Candidate's Examination Number ……

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
FORM TWO SECONDARY EDUCATION EXAMINATION, 2002

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		

SECTION A (10 MARKS)
Answer ALL questions from this section.

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

(i) The study of chemistry involves:
A. Living organisms and their functions
B. Composition and reactions of substances
C. Physical properties of planets
D. Mathematical calculations

(ii) The number of protons in an atom is known as its:
A. Mass number
B. Atomic number
C. Neutron number
D. Electron number

(iii) In a Bunsen burner, the hottest part of the flame is:
A. The yellow region
B. The blue zone
C. The unburnt gas area
D. The outer edge

(iv) A solution with a pH of 2 is:
A. Neutral
B. Weakly acidic
C. Strongly acidic
D. Alkaline

(v) When an element from Group II combines with an element from Group VII, the formula of the compound formed is:
A. MX
B. M_2X
C. MX_2
D. X_2M

(vi) Group I elements are known as:
A. Halogens
B. Alkali metals
C. Noble gases
D. Transition metals

(vii) The ionic equation for the reaction between an acid and a base is:
A. $H^+ + Cl^- \rightarrow HCl$

B. $Na^+ + OH^- \rightarrow NaOH$
C. $H^+ + OH^- \rightarrow H_2O$
D. $H^+ + Na^+ \rightarrow NaH$

(viii) Which of the following species have the same number of electrons?
A. Na^+, Mg^{2+}, F^-, Ne
B. Cl^-, K^+, Ca^{2+}
C. O^{2-}, S^{2-}, Ar
D. Li^+, Be^{2+}, B^{3+}

(ix) A burette is used for:
A. Heating substances
B. Measuring precise volumes of liquids
C. Filtering suspensions
D. Storing chemicals

(x) The purpose of filtration in water treatment is to:
A. Remove dissolved salts
B. Kill bacteria
C. Remove solid particles
D. Add flavor

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) Gas that supports burning	A. Evaporation
(ii) Process of separating salt from water	B. Oxygen
(iii) Element with atomic number 11	C. Sodium
(iv) Apparatus for heating liquids	D. Beaker
(v) Gas that produces a pop sound	E. Hydrogen
(vi) Prevents rust by coating iron	F. Galvanization
(vii) Liquid at room temperature	G. Mercury
(viii) Separates immiscible liquids	H. Separating funnel
(ix) Turns litmus paper red	I. Acid
(x) Method to test for starch	J. Iodine solution

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) What is an element?

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(b) Mention three elements found in everyday life.

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

(i) Liquid to solid: .....

(ii) Solid to gas: .....

(iii) Gas to solid: .....

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

(i) Iron: .....

(ii) Sulphur: .....

(iii) Silver: .....

(iv) Calcium: .....

(v) Nitrogen: .....

(b) Write the formulae for the following compounds:

(i) Sodium chloride: .....

(ii) Carbon dioxide: .....

(iii) Magnesium sulphate: .....

(iv) Water: .....

(v) Ammonia: .....

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

(i) Sodium + Water → Sodium hydroxide + Hydrogen

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(ii) Burning of carbon in oxygen

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(iii) Calcium hydroxide + Nitric acid → Calcium nitrate + Water

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(iv) Zinc + Hydrochloric acid → Zinc chloride + Hydrogen

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(v) Decomposition of copper(II) carbonate

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5. (a) Define the term acid.

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

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

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

(i) Na: .....

(ii) CO_3^{2-} (C underlined): .....

(iii) H_2SO_4 (S underlined): .....

(iv) K_2CrO_4 (Cr underlined): .....

6. (a) Elements X and Y in the Periodic Table have atomic numbers 9 and 10 respectively.

(i) Which element has a higher ionization energy?

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

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(iii) Which type of bond forms when element X combines with hydrogen?

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

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(b) Mention four laboratory safety rules.

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(c) Define the following:
(i) Base: .....
(ii) Mixture: .....

7. (a) Which method would you use to separate each of the following mixtures?
(i) Oil mixed with water: .....
(ii) Sugar mixed with sand: .....
(iii) Iodine mixed with sodium chloride: .....
(iv) Ethanol mixed with water: .....

(b) Write three differences between a homogeneous and a heterogeneous mixture.
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8. (a) Classify each of the following chemical equations as displacement, combination, neutralization, decomposition, or precipitation:
(i) $Zn(s) + CuSO_4(aq) \rightarrow ZnSO_4(aq) + Cu(s)$: .....
(ii) $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$: .....
(iii) $HCl(aq) + NaOH(aq) \rightarrow NaCl(aq) + H_2O(l)$: .....
(iv) $Pb(NO_3)_2(aq) + 2NaCl(aq) \rightarrow PbCl_2(s) + 2NaNO_3(aq)$:
.....
(v) $2KClO_3(s) \rightarrow 2KCl(s) + 3O_2(g)$: .....

(b) What is the use of the following apparatus?
(i) Evaporating dish: .....
(ii) Spatula: .....
(iii) Bunsen burner: .....
(iv) Measuring cylinder: .....
(v) Fume cupboard: .....

9. (a) Draw a well labelled diagram of preparation of oxygen gas.
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(b) What is the test for oxygen gas?
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(c) State any three uses of oxygen.
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10. (a) Define the term fuel.

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(b) Write down three examples of fuels used in Tanzania.

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(c) Explain why a non-luminous flame is preferred for heating.

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

(i) Corrosive: .....

(ii) Toxic: .....

(iii) Irritant: .....

(iv) Oxidizing: .....