Candidate's Examination Number ……

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
FORM TWO SECONDARY EDUCATION EXAMINATION, 2003

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 6 printed pages.

SECTION A (10 MARKS)

1. Write down the letter of the most correct response for each question:

(i) Chemistry is one of the sciences which deals with:
A. Alkalinity and basicity of substances
B. The study of body cells
C. Composition, properties and behaviour of matter
D. Chemical changes

(ii) One isotope of an element has atomic number A and mass number M. How many neutrons are contained in the nucleus of its atom?
A. M
B. A
C. A - M
D. M - A

(iii) In the diagram T represents a:
A. Bunsen burner flame
B. Region of unburnt gas
C. Zone of complete combustion
D. Gas burning

(iv) The neutral point in the pH scale is:
A. 0.7
B. 7
C. 6
D. 8.0

(v) If the element M in group I combines with element X of group VI, the formula of the compound formed is:
A. MX
B. MX_2
C. X_2M
D. M_2X

(vi) Group seven elements are known as:
A. Alkali metals
B. Transition metals
C. Alkaline earth metals
D. Halogens

(vii) The simplest ionic equation which summarizes the process of neutralization is:
A. $H^+ + NaO^- \rightarrow H_2O + Na^+$
B. $NaOH + Cl^- \rightarrow NaCl$

C. $H^+ + OH^- \rightarrow H_2O$
D. $Na^+ + Cl^- \rightarrow NaCl$

(viii) Which of the following chemical species have the same number of electrons?
A. K^+, Ca^{2+}, Cl^-, and Ar
B. Cl^-, Be^{2+}, and O^{2-}
C. O^{2-}, Mg^{2+}
D. Na^+, Mg^{2+}, Be^{2+}, and Li^+

(ix) A pipette is used for:
A. Measuring distance or length
B. Measuring specific volume of liquids
C. Measuring volumes
D. Heating liquid

(x) The process of chlorination in water treatment aims at:
A. Killing micro-organisms
B. Syrup making
C. Forming suspension
D. Removing bad odours

2. Match each item in List A with a correct response in List B by writing its letter against the appropriate statement in the space provided.

LIST A	LIST B
(i) ... is a non-metal oxide which combines with water to form an acid	A. Mercuric oxide
(ii) ... determines the arrangement of orbital electrons of an atom	B. Efflorescent
(iii) ... is the addition of hydrogen to or removal of oxygen from a substance	C. Air
(iv) ... loses water of crystallization at room temperature	D. Data analysis
(v) ... Is a gas heavier than air, does not support combustion and extinguishes flames	E. Bonding
(vi) ... Shows both acidic and basic properties	F. Valency
(vii) ... is used to test the presence of water in a substance	G. Hydrogen oxide
(viii) ... is the way by which atoms become stable	H. Electronic configuration
(ix) ... Is a mixture of gases	I. Washing soda
(x) ... the modern scientific procedure	J. Carbon dioxide
	K. Zinc oxide
	L. Combustion
	M. Sulfur dioxide
	N. Reduction
	O. Anhydrous copper sulphate

SECTION B (70 MARKS)

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

3. (a) What is matter?

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(b) Mention three (3) states of matter.

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(c) Write the names of the following processes of changing matter from one state to another:

(i) Solid to liquid: .....

(ii) Liquid to gas: .....

(iii) Gas to liquid: .....

4. (a) Write the chemical symbols for the following:

(i) Lead: .....

(ii) Potassium: .....

(iii) Gold: .....

(iv) Sodium: .....

(v) Chlorine: .....

(b) Write the formulae for the following compounds:

(i) Carbon tetrachloride: .....

(ii) Magnesium oxide: .....

(iii) Aluminum sulphate: .....

(iv) Ammonia: .....

(v) Nitrogen dioxide: .....

(c) Write balanced equations for the following chemical reactions:

(i) Iron + Sulphate → Iron sulphate

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(ii) Decomposition of calcium carbonate

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(iii) Magnesium hydroxide + Hydrochloric acid → Magnesium chloride + H_2O

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(iv) Silver nitrate + Sodium chloride → Silver chloride + Sodium nitrate

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(v) Potassium + Sulphuric acid → Potassium sulphate + Hydrogen gas

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5. (a) Define the term indicator.

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(b) Name the colours of indicators when they are in acidic or alkaline solution.

INDICATOR	ACID SOLUTION	ALKALINE SOLUTION
(i) Methyl Orange (MO)	.....	.....
(ii) Litmus	.....	.....
(iii) Phenolphthalein (POP)	.....	.....

(c) Find the oxidation state or number of the following underlined elements:

(i) Mg: .....

(ii) NO_3^- (N underlined): .....

(iii) SO_2 (S underlined): .....

(iv) Na_3PO_4 (P underlined): .....

6. (a) Element A and B in the Periodic Table have atomic numbers 12 and 13 respectively.

(i) Which element has a higher ionization energy?

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(ii) Of the two elements, which one has smaller atoms?

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(iii) Which type of bond forms when element A combines with chlorine?

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(iv) Find the charge of atom A after the reaction in question (iii).

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(b) Mention four methods of preventing rusting.

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(c) Define the following:

(i) Acid: .....

(ii) Base: .....

7. (a) Which method would you use to separate each of the following mixtures?

(i) Water mixed with kerosene: .....

(ii) Iron powder mixed with sand: .....

(iii) Ammonium chloride crystals mixed with sodium chloride crystals:

.....

(iv) Water mixed with alcohol: .....

(b) Write three differences between a mixture and a compound.

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8. (a) Classify each of the following chemical equations as displacement, combination, neutralization, deposition, or decomposition:

(i) $BaCl_2(aq) + ZnSO_4(s) \rightarrow BaSO_4(s) + ZnCl_2(aq)$: .....

(ii) $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$: .....

(iii) $2Na(s) + 2HCl(aq) \rightarrow 2NaCl(aq) + H_2(g)$: .....

(iv) $CaO(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + H_2O(l)$: .....

(v) $CuCO_3(s) \rightarrow CuO(s) + CO_2(g)$: .....

(b) What is the use of the following apparatus?

(i) Sandbath: .....

(ii) Dropper: .....

(iii) Tripod stand: .....

(iv) Pipette: .....

(v) Desiccator: .....

9. (a) Draw a well labelled diagram of preparation of hydrogen gas.

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(b) What is the test for hydrogen gas?

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(c) State any three uses of hydrogen.

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10. (a) Define the term combustion.

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(b) Write down three (3) examples of combustible substances.

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(c) Explain why a luminous flame is not used for heating.

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(d) What do you understand by the following chemical warning terms?

(i) Explosive: .....

(ii) Toxic: .....

(iii) Flammable: .....

(iv) Harmful: .....