Candidate's Examination Number ……

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
FORM TWO SECONDARY EDUCATION EXAMINATION, 2012

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)

Answer ALL questions from this section.

1. Write the letter of the correct answer in the box provided for each of the following items.

(i) All domestic utensils made of iron undergo rusting when exposed to:
A. Air and fire
B. Air and oil
C. Air and water
D. Water and oil

(ii) When a small amount of common salt is dissolved in a glass of water, the mixture formed is:
A. Heterogeneous
B. Homogeneous
C. Immiscible
D. Suspension

(iii) A chemist should acquire all of the following skills except:
A. Experimentation
B. Observation
C. Problem identification
D. Surgery

(iv) An important property of oxygen which distinguishes it from other gases is that it:
A. Burns and supports combustion
B. Burns but does not support combustion
C. Neither burns nor supports combustion
D. Supports combustion but does not burn

(v) The process of chlorination in water treatment aims at:
A. Forming suspension
B. Killing micro-organisms
C. Making syrup
D. Removing bad odour

(vi) One of the following is not correct about coke being a better fuel than coal as it:
A. Does not produce carbon dioxide gas
B. Does not produce poisonous gas
C. Has a higher heat content
D. Is clean and smokeless

(vii) Class E fire can best be extinguished by using:
A. Carbon dioxide
B. Fire blanket
C. Sand

D. Water

(viii) The following is a set of apparatuses which are used for heating:
A. Crucible, test tube, evaporating dish
B. Evaporating dish, tongs, crucible
C. Test tube, evaporating dish, tongs
D. Tongs, crucible, test tube

(ix) Which of the following methods can be used to get oil from cotton seeds?
A. Decantation
B. Distillation
C. Grinding and distillation
D. Grinding followed by squeezing

(x) Which of the following apparatuses is suitable for measuring volumes of smaller quantities of liquids?
A. Beaker
B. Burette
C. Conical flask
D. Measuring cylinder

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) A method used to separate mixtures of two or more liquids that form homogeneous solution by means of fractional column.	A. Biogas
(ii) A substance that absorbs moisture from the atmosphere and dissolves in it.	B. Chromatograph
(iii) Elements with stable structure.	C. Coke
(iv) Molecular mass of calcium carbonate.	D. Corrosive
(v) Poisonous gases prepared in it.	E. Deliquescent
(vi) Produces a "pop" sound.	F. Fractional distillation
(vii) Quiet and unsteady flame.	G. Fume chamber
(viii) Smokeless solid fuel.	H. Hydrogen
(ix) Source of energy derived from animal waste.	I. Luminous flame
(x) Used to prevent direct heat to reach the apparatus.	J. Noble gases
	K. Non-luminous flame
	L. Oxygen
	M. Wire gauze
	N. 80g/mol
	O. 100g/mol

Answers:

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

SECTION C

3. (a) Mariam was preparing food for her family using hot oil in a frying pan. Accidentally the pan tripped over and a huge fire spread over her kitchen floor.
   (i) Mention two extinguishers which would be appropriate for putting out the fire.
   (ii) Which fire extinguisher would be dangerous to use when trying to put out the fire in (a) above? Give reason.
   (b) Mention three conditions for a fire to start.
   (c) (i) What is combustion?
   (ii) Give three areas where combustion is applied.

4. (a) In an experiment, two iron nails A and B were used whereby painting was applied on nail A. The two nails were placed in a moist environment and after one month the weight of each nail was determined. Which of the two nails would be heavier? Give reason.
   (b) State the method which will be used to protect each of the following from rusting:
   (i) Covering iron sheets with a layer of most reactive metals
   (ii) Bicycle chain
   (c) Find the oxidation number of the underlined elements in the following:
   (i) MnO_4^-
   (ii) $K_2Cr_2O_7$

5. Use the details given below about elements P, Q, R, S, and T to answer questions (a) and (b).

Element	Atomic number	Atomic Mass
P	10	20
Q	11	23
R	12	24
S	13	26
T	14	32

   (a) (i) Write down the electronic configuration of the elements represented by letters from P to T.
   (ii) How many neutrons are present in element Q?

(b) Name the type of bonds that will be formed in the combination between the following elements:

(i) Q and T

(ii) S and T

(c) Write the chemical symbol for each of the following elements:

(i) Silver

(ii) Lead

(iii) Manganese

6. (a) Explain why petroleum and coal are non-renewable resources of energy.

(b) What is fuel?

(c) The problem facing Tanzanian society is misuse of charcoal and firewood as a source of fuel. Give two points of advice to the society on how to use less charcoal and firewood efficiently.

(d) Mention three categories of fuel and give two examples in each category.

7. (a) List down four careers that are a result of studying Chemistry.

(b) The following are possible causes of accidents which can occur in the Chemistry laboratory. State how you can avoid them.

(i) Poisonous chemicals left in an unlocked cupboard

(ii) A student picking up a bottle containing concentrated H_2SO_4 acid by the neck

(iii) Concentrated acids stored in the uppermost shelf of cupboard

8. (a) An experiment showed that 13.88g of calcium chloride were obtained from the combination of 5g of calcium with unknown relative mass of chlorine.

(i) What is the simplest formula of calcium chloride?

(ii) What kind of bond exists between calcium and chlorine?

(iii) Give two properties of the bond you have mentioned in (ii) above.

(b) Define the following terms as applied in Chemistry:

(i) Decantation

(ii) Filtration

(iii) Picking

(iv) Funnel Separation

(c) (i) Which is the most abundant element on the earth's outer crust?

(ii) The term used for acidic chemicals which can burn your skin is

(iii) Give the name of a flame which forms soot

9. (a) Explain why:

(i) A magnesium ion has a charge of 2+

(ii) A magnesium oxide has no overall charge

(b) Give the name of a bond which can be formed between two oxygen atoms

(c) (i) State the modern periodic law

(ii) Give the special name for each of the following groups of elements in the periodic table:

Group I

Group VII

(iii) Why is the atomic number a better way of identifying an element than the mass number?

10. (a) Mention four physical properties of water.

(b) What will happen when:

(i) A burning splint of wood is introduced into a gas jar containing oxygen gas

(ii) Oxygen gas reacts with metals

(iii) Hydrogen gas reacts with oxygen gas

(c) List four uses of hydrogen in our daily life.