

R&PUBLIC OF SOMALILAND

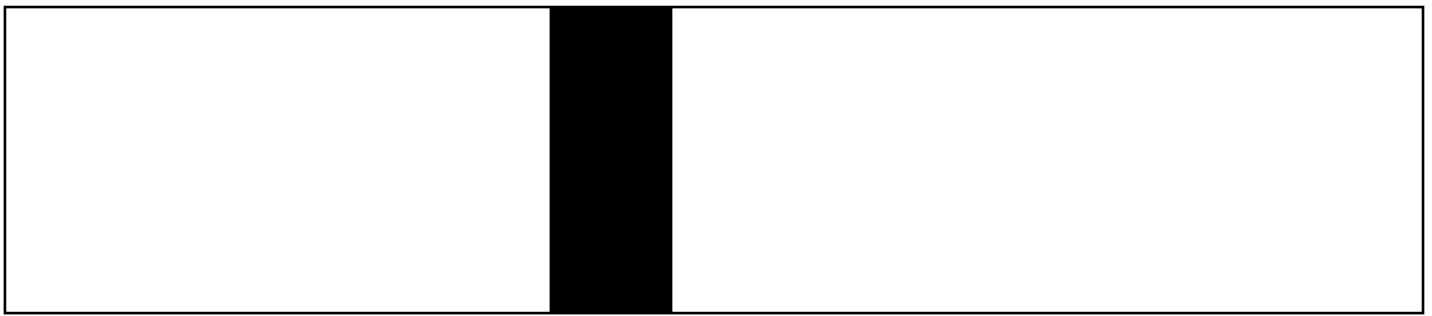
FORM FOUR EXAMS, 2022

CHEMISTRY



NATIONAL EXAMINATION BOARD





Total score

Name

School.....

Roll No.....

Republic of Somaliland

Somaliland National Examination Board

Form Four

Chemistry

JUNE 2022

TIME 2 HOURS

Plus 10 Minutes for reading through paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 12 printed pages.

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

PART 1: 20 MULTIPLE CHOICE QUESTIONS 40 MARKS

PART 2: SRTUCTURES QUESTIONS 60 MARKS

TOTAL 100 MARKS

- Answer ALL questions in part 1 and 2

All answers must be written on this paper in the spaces provided immediately after each question. Only write on this exam paper

Part one : Multiple choice

(20 x 2 marks = 40 marks)

- The number of electron in magnesium ion (Mg^{2+}) is
 - 10
 - 12
 - 11
 - 24
- The mass number of atom (A) is -
 - Protons and electrons
 - Protons and neutrons
 - Protons only
 - Electrons only
- The electronic Configuration of an atom with atomic number 13 is
 - $1S^2, 2S^2, 2P^6$
 - $1S^2, 2S^2, 2P^6, 3S^2$
 - $1S^2, 2S^2, 2P^3$
 - $1S^2, 2S^2, 2P^6, 3S^2, 3P^1$
- Below is diagram of two atoms:-



the above atoms are called :-

- Isomers
 - Allotropes
 - Isotopes
 - Iso electrons
- The attraction between oppositely charged ions in molecule is called:
 - Ionic bond
 - Covalent bond
 - Metallic bond
 - Polyatomic bond

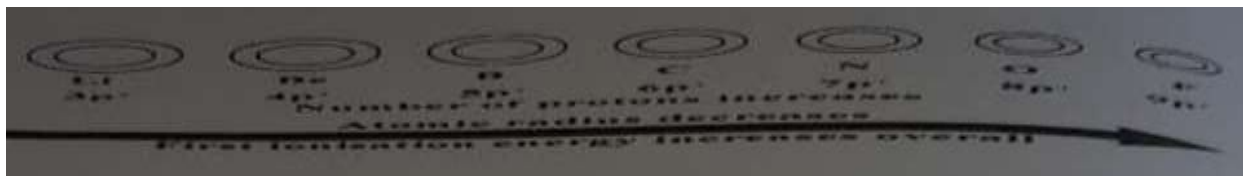
- A bond formed when two atoms share electrons is called :-

- a. Ionic bond
 - b. Covalent
 - c. Metallic
 - d. Polyatomic
7. In a double covalent bond atoms share
- a. One pair of electrons
 - b. 2 pair of electrons
 - c. 3 pair of electrons
 - d. 3 pair of electrons
8. The relative molecule mass of Oxygen molecule (O_2) is :- { RAM = O=16}
- a. 8
 - b. 16
 - c. 32
 - d. 48
9. The relative formula mass of (CO_2) is :- { RAM = C= 12 O=16}
- a. 42
 - b. 45
 - c. 44
 - d. 46
10. Molar mass of hydrogen Chloride (HCl) gas is :- { RAM =H = 1 CL=35.5}
- a. 36 g
 - b. 35.5 g
 - c. 36.5 g
 - d. 36.6 g
11. Organic compounds containing the functional group $-OH$ is:-
- a. Alkalis
 - b. Alcohols
 - c. Esters
 - d. Salts
12. Primary alcohol can be oxidized to form
- a. Bases
 - b. Acids
 - c. Esters
 - d. Aldehydes
13. The general formula of alkene homologous series is:-
- a. C_nH_{2n+2}

- b. C_nH_{2n+1}
 - c. C_nH_{2n}
 - d. C_nH_{2n-2}
14. In exothermic process
- a. Heat is produced
 - b. Catalyst is used
 - c. A gas is given off
 - d. Heat is absorbed
15. Which one of the following is endothermic process
- a. Combustion
 - b. Evaporation
 - c. Neutralization
 - d. Photosynthesis
16. Burning fuel is an example of
- a. Endothermic reaction
 - b. Neutrazation reaction
 - c. Exothermic reaction
 - d. Perception reaction
17. Which one of the following properties is base :-
- a. Turns litmus red
 - b. Turns litmus blue
 - c. It has sour taste
 - d. React with carbonates to produce CO_2
18. The liquid that allows electricity to pass through is :-
- a. Electroplating
 - b. Electrolysis
 - c. Electrolyte
 - d. Insulators
19. When a solvent and solute are soluble they form :-
- a. Melting
 - b. Freezing
 - c. Evaporation
 - d. Condensation

PART TWO STRUCTURE QUESTIONS (10X6=60 marks)

1. The Diagram below shows the gradual change in atomic radius across a Period



- a. Define the term atomic radius (1 mark)
.....
.....
- b. In the above figure what the term 3p, 4p, 5p, represents (2 marks)
.....
.....
- c. Lithium and fluorine, which one has a higher atomic radius. (1 mark)
.....
.....
- d. State the reason atomic radius of element decreases across a Period (2 marks)
.....
.....

2. This table shows symbols of several ions and atoms: -

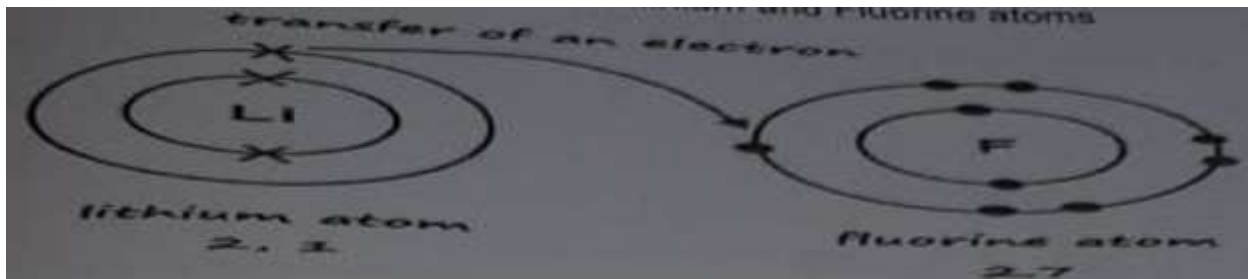
A	B	C	D
23 11 N ⁺	16 8 O ²⁻	40 20 C	35 17 Cl

- a. Define the following terms:
 - i. Ion
.....
.....
 - ii. Atom
.....
 - iii.
.....
- b. State the number of electrons in A. (2 marks)
.....

c. State the number of electrons in B (2 marks)

.....

3. Below is the cross-dot diagram of lithium and fluorine atoms



In above diagram:-

a. How many electrons are transferred (1 mark)

.....

b. Write down the chemical symbols of lithium ion and fluoride ion. (2 marks)

.....

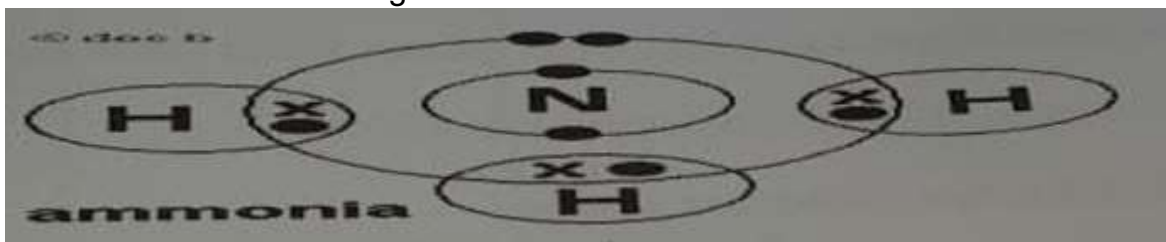
c. Name the type of bond formed when lithium and fluorine react (1 marks)

.....

d. Write a balanced chemical equation for the above reaction (2 marks)

.....

4. Below is the cross dot diagram of ammonia molecule:-



In this molecule:-

a. How many electrons are shared? (1 marks)

.....

b. Name the type of bond that holds the atoms (2 marks)

.....

c. Name the Un-shared pair of electrons. (1 marks)

.....

d. State two uses of Ammonia. (2 marks)

.....

.....

5. Ammonium nitrate (NH_4NO_3) is a compound used as fertilizer

a. Define these terms:-

i. Formula mass (1 mark)

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

ii. Molar mass (1 mark)

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

b. Calculate the relative formula mass of Ammonia (NH_3) molecule
(N=14, H=1) (2 marks)

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

c. Calculate the molar mass of ammonium nitrate NH_4NO_3
(NH_4NO_3), (N=14, O=16, H=1) (2 marks)

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

6. Hydrogen and Oxygen are two common gasses found naturally:-
(Avogadro's rule: - 1 mole of any gas at rtp = 24dm^3)

a. Define the term molar gas volume (2 marks)

.....
.....

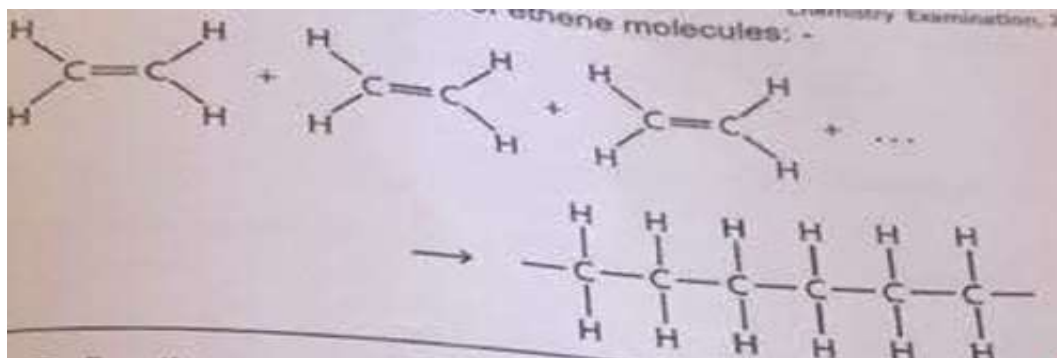
b. What is the volume occupied by 1 mole of any gas at rtp? (2 marks)

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

c. Calculate the molar gas volume of Oxygen (O_2) molecule at rtp
(2 marks)

d.
.....

7. This is a polymerization reaction of ethane molecules:-



a. Define the term polymerization (2 marks)

.....
.....

b. State the name of the Ethene molecules the joined together (1 mark)

.....
.....

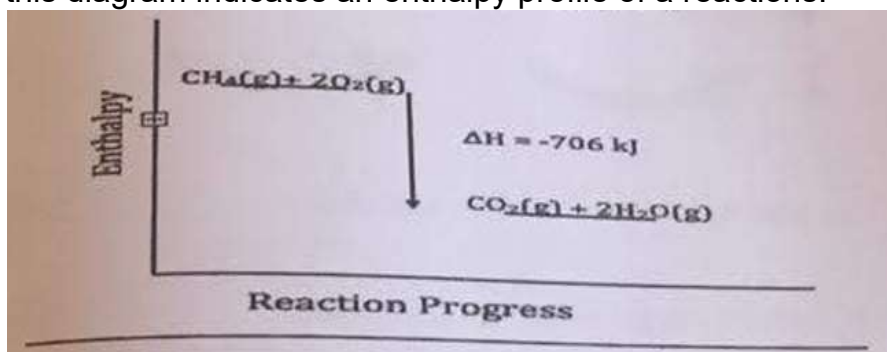
c. State the name of the product formed (1 mark)

.....
.....

d. is it addition or condensation polymerization? (2 marks)

.....
.....

8. this diagram indicates an enthalpy profile of a reactions:-



a. define the term, Bond enthalpy (2 marks)

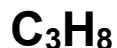
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b. State the unit used to measure the energy change in a reaction. (2 marks)

.....
.....

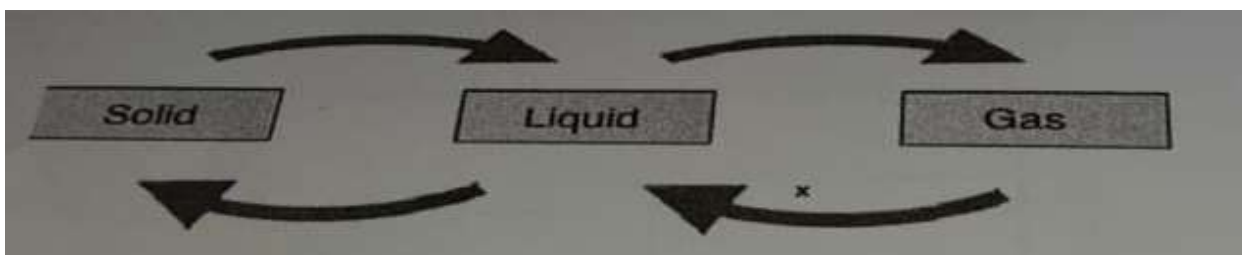
- c. What does the direction of the arrow indicate? (2 marks)
- d.

9. These are first four members of Organic family



- a. define the term homologous series (1 mark)
.....
.....
- b. State the homologous series of the above molecules belong to.
.....
.....
- c. Name another 2 members of this family (2 marks)
.....
.....
- d. Are they saturated or unsaturated hydrocarbons (2 marks)
.....

10. This figure indicates the change of state in water:-



- a. State the change of state from water to gas (1 mark)
.....
.....
- b. State the change of state from gas to water (1 mark)
.....
.....
- c. What name is given to the change of state from solid direct to gas? (2 marks)
.....
.....
- d. What happens to the particles of water when it changes gas to liquid? (2 marks)
.....