Candidate's Examination Number_____

SMZ

ZANZIBAR EXAMINATIONS COUNCIL

FORM THREE ENTRANCE EXAMINATION

043 CHEMISTRY

TIME: 2.30 HOURS THURSDAY 5th DECEMBER, 2019 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 (9) is compulsory.**
3. **All answers must be written in spaces provided under each question.**
4. **Write your examination number on each page.**
5. **The following constants may be used**
   C = 12, O = 16, H =1, Na =23, Ca =40
6. **Cellular phones are not allowed in the examination room.**
7. **Use blue or black pen in writing. The diagrams must be drawn in pencil.**

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

This paper consists of 14 printed pages

SECTION A: (30 Marks)

Answer all questions in this section

1. Choose the letter of the best answer and write it in the table below.

   i. Chemistry deals with
   A. Composition and structure of matter.
   B. Structure and properties of matter.
   C. Composition and properties of matter.
   D. Composition, structure and properties of matter.

   ii. The blockage of upper part of the airway by food or other objects
   A. Bruises B. Choking C. Shock D. Suffocation

   iii. A summary of the results of the experiment and a statement of how the results relate to the hypothesis
   A. Data interpretation B. Problem identification
   C. Drawing conclusion D. Data collection

   iv. One of the following is physical change
   A. Milk left on the counter turns sour.
   B. Common salt dissolves completely in water.
   C. A forest fire burns all the trees.
   D. Fruits are fermented to produce wine.

   v. The process of separating heterogeneous mixture of a solid and liquid.
   A. Layer separation B. Decantation.
   C. Evaporation D. Filtration

   vi. The process of coating iron or steel with zinc.
   A. Tin plating B. Painting C. Galvanization D. Oiling

   vii. Hydrogen can be collected by upward displacement of water because
   A. It is slightly soluble in water B. It is highly soluble in water
   C. It is highly colourised in water D. It is highly reactive in water

   viii. In an atom protons are
   A. Positively charged in the shells B. Negatively charged in the shells.
   C. Positively charged in the nucleus. D. Negatively charged in the nucleus.

ix. The correct formula for the combination of Mg^{2+} and PO_4^{3-} ions
A. Mg_2PO_4 B. $Mg_3(PO_4)_2$ C. $Mg_2(PO_4)_3$ D. $MgPO_4$

x. The highest temperature that can be reached by the burning fuel.
A. Pyrometric burning effect. B. Velocity of combustion.
C. Ignition point. D. Energy value.

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

2. Match the following uses in **LIST A** with their corresponding items in **LIST B**. Write the letter of the correct answer in the table below.

LIST A	**LIST B**
i. Measure and indicate temperature.	A. Electronic balance
ii. Soothing chapped skin	B. Mortar and pestle
iii. Reducing muscle pain	C. Thermometer
iv. Add reagents into flasks during experiment	D. Antibiotic
v. Crushing or grinding substance	E. Petroleum jelly
vi. Cleaning wounds to kill germs	F. Liniment
vii. Treating mild bacterial infections on the skin	G. Pipette
viii. Measure specific volume of a liquid	H. Soap
ix. Covering small wounds	I. Plaster
x. Measure the mass of chemicals	J. Antiseptic
	K. Thistle funnel
	L. Spatula

ANSWERS

i	ii	iii	iv	v	vi	vii	viii	ix	x

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

i) Weed killers are _____ substances that are used to destroy unwanted _____ which are harmful to crops.

ii) Stored chemicals in laboratory should be _____ regularly to ensure they have not _____.

iii) The two types of hardness of water are _____ hardness and _____ hardness.

iv) A radical is group of _____ with _____ electrons.

v) The process of separating a _____ from a liquid is called _____.

SECTION B: (50 Marks)
Answer ALL questions in this section.

4. a) Define an atom.

_____

_____

_____

b) i) List down any three (3) points of Dalton's atomic theory.

_____

_____

_____

_____

ii) What is electronic configuration?

_____

_____

_____

c) Below are elements, draw their electronic configuration and suggest if they are either metals or non metals.

i) ^{3}X _____

ii) ^{9}Y _____

iii) ^{19}K _____

iv) ^{17}CF _____

5. a) What is a Bunsen burner?

_____

_____

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b) Why is the Bunsen burner most widely used as a source of heat in the laboratory?

_____

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_____

c) Briefly explain the following

i) Why is a non-luminous flame suitable for cooking?

_____

_____

_____

ii) Why is luminous flame used for lighting?

_____

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iii) Why are some chemicals and mixtures needed to be heated up?

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6. a) Define the following

i) Nomenclature

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ii) Ionic compound

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b) Write the chemical formulae of the following compound

i) Sodium chloride _____

ii) Magnesium sulphate _____

iii) Calcium chloride _____

c) Calculate and write the molecular formula of the following compounds

i) $C_3H_6O_3$ if its molecular mass is 180

_____

_____

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_____

ii) CH_2O if its molecular mass is 360

_____

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7. a) i) What is firefighting?

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_____

ii) List down components needed to start a fire.

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iii) List down any two (2) domestic application of combustion

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b) i) What is portable fire extinguishers?

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

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8. a) Define the following

i) Noble gases

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ii) Halogens

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b) Write any four (4) properties of transition metals.

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c) i) What are metalloids? Give any two (2) examples

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ii) In the periodic table elements are classified into group number, what does this signifies (mean)?

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SECTION C: (20 marks)

Answer ANY TWO (2) questions from this section.

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

9. a) Khatibu of a certain Secondary School wants to prepare hydrogen and oxygen.

i) List down chemicals that he could use in the preparation of oxygen and hydrogen.

Oxygen	Hydrogen

ii) Differentiate between chemical test of oxygen and hydrogen.

Chemical test of oxygen	Chemical test of hydrogen

iii) List two (2) industrial uses of oxygen.

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iv) List down any two (2) laboratory methods of preparation of hydrogen.

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vi) List down two (2) common laboratory methods of preparation of oxygen.

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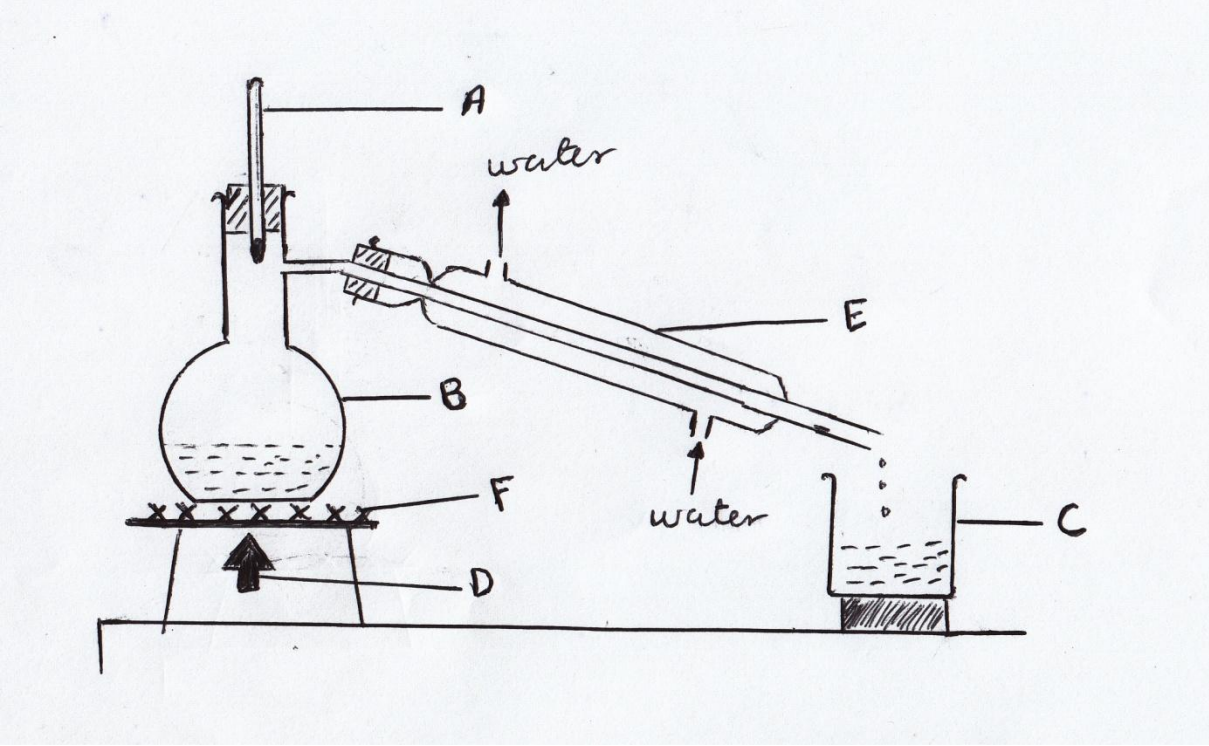
9. b) Below is an experimental apparatus arrangement done by a certain student at XYZ Secondary School.



i) Label the parts marked from A to F

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ii) What is the role of the apparatus marked E

_____

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iii) Suggest the aim of this experiment

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iii) Suggest the name of this process

_____

_____

iv) Define the process

_____

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10. a) What is covalent bond?

_____

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_____

b) List down any three (3) properties of covalent compounds

_____

_____

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_____

c) What is oxidation number?

_____

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d) Find the oxidation state of underlined elements

i) $K\underline{Cl}O_3$

_____

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ii) $\underline{Cr_2O_7}^{2-}$

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11. a i) What is biogas?

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ii) How can biogas be produced?

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b. i) What is global warming?

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ii) Write short essay on any three (3) environmental effects of using firewood as source of fuel.

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