MINISTRY OF EDUCATION AND HIGHER EDUCATION

FORM FOUR EXAMS, 2020

CHEMISTRY

2020

P/LAND NATIONAL EXAMINATION BOARD

MINISTRY OF EDUCATION AND HIGHER EDUCATION
PUNTLAND NATIONAL EXAMINATIONS BOARD

Code Number

FORM FOUR EXAMINATION 2020
TIME: 1 HOUR AND 30 MINUTES

CHEMISTRY

Instructions to candidates

- Answer all the questions
- This paper consists of 7 pages, count it and if any is missing inform your invigilator
- Do not write your **name and roll number** on the exam paper
- Make sure that **student's profile** is attached to the exam paper, if not, inform you invigilator.
- No extra paper is allowed.
- If you make a mistake, **cross out the incorrect** answer and **write your correct answer.**

This exam paper consists of following Parts

Parts	Marks
Part one: Multiple Choice	24 marks
Part two: Structured Questions	76 marks
	Total: 100 Marks

For the markers only

PARTS	MARKS
Part one	
Part two	
TOTAL	%

Part One Multiple Choice Questions: (24 marks)

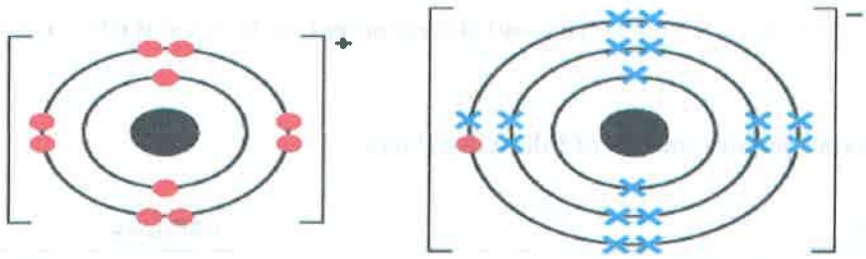
1- What is the electronic structure of an atom with an electron number 5?

A. 2, 8, 1.
B. B- 2, 8.
C. C- 2, 3.
D. D- 2,1

2- Which of the following reaction is an endothermic?

A. $CaCO_3 \rightarrow CaO + CO_2$
B. $CaO + 2HCl \rightarrow CaCl_2 + H_2O$
C. $2Ca + O_2 \rightarrow 2CaO$
D. $Ca + 2HCl \rightarrow CaCl_2 + H_2$

3- The diagram below shows the electronic configurations of two ions,



The two ions are:

A. Calcium ions and Chloride ions
B. Magnesium ions and oxide ions
C. Sodium ions and chloride ions
D. Calcium ions and oxide ions

4- Which of the following is an acidic oxide?

A. CaO
B. MgO
C. Na_2O
D. SO_2

5- The reaction between sodium hydroxide and hydrochloric acid is:

A. Displacement reaction
B. Neutralization reaction
C. Decomposition reaction
D. Precipitation reaction

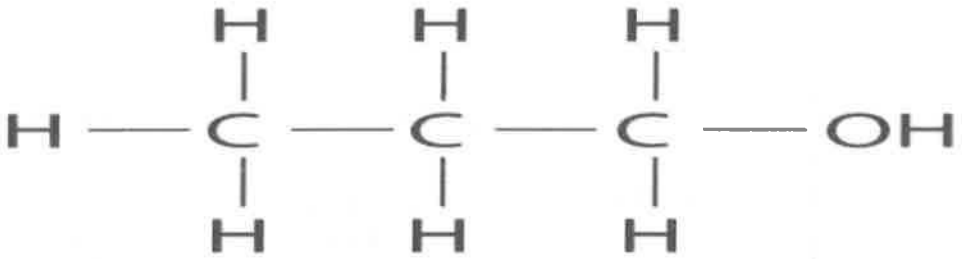
6- Which family of organic compound does **ethane** belong to:

A. Alkane
B. Alkene
C. Alcohol
D. carboxylic acid

7- Which of the following compounds belong to same homologous series?

A. Ethanol and propane
B. Ethanol and propanol
C. Ethanoic acid and ethane
D. Propanoic acid and ethanol

8- The diagram shows the displayed formula of an organic molecule. Its name is:



A. Ethane
B. Ethene
C. Ethanol
D. Ethanoic acid

9- A chemical reaction that release heat energy to the surrounding is said to be:

A. Endothermic reaction
B. Exothermic reaction
C. Decomposition reaction
D. Photosynthesis reaction

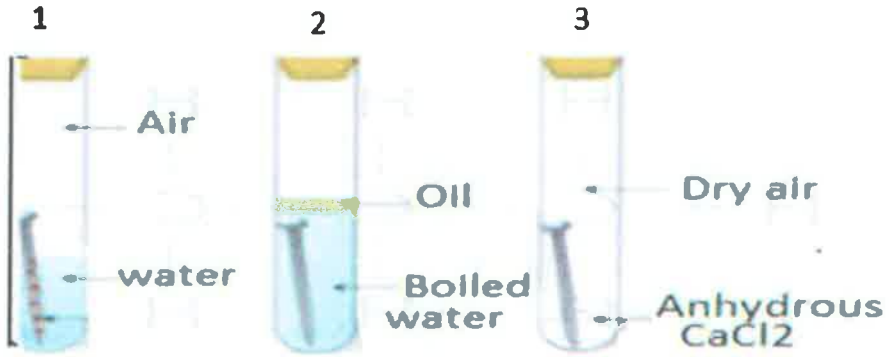
10- Which method is used to separate a mixture of sulphur and iron fillings:

A. Evaporation
B. Fractional distillation
C. By magnet
D. Filtration

11-Which PH value indicates the most basic solution

A. 3
B. 5
C. 7
D. 14

12- Which one of the nails in the test tubes corrodes first?



A. 1
B. 2
C. 3
D. 2 and 3

Part two: Structural questions (76 marks)

Question 1: (27 marks)

A) Atoms are made of smaller particles called electrons, protons and neutrons.

Complete the table below: One is done for you. (5M)

Particle		Relative charge	Relative mass
i)	Proton		
ii)	Neutron		
iii)	Electron		Almost no mass

B) The short form for sodium atom is written as $^{23}_{11}Na$. Calculate the number of protons, electrons and neutrons of sodium atom. (6M)

i) Number of protons _____

ii) Number of electrons _____

iii) Number of neutrons _____

C) Complete the sentence about the isotopes using the words below. (6M)

Neutrons	Atoms	element

Isotopes are _____ of the same _____

Which have the same protons, but a different number of _____

D) Write the electronic configuration of these elements. (2M)

i) Na = 11 electrons _____

ii) S = 16 electrons _____

E) Write the chemical formula of the following:

i) Magnesium Oxide _____ (2M)

ii) Carbon dioxide _____ (2M)

iii) Sodium hydroxide _____ (2M)

iv) Water _____ (2M)

Question 2: (18 marks)

A) Magnesium ribbon and excess dilute hydrochloric acid were reacted together. The graph below shows the volume of gas produced in the experiment over a time. $Mg(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + H_2(g)$

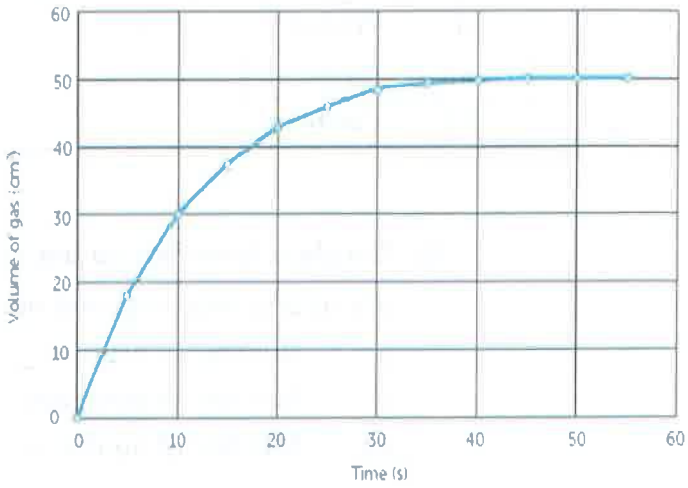
i) Name the gas produced during the reaction? (2M)

_____

ii) How much gas was produced when the time was 10 seconds? (2M)

_____

iii) What is the total volume of gas produced at the end of the reaction? (2M)



_____

C) Some PH values are given below.

PH1 PH5 PH7 PH8 PH13

Use from the list of PH values and choose:

i) The PH which indicates a strong acid. _____ (2M)
ii) The PH which indicates a weak alkali _____ (2M)
iii) The PH which indicates a neutral solution. _____ (2M)

iv) Write two uses of water in our homes?

_____

_____ (2M)

v) What is the percentage of oxygen in the air? _____ (2M)

vi) What is the percentage of nitrogen in the air? _____ (2M)

Question 3: (10 marks)

A) **Propene** ($CH_3 CH = CH_2$) is one of the many important hydrocarbons made from oil. Like **propane** ($CH_3 CH_2 CH_3$) it is made up of molecules that contain three carbon atoms.

i) Is propane alkane or alkene family? (2M)

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ii) How many carbon atoms are there in propane molecule? (2M)

---

iii) Write the general formula of alkanes. (2M)

---

iv) Which two elements do hydrocarbons contain only? (4M)

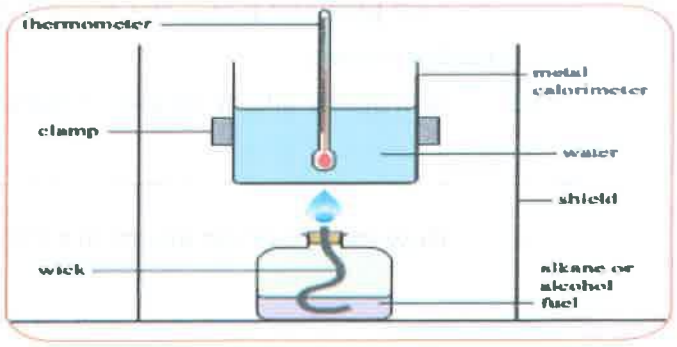
Question 4: (12 marks)

Match the terms with their definitions.

No	Terms	Answer	Letter	Definitions
1	Combustion		A	Is an indicator
2	Neutralization		B	Mixture of metals
3	Corrosion		C	Is decomposition caused by electricity
4	Litmus		D	Reaction between of alkali and acid
5	Alloys		E	Means burning
6	Electricity		F	Means rusting

Question 5: (9 marks)

A) The diagram shows how a student set up on experiment to find the energy released when ethanol burnt.



The student burnt 2 gram of ethanol, and the water temperature rose by 10 ^{0}C

Mass of water (m) = 100 g

ΔT = 10 ^{0}C

Fuel burnt = 2 grams

Specific heat capacity (c) = 4.2 j/g/c

i) Calculate the heat change of the reaction during the experiment. ($Q= mc\Delta T$)?

_____

_____

_____ (3M)

ii) Is the reaction endothermic or exothermic?

_____ (2M)

B) Classify the following as exothermic or endothermic reaction: (4M)

Neutralization	Photosynthesis
Decomposition	Combustion

i) Exothermic _____

_____

ii) Endothermic _____

_____

END