

R&PUBLIC OF SOMALILAND

FORM FOUR EXAMS, 2023

CHEMISTRY



NATIONAL EXAMINATION BOARD





SOM EXAMS

OK

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Total Score

Name.....

School

Roll No

Republic of Somaliland
Somaliland National Examination Board
Form Four

Chemistry
Examination

2023

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of **10** printed pages.

Count them now. Inform the invigilator if there are any pages missing.

Exam consists of two Parts:

PART 1:	Multiple choice Questions	40 Marks
PART 2:	Structured Questions	60 Marks
	TOTAL	100 Marks

- Answer ALL questions in Part 1 and 2.
- Extra papers and Mobile Not Allowed.



Part One: Multiple Choice

(20 X 2 Marks = 40 Marks)

1. The Atomic number of atom (Z) is the: -
 - a. Number of electrons only
 - b. Number of protons
 - c. Number of protons and neutrons
 - d. Number of electrons and protons

2. The Electron arrangement of Oxygen atom is:-
 - a. $1S^2, 2S^2, 2P^5$
 - b. $1S^2, 2S^2, 2P^6$
 - c. $1S^2, 2S^2, 2P^3$
 - d. $1S^2, 2S^2, 2P^2$

3. A P-Sub-Shell Contains :-
 - a. 1 Orbital
 - b. 2 Orbital
 - c. 3 Orbital
 - d. 4 Orbital

4. The Relative formula mass of MgO is: -
(Mg=24, O=16)
 - a. 41
 - b. 42
 - c. 40
 - d. 43

5. The relative molecular mass HNO_3 is: -
(H=1, N=14, O=16)
 - a. 60
 - b. 63
 - c. 61
 - d. 62

6. The molecular mass of N_2 molecule is: -
(N=14)
 - a. 30
 - b. 29
 - c. 27
 - d. 28

7. Which of the following is Ionic compound: -
- SO₂
 - H₂O
 - AlCl₃
 - NH₃
8. Which of the following is Covalent Compound: -
- NaCl
 - MgO
 - CaCl₂
 - CO₂
9. Which of the following compound is Carboxylic acid: -
- HCl
 - H₂SO₄
 - HNO₃
 - CH₃COOH
10. A triple Covalent bond atoms share: -
- 1 pair of electrons
 - 2 pair of electrons
 - 3 pairs of electrons
 - 4 pairs of electrons
11. Organic compound with same molecular formula but different structural formula are: -
- Isotopes
 - Allotropes
 - Isomers
 - Polymers
12. When ΔH (KJ/mole) is a negative value it indicates:-
- Endothermic process
 - Exothermic process
 - Oxidation process
 - Reduction process
13. Which of the following is a characteristic of Acids: -
- Change the red Litmus to blue
 - Has a bitter test
 - Produces OH⁻ ions
 - Produces H ions

14. Carbon dioxide gas is produced when an acid react with: -
- An alkali
 - A metal
 - A Carbonates
 - Another acid
15. In an electrolytic cell, negative ions (Anions) are attracted to the:-
- Cathode
 - Anode
 - Both Cathode and Anode
 - All of the above
16. Electrolysis can be used: -
- Metal extraction
 - Metal purification
 - Electroplating
 - All of the above
17. Which of the following gases is an air pollutant?
- Hydrogen
 - Oxygen
 - Nitrogen
 - Carbon monoxide
18. Air pollution that generated from human activities is called: -
- Natural pollution
 - Artificial pollution
 - Catalytic converter
 - Reducing pollution
19. When a solvent and solute are soluble they form: -
- Suspension
 - Solution
 - Solute
 - Solubility
20. We can Separate salt from a salt solution by:-
- Filter funnel
 - Filtration
 - Evaporation
 - Chromatography

PART TWO Structured Question

(10 X 6=60 marks)

1. Atoms of Carbon are shown below

A	B	C
^{12}C	^{13}C	^{14}C

a. State the number of protons in atom A and B. (2 Marks)

.....
.....

b. State the number of neutrons in atom A and B. (2 Marks)

.....
.....

c. What do mean by the term Isotope? (2 Marks)

.....
.....
.....

2. The table below shows two ions:

A	B
$^{40}_{20}\text{Ca}^{2+}$	$^{35}_{17}\text{Cl}^{-}$

a. State the number of electrons of the above ions. (2 Marks)

.....
.....

b. Write the electronic configuration (in Spdf) of particle A? (2 Marks)

.....
.....
.....

c. Write down the electronic arrangement (in Spdf) of particle B?(2 Marks)

.....
.....
.....

3. Butane is Hydrocarbon molecule (C_4H_{10})

a. Workout the relative molecular mass of C_4H_{10} :- (2 Marks)
(RAM = C=12, H=1)

.....
.....

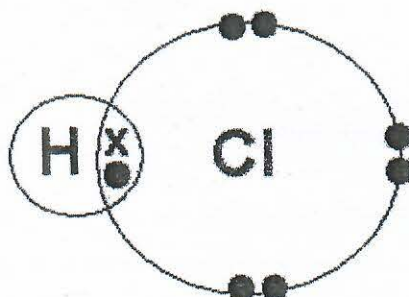
b. Calculate the mass percent of Hydrogen in Butane? (2 Marks)

.....
.....

c. Calculate the mass percent of Carbon in Butane? (2 Marks)

.....
.....

4. This diagram shows the cross-dot diagram of Hydrogen Chloride molecule:-



hydrogen chloride
only outer electrons shown

a. How many electrons are shared? (2 Marks)

.....
.....

b. Name the bond that hold the atoms together. (2 Marks)

.....
.....

c. Why atoms of different elements react together? (2 Marks)

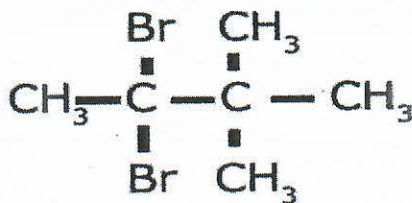
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5. Write down the correct IUPAC name of the following organic compounds:-
(2 Marks)

a.

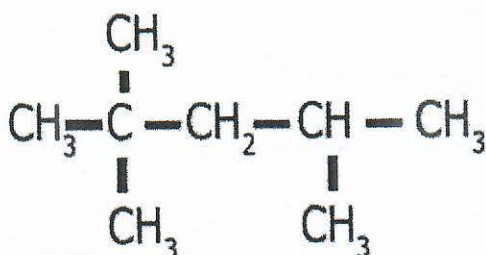


b.



(2 Marks)

c.



(2 Marks)

6. Define the following terms:-

a. i) Exothermic process. (1 Marks)

.....
.....

ii) Endothermic process. (1 Marks)

.....
.....

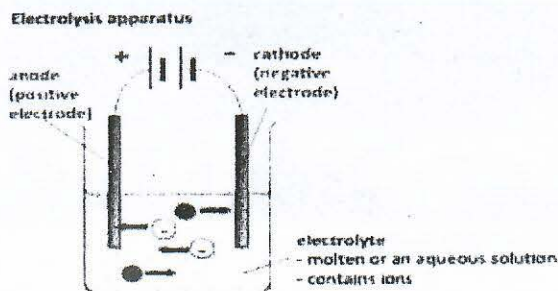
b. Bond energy. (2 Marks)

.....
.....

c. Enthalpy change. (2 Marks)

.....
.....

7. The electrolysis of Lithium Chloride Solution is shown below.



a. What is?
i. Anode. (1 Marks)

.....

ii. Cathode. (1 Marks)

.....

b. Define the electrolyte? (2 Marks)

.....

c. List four ions present in the above solution (2 Marks)

.....

8. The table below show PH of some acids Alkalis.

A	B	C	D	E
14	1	6	8	7

Which of the above substance is a:-

a. i) Weak acid (1 Mark)

.....

ii) Weak alkali (1 Mark)

.....

b. i) Strong acid (1 Mark)

.....

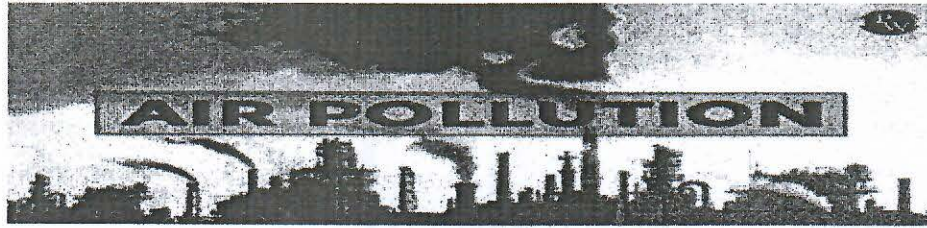
ii) Strong Alkali (1 Mark)

.....

c. Name one weak acid and one weak alkali in everyday life. (2 Marks)

.....

9. Air Pollution is serious Environmental problem:-



a. What is Air pollution? (2 Marks)

.....
.....
.....

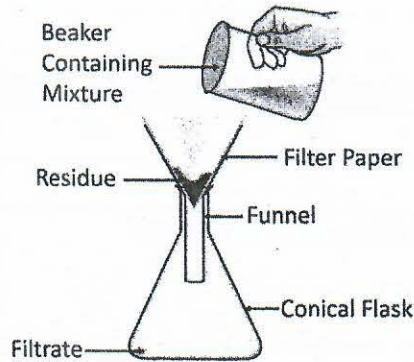
b. State two source of Air pollution? (2 Marks)

.....
.....
.....

c. List any two Pollutant gases. (2 Marks)

.....
.....
.....

10. Sand and water can be separated by this methode:-



a. What is the filtrate? (2 Marks)

.....
.....
.....

b. What is Residue? (2 Marks)

.....
.....
.....

c. Name the above separation process? (2 Marks)

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