



# Chapter 1

## Introduction to Chemistry



### Introduction to Chemistry

#### Short Question & Answers

#### Question 1.

Give two examples for each of the following substances:

- (a) Food preservatives
- (b) Fuel
- (c) Fungicides
- (d) Medicines
- (e) Building materials
- (f) Chemical war weapons

**Answer:** Two examples of:

**(a) Food preservatives:**

1. Sodium Benzoate
2. Sodium Meta bisulphate
3. Sugar
4. Common salt

**(b) Fuel:**

1. L.P.G.
2. Petrol
3. Coal

**(c) Fungicides:**

1. Sulphur
2. Bordeaux mixture

**(d) Medicines:**

1. Penicillin
2. Painkillers
3. Antibiotics

**(e) Building materials:**

1. Cement
2. Steel
3. Glass

**(f) Chemical war weapons:**

1. TNT
2. RDX

**Question 2.**

**Give short answers:**

**(a) What is science?**

**Answer:** **SCIENCE** is the systematic effort by human beings to control nature through experiments and observation for their own use. OR **SCIENCE** is the systematic on-going efforts by human beings to study understand and utilise nature for meaningful purposes. This understanding is slowly developed by careful observations and experiment.

**(b) What is chemistry?**

**Answer: Chemistry:** “The branch of science that deals with the study of the composition and the physical and chemical properties of various forms of matter is called Chemistry.”

**(c) What is a fuel?**

**Answer: Fuels:** The substances which on burning produce heat energy are called fuels.

**(d) How is chemistry helpful in improving the health of human beings?**

**Answer: Chemistry** is very helpful in improving the health of human beings by providing Antibiotics, Pain killers, Penicillin, Tetracycline etc. It has provided us with Vitamins, Enzymes, Minerals and Anaesthesia (chloroform, formalin etc.)

**(e) What is alchemy?**

**Answer:** The word “Alchemy” has its origin in a Greek word ‘Khemeia’ means “art of transmuting metals”. It was partly based on experimentations and partly on spiritual discipline.

**(f) What kind of experiments did Alchemists do?**

**Answer:** ‘Alchemists’ considered being early chemists. They used all general techniques of chemistry in healing humans. Their contribution proved valuable to the society and in the advancement of civilization. They had contributed to an incredible number of future uses of chemicals, metals, ink, paints, cosmetic, medicines, porcelain, etc.

**(g) What is ‘Philosopher’s stone’?**

**Answer:** The goal of alchemy was to find a mythical and magical substance called philosopher’s stone” not a literal stone but wax, liquid or powder with magical power, which on heating with a base, iron and copper metals would turn into gold, the purest form of matter which would bring wealth, health and immortality.



**(h) What is the main difference between alchemy and chemistry?**

**Answer:** Alchemy was both scientific and spiritual. Alchemists never separated them. It also lacked a common language for its concepts and processes i.e. there was no standardized scientific practice. Chemistry was completely separated from ancient traditional alchemy. Still modern chemistry in general owes a great deal to alchemy. Alloys are formed by mixing metals with other metals and substances.

**(i) Name the chemicals which help in increasing food production.**

**Answer: Chemicals** which help in increasing food production are fertilisers like urea, sodium nitrate, potash, ammonium phosphate, calcium nitrate etc. **Pesticides** like **aldrin, malathion** which are used to kill pests. Insecticides like D.D.T., B.H.C. **fungicides** like **sulphur, Bordeaux mixture** etc.

**(j) Name six such products, which we use daily.**

**Answer: Six products of daily use** are soap, paints, pen, tooth-paste, cooking oil, potable water.

**(k) How is the knowledge of chemistry important to mankind?**

**Answer: Importance of chemistry to mankind** chemistry plays an important role to provide us with things of daily use like toothpaste, soap, detergents, paints, clothes, medicines, fertilisers, pesticides, plastics, in preparing fuels, consumer products like glass, paper, pencils, pens, in substances used in defence like gunpowder, T.N.T. etc.

### **Question 3.**

**What is the contribution of chemistry in the following fields?**

**Answer:** Contribution of chemistry in the field of:

**(a) Industry**

**Industry:** To improve efficiency and production of metals, paints, paper, plastics, alloys, textile, pharmaceuticals, electroplating, cosmetics, synthetic fibres etc.

**(b) Clothing's**

**Clothing's:** Chemistry is widely used in textile industry which manufactures clothing for us. Clothes guard our body from external environment. Formation of clothing begins with the knowledge of conversion of fibres into fabrics. Fibres can be natural or synthetic. Earlier only natural fibres were known to man such as cotton, jute, silk, wool, etc. which were used to produce dress materials, sarees, bags, sweaters, shawls, etc. With more development, synthetic fibres were also made such as nylon, terylene etc. These fibres are strong, wrinkle resistant and dry quickly. They are used to make towels, bed sheets, bags, curtains, carpets, blankets, dress materials, etc.

**(c) Cosmetics**

**Cosmetics:** The use of talcum powder, skincare creams, lipsticks, eyes and facial make up, deodorants, lotions, perfumes, bathing oil, body butter, baby products, etc. It is possible to convert various ingredients into usable cosmetics due to knowledge of chemistry.

#### (d) National Defence

**National Defence:** Substances like gunpowder, T.N.T. (trinitrotoluene), phosgene, chemical weapons, laughing gas, etc., are all products of chemistry which contribute to the national defence.

#### (e) Medicines

**Medicines:** Extensive researches by chemists have led to the discovery of number of medicinal drugs. These drugs help in fighting diseases and have thus increased the life span of human beings. Examples: Aspirin, paracetamol, antibiotics like penicillin, tetracycline, antiseptics and various other medicines used to kill germs and cure diseases and their symptoms.

#### Question 4.

**Who is known as Father of chemistry? Why?**

**Answer:** Robert William Boyle is known as 'Father of Modern Chemistry'. He was an Anglo Irish scientist born in Ireland. He was the first to perform experiments under controlled conditions and publish his researches with elaborate details of procedure, apparatus and observations. Robert Boyle put chemistry on a firm scientific footing transforming it from alchemy into one based on measurements. He defined elements, compounds and mixtures.

#### Question 5.

**Name the scientists who discovered the following.**

**(a) Atoms (b) Oxygen (c) Safety lamp (d) Elements**

**Answer:** The scientists who discovered

**(a) Atoms:** John Dalton was a British chemist and physicist. He proved that matter consists of small indivisible called 'atoms'. For this he proposed the atomic theory which was later on called "Dalton's atomic theory".

**(b) Oxygen:** Joseph Priestly.

**(c) Safety lamp:** Sir Humphry Davy.

**(d) Elements:** Antoine Lavoisier was a French nobleman. He revolutionized chemistry. Lavoisier named the elements carbon, hydrogen and oxygen and discovered the role of oxygen in combustion and respiration for which he is most noted. He established that water is a compound and helped to continue the transformation of chemistry from a qualitative science to a quantitative one.