PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT
KILIMANJARO REGION
FORM ONE ANNUAL EXAMINATION

032 **CHEMISTRY**

MARKING GUIDE

SECTIONA (15 marks)

1)

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

1 Mark each, Total = 10marks

2)

i	ii	iii	iv	v
D	H	C	G	B

1Mark each, Total = 5marks

3) i. Refrigeration
ii. Refinery
iii. Steam engines
iv. Drying materials
v. Production of electricity
vi. Metallurgy

2marks @ total 10 5points

a. i. In a liquid, the particles are close together but not in fixed positions. They can move past one another, which allows the liquid to flow and take the shape of its container. This mobility of particles makes it easy to pour a liquid.

ii. In a gas, the particles are far apart and move freely in all directions. Because of this constant random motion, gas particles spread out to occupy the entire volume of the container, regardless of its size or shape.

iii. In a solid, particles are closely packed and vibrate in fixed positions. When heated, the particles gain kinetic energy and vibrate more vigorously, causing them to push slightly further apart. This increase in distance between particles results in the expansion of the solid.
01mark @ total 3 marks

b. Chemical change

Justification: Burning charcoal produces new substances like carbon dioxide and ash. The original substance (charcoal) cannot be recovered. Energy in the form of heat and light is also released.

ii. Physical change

Justification: This involves condensation of water vapor into liquid water. No new substance is formed; water remains H_2O.

iii. Physical change

Justification: Ice changes from solid to liquid, but the chemical composition (H_2O) remains the same. No new substance is formed.

iv. Chemical change

Justification: Tooth decay involves the breakdown of enamel and dentin by acids produced by bacteria. New substances are formed, and the original tooth material is chemically altered.

02 mark @ total 08 marks

5. (a). i. Always wear safety goggles and a lab coat to protect eyes and clothes.

ii. Tie back long hair and avoid loose clothing to prevent accidental contact with chemicals or flames.

iii. Do not taste chemicals – prevents poisoning.

iv. Wear goggles – protects eyes from chemical splashes.

v. Do not run in the lab – prevents accidents and spillage.

01 mark @ total 04marks

b) **i.** **Beaker** – used for mixing and holding liquids.

ii. **Measuring cylinder** – used to measure precise volumes of liquids.

iii. **Glass stirring rod** – used to stir solutions safely.

02 **mark @ total 06 marks**

6(a.) i. **So** – is incorrect; the correct symbol is **Na**

ii. **Ir** – incorrect for iron; **Fe** is correct symbol.

iii. **CL** – should be lowercase **l** for chlorine, so correct is **Cl**.

02 mark @ total 06 marks

b. i. Saves time and space – Symbols are short (one or two letters), making chemical equations and formulas easier to write and read instead of writing long names repeatedly.

ii. Chemical symbols are internationally recognized, so scientists from different countries and languages can easily communicate and understand chemical information without confusion.

iii. Distinguish one element from

01 mark @ total 02 marks the other

c. i. Simplicity for unique elements – Elements discovered early and having unique names (e.g., Hydrogen → **H**, Oxygen → **O**) are often represented by one letter to make them easy and quick to write.

ii. Avoiding repetition – When two or more elements start with the same letter, only the first discovered or most common keeps the one-letter symbol, while the rest are given two letters. Example: **C** = Carbon, while Calcium became **Ca**.

iii. Based on Latin/Greek names – Some symbols come from Latin names of elements, requiring two letters for clarity. Example: Sodium (Latin: *Natrium*) → **Na**, Potassium (Latin: *Kalium*) → **K**.

iv. Large number of elements – Since there are many elements, using only one letter would cause too much duplication. Two-letter symbols allow each element to have a distinct and unambiguous identity.

01mark @ total 02 marks

7. **a). i.** Dissolution then filtration – Because sand is insoluble while salt is soluble.
Pour the mixture through filter paper; sand remains on the paper (due to insolubility), while the salt solution passes through.

ii. Evaporation – gently heat the salt solution to evaporate the water, leaving behind solid salt (due to different boiling points)

02 mark @ total 04 marks.

b. i. Constituent elements (O and C) cannot be separated by physical methods but by chemical methods. Mixtures can be separated by physical methods.

ii. In CO and CO_2, carbon and oxygen combine in fixed ratios of 1:1 and 1:2. Mixture does not have a fixed ratio of its components.

iii. Carbon and oxygen atoms are chemically combined to form a new substance. In mixture, components are just physically combined.

v. Properties of C and O are very different from the properties of CO and CO_2. In a mixture, the original properties of the substance remain.

01 mark @ total 04 marks

c. i. To study blood cells
ii. To detect types of drugs in the blood
iii. For purification of substances
iv. For testing blood contamination
v. For mixture separation
vi. For testing quality of products
vi. For testing shelf life of food substances

01mark @ total 03 marks

8. a). i. Wash the wound with clean water
ii. Stop bleeding by applying pressure with a clean cloth,
iii. Cover with a sterile bandage
iv. Seek medical help if deep.

01 mark @ total 04 marks

b. i. Fertilizer production and use – Chemistry helps in manufacturing and applying fertilizers such as *urea, NPK, and ammonium sulfate* to improve soil fertility and increase crop yield (e.g., maize in Tanzania's Southern Highlands).

ii. Pesticides and herbicides – Chemistry provides insecticides, fungicides, and herbicides that protect crops like maize, rice, and coffee from pests, weeds, and diseases.

iii. animal drugs and vaccines

iv. Post-harvest preservation – Chemistry is used to develop chemical treatments (like fumigants) that protect stored crops such as maize and beans from pests like weevils.

v. Animal feeds – Chemistry helps in formulating animal feeds with the right balance of proteins, carbohydrates, minerals, and vitamins.

01 mark @ total 03 marks

c. i. Avoid inhaling or tasting the chemical.

ii. Handle with gloves and goggles.

iv. Follow teacher's instructions

01 mark @ total 03 marks carefully.

9. a. i. Applying oil or grease to tools.

ii. Storing tools in a dry place after use.

iii. Painting or coating with mud/clay for temporary protection

01 mark @ total 03 marks

b. Water conducts electricity and can cause electric shock. A safer method is using a carbon dioxide extinguisher, dry powder fire extinguisher**,** sand, or switching off the power source first.

03 marks

c. i. Keep reasonable distance at least 1.5metres from the fire as it may change direction suddenly

ii. For a person on fire, use fire blanket instead of fire extinguisher

iii. Do not return a used portable fire extinguisher to its place.

iv. Do not hold the discharge horn when using carbon dioxide extinguisher as it becomes extremely cold that can lead to severe frost burns.

01 mark @ total 04 marks

SECTION C (15 MARKS)

10. How a Bunsen burner works

i. Gas enters the burner through a tube connected to a jet inside the base

ii. Air enters the burner through adjustable air holes

iii. As the gas enters from the bottom and travel up the barrel, draws in air through an adjustable air hole via venturi effect.

iv. This air-gas mixture is then ignited at the top of barrel producing a flame whose size and temperature are regulated by the amount of air drawn through the collar.

v. To get luminous flame air hole is closed to allow less oxygen

vi. To get non luminous flame air hole is opened to allow more oxygen.

@ 1mark = 6marks

A diagram of a Bunsen burner

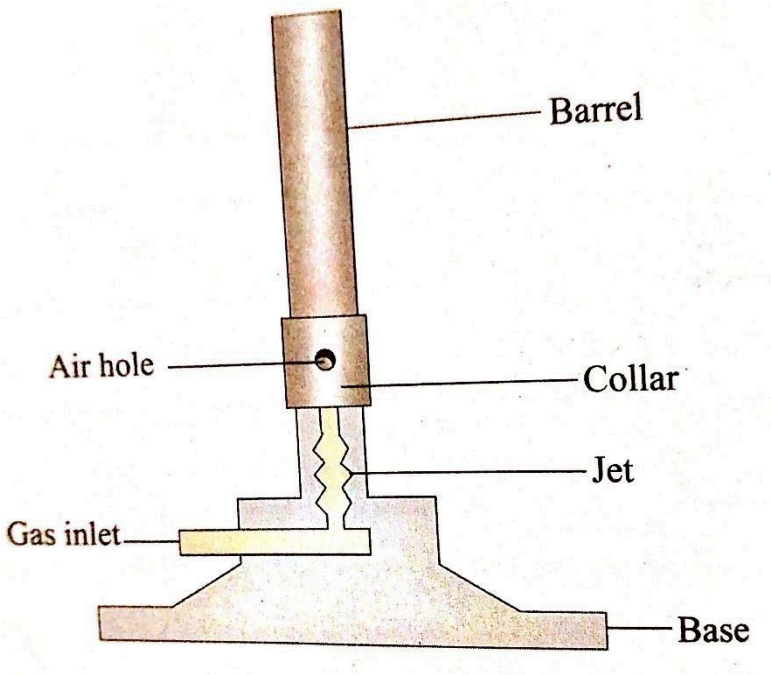

Diagram = 2marks

Heading = 1mark

Labels @1mark = 6 marks