

Candidate's Examination Number _____

SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM THREE ENTRANCE EXAMINATION

043

CHEMISTRY

TIME: 2:30 HOURS

MONDAY 3RD DECEMBER 2018 a.m

INSTRUCTIONS TO CANDIDATES

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 **NINE (9)** is compulsory.
3. Write your Examination Number on each page.
4. Write your answers in the space provided.
5. Use blue or black pen in writing. The diagrams must be drawn in pencil.
6. Cellular phones are not allowed in the examination room.
7. The following constants may be helpful
N =14, H=1, O=16, Cu= 64, S=32, Mg =24, Cl =35.5, C = 12

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

This paper consists of 15 printed pages

SECTION A: (30 Marks)

Answer ALL questions

1. Choose the letter of the best answer and write it in the table below.
- i. Converts mechanical energy into electrical energy
A: Electric iron B: Speaker
C: Hydroelectric power plant D: Machine
- ii. The force of attraction that holds atoms together to form molecule
A: Chemical bond B: Energy C: Power D: Valency
- iii. Chemical process that occurs in iron
A: Plating B: Burning C: Removal D: Rusting
- iv. The use of oxygen
A: Used in refrigeration B: Killing living organism
C: Sustenance of living organism D: Used as a fuel
- v. The lightest and most abundant element in the universe
A: Hydrogen B: Calcium C: Oxygen D: Iron
- vi. The process of removing of contaminants from treated water to produce pure water
A: Water treatment B: Uses of water
C: Boiling D: Water purification
- vii. Arrangement of electrons in different energy level
A: Shell B: Electronic configuration
C: Electronic changing D: Nuclide notation
- viii. The oxidation number of Cr in $\text{Cr}_2\text{O}_7^{2-}$
A: -6 B: +6 C: 0 D: -4

- ix. The chemical formula of aluminum sulphate
 A: $AlSO_4$ B: Al_2SO_4 C: $Al_2(SO_4)_3$ D: $Al_2(SO)_4$
- x. Which of the following sets of symbols represents isotopes?
 A: $X_8^{16}, X_8^{17}, X_8^{18}$ B: $Y_7^{16}, Y_8^{17}, Y_9^{18}$
 C: $X_7^{16}, X_8^{16}, X_9^{16}$ D: $X_7^{16}, Y_8^{17}, Z_9^{18}$

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match the items in **LIST A** with the response in **LIST B**. Write the letter of the correct answer in the table below.

LIST A	LIST B
i. Are used to improve the quality and quantity of crops grown. ii. Special room or building that is designed and used for scientific experiment. Usually used to accurately measure and dispense liquid. iv. It is among the causes of accident in the laboratory. v. The injury that causes a change in the colour of the skin. vi. It produces a black substance known as soot. vii. Protons and neutrons. viii. A group of atoms with unpaired electrons. ix. The ability or capacity of doing work. x. The regular periodic changes of elements due to their atomic number	A: Bruises B: Luminous flame C: Radicals D: Periodicity E: Burette F: Energy G: Nucleons H: Laboratory I: Fertilizers J: Beaker K: Power L: Wrong use of equipment M: Choking N: Non luminous flame

ANSWERS

LIST A	i	ii	iii	iv	v	vi	vii	viii	ix	x
LIST B										

3. Fill in the blanks, one word for each space.

- i. Heat is the _____ of being _____.
- ii. Weed killers are chemical _____ that are used to destroy unwanted _____ which are harmful to crops.
- iii. Chemical _____ signs are _____ symbols found on chemical containers especially those used in the laboratory.
- iv. In immiscible liquids the dense liquid settles at the _____ while the least dense remain at the _____ of the separating funnel.
- v. Fire is the state or process of _____ in which ignited material combine with _____ and give off light, heat and flame.

SECTION B: (50 Marks)

Answer ALL questions in this section.

4. a) What is a chemical formula?

b) Differentiate between molecular formula and empirical formula.

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c) A certain compound contains 1.59% hydrogen, 22.22% nitrogen and 76.19% oxygen. Calculate its

i) Empirical formula

ii) Molecular formula, if its relative molecular mass is 63.

iii) Name the compound

5. a) i) What is biogas?

ii) List down any two (2) materials that can produce biogas in our local environment.

iii) Why is the biogas is mostly encouraged to use as fuel compare to other types of fuel.

b) i) What is renewable energy?

ii) Mention any two (2) examples of renewable energy.

iii) Write two (2) areas where renewable energy can be used.

6 a) i) What is scientific procedure?

ii) List down all steps of scientific procedure.

iii) Mention any two (2) areas of application of scientific procedures.

7 a) Define the following terms

i) Unsaturated solution

ii) Solute

iii) Emulsion

b) Give any two (2) differences between mixture and compound.

Mixture	Compound
i)	i)
ii)	ii)

c) i) Outline any two (2) significance of chemical symbol.

ii) Write the symbols of Sodium, Potassium and Beryllium.

8. a) i) How an ion is formed?

ii. By using \odot and \times , Show how potassium chloride is formed.

b. List down three (3) properties of electrovalent compound.

c. Calculate the oxidation number (state) of underlined elements

i) $K\underline{C}lO_3$

ii) $\underline{C}O_3^{2-}$

SECTION C: (20 Marks)

Answer any two (2) questions from this section.

Question 9 is compulsory; answer either (9a) or (9b)

9. a i) Study the table which shows reaction of some metals with oxygen, then fill the blanks

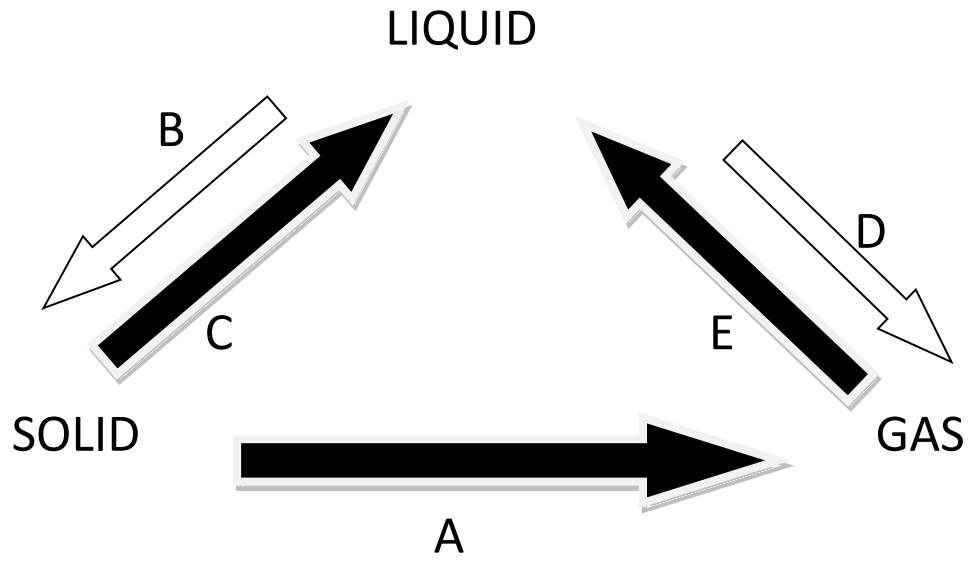
Metal	How it burns	Colour of flame	Name of product formed
Potassium		White powder	
Calcium		White solid	
Zinc	Slowly with a dull red flame		

- ii) Outline two (2) physical properties of oxygen.

- iii) List down any two (2) industrial uses of oxygen

9. b i) Explain briefly the three (3) states of matter.

ii) Study the summary diagram of the change of matter from one state to another and then answer the questions that follows:



Identify the name of change indicated by letters

A _____

B _____

C _____

D _____

E _____

iii) Define the change represented by letter A

iv) Mention one example of substance that can undergo the change represented by letter A

10 a. i. Define periodic table.

ii. State modern Periodic law.

iii. Below are groups of elements, arrange them in their respective position in the periodic table as shown below

I	II	III	IV	V	VI	VII	O

(Li, B, C, N, O, F, Ne, Mg, Al, Si, P, Cl)

11. a) Draw the warning sign which represent

i) Harmful substance

ii) Irritant substance

iii) Oxidant

b) i) Why it is important to put in a place safety measures in a laboratory?

ii) Why all persons working in a laboratory required to wear appropriate protective clothing?

c) What is the aim of using fume chamber in the laboratory?

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FOR ROUGH WORK