R&PUBL IC OF SOMALILAND

FORM FOUR EXAMS, 2017

CHEMISTRY

2017

NATIONAL EXAMINATION BOARD

SomExams

Total Score

Name.....

School.....

Roll No.....

Republic of Somaliland

Somaliland National Examination Board

Form Four

CHEMISTRY EXAMINATION

July 2017

TIME 2 HOURS

Plus 10 minutes for reading through the paper

INSTRUCTIONS TO CANDIDATES

This paper consists of 13 printed pages

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

There are two parts:

PART 1:	20 Multiple Choice Questions	20 Marks
PART 2:	7 Structured Questions	80 Marks
	TOTAL	**100 Marks**

- Answer all questions in part 1 and 2.
- No extra paper is allowed

Use this page for rough work. It will NOT be marked.

PART 1: Multiple choices:. Circle the correct answer. (20 Marks)

1. Isotopes of the same element differ in their :
   A. Number of protons
   B. Number of Neutrons
   C. Physical properties
   D. Chemical properties
2. The electronic configuration of the element in period 3 and group 4 of the periodic table is:
   A. 2, 8, 6
   B. 2, 8, 8, 3
   C. 2, 8, 18, 3
   D. 2, 8, 4
3. Electrons in one orbital must all have:
   A. Paired spins
   B. Unpaired spins
   C. Parallel spins
   D. Clockwise spins
4. The maximum number of electrons in the s and d sub- shells are respectively:
   A. 2, 6
   B. 6, 10
   C. 2, 10
   D. 2, 2
5. Which of the following is a polar covalent molecule :
   A. Hydrogen
   B. Oxygen
   C. Water
   D. Sodium chloride

6. Which of the following compounds contains a double bond :
   A. Hydrogen
   B. Hydrogen chloride
   C. Oxygen
   D. Ozone
7. The bond between atoms that both shared electrons is donated by one atom is called:
   A. Sigma bond
   B. Covalent bond
   C. Dative covalent bond
   D. Ionic bond
8. Which of the following is not true about Oxide ion $^{16}_{8}O$:
   A. 8 protons
   B. 10 electrons
   C. 8 electrons
   D. 8 Neutrons
9. The two types of bonds found in ammonia ion are :
   A. Covalent and ionic bond
   B. Metallic and Ionic bond
   C. Coordinate covalent and Covalent bond
   D. Polar Covalent and ionic bond

10. How many moles of carbon atoms are contained in 36 g?(RAM. C=12)
    A. 4
    B. 2.5
    C. 3
    D. 2
11. What is the percentage by mass of Oxygen in one molecule of water : (H =1, O=16)
    A. 11.11%
    B. 88.8%
    C. 20%
    D. 30%

12. How many moles are there in **0.5 gram** of $CaCO_3$

(RAMS = Ca = 40, C = 12, 0 = 16)

A. 50 moles

B. 100 moles

C. 25 mole

D. 75 mole

13. The formula Mass of ammonium Nitrate (NH_4NO_3) is :

(RAM, N = 14, H = 1, O = 16)

A. 80

B. 70

C. 60

D. 50

14. ΔH is negative for what type of reactions?

A. Exothermic

B. Endothermic

C. Oxidation

D. Displacement

15. Which of the following reactions are exothermic :

A. Photosynthesis

B. Combustion

C. Ethanoic acid + sodium carbonate

D. = Ammonium nitrate + water

16. Which of the following is produced when ethanol C_2H_5OH is dehydrated:

A. CH_4

B. C_2H_5

C. C_2H_4

D. CO_2

17. The IUPAC name for the compound $CH_3(CH_2)_4CH_2OH$ is :

A. Hexan – 1- 01

B. Hexen -1 – 01

C. Hexan -2 -01

D. Hexen -2- 01

18. The monomer which form the polythene Polymere is :

A. $CH_2 CH = CH_2$

B. $CH_2 = CH_2$

C. $CH_2 = CHC$

D. $CH_3 CH_3$

19. Starch can be converted to ethanol by the process of :

A. Addition

B. Fermentation

C. Neutralization

D. Condensation

20. In Endothermic reaction :

A. A gas is given off

B. Heat is produced

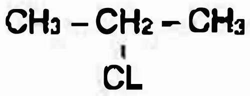
C. Heat is evolved

D. The colour is changed

PART 2: STRUCTURED QUESTION (80 MARKS)

1. Use the following compound to answer these question:

A) $CH_2 = CH - CH_3$

B) 

$$CH_3 - \underset{\displaystyle CL}{\underset{|}{CH_2}} - CH_3$$

C) $CH_3 - CH_2 - CH_2\,CL$

D) $CH_3 - CH_2 - CH_2 - OH$

i) Identify the functional group of compound a, b, c, and d? (2 Marks)

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ii) Which of the folloing compupund is / are unsaturated ? (2 Marks)

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iii) Which of these compounds are Isomers ? (2 Marks)

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iv) Which of these compounds can undergo addition reactions ? (2 Marks)

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v) Give the name of the compound a, b, c, and d ? (2 Marks)

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2. The Equation For The reaction of Cu with methane (CH_4) is shown below :

$$4CuO_{(s)} + CH_{4\,(g)} \longrightarrow 4\,Cu_{(s)} + 2H_2O_{(g)} + CO_{2\,(g)}$$

a) Calculate the formula mass of methane (CH_4) (2 Marks)
(RAM, C = 12, H= 1)

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b) Calculate the formula mass of CuO (RAM = Cu = 64, 0 =16) ? (2 Marks)

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c) Calculate the percentage of copper in copper oxide CuO? (2 Marks)
(RAM, Cu = 64, 0 = 16)

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d) In the above equation, 4 moles of CuO is used in this reaction . calculate how many grams of CO_2 is produced ? (3 Marks)

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e) In the above equation , 4 moles of CuO is used , calculate how many grams of water is produced ? (3 Marks)

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3. Classify each of the following process as Endthermic and Exothermic . In each case , indicate which has greated heat conten (enthapy) reactants or products.

a) Combustion of Natural Gas ? (2 Marks)

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b) Condenation of water vapor ? (2 Marks)

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c) Spliting Carbon dioxide into Carbon and Oxygen. (2 Marks)

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d) Formation of sodium Chloride from its elements ? (2 Marks)

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e) Evaporation of alcohol ? (2 Marks)

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f) Draw an energy level diagram for exothermic reactions? (2 Marks)

4. **Potassium** is below **Sodium** in group 1 elements in the periodic table
(Na = 2, 8, 1 K = 2, 8, 8, 1) using this inforfmation answer the following:

a) How many electrons contian outer most shall of porassium ? (1 Mark)

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B) Is the size of potassium atom greater or smaller then Sodium atom? Explain your answer? (3 Marks)

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C) Is the boiling and melting point of potassium higher or lower than sodium atom ? Explain your answer. (3 Marks)

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D) is potassium more reactive or less reactive than Sodium ? Explain your answer (3Mark)

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E) Potassium reactive very fast with cold water, name the product of this reactive (1 Mark)

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f) Write balance chemical equation for the reaction above (2 Marks)

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5. A Compound Consist of **40% Carbon, 6.7 Hydrogen, 53.3% Oxygen** and with a molar mass of **180 g/mol**?

A) Define Empirical formula? (2 Marks)

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b) Define Molecular formula? (2 Marks)

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C) Calculate the empirical formula of the compound? (4 Marks)

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d) Calculate the molecular formula of the compound ? (3 Marks)

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E) Give The Name of the compound formed? (2 Marks)

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6. **Nitrogen** reacts with **Hydrogen** to form **Ammonia Molecule** NH_3?

I) What is molecule? (2 Marks)

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II) How Many pairs of electrons are shared is one molecule of Ammonia? (2 Marks)

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III) What Term is used to describe the unshared pair of electrons in ammonia molecule? (1Mark)

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IV) Name the type of bonds that holds the atoms together in ammonia molecule? (1Mark)

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V) Draw a **cross (x) dot (.)** diagram to show how electrons are shared in ammonia molecule? (2 Marks)

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VI) What term is used to describe when electrons are not equally shared in a covalent molecule? (1 Mark)

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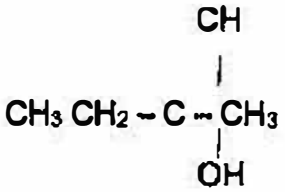
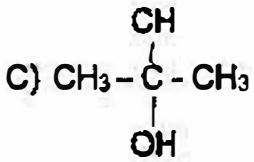
7. Consider The Following organs compounds

A) 

B) $CH_3\ CH_2\ CH_2OH$

C) 

I) Name each of the compounds above (3 Marks)

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II) Which is primary alcohol? (1 Mark)

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I) Which is secondary alcohol? (1 Mark)

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II) Which is tertiary alcohol? (1 Mark)

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iii) Which could be oxidized to aldehyde ? (2 Marks)

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iv) Which has the lowest boiling point ? (2 Marks)

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END