

**SMZ****ZANZIBAR EXAMINATIONS COUNCIL****FORM THREE ENTRANCE EXAMINATION****043****CHEMISTRY****TIME: 2.30 HOURS****THURSDAY 5<sup>th</sup> 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.

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

**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 coloured 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  $\text{Mg}^{2+}$  and  $\text{PO}_4^{3-}$  ions  
 A.  $\text{Mg}_2\text{PO}_4$       B.  $\text{Mg}_3(\text{PO}_4)_2$     C.  $\text{Mg}_2(\text{PO}_4)_3$     D.  $\text{MgPO}_4$
- 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.

| <b>LIST A</b>                                       | <b>LIST B</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.

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

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- ii) What is electronic configuration?

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

i)  ${}^3\text{X}$  \_\_\_\_\_

ii)  ${}^9\text{Y}$  \_\_\_\_\_

iii)  ${}^{19}\text{K}$  \_\_\_\_\_

iv)  ${}^{17}\text{CF}$  \_\_\_\_\_

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?

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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 |
|-------------------------|---------------------------|
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- 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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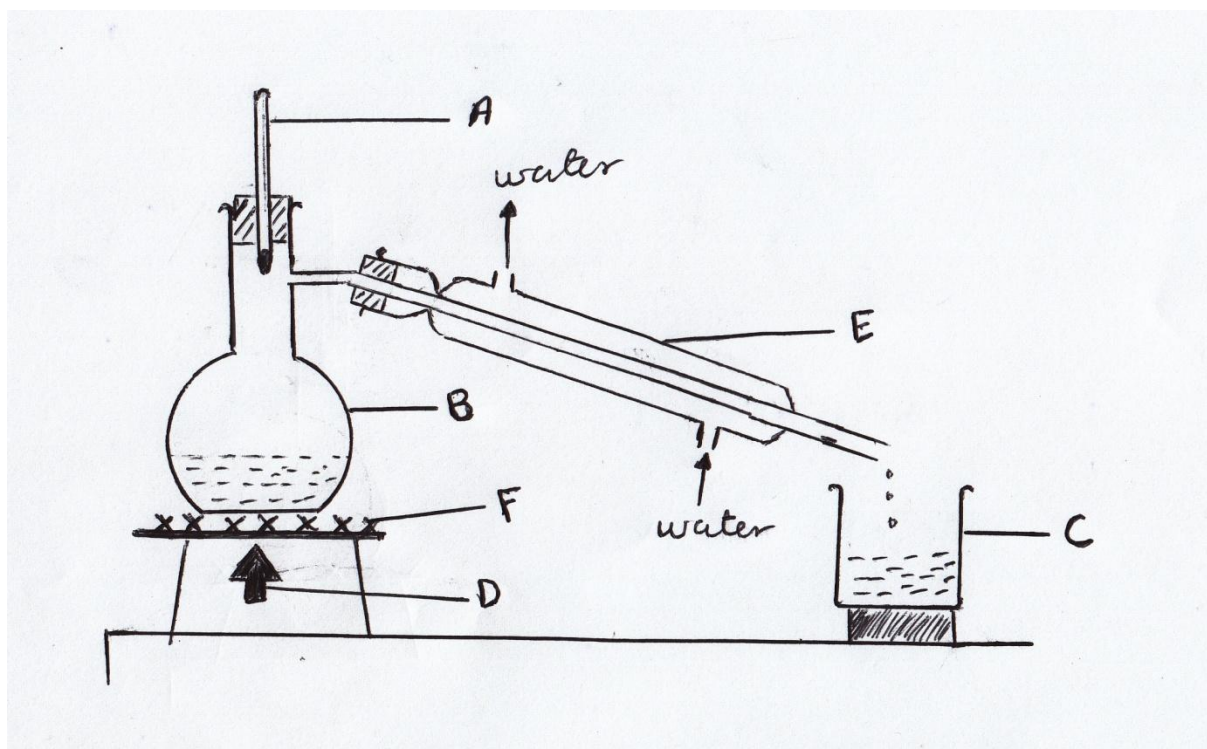


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9. b) Below is an experimental apparatus arrangement done by a certain student at XYZ Secondary School.



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

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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)  $\text{K}\underline{\text{Cl}}\text{O}_3$

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ii)  $\text{Cr}_2\text{O}_7^{2-}$

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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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