Candidate's Examination Number ……

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
FORM TWO SECONDARY EDUCATION EXAMINATION, 2001

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 8 printed pages.

SECTION A (10 MARKS)

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

(i) A hypothesis in chemistry is:
A. A proven fact
B. A tentative explanation
C. A final conclusion
D. An observation

(ii) An isotope of an element has 8 protons and 9 neutrons. How many neutrons are in its nucleus?
A. 8
B. 9
C. 17
D. 1

(iii) The region of a Bunsen burner flame with incomplete combustion is:
A. Blue zone
B. Yellow region
C. Inner cone
D. Outer edge

(iv) A solution with a pH of 10 is:
A. Neutral
B. Weakly acidic
C. Strongly alkaline
D. Weakly alkaline

(v) When an element from Group I 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 II elements are known as:
A. Alkali metals
B. Halogens
C. Alkaline earth metals
D. Noble gases

(vii) The product of neutralization between an acid and a base is:
A. Salt only
B. Water only

C. Salt and water
D. Gas and water

(viii) Which of the following species are isoelectronic?
A. Li^{+}, Be^{2+}, B^{3+}, C^{4+}
B. F^{-}, Ne, Na^{+}, Mg^{2+}
C. Cl^{-}, K^{+}, Ca^{2+}
D. O^{2-}, S^{2-}, Ar

(ix) A measuring cylinder is used for:
A. Heating liquids
B. Measuring approximate volumes of liquids
C. Filtering solids
D. Storing gases

(x) The purpose of boiling in water treatment is to:
A. Remove dissolved impurities
B. Kill micro-organisms
C. Soften water
D. Improve taste

- 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 used in fire extinguishers	A. Carbon dioxide
(ii) Process of coating iron with zinc	B. Galvanization
(iii) Element with atomic number 17	C. Chlorine
(iv) Apparatus for precise liquid measurement	D. Pipette
(v) Gas that relights a glowing splint	E. Oxygen
(vi) Separates liquids with different densities	F. Separating funnel
(vii) Liquid used in antiseptics	G. Ethanol
(viii) Turns anhydrous copper sulphate blue	H. Water
(ix) Method to test for proteins	I. Biuret test
(x) Element in group IV, period 2	J. Carbon

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 a compound?

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(b) Mention three compounds used in daily life.

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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 solid: .....

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

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

(i) Aluminium: .....

(ii) Phosphorus: .....

(iii) Copper: .....

(iv) Magnesium: .....

(v) Fluorine: .....

(b) Write the formulae for the following compounds:

(i) Calcium chloride: .....

(ii) Nitrogen monoxide: .....

(iii) Sodium carbonate: .....

(iv) Hydrogen sulphide: .....

(v) Potassium nitrate: .....

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

(i) Magnesium + Oxygen → Magnesium oxide

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(ii) Sodium hydroxide + Sulphuric acid → Sodium sulphate + Water

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(iii) Decomposition of potassium chlorate

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(iv) Iron + Chlorine → Iron(III) chloride

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(v) Calcium + Hydrochloric acid → Calcium chloride + Hydrogen

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5. (a) Define the term base.

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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) Phenolphthalein	.....	.....
(iii) Methyl Orange	.....	.....

(c) Find the oxidation state or number of the following underlined elements:
(i) K: .....
(ii) SO_4^{2-} (S underlined): .....
(iii) HNO_3 (N underlined): .....
(iv) $KMnO_4$ (Mn underlined): .....

6. (a) Elements P and Q in the Periodic Table have atomic numbers 16 and 17 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 P combines with hydrogen?

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

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(b) Mention four methods of separating mixtures.

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(c) Define the following:
(i) Acid: .....
(ii) Solution: .....

7. (a) Which method would you use to separate each of the following mixtures?
(i) Sand mixed with water: .....
(ii) Iron filings mixed with sulphur powder: .....
(iii) Ammonium chloride mixed with sand: .....
(iv) Methanol mixed with water: .....

(b) Write three differences between a solution and a suspension.

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

(i) $2Mg(s) + O_2(g) \rightarrow 2MgO(s)$: .....

(ii) $AgNO_3(aq) + NaCl(aq) \rightarrow AgCl(s) + NaNO_3(aq)$: .....

(iii) $HCl(aq) + KOH(aq) \rightarrow KCl(aq) + H_2O(l)$: .....

(iv) $Cu(s) + 2AgNO_3(aq) \rightarrow Cu(NO_3)_2(aq) + 2Ag(s)$: .....

(v) $2H_2O_2(l) \rightarrow 2H_2O(l) + O_2(g)$: .....

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

(i) Crucible: .....

(ii) Tongs: .....

(iii) Gas jar: .....

(iv) Dropper: .....

(v) Filter funnel: .....

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

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(b) What is the test for carbon dioxide gas?

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(c) State any three uses of carbon dioxide.

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10. (a) Define the term laboratory safety.

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(b) Write down three examples of laboratory accidents.

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(c) Explain why a fume cupboard is used in a laboratory.

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

(i) Flammable: .....

(ii) Corrosive: .....

(iii) Harmful: .....

(iv) Explosive: .....