Student's Assessment Number ……

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

032 **CHEMISTRY**

Time: 2:30 Hours **Year: 2020**

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. Section A carries **twenty (20)** marks and section B carries **eighty (80)** marks.
4. All writing must be in black or blue ink **except** diagrams which must be in pencil.
5. Cellular phones and any unauthorized materials are **not** allowed in the assessment room.
6. Write your **Assessment Number** at the top right corner of every page.
7. The following atomic masses may be used: H = 1, N = 14, O = 16, S = 32, Ca = 40.

FOR ASSESSOR'S USE ONLY		
QUESTION NUMBER	**SCORE**	**ASSESSOR'S INITIALS**
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
TOTAL		
CHECKER'S INITIALS		

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) The net charge inside the nucleus of an atom is contributed by
A protons B neutrons
C electrons D all nucleons. ☐

(ii) Why oxygen as one of the components of air is unique?
A It support combustion
B It is a diatomic gas.
C It forms the largest part of the air.
D It has the largest density. ☐

(iii) Which material **is not** involved in respiration?
A Carbon dioxide B Nitrogen
C Oxygen D Water ☐

(iv) Which element causes permanent hardness of water when combined with sulphate?
A aluminium B magnesium
C potassium D sodium. ☐

(v) Carbon dioxide, Oxygen, Nitrogen and Hydrogen Sulphide are
A major components of air.
B covalent compounds.
C divalent gases.
D ionic compounds. ☐

(vi) Which common feature is associated with elements of the same group?
A Equal number of protons
B Equal number of electrons
C Equal number of valence electrons
D Equal number of shells. ☐

(vii) The oxidation state of metallic elements is always
A negative B neutral
C positive D zero. ☐

(viii) An isotope of Lead with atomic number of 82 and mass number of 207 has
A 82 protons, 125 neutrons and 82 electrons.
B 125 protons, 82 neutrons and 125 electrons.
C 82 protons, 207 neutrons and 125 electrons.
D 207 protons, 207 electrons and 82 neutrons. ☐

(ix) Which conditions are necessary for iron nails to rust?
A oxygen and moisture B carbon and oxygen
C carbon dioxide and oxygen D oxygen and nitrogen. ☐

(x) Which decision should be made if the results of an experiment **do not** support the stated hypothesis?

A To use the results as an idea for further testing.
B To ignore the results and set a new experiment.
C To repeat the experiment in the same way.
D To identify a new problem.

2. (a) Match the items in **List A** with a correct response in **List B** by writing the letter of the correct response below the corresponding item number in the table provided.

List A	List B
(i) An element with atomic number 2.	A Groups
(ii) The type of bonding which occurs between non metals.	B Group 1
(iii) Elements in the Periodic Table found in groups IV to VII.	C Ionic bonding
(iv) Vertical columns of the Periodic Table.	D Metals
(v) Elements which react vigorously with water.	E Noble gas
	F Non - metals
	G Covalent bonding
	H Halogen

Answers

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

(b) Answer the given questions by writing the correct answer in the blank spaces provided.

(i) In which stage is the hypothesis tested during scientific investigation? …….
(ii) On which factor does the physical state of a molecule depend? …….
(iii) Which properties depend on the proportions of mixing substances in a mixture? …….
(iv) What are the building blocks of matter? …….
(v) Which particles are transferred during chemical reactions? …….

SECTION B (80 Marks)

Answer **all** questions in this section.

3. (a) Why candles are not suitable for heating in the laboratory? Give two reasons.

(i) ……

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(ii) ……

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(b) Differentiate luminous from non-luminous flame by giving five points.

S/N	Luminous flame	Non luminous flame
(i)		
(ii)		
(iii)		
(iv)		
(v)		

4. (a) State four main ideas of Dalton's atomic theory of matter.

(i) ……

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(ii) ……

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(iii) ……

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(iv) ……

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(b) Classify each of the following elements into their respective groups and periods.

S/N	Element	Group	Period
(i)	Calcium		
(ii)	Hydrogen		
(iii)	Chlorine		
(iv)	Boron		
(v)	Aluminium		

5. (a) With an example for each, give two fields in which the scientific procedure is applied.

(i) ……
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(ii) ……
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(b) Categorize the three factors (variables) which affect the problem being investigated during scientific investigation.

(i) ……
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(ii) ……
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(iii) ……
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6. (a) Briefly explain why:

(i) the use of charcoal is harmful to the environment.

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(ii) charcoal is still being used by majority of Tanznaians for domestic purposes.

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(b) A mass of 20.0 g of petrol was burnt in air. The heat produced was used to heat 2.5 litres of water. Given that the heat value of petrol is 43,640 kJ/kg, by how much the temperature of water could have changed? (The specific heat capacity of water = 4.18 kJ kg^{-1} K^{-1}, Density of water = 1000 kg/m^3).

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7. (a) Why is petrol **not** recommended to be used as fuel in school laboratories? Briefly explain.

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(b) Which three heat sources can be used to boil some water in the laboratory instead of the Bunsen burner.

(i) ……
(ii) ……
(iii) ……

(c) Arrange the following steps for lighting the Bunsen burner in a correct sequence using letter A to F.

A Turn the collar to close the air hole completely.
B Turn on the gas fully to ensure that plenty of gas is entering the burner.
C Connect the Bunsen burner to the gas mains.
D Adjust the gas tap until the supply of gas is enough for a time.
E Light the gas at the top of the barrel with a lighted matchstick.
F Close the air hole.

Answer

Step	1	2	3	4	5	6
Letter						

8. (a) Giving a reason, state whether rust will form or not in each of the situations (i) - (vi).

(i) Iron bar is dipped into boiling water.

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(ii) Painted iron is dipped into un-boiled water.

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(iii) Iron bar is dipped in un-boiled water.

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(iv) Oiled bar is left outside the room over nights.

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(v) Aluminium wire is dipped in un-boiled water.

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(vi) A dry iron bar is wrapped with cotton wool.

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(b) Briefly explain any four methods of preventing rusting.

(i) ……

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(ii) ……

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(iii) ……

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(iv) ……

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9. (a) Write chemical formulae of the two compounds from which oxygen gas can be prepared by decomposition.

(i) ……

(ii) ……

(b) What are the three physical properties of oxygen gas?

(i) ……

(ii) ……

(iii) ……

(c) Why is it important to have abundant oxygen gas on the Earth? Give five reasons.

(i) ……

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(ii) ……………………………………………………………………………………………
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(iii) ……………………………………………………………………………………………
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(iv) ……………………………………………………………………………………………
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(v) ……………………………………………………………………………………………
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10. Identify the five accidents which are common in the laboratory and in each explain possible causes and preventive measures to be taken.

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