Candidate's Examination Number ……

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
FORM TWO SECONDARY EDUCATION EXAMINATION, 2013

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 the letter of the correct answer in the box provided for each of the following items:

(i) The apparati used for grinding granular chemicals in the laboratory include:
A. crucible and watch glass
B. mortar and pestle
C. pestle and pair of tongs
D. spatula and basin.

(ii) The substances that can be used to extinguish fire are:
A. carbon dioxide and sand
B. carbon dioxide and sugar
C. nitrogen and sand
D. nitrogen and water.

(iii) Which of the following electronic configurations are of metals?
A. 2:8:1 and 2:5
B. 2:8:2 and 2:6
C. 2:8:3 and 2:8:8:1
D. 2:8:6 and 2:8:8:7

(iv) When sugar is dissolved in water, a uniform mixture is formed. The resulting mixture is called a:
A. solute
B. solution
C. solvent
D. suspension.

(v) Flammable chemicals are those which:
A. burn skin
B. catch fire easily
C. explode
D. extinguish fire.

(vi) Which of the following can be classified as a renewable source of energy?
A. Biomass
B. Coal
C. Coke
D. Petroleum

(vii) The part of the Bunsen burner that controls the amount of air coming in is called:
A. air hole
B. barrel
C. collar
D. jet.

(viii) An element X with atomic number 16, belongs to:
A. period 3, group III, valency of 2
B. period 3, group VI, valency of 2
C. period 3, group VI, valency of 6
D. period 6, group VI, valency of 6

(ix) The simplest formulas of a compound formed when combining 13g of aluminium and 17g of chlorine is:
A. AlCl
B. Al_2Cl
C. Al_3Cl_2
D. $AlCl_3$

(x) The second step in the scientific procedure is:
A. data collection and analysis
B. data interpretation
C. experimentation and observation
D. hypothesis formulation

SECTION B (20 MARKS)

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)	Ability of an atom to gain or attract electrons towards itself	A. Chlorination
(ii)	Addition of oxygen to or removal of hydrogen from a substance	B. Covalent
(iii)	A substance which behaves in three states of matter	C. Electronegativity
(iv)	Bond formed between two atoms due to sharing of two electrons from each other	D. Electropositivity
(v)	Combining power of an element	E. Evaporation
(vi)	Liquids which form layers when mixed	F. Groups
(vii)	Reddish brown coating on metals	G. Ionic
(viii)	Supports burning of substances	H. Kerosene and water
(ix)	The number of electrons in the outermost shell	I. Oxidation
(x)	Treatment and purification of water for human uses	J. Oxygen
		K. Reduction
		L. Rust
		M. Sugar and alcohol
		N. Valency
		O. Water

ANSWERS

LIST A	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
LIST B										

3. (a) What do you understand by the following terms?
   (i) Empirical formula _____

   _____

   (ii) Relative atomic mass _____

   _____

   (b) A certain compound K contains 15.8% carbon and 84.2% sulphur. The molar mass of K is 76 g/mol. Determine its:

   (i) simplest formula

   (ii) molecular formula

4. (a) What do you understand by the following terms?
   (i) Flame _____

   _____

(ii) Bunsen Burner _____

_____

(iii) Laboratory _____

_____

(b) List four properties of each of the following:

(i) A luminous flame _____

_____

_____

_____

(ii) A non-luminous flame _____

_____

_____

_____

(c) Write the chemical formula for each of the following compounds:

(i) Sodium carbonate _____

(ii) Calcium nitrate _____

(iii) Ammonium chloride _____

5. (a) Calculate the percentage by composition of the underlined elements in the following compounds:

(i) Na_2SO_4	(ii) $Ca(HCO_3)_2$

(b) Give the use of each of the following components which are found in the First aid kit:

(i) Plaster _____

_____

(ii) A pair of scissors _____

_____

(iii) Cotton wool _____

_____

(iv) Gloves _____

_____

(c) Categorize the following changes as either chemical or physical:

(i) Freezing of juice in a bottle _____

(ii) Rusting of iron _____

(iii) Burning of wood _____

(iv) Drying of wet clothes _____

6. (a) Define the following terms:

(i) Chemistry _____

_____

(ii) Element _____

_____

(iii) Catalyst _____

_____

(b) Give three differences between the following:

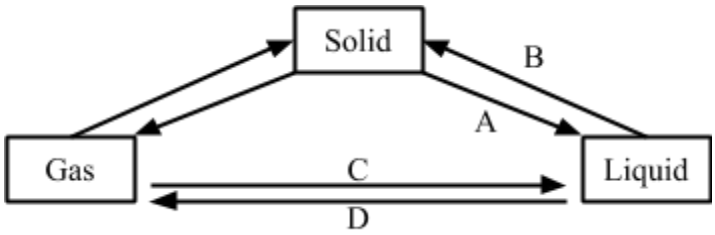
(i) Compound and mixture

Compound	Mixture

(ii) Suspension and solution

Suspension	Solution

7. (a) The figure below shows the relationship among three states of matter.
Name the processes involved in A, B, C and D.



A _____ B _____

C _____ D _____

(b) State the valency of the following atoms:

(i) Aluminium _____ (ii) Neon _____

(iii) Sulphur _____ (iv) Potassium _____

(c) Give the chemical formula for the combination of the following sets of ions:

(i) Mg^{2+}, PO_4^{3-} _____

(ii) Fe^{3+},SO_4^{2-} _____

8. (a) Write a word equation for each of the following reactions:

(i) Calcium burns in oxygen

_____

(ii) Sodium reacts with water

_____

(b) What do you understand by the following terms?

(i) Water treatment _____

_____

(ii) Water purification _____

_____

(c) Mention six uses of water in economic activities

(i) _____ (ii) _____

(iii) _____ (iv) _____

(v) _____ (vi) _____

9. Gas "L" has the following properties: It is highly flammable, readily combines with other elements, readily reacts with other chemical substances and is a strong reducing agent.

   (a) Name the gas "L" _____

   (b) What is the method used to collect gas "L" in the laboratory? Give a reason.

   Method _____

   Reason _____

   (c) Give four uses of gas "L".

   (i) _____

   (ii) _____

   (iii) _____

   (iv) _____

10. (a) Mention four chemical properties of Oxygen.

   (i) _____

   (ii) _____

   (iii) _____

   (iv) _____

   (b) Find the oxidation number of each of the underlined elements in the following:

(i) $K\underline{Cl}O_3$	(ii) $\underline{Cr}_2O_7^{2-}$

   (c) Use the IUPAC system to name each of the following chemical compounds:

   (i) CuO _____

   (ii) $CaSO_4$ _____

   (iii) HNO_3 _____

   (iv) $ZnCl_2$ _____