

**THE PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT**

BUNDA DISTRICT COUNCIL

**FORM TWO PRE-NATIONAL EXAMINATION
032 CHEMISTRY**

Time: 2½ hours

2024

Instructions

1. This paper consists of sections **A, B, and C** with a total of **Ten (10)** questions.
2. Answer all questions in both sections
3. Section **A carries (15) marks, section B seventy (70) marks** and section **C carries fifteen (15) marks**
4. All answers should be written in the space provided.
5. All writings must be in **blue or black** ink, except for diagrams that must be in pencil
6. Cellular phones and any unauthorized material are not allowed in the examination room
7. The following atomic masses may be used: H=1, C=12, O=16

SECTION A (15 Marks)

1. For each of the items (i) – (x) choose the best answer among the given alternatives and write the answers in the box provided.
 - i. Chemistry is a scientific activity because
 - A. Chemistry is studied in schools
 - B. Knowledge of chemistry is acquired through observations, experimentation and logical reasoning.
 - C. It is an interesting subject
 - D. It involves the study of non-living things
 - ii. On her first experiment, Lillian dissolved sulphuric acid in water and heat was evolved. In her second experiment she dissolved sugar in water and no heat was evolved or absorbed. She concluded that: -
 - A. Her first experiment was a physical change
 - B. Both of her experiments were physical changes
 - C. Her second experiment was a chemical change
 - D. Her first experiment was a chemical change
 - iii. Loose or floppy clothing is not allowing in the laboratory. Why?
 - A. Movement has to be fast.
 - B. It will get wet when water splashes.
 - C. It may catch fire or cause one to fall
 - D. It causes poor ventilation in the body
 - iv. Steam reforming of natural gas is the method used to produce pure hydrogen gas. The natural gas used in the process is;
 - A. Water gas
 - B. Methane
 - C. Hydrogen Chloride
 - D. Ammonia
 - v. Substance B has a percentage composition by mass of 54.6% carbon, 9.1% Hydrogen, 36.3% Oxygen. the empirical formula of substance B is :
 - A. CH₂O
 - B. CH₄O
 - C. C₂H₄O
 - D. C₂H₆O
 - vi. Which of the following is **not** a component of the First Aid Kit?

- A. Goggles
B. Gloves
C. Dropper
D. A pair of scissors

- vii. If you want the Bunsen burner flame to have the same colour as the candle flame you must;
A. Have the air hole completely open
B. Turn on a large supply of gas
C. Have the air holes completely closed
D. D. Have more candle burning
- viii. There are two particles inside the nucleus. Which **one** contributes to the net change of the nucleus?
A. Dalton
B. Protons
C. Electrons
D. Neutron
- ix. A rapid chemical reaction that releases energy in the form of light and noticeable heat is called
A. Ignition
B. a reactant
C. combustion
D. heating
- x. Given that element "M" with of 2:8:3 combines with "G" with electronic configuration of 2:6 to form a compound. What is the chemical formula of compound formed
A. G_3M_2
B. M_2G_3
C. G_2M_3
D. M_3G_2

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)

2. Match the mixtures in **LIST A** with the corresponding methods of separation in **LIST B** by writing the letter of the correct answer below the item number in the table below.

LIST A		LIST B	
i.	Ethanol from water	A.	Chromatography
ii.	Salt from sea water	B.	Filtration
iii.	Rice and husk	C.	Solvent extraction
iv.	Oil in sunflower	D.	Fractional distillation
v.	Erythrocytes from blood.	E.	Decantation
		F.	Layer separation
		G.	Centrifugation
		H.	Winnowing
		I.	Simple distillation

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

SECTION B (70 Marks)

3. (a) Is an air a mixture or a compound?
Give four reasons
i.
ii.
iii.
iv.
- (b) A form two student dipped a clean iron rod into a cold distilled water in a test tube and left it for 2 days.
i. State what will happen to the iron rod after two days
.....
ii. Explain the observations if the rod is replaced by a painted nail in the same test tube and left there for 2 days

iii. Explain the observation if cold distilled water will be replaced by a mixture of hot water and oil

.....

(c) Explain any **two** methods that are used to prevent iron from rusting by giving vivid examples.

i.....

ii.....

4. (a) i.....are atoms of different elements having the same number of neutrons but different masses.

ii. Which particles are transferred during chemical reaction.....?

iii.....tend to display metallic and nonmetallic characteristic

iv. Serum is separated from blood samples by employing a technique called.....

(b) Matter is anything that has mass and occupies space. It includes all materials that make up our environment. Matter exists in three states. The states of matter can be changed from one to another by varying various conditions like pressure and temperature. Of **what importance** is change of states of matter useful in human life? Give reasons to support each of your answer. **(2marks @)**

i.

ii.

iii.

5. (a) All matter is composed of very small indivisible particles which fit together to form various substances that exist as solid, liquid and gases.

i. What is the name of that particle?

ii. Name three sub particles of that particle in question 4(a) (i) above?

iii. It is said that the mass of that particle in question 4(a)(i) is contributed only by nucleons and not electrons. Explain, why?

(b) What was the reason for making modification of the Dalton's atomic theory? Give one reason

.....

(c) Carbon has main isotopes, $^{12}_6\text{C}$ and $^{14}_6\text{C}$ with relative abundances 98.89% and X% respectively. Calculate the value of X and the relative atomic mass of Carbon.

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6. (a) Mrs. Seypalm was addressing the villagers about uses of a good fuel for proper environmental conservation. What are the four qualities of a good fuel?

i.

ii.

iii.....

iv.

(c) The experiment was done to measure the heat value of biodiesel. In this experiment 12 litre of water was heated using 56g of biodiesel. The temperature of water raised from 24.7°C to 68.5°C . Determine heat value of the biodiesel. (Specific heat capacity of water = $4.18 \text{ KJ Kg}^{-1} \text{ K}^{-1}$, density of water = 1000 kg/m^3)

7. (a) All living things on the earth depend on substance Q which is found in air for their survival. Both marine and aquatic living organisms require that substance Q for respiration and some industrial processes also requires that substance Q.

i. What is the name of substance Q

ii. Mention two methods by which the substance Q can be prepared in the laboratory.

iii. Draw a neat, large and well labeled diagram for the set up for preparation of substance Q if potassium chlorate were to be used.

- iv. Write the word equation for the laboratory preparation of substance Q using the chemical mentioned in (a)(iii) above.
- (b) Write two (2) other uses of substance Q other than respiration.
- i.
- ii.

8. Write the letters given after the table with the information to fit the elements in the table use the information given in each part of the question.

Table:

I	VIII					
	II	III	IV	V	VI	VII

(a) Write;

- i. **A** in the table for an element found in group (II) and period 3.
- ii. **B** for an element found in group (III) and period 2. iii. **C** for an element found in group (VII) and period 2. iv. **D** for an element found in group (I) and period 3.
- v. **E** for an element found in group (VII) and period 3. vi. Write the actual symbols of element A-E
- A.....B.....C.....D.....E.....
- vii. The tendency of showing a regular repeating pattern of elements in the table above is called.....

(b) Briefly explain the importance of using chemical symbols, Give giving four (4) points.

9. (a) Differentiate;

- i. Homogenous mixture from heterogeneous mixture
- ii. Miscible from immiscible liquids

(b) Seypalm was in the kitchen frying eggs in the container A and by the same time he sublimated solid iodine in the other container which was labeled B.

- i. What changes were encountered by the two substances? Mention two. **(1 mark@)**
- and
- ii. State the difference which exists between the changes mentioned in (a) (i) by providing three (3) points. **2 marks @)**

Change in container A	Change in container B
i.	
ii.	
iii.	

SECTION C (15 Marks)

10. Compound N is the most abundant substance on the earth. About 71% of the earth's surface is covered by the compound N. Without compound N, no life. This means compound N is very important in everyday life of a human being and other organisms. By giving six (6) reasons explain why substance N is very important in our daily lives?