
4. **All answers must be written in space provided under each question.**
5. **Use a blue or black pen in writing. The diagrams must be in pencil.**
6. **Cellular phones and unauthorized materials are not allowed in the examination room.**
7. **The following constants may be used**

   C =12, O= 16, H =1, Na =23, Ca =40, N = 14

FOR EXAMINER'S USE ONLY		
QUESTION NUMBER	**MARKS**	**SIGNATURE**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9a.		
9b.		
10.		
11.		
TOTAL		
CHECKER'S SIGNATURE		

Candidate's Examination Number _____

SECTION A: (30 Marks)

Answer ALL questions in this section.

1. Choose the correct answer and write its letter in the table below.

i. The ignited materials combines with oxygen to produce
   A. Heat, light and flame
   B. Hydrogen, light and water
   C. Light, water and soot
   D. Soot, heat and flame

ii. Atomic radius in the periodic table increases as you move
   A. All directions
   B. Down the group
   C. Left to right of the period
   D. Upward the group

iii. Which of the following is the oxidation state of oxygen in H_2O_2?
   A. +2 B. +1 C. -1 D. -2

iv. One of the following is a laboratory rule
   A. Eat in the laboratory
   B. Keep windows open for ventilation
   C. Make noise in the laboratory
   D. Use broken apparatus

v. Hypothesis can be defined as
   A. A summary of the experiment
   B. A possible explanation to the asked question
   C. Interpretation of the results
   D. Recording what you have observed

vi. One of the following elements can react with water to form alkaline solution
   A. Aluminium B. Carbon C. Potassium D. Zinc

vii. Blockage of the upper part of the air way by food or other object is called
   A. Bruises B. Chocking C. Shock D. Suffocation

viii. In which organ does cardiopulmonary resuscitation is performed?
   A. Ear B. Eye C. Mouth D. Nose

ix. The colour and temperature of flame depend on
   A. Source of flame
   B. The heat used
   C. Type of fuel and the source
   D. Type of fuel

x. Test tube rack is used for
   A. Cleaning test tubes
   B. Heat chemicals in test tubes
   C. Holding and supporting test tubes
   D. Mixing solutions in test tubes

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match the statements in **LIST A** with their correct response in **LIST B** as they are used in the topic of matter. Write the answer in the table below.

LIST A	**LIST B**
i. Cause a substance to change to a completely different one	A. Condensation
ii. Is the process of changing a substance from gas to liquid	B. Diffusion
iii. Is the process of changing a substance from liquid to gas	C. Chemical change
iv. Is the movement of particles from an area of high concentration to an area of low concentration	D. Gaseous state
v. Particles experience very weak forces of attraction and they are free to move.	E. Sublimation
vi. Do not change the identity of substance	F. Liquid state
vii. Particles are held together by strong attractive forces so that they are not free to move.	G. Evaporation
viii. Is a measure of quantity of matter in an object	H. Solid state
ix. Is the process of changing a substance from solid to gas	I. Physical change
x. Is the process of changing a substance from liquid to solid	J. Freezing
	K. Mass
	L. Osmosis

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

3. Fill in the blank spaces. Use one word for each space.

   i. The joining together of metal pieces by heating their surfaces is called _____ and _____ flame is suitable for this task.

   ii. In periodic table metals in block between Group II and III are _____ elements and elements with both metallic and non-metallic characteristics are called_____

   iii. In a compound of Ammonium Sulphate $(NH_4)_2\ SO_4$, Ammonium radical form a _____ ion and Sulphate radical form a _____ ion.

   iv. To prevent metal from rusting we must ensure both _____ and _____ do not come into contact with the metal.

   v. The three components needed to start a fire are referred to as the fire _____ which are oxygen, fuel and _____

SECTION B: (50 Marks)

Answer ALL questions in this section.

4. a. Define the following terms

   i. Water treatment

   _____

   _____

   _____

   _____

   ii. Water purification

   _____

   _____

   _____

   _____

   iii. Solubility of a solute

   _____

   _____

   _____

   _____

iv. Organic solvent

_____

_____

_____

_____

b. List down two (2) factors which affect solubility of a substance.

i. _____

_____

ii. _____

_____

c. How can you test the presence of water in a substance?

_____

_____

_____

d. Why does sugar not dissolve in kerosene?

_____

_____

_____

_____

5. a. Define the following terms

i. Combustion

_____

_____

_____

ii. Fire fighting

_____

_____

_____

iii. Painting

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iv. Galvanization

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b. Mention three (3) areas where combustion is used.

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c. List down three (3) precautions that should be taken when using fire extinguishers.

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6. a. Mention classes of fuels according to their states.

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b. Explain briefly how biogas can be produced.

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c. Complete the following table

S/N	Conversion of forms of energy	Device used
i.	Electrical energy to heat energy	
ii.	Electrical energy to sound energy	
iii.	Solar energy to electrical energy	

d. List two (2) examples of non-renewable energy sources

_____

_____

_____

7. a. i. Define an atom.

_____

_____

_____

ii. Why protons and neutrons are called nucleons?

_____

_____

_____

_____

b. List down three (3) points of Dalton's Atomic Theory.

_____

_____

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c. Mention three (3) properties of electrons.

_____

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d. An atom Ag has mass number of 108 and an atomic number of 47.

Calculate the following

i. Number of neutrons

_____

_____

_____

_____

ii. Number of electrons

_____

_____

_____

_____

_____

8. a. What is an emulsions?

_____

_____

_____

b. i. Define chemical symbols

_____

_____

_____

_____

ii. Complete the following table

Name of element with two letters	**Symbol**
i.	
ii.	
Name of element with one letter	
i.	
ii.	

c. Give two (2) differences between compound and mixture.

_____

_____

_____

_____

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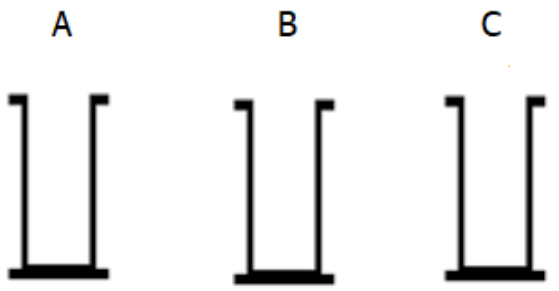
SECTION C: (20 Marks)

Answer TWO (2) questions from this section.

Question 9 is **COMPULSORY,** answer either (9a) or (9b)

9. a. You are provided with three gas jars A, B, and C. The first gas jar contains gas X, second contains gas Z and third contains gas Q respectively as shown below



Gas X reacts with potassium to form potassium oxide. Gas Z is highly flammable and burns with a blue flame. Gas Q turns lime water to milky.

i. Identify gas X, Z and Q

Gas X is _____

Gas Z is _____

Gas Q is _____

ii. Name the products formed when gas X reacts with gas Z

_____

_____

iii. How the gas X can be tested

_____

_____

_____

iv. Write down four (4) uses of gas Z

_____

_____

_____

_____

_____

9. b. I. Imagine you want to perform an experiment in the laboratory, name the apparatus to be used for the following work.

i. Holding a hot test tube _____

ii. Measuring weight of a substance _____

iii. Transferring a liquid from one beaker to another_____

iv. Adding reagent into the flask during experiment _____

v. Heating substance in the laboratory _____

II. Explain briefly the experiment used to separate salt from sea water by the following guidelines.

i. Aim of the experiment

_____

_____

_____

ii. Materials used

_____

_____

_____

iii. Diagram

10. a. What is molecular formula?

_____

_____

_____

_____

_____

b. Write two (2) points to remember when writing a chemical formulae.

_____

_____

_____

_____

_____

c. i. Calculate the molecular formula of calcium carbonate ($CaCO_3$), if its relative molecular mass is 200.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

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_____

_____

ii. Write the formula for the compound above.

_____

d. i. Calculate the molecular formula of methane (CH_4),if its relative Molecular mass is 48.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

ii. Write the formula for the compound above.

_____

11. a. Define the following terms

i. A covalent bond

_____

_____

_____

_____

ii. Molecule

_____

_____

_____

_____

b. Complete the following table

S/n	Name of compound	Chemical formulae of compound
i.	Sodium Chloride	
ii.	Iron(iii) Sulphate	
iii.	Magnesium Carbonate	
iv.	Potassium Chlorate	

c. List down four (4) properties of electrovalent compounds.

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