Candidate's name/ Index number .....

THE UNITED REPUBLIC OF TANZANIA
PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
KIGAMBONI DISTRICT JOINT EXAMINATION

FORM TWO
032 CHEMISTRY

Time: 2½ hours **Thursday, 15th May 2025 a.m.**

Instructions

1. This paper consists of sections A and B with a total of ten (10) questions.
2. Answer **ALL** questions in the spaces provided.
3. All writing must be in blue or black ink, except drawing, which must be in pencil.
4. Cellular phones and any unauthorized materials are **not** allowed in the examination room.
5. Write your **Examination Number** at the top right corner of every page.

QUESTION #	MARKS	INITIALS OF EXAMINER
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
Total		

Candidate's name/ Index number .....

SECTION A (15 MARKS)

1. Choose the most correct answer among the given alternatives and write the answer in the space given.

(i) Which of the following is the best apparatus for measuring accurately a fixed volume of a given solution?

A. Beaker
B. Burette
C. Pipette
D. Measuring cylinder

(ii) Sepalm's child was stung by a wasp. Which of the following would you advise him to apply on the affected area of his child's body?

A. Vinegar
B. Washing soda
C. Ethanol
D. Water

(iii) Which of the following sets of substances contain mixtures only?

A. Water, cooking oil and petrol
B. Steel, bronze and brass
C. Iron, brass and Ice
D. Table salt, sugar and chalk

(iv) Substances that can burn or corrode your skin are called…

A. Oxidizing agent
B. Flammable
C. Corrosive
D. Biohazard

(v) One of the reasons for painting car bodies is to avoid rusting. How does the paint prevent the rusting?

A. By preventing sunlight and oxygen from reaching the iron
B. By preventing oxygen and water from reaching the iron
C. By preventing sunlight and water from reaching the iron
D. Because paint is higher in the electrochemical series than iron

(vi) Form two students at Seypalm Secondary School strongly heated a sample of ammonium chloride in a crucible. Which of the following was the result of heating the sample after some time?

A. The sample changed into liquid through melting
B. The sample changed into solid through deposition
C. The sample did not change its state
D. The sample changed into vapour through sublimation

(vii) Shock is a condition which results into

A. The rupturing of the blood vessel in the brain

B. A stroke, because shock is another word for stroke
C. The body system failing to take enough blood to the vital organs.
D. Choking because the air passage becomes blocked

(viii) During an experiment, dry hydrogen gas was passed through a test tube containing a strongly heated black copper oxide without any air. What was eventually observed in the test tube?
A. The black copper oxide changed into white copper metal
B. The black copper oxide changed into brown copper metal.
C. The hydrogen gas exploded with a pop sound
D. The copper dissolves to form salt

(ix) The following are reasons for keeping all chemicals in properly labelled containers in the Chemistry laboratory EXCEPT.
A. To show how skilled the laboratory technician is
B. To avoid accidents
C. To avoid errors in experiments
D. To make it easy for laboratory users to find what they need

(x) Which of the following statements is not true about non-luminous flame?
A. It is very hot and not so bright
B. It does not produce much soot
C. It is very bright and not very hot
D. It is obtained when the air hole of the Bunsen Burner is open

Answers

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

2. Match the mixtures in list A with the correct separation method in list B.

LIST A	LIST B
(i) Applied on car bodies to create a waterproof and airproof cover over the surface of the iron.	A. Use of silica gel
(ii) Applied on moving parts of machinery to form a protective film, preventing rusting.	B. Painting
(iii) Using mixtures of iron and other metals, for example, stainless steel, to prevent rusting.	C. Oiling and greasing
(iv) The coating of one metal with a layer of another metal by means of electrolysis, where the metal to be coated is the cathode and the coating metal the anode.	D. Alloying
(v) Involves the covering of an iron object with a layer of zinc. In this case, even if the zinc is scratched to expose the iron, the iron does not rust.	E. Electrolysis
	F. Fire extinguishing
	G. Electroplating
	H. Galvanizing

Answers

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

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SECTION B (70 MARKS)

3. (a) When you burn a piece of paper in fire, you get ash. Mention the type of the change that occurs and give its definition.

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(b) Give four characteristics of the type of change described in 3 (a) above.

(i) .....

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(ii) .....

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(iii).....

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(iv).....

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4. (a) (i) Mr. Seypalm, who is a builder, went away on a one-week vacation to wait for the rains to end before he could continue with his construction work. He had unintentionally left his iron nails outside; when he returned, he was dismayed to find most of his iron nails reddish brown and corroded. Define the process that affected his iron nails.

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(ii) State two necessary conditions for the process in (a)(i) above to occur

..... and .....

(b) Briefly describe any four methods that can be used to prevent the processes that destroyed Mr. Seypalm's iron nails.

(i) .....

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(ii) .....

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(iii).....

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(iv)

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5. (a) Hydrogen is most commonly prepared in the laboratory. Outline the most convenient way of preparing hydrogen gas in the school laboratory and write a word equation for the reaction during the preparation.

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(b) State any six uses of hydrogen gas.

(i) .....
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(ii) .....
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(iii).....
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(iv).....
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(v) .....
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(vi).....
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6. (a) In his first day at school as a form one student, Seypalm was telling his parents that he has learned Chemistry. His parents asked him, "what is that?" Help Seypalm to answer his parents' question correctly.

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(b) After getting an answer about what Chemistry was, Seypalm's parents asked him again where that knowledge of Chemistry is applied. What could be the correct response in four points?

(i) .....
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(ii) .....
.....
(iii).....
.....

7. (a) As a form one student who has already visited and worked in the Chemistry laboratory, how would you explain to someone who has never seen it about what it is?

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(b) Working in the Chemistry laboratory can be dangerous sometime. What are the four possible causes of the danger in the laboratory?

(i) .....
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(ii) .....

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(iii).....

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8. (a) Mixtures can be categorized as homogenous or heterogeneous, with at least one example, explain each of the two categories of mixtures.

(i) A homogeneous mixture:

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.....

.....

(ii) A heterogeneous mixture:

.....

.....

(b) When it comes to the separation of mixtures, an appropriate method may need to be used in order to make the mixture separation process successful. One of the methods is chromatography; explain the following about it:

(i) Its definition:

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(ii) Two of its practical application in life:

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9. (a) The kinetic theory of matter has three main points. Outline any two of those points.

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(b) Explain the three states of matter

(i) .....

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(ii) .....

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(iii).....

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SECTION C (15 MARKS)

10. Gas N is made up of the most abundant element in the earth's crust. The clear, colourless gas, which is odourless and tasteless can be prepared in the school laboratory by using potassium chlorate.

(i) Suppose you were required to demonstrate the preparation of the gas by using potassium chlorate, with the aid of a well labelled diagram, illustrate the preparation of gas N.

(ii) Describe the test used to identify gas N

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(iii) State any three chemical properties of gas N

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KIGAMBONI DISTRICT JOINT EXAMINATION

FORM TWO
032 CHEMISTRY
MARKING SCHEME MAY 2025

SECTION A (15 MARKS)

1.

(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
C	A	B	C	B	D	C	B	A	C

(01@ = 10 marks)

2.

List A	(i)	(ii)	(iii)	(iv)	(v)
List B	B	C	D	G	H

(01@ = 05 marks)

SECTION B (70 MARKS)

3. (a) Chemical change: A permanent change in chemical properties of a substance 02 marks

(b) Four characteristics of a chemical change

(i) There is formation of a new substance. The new substance has different chemical and physical properties as compared to the original substance. 02@ = 08 marks

(ii) It is generally not reversible. For example, you cannot turn the ash back to paper.

(iii) There is a change in weight or mass of the substance undergoing the change. When you burn papers weighing 5 kg, you cannot expect to get the same weight of ash.

(iv) The change is accompanied by a considerable heat change. **(Total: 10 marks)**

4.

(a) (i) Rusting is the oxidation of iron or steel in the presence of moisture; it is also called corrosion *(01 mark)*

(ii) Water and Oxygen *(00½ @ = 01 mark)*

(b)

(i) Electroplating: Electroplating is the coating of one metal with a layer of another metal by means of electrolysis, where the metal to be coated is the cathode and the coating metal the anode. An example of this method is a 'tin can' is made of steel coated on both sides with a fine layer of tin.

(ii) Galvanizing: Galvanizing involves the covering of an iron object with a layer of zinc. In this case, even if the zinc is scratched to expose the iron, the iron does not rust. This process is used for dustbins, car bodies, barbed wires and motorway crash barriers

(iii) Sacrificial protection: This is a method of rust protection in which blocks of a metal more reactive than iron are attached to the iron surface. Zinc and magnesium are more reactive than iron. When blocks of zinc or magnesium are attached to the hull of a steel ship or any underwater iron structure, it corrodes in preference to iron. This is called sacrificial protection because the zinc or magnesium is sacrificed to protect the iron.

(Any four 02@ =08 mark)

(iv) Use of silica gel: Silica is a common name for silicon dioxide (SiO_2). Despite its name, silica gel is a solid. It is used as a desiccant, which absorbs moisture to prevent rusting of iron items. Most often, a small bag of silica gel is put inside bags or boxes used for storing or carrying iron items to absorb any moisture that may cause rusting.

Oiling/greasing, painting… **(Total: 10 marks)**

5. (a) The most convenient way to prepare hydrogen in the laboratory is by addition of dilute hydrochloric acid or dilute sulphuric acid on zinc granules. 02 marks

Zinc + hydrochloric acid → Zinc Chloride + Hydrogen gas

Or Zinc + sulphuric acid → Zinc sulphate + Hydrogen gas 02 marks

(b) Six uses of hydrogen gas:

(i) It is used in the manufacture of ammonia by the Haber process, which is based on the direct combination of hydrogen and nitrogen.

(ii) It is used in the hardening of vegetable oils to make margarine.

(iii) Hydrogen is used by meteorologists to fill weather balloons, which carry weather instruments that record information on various elements of weather in the upper atmosphere.

(iv) It is as a fuel for space rockets in a form of water gas. When hydrogen contained in water gas is burned in air, it produces extremely high heat energy that is used to power rocket engines.

(v) It is used as an oxy-hydrogen flame in the welding and cutting of metals.

(vi) It is used in the synthesis of hydrochloric acid. In this case, hydrogen combines directly with chlorine to form hydrogen chloride gas. The hydrogen chloride gas is then dissolved in water to form hydrochloric acid.

(vii) It is used in the manufacture of methanol (wood spirit). In this process hydrogen combines directly with carbon monoxide. Any six, @01 marks = 06 marks

(viii) It is used in the reduction of metallic ores. **(Total: 10 marks)** 02 marks

6. (a) Chemistry is a branch of science that deals with the study of nature, properties and composition of matter. 02 marks

(b) Application of Chemistry

(i) … is applied in other fields such as agriculture in making fertilizers

(ii) …applied in pharmaceutical industry in manufacturing medicine,

(iii)…applied in the food industry in food processing 02@ = 08 marks

(iv)…in cosmetics and home care industries, etc. **(Total: 10 marks)**

7. a) A laboratory is a room or building specially designed for conducting various scientific experiments.

(b) Some possible causes of accidents in the laboratory include:

- Failure to follow the correct experimental procedures for example, pouring water into an acid instead of pouring an acid into water.
- Neglecting some laboratories rules such as eating or drinking while in the laboratory.
- Improper use or handling of laboratory equipment and apparatus when conducting experiments, which could lead to breakage and in turn cause cuts.
- A slippery laboratory floor which can cause fractures.
- Poor ventilation in the laboratory may cause suffocation. Any four, @02 marks = 08 marks
- The leaking of gases from taps or cylinders may cause fires or even explosions.

(Total: 10 marks)

8. (a)

(i) A homogeneous mixture is one where the substances forming the mixture are totally mixed together uniformly. Examples include solutions of salts and sugars in water. (02 marks)

(ii) A heterogeneous mixture is one where the substances forming the mixture remain separate and one substance is spread throughout the other as small particles, droplets, or bubbles. All emulsions and suspensions fall under this category. (02 marks)

(b)

(i) Chromatography is a method used to separate a mixture of coloured substances. An example of this is the separation of dyes that make up black ink. (02 marks)

(ii) The following are some of the application of chromatography:

- It can be used to find out the components of a liquid or solid, or even to identify different substances. (Any two 02 @ = 04 marks)
- It can be used by security agents and medical personnel to analyse blood and urine samples.
- Causes of pollution in water and in animals that live in water can also be detected using chromatography.
- It is used to test the purity of substances and in separation of mixtures. **(Total: 10 marks)**

9.

(b) The kinetic theory of matter has the following main points:

- All matter is made up of tiny discrete particles.
- The particles are in constant motion. *(Any two: 04 marks)*
- The kinetic energy of a particle changes with temperature; the higher the temperature the faster the particle moves.

(b)The three states of matter:

(i) The solid state

In the solid state, the particles are so closely packed and are held together by strong forces of attraction. They cannot move around freely in this arrangement, instead, they vibrate about a fixed position.

(ii) The liquid state

The particles of a liquid are also closely packed but the forces of attraction between them are weaker than that of a solid. The particles have more kinetic energy and they can move around each other. Liquid has a definite volume, however, since the particles are fairly free to move a liquid does not have a definite shape; it takes the shape of its container.

(iii)The gaseous state *(02@ = 06 marks)*

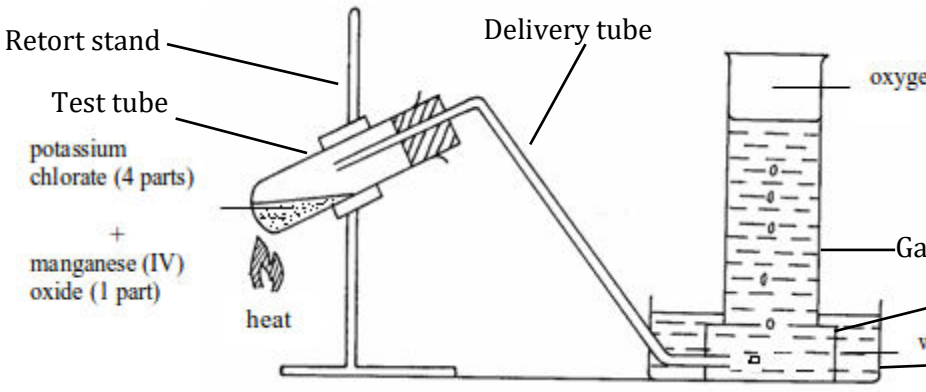
The gaseous state is one in which the particles are moving independently of each other; they exert no force of attraction on each other. They move rapidly and randomly, colliding with each other and with the walls of the container. **(Total: 10 marks)**

SECTION C (15 MARKS)

10.

(i) Preparation of gas N using potassium chlorate method

The gas is Oxygen. A ground mixture of potassium chlorate and manganese (IV) oxide, at a ratio of 4:1, is placed in a set up shown in the diagram below. The mixture is then heated and oxygen gas is readily given off. The gas is collected over water. 03 marks



Tittle: 00½ mark
Diagram: 02½ mark
Labels: 8 × 0½ = 04 marks

Preparation of oxygen from potassium chlorate

(ii) Test for oxygen: Oxygen rekindles a glowing splint of wood. 02 marks

(iii)Chemical property

- Oxygen supports combustion but does not burn.
- It is a very strong oxidizing agent.
- Oxygen is very reactive.

Any three: 03 marks

- It reacts with non-metals to form acidic oxides respectively. Non-metals + Oxygen gives non–metallic oxide (most of these are acidic in character).
- It reacts vigorously with many metals to form basic oxides. Metal + Oxygen gives metallic oxide
- When heated with nitrogen monoxide, oxygen produces brown fumes of nitrogen dioxide. Dinitrogen oxide has no effect on nitrogen monoxide.

(Total: 15 marks)