*Candidate's Examination Number ……*

**THE UNITED REPUBLIC OF TANZANIA**
**NATIONAL EXAMINATIONS COUNCIL**
**FORM TWO SECONDARY EDUCATION EXAMINATION, 2010**

**0032** **CHEMISTRY**

**Time: 2½ HOURS**

**INSTRUCTIONS**

1. This paper consists of sections A, B and C.

2. Answer **ALL** questions.

3. Write your examination number at the top right corner of every page.

4. **ALL** writing must be in black or blue ink **EXCEPT** diagrams which must be in pencil.

5. Cellphones and calculators are not allowed in the examination room.

6. The following atomic masses may be used: $H = 1$, $O = 16$, $C = 12$, $Na = 23$, $S = 32$, $Ca = 40$

| **FOR EXAMINER'S USE ONLY** | | |
|---|---|---|
| **QUESTION NUMBER** | **SCORE** | **INITIALS OF EXAMINER** |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |
| 9 | | |
| 10 | | |
| **TOTAL** | | |

This paper consists of 4 printed pages.

## SECTION A (10 MARKS)

1. Questions (i) - (x) are multiple choice items. Select the best answer in each case and write its letter (A, B, C, or D) in the box provided.

(i) In scientific study, the tentative explanation for the observed chemical phenomenon can be proved by:
A. Data analysis
B. Experimentation
C. Hypothesis
D. Observation

(ii) A certain liquid dissolves copper (II) sulphate to form a blue solution. This liquid is likely to be:
A. Hydrochloric acid
B. Liquid oxygen
C. Nitric acid
D. Water

(iii) When a chemist studies a substance he/she is interested in its:
A. Force of attraction
B. Properties
C. Shape
D. Smell

(iv) The boiling point of pure water at sea level is 100°C and that of ethanol is 78°C. The mixture of ethanol and water can be separated by:
A. Filtration process
B. Fractional distillation process
C. Layer separation process
D. Sublimation process

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(vi) Which group among the following elements are metals?
A. Calcium, magnesium, and sodium
B. Calcium, hydrogen, and nitrogen
C. Calcium, carbon, and magnesium
D. Oxygen, potassium, and sodium

(vii) An electrovalent bond is formed by:
A. Arrangement of electrons
B. Sharing of electrons

C. Transfer of electrons
D. Vibrations of electrons

(viii) Petrol is an example of:
A. Corrosive substance
B. Flammable substance
C. Irritating substance
D. Toxic substance

(ix) The electronic configuration of silicon is:
A. 2:7:3
B. 2:8:2
C. 2:8:3
D. 2:8:4

(x) The most abundant element on the earth is:
A. Carbon
B. Iron
C. Nitrogen
D. Oxygen

2. Match each item in List A with a correct response in List B by writing its letter below the number of the corresponding item in the table provided.

| LIST A | LIST B |
|---|---|
| (i) Gas that relights a glowing splint | A. Hydrogen |
| (ii) Process of coating iron with zinc | B. Nitrogen |
| (iii) Separates immiscible liquids | C. Galvanization |
| (iv) Element with atomic number 7 | D. Oxygen |
| (v) Turns lime water cloudy | E. Carbon dioxide |
| (vi) Used to measure precise volumes of liquids | F. Burette |
| (vii) Liquid at room temperature | G. Mercury |
| (viii) Method to separate salt from seawater | H. Evaporation |
| (ix) Gas used in electric bulbs | I. Argon |
| (x) Prevents direct heating of glassware | J. Wire gauze |

**Answers:**

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

## SECTION B (70 MARKS)

Answer ALL questions from this section. Each question carries 7 marks.

3. (a) Define the term "element".

   (b) Name three elements found in the earth's crust.

   (c) Classify the following as metals or non-metals:

   (i) Sodium

   (ii) Chlorine

   (iii) Carbon

4. (a) What is meant by the term "chemical bond"?

   (b) Draw diagrams to show the electron arrangement in:

   (i) A sodium atom (atomic number 11)

   (ii) A sodium ion

   (c) State the type of bond formed between sodium and chlorine.

5. (a) Define the term "mixture".

   (b) List three differences between a homogeneous and a heterogeneous mixture.

   (c) Name one method to separate sand from a sand-water mixture.

6. (a) What is meant by the term "combustion"?

   (b) State three conditions necessary for combustion to occur.

   (c) Name one product formed when carbon undergoes combustion.

7. (a) Define the term "oxidation number".

   (b) Calculate the oxidation number of the underlined elements:

   (i) $K_2CO_3$ (C underlined)

   (ii) $HNO_3$ (N underlined)

   (c) State one example of an oxidation reaction in everyday life.

8. (a) What is meant by the term "laboratory safety"?

   (b) List three safety rules to follow when handling acids in the laboratory.

   (c) Name one piece of equipment used for personal protection in the laboratory.

9. (a) Define the term "fuel".

   (b) Name two fuels commonly used in Tanzanian households.

   (c) Explain one disadvantage of using firewood as a fuel.

10. (a) What is meant by the term "water purification"?

    (b) Describe two methods used to purify water in a laboratory.

    (c) State one importance of purifying water for domestic use.