Candidate's Examination Number.....

THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
FORM TWO NATIONAL ASSESSMENT

032 **CHEMISTRY**

Time: 2:30 Hours **Friday, 17th November 2017 a.m.**

Instructions

1. This paper consists of sections A and B with a total of **ten (10)** questions.
2. Answer **all** questions in the spaces provided.
3. **All** writing must be in black or blue ink **except** diagrams which must be in pencil.
4. **All** communication devices and calculators are **not** allowed in the examination room.
5. Write your **Examination Number** at the top right corner of every page.
6. The following atomic masses may be used: H = 1, N = 14, O = 16, S = 32, Ca = 40.

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QUESTION NUMBER	**SCORE**	**EXAMINER'S INITIALS**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTAL		

1 719032 100013

SECTION A (20 Marks)

Answer **all** questions in this section

1. For each of the items (i) - (x), choose the correct answer from the given alternatives and write its letter in the box provided.

(i) Which statement gives clear meaning of Chemistry?

A The study of matter in relation to energy
B The study of nature and properties of matter
C The study of matter and arrangement of particles
D The study of matter and chemical reactions

(ii) The mass number of an atom is determined by

A protons and neutrons.
B protons and electrons.
C neutrons and electrons.
D protons alone.

(iii) Which of the following is a metal?

A Water
B Chlorine
C Sodium
D Nitrogen

(iv) Air entering the Bunsen burner barrel can be controlled by

A metal ring.
B air hole.
C metal jet.
D air ring.

(v) How many atoms are there in a water molecule?

A Two
B Three
C Four
D Five

(vi) Which neutral atom has the same number of electrons as Mg^{2+}?

A Magnesium
B Sodium
C Neon
D Argon

(vii) The appropriate extinguisher used to put off fire caused by cooking oil is

A Water extinguisher.
B Carbon extinguisher.
C Wet chemical extinguisher.
D Dry air extinguisher.

(viii) A non-luminous flame is obtained if the air hole is

A fully opened.
B partially opened.
C closed.
D half opened.

(ix) Which gas is the least abundant gas in the air?

A Nitrogen.
B Oxygen.
C Neon.
D Carbon dioxide.

(x) The process which produces energy in form of heat and light is called

A decomposition.
B combustion.
C distillation.
D sublimation.

2. (a) 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 process of separating a mixture of sodium chloride and ammonium chloride.	A Evaporation
(ii)	A method used to separate oil and water.	B Filtration
(iii)	A method by which coloured substances is separated and identified.	C Boiling
(iv)	A method by which salt and water can be separated.	D Chromatography
(v)	A method used to get the solvent from the solution mixture.	E Distillation
		F Layer separation
		G Decantation
		H Sublimation

ANSWERS

List A	(i)	(ii)	(iii)	(iv)	(v)
List B					

(b) Fill in the blanks with the correct answer.

(i) A flame is a zone of burning gas that produces _____ and _____.

(ii) The arrangement of electrons in different shells in the atom is called _____.

(iii) A type of gas fuel derived from decomposing biological waste is called _____.

(iv) The three components of the fire triangle are heat, fuel and _____.

(v) A substance that speeds up a chemical reaction but remains chemically unchanged is called _____.

SECTION B (80 Marks)

Answer **all** questions in this section.

3. (a) Draw and state one function of each of the following apparatuses:

Apparatus	Drawing	Function
(i) Burette		

(ii) Filter funnel		
(iii) Beaker		

(b) Define the following terms:

(i) First aid

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(ii) Laboratory

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(c) List two components of a first aid kit.

(i) .....

(ii) .....

4. (a) Define matter.

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(b) Tell whether the following is a chemical change or physical change:

(i) Rotting of mango.....

(ii) Clouds changing into rain.....

(iii) Decaying of teeth.....

(c) State four differences between a chemical change and physical change.

S/n	Chemical change	Physical change
(i)		
(ii)		
(iii)		
(iv)		

5. (a) Write the names and formulae of the two chemicals that can be used in the preparation of oxygen gas.

(i) .....

(ii) .....

(b) (i) State an appropriate method of collecting oxygen gas based on solubility and density of the gas in water.

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(ii) How can oxygen gas be tested?

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(c) List four uses of oxygen gas.

(i) .....

(ii) .....

(iii) .....

(iv) .....

6. (a) Write the names of the following radicals:

(i) SO_3^{2-} .....

(ii) ClO_3^- .....

(iii) PO_4^{3-} .....

(b) Calculate the oxidation state of the underlined element in the following compounds:

(i) $NH_4\underline{Cl}$

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(ii) $Al_2\underline{O_3}$

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(iii) $Na_2\underline{SO_4}$

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(iv) H_2O_2

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(c) Calculate the percentage composition by mass of the underlined element in the following compounds:

(i) H_2SO_4

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(ii) $Ca(NO_3)_2$

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7. (a) (i) Why a flame produced by a "spirit lamp" may not be good for heating in the laboratory? Give two reasons.

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(ii) Name the type of flame produced by a spirit lamp.

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(b) By using locally available materials in your school, state how the fire can be extinguished in the following situations:

(i) Kerosene spilled on the floor catches fire.

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(ii) Friend's clothes catch fire which gets out of her control.

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(c) Suggest the suitable method of preventing rust in the following:

(i) Moving parts of machines e.g. motorcycle chain.

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(ii) Motor vehicle (car) bodies.

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8. The following is a part of periodic table with some elements represented by letters. Study it and answer the questions that follow.

I							VIII
A	II	III	IV	V	VI	VII	B
C							D
E					F	G	
	H						

(a) (i) Mention the names of the elements represented by letters:

A .....

B .....

C .....

D .....

E .....

F .....

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G .....

H .....

(ii) Write the electronic configuration of the elements represented by letter G and H.

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(b) Identify the letter which represents the elements with the following properties:

(i) Zero valency.....

(ii) Lightest atom.....

(iii) Alkaline earth metal.....

9. Hydrogen gas is prepared in the laboratory by reacting dilute hydrochloric acid and zinc granules.

(a) Write an alternative acid that can be used to prepare hydrogen instead of dilute hydrochloric acid.

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(b) Give two physical and two chemical properties of hydrogen.

S/n	Physical properties	Chemical properties
(i)		
(ii)		

(c) What will happen if a burning wooden splint is lowered in a test tube containing hydrogen gas?

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(d) Give two uses of hydrogen gas in daily life.

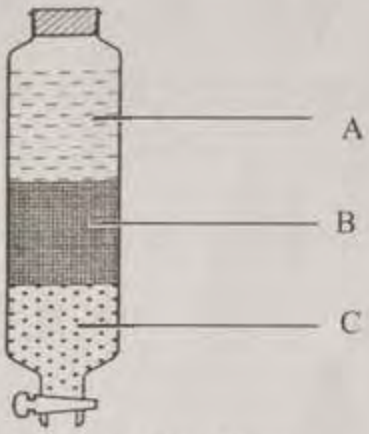
(i) .....

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(ii) .....

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10. (a) The following Figure shows the apparatus that can be used to separate three liquids: cooking oil, kerosene and water with density 0.92 g/cm^3, 0.65 g/cm^3 and 1.00 g/cm^3 respectively.



(i) Name the apparatus shown by the given figure.

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(ii) By giving a reason, identify liquids A and C.

Liquid A .....

Liquid C .....

Reason .....

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(b) The following table shows the name and the chemical formula of the product formed when ions combine together. Complete filling the table.

Table showing combination of ions

Ions		Name	Formula
Ca^{2+}	Cl^-	Calcium chloride	
Al^{3+}	SO_4^{2-}		$Al_2(SO_4)_3$
H^+		Hydrogen sulphate	