

SECTION A (15 Marks)

1. Multiple Choice Questions

- i. C – The study of matter, its composition, and changes
- ii. C – Pipette
- iii. C – Air
- iv. C – Distillation
- v. B – Water
- vi. C – They have fixed proportions of elements
- vii. B – Non-luminous flame
- viii. C – Bunsen burner
- ix. A – Anything that occupies space and has mass
- x. C – Magnet

2. Matching Items

- i. Compound → D (Substance formed when elements combine chemically)
- ii. Filtration → C (Separation of insoluble solids from liquids)
- iii. Matter → A (Anything that has mass and occupies space)
- iv. Luminous flame → B (Flame that produces soot and gives yellow light)
- v. Non-luminous flame → E (Flame with enough oxygen and burns cleanly)

SECTION B (70 Marks)

3.

(a) Chemistry is the branch of science that deals with the study of **matter, its composition, properties, and changes**.

(b) Four branches of Chemistry:

1. **Organic Chemistry** – Study of compounds containing carbon. Example: ethanol.
2. **Inorganic Chemistry** – Study of compounds not primarily containing carbon. Example: salts.
3. **Physical Chemistry** – Study of the physical properties and changes of matter. Example: gas laws.
4. **Analytical Chemistry** – Study of methods to determine the composition of substances. Example: titration.

4.

(a) Five common apparatus and their uses:

1. **Beaker** – Holding and mixing liquids.
2. **Test tube** – Carrying out small experiments.
3. **Pipette** – Measuring accurate volumes of liquids.
4. **Bunsen burner** – Heating substances.
5. **Conical flask** – Mixing chemicals and performing reactions.

(b) Three safety rules in the laboratory:

1. **Wear protective gear** (e.g., lab coat, goggles) – Protects against chemical splashes.
2. **Do not eat or drink in the lab** – Prevents ingestion of harmful chemicals.
3. **Handle chemicals carefully** – Prevents accidents like burns, poisoning, or spills.

5.

(a) Matter is **anything that occupies space and has mass**.

(b) Three states of matter:

1. **Solid** – Particles are tightly packed, vibrate in place; definite shape and volume.

2. **Liquid** – Particles are close but can move past each other; definite volume but no definite shape.
3. **Gas** – Particles are far apart and move freely; no definite shape or volume.

(c) Examples:

- Solid: Ice
- Liquid: Water
- Gas: Oxygen

6.

(a) Definitions:

- i. **Element** – A substance made of only one type of atom. Example: Oxygen (O)
- ii. **Compound** – A substance formed when two or more elements chemically combine in fixed proportions. Example: Water (H_2O)
- iii. **Mixture** – A combination of two or more substances not chemically combined. Example: Sand and salt

(b) Two differences between compound and mixture:

1. Compounds have **fixed composition**; mixtures do not.
2. Compounds can be separated chemically; mixtures can be separated physically.

(c) Examples of mixtures in daily life:

1. Tea with sugar
2. Air

7.

(a) Methods of separating mixtures:

1. **Filtration** – Separating insoluble solids from liquids. Example: Sand from water.
2. **Distillation** – Separating liquids based on boiling points. Example: Pure water from seawater.
3. **Evaporation** – Removing a liquid from a solution to leave a solid. Example: Salt from saltwater.
4. **Magnetism** – Using a magnet to separate magnetic materials. Example: Iron filings from sand.

(b) Laboratory apparatus for distillation:

1. **Condenser**
2. **Round-bottom flask**

8.

(a) A **Bunsen burner** is a laboratory device that produces a single open flame for heating, sterilization, or combustion.

(b) Two main types of Bunsen burner flames:

1. **Luminous flame** – Yellow, sooty, less hot; occurs when air supply is limited.
2. **Non-luminous flame** – Blue, clean, hotter; occurs when air supply is sufficient.

(c) Advantages of non-luminous flame:

1. Produces a **hotter flame**, suitable for heating substances quickly.
2. Burns **cleanly**, leaving no soot on apparatus.

9.

(a) Contributions of Chemistry in everyday life:

1. Production of medicines for health care.

2. Making of soaps, detergents, and cleaning products.
3. Preservation of food and production of fertilizers for agriculture.

(b) Proper laboratory practices protect the environment by:

1. Ensuring **proper disposal of chemicals** to prevent pollution.
2. Reducing **wastage of chemicals**, conserving natural resources.

SECTION C (15 Marks)

10. Essay: “The Importance of Chemistry in Understanding Matter and its Changes”

(a) **Introduction:** Chemistry is the study of matter, its properties, composition, and changes it undergoes.

(b) **Concept of matter:** Matter is anything that occupies space and has mass. It exists in three main states: solid, liquid, and gas, each with distinct particle arrangement and movement.

(c) **Role of Chemistry in separating and transforming substances:** Chemistry enables the separation of mixtures using techniques such as filtration, distillation, and evaporation. It also helps in transforming substances to make useful products, like converting raw materials into medicines, fuels, and soaps.

(d) **Importance of Chemistry in daily life:** Chemistry is used in medicine, food preparation, cleaning, water purification, energy production, and manufacturing. It improves our quality of life and helps solve practical problems.

(e) **Conclusion:** Understanding Chemistry is essential because it explains the composition, structure, and changes of matter. It plays a vital role in science, industry, and daily life, making it a key subject for learning and application.

 **END OF ANSWERS**