

## Group B

- 1. Why should we wear apron while working in the science laboratory?**  
We should wear an apron while working in the science laboratory to protect our clothes and body from chemicals and spills.
- 2. Write one difference between telephone and mobile phone.**  
A telephone is fixed at one place, whereas a mobile phone can be carried anywhere.
- 3. Define retardation.**  
Retardation is the rate of decrease of velocity of a moving object.
- 4. Write any two applications of X-rays.**  
Two applications of X-rays are detecting bone fractures and checking luggage at airports.
- 5. What is meant by heating effect of electricity?**  
Heating effect of electricity is the production of heat when electric current flows through a conductor.
- 6. Name the chemical required to prepare oxygen gas in the laboratory using heat.**  
Potassium chlorate is the chemical required to prepare oxygen gas in the laboratory using heat.
- 7. We should not let children to keep mercury thermometer in their mouth, why?**  
We should not let children keep a mercury thermometer in their mouth because mercury is poisonous if the thermometer breaks.
- 8. Write one difference between inorganic chemical insecticide and organic insecticide.**  
Inorganic chemical insecticides are made from minerals, whereas organic insecticides are made from plant or animal sources.

## Group C

- 1. How is scientific learning done? Describe in brief.**  
Scientific learning is done by observing facts and performing experiments. It also involves collecting data, analyzing results, and drawing conclusions based on evidence.
- 2. Write any two differences between antivirus and firewall.**  
Antivirus software detects and removes viruses from a computer, whereas a firewall blocks unauthorized access to or from a network. Antivirus works on infected files, whereas a firewall controls network traffic.
- 3. Write any two utilities of information and communication technology.**  
Information and communication technology helps in fast communication through email and messaging. It also helps in storing, processing, and sharing large amounts of information.
- 4. Mushroom is considered very important in the context of human health and economic gain. Justify this statement in any two points.**  
Mushrooms are rich in proteins, vitamins, and minerals, so they are beneficial for human health. Mushroom cultivation is a good source of income and employment, so it helps in economic gain.
- 5. Write any two difference between Darwin's theory and De Veries theory.**  
arwin's theory states that evolution occurs through natural selection, whereas De Vries theory states that evolution occurs due to sudden mutations. Darwin believed changes occur slowly over time, whereas De Vries believed changes occur suddenly.
- 6. Write any two functions of each of the given hormones.**

### a) Growth Hormones

Growth hormone helps in the growth of bones and muscles. It also helps in cell division and development of body tissues.

**b) Testosterone**

Testosterone helps in the development of male reproductive organs. It also causes the appearance of secondary sexual characters such as beard and deep voice.

**7. Write any two uses of each of given waves.****a) Infrared wave**

Infrared waves are used in remote controls for televisions. They are also used in night vision cameras and thermal imaging.

**b) Microwave**

Microwaves are used in microwave ovens for cooking food. They are also used in satellite communication and radar systems.

**8. Nebula is called stellar nursery. Why?**

Nebula is called a stellar nursery because new stars are formed from the gas and dust present in a nebula.

**9. Calculate the maximum number of electrons present in shell L and N by using  $2n^2$  rule.**

Using the rule:

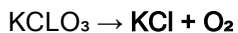
$$\text{Maximum electrons} = 2n^2$$

For shell L,  $n = 2$

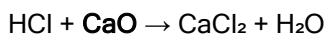
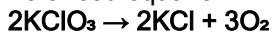
$$\text{Maximum electrons} = 2 \times (2^2) = \mathbf{8 \text{ electrons}}$$

For shell N,  $n = 4$

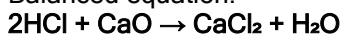
$$\text{Maximum electrons} = 2 \times (4^2) = \mathbf{32 \text{ electrons}}$$

**10. Complete and balance given chemical equations:**

Balanced equation:



Balanced equation:



### Group C

11. Government of Nepal encourages the farmers to establish bio-gas plant. Write any two scientific reasons to it. Write any two reasons why energy like solar power should be used in the context of Nepal.

#### Scientific reasons to establish bio-gas plant:

1. Bio-gas plants use animal dung and organic waste to produce methane gas, which can be used as a clean fuel.
2. The slurry left after producing bio-gas can be used as an organic manure to increase soil fertility.

#### Reasons to use solar power in Nepal:

1. Nepal receives abundant sunlight throughout the year, so solar energy can be easily produced.
2. Solar energy is renewable and reduces dependence on non-renewable energy sources like fossil fuels.

12. Introduce CT scan and explain its working mechanism.

**CT scan (Computed Tomography scan)** is a medical imaging technique used to obtain detailed internal images of the human body.

#### Working mechanism:

1. In a CT scan, X-rays are passed through the body from different angles.
2. The X-ray detectors measure the amount of radiation absorbed by body tissues.
3. A computer processes this data to form cross-sectional images of the body.
4. These images help doctors detect diseases, injuries, and internal abnormalities.

13. Potassium chloride is called an electro valent compound whereas carbon dioxide is called covalent compound, Why?

· Potassium chloride (KCl) is formed by the transfer of electrons from potassium to chlorine. The transfer of electrons forms oppositely charged ions, so KCl is an electrovalent (ionic) compound.

· Carbon dioxide (CO<sub>2</sub>) is formed by the sharing of electrons between carbon and oxygen atoms. The sharing of electrons forms covalent bonds, so CO<sub>2</sub> is a covalent compound.

14. What is the valency of magnesium and hydroxide in the molecular formula Mg(OH)<sub>2</sub>? What are the acidic and basic radicals in that molecular formula.

· The valency of magnesium (Mg) in Mg(OH)<sub>2</sub> is **2** and the valency of hydroxide (OH) is **1**.

· The acidic radical in Mg(OH)<sub>2</sub> is **hydroxide (OH<sup>-</sup>)** and the basic radical in Mg(OH)<sub>2</sub> is **magnesium (Mg<sup>2+</sup>)**.

15. Write any one uses of given substances.

#### a) Compost manure

Compost manure is used to increase soil fertility and improve plant growth.

#### b) Insecticides

Insecticides are used to kill harmful insects that damage crops.

#### c) Diamond

Diamond is used for cutting glass and hard materials due to its hardness.

**d) Graphite**

Graphite is used in making pencil leads.

