

**CLASS-6**  
**Chapter-1**

**Exercise**

A. 1. Photosynthesis 2. Ingredients 3. Tuber 4. Nectar 5. Apiculture

B. 1. Heterotrophs 2. beverages 3. nutritious 4. milch animals 5. dead animals

C. 1. Root 2. Stem 3. Leaves 4. Flower 5. Root 6. Seeds 7. Fruit 8. Stem 9. Root

D.1. Tiger

Reason: Tiger is a carnivore (meat-eating animal), while the others (cow, buffalo, deer, giraffe) are herbivores (plant-eating animals).

2. Arhar

Reason: Arhar is a pulse (legume), while the others (rice, wheat, maize, barley) are cereals (grains).

3. Turnip

Reason: Turnip is a root, while the others (potato, onion, ginger, taro root) are underground stems.

4. Zebra

Reason: Zebra is a herbivore, while the others (condor, vulture, hyena, jackal) are scavengers or carnivores.

5. Pulses

Reason: Pulses are plant-based proteins, while the others (fish, meat, egg, mutton) are animal-based proteins.

E. 1. Autotrophs – Organisms that can prepare their own food using sunlight, water, and carbon dioxide through the process of photosynthesis. Example: Green plants.

2. Heterotrophs – Organisms that cannot make their own food and depend on plants or other animals for their nutrition. Example: Humans and animals.

3. Ingredients – The materials or substances that are used to prepare a dish or food item. Example: Flour, sugar, and butter are ingredients to make a cake.

4. Nectar – A sweet liquid produced by flowers that attracts insects like bees and butterflies. Bees collect nectar to make honey.

5. Herbivores – Animals that eat only plants, leaves, fruits, and grass. Example: Cow, deer, goat.

6. Omnivores – Animals that eat both plants and animals. Example: Humans, bears, and crows.

F. 1. Because they prepare their own food using sunlight through the process of photosynthesis.

2. Because it contains all essential nutrients like proteins, fats, carbohydrates, vitamins, and minerals.

3. Because it has antibacterial, healing, and soothing properties that help in treating cough, wounds, and throat infections.

4. Because they clean the environment by eating dead animals and preventing the spread of diseases.

5. Because fish and seafood are easily available there due to the nearby sea and oceans.

G.

Sarson ka sag	- Punjab
Dal-bati	-Rajasthan
Mal-pua	-Bihar
Dhokla	-Gujarat
Karam ka sag	-Jammu & Kashmir
Idli-dosa	-Tamil Nadu

H.

1. We get fruits, vegetables, grains, pulses, oils, spices, tea, coffee, and sugar from plants.
2. Soak gram seeds in water overnight. Drain the water and keep them in a moist cloth for 1-2 days. When small shoots appear, they are sprouted and ready to eat.
3. We get milk, eggs, meat, honey, and fish from animals.
4. Bees collect nectar from flowers, store it in their hives, and process it by evaporating water content to turn it into thick, sweet honey.
5. Animals are grouped as herbivores (plant-eaters), carnivores (meat-eaters), omnivores (both plants and animals), and scavengers (feed on dead animals).
6. Food habits depend on the climate, availability of food, culture, and traditions of a region.

I.

1. Self
2. Root
3. Nectar
4. Elephant
5. Omnivores
6. Tea
7. Bulb
8. Rice

### **HOTS Questions**

1. People in very cold areas eat a lot of fats because fats provide more energy and help keep the body warm by producing heat. In cold regions, people need extra energy to maintain body temperature and survive the harsh climate.

2. Birds of prey have sharp, strong talons to catch, hold, and tear their prey. Talons help them grip animals tightly and kill them quickly for food.

### **Assertion-Reason Questions**

1. Both assertion and reason are true, and the reason correctly explains the assertion.
2. Assertion is false (not all plant parts are edible), but the reason is true.
3. Both assertion and reason are true, and the reason correctly explains the assertion.
4. Both are true, but the reason is not the correct explanation (some carnivores may occasionally eat plants, but digestion is not always the only reason).
5. Assertion is true (they are scavengers), but the reason is false (some of these animals, like hyenas and jackals, can hunt as well).
6. Both assertion and reason are true, and the reason correctly explains the assertion.

### **Case based /Passage based Questions**

1. Sustainable agriculture is a way of farming that focuses on protecting the environment, conserving natural resources like soil and water, and ensuring long-term food production without harming nature.
2. Conserving soil and water.
  - Practicing agroforestry (growing trees with crops).
  - Using crop rotation to keep soil healthy.
  - Adopting organic farming (using natural fertilizers and pesticides).
  - Reducing the use of harmful chemicals.

3. It maintains soil fertility and prevents land degradation. It protects the environment and promotes healthy ecosystems.
4. Developing climate-resilient and disease-resistant crops. Reducing food waste and using better storage methods.
5. Vertical Farming:
  - Saves space by growing crops in layers.
  - Requires less water and allows year-round production.

Hydroponics:

- Grows plants without soil, using nutrient-rich water.
- Reduces land use and minimizes the need for harmful pesticides.

## **WORD MAZE**

1. CHIMPANZEE
2. STARFISH
3. KANGAROO
4. CROCODILE
5. ELEPHANT

## **Chapter-2**

### **Exercise**

A. 1. Carbohydrates 2. Carbohydrates 3. Carbohydrates 4. Proteins and Fats 5. Proteins 6. Proteins and Fats 7. Fats and Proteins 8. Fats 9. Fats 10. Carbohydrates (Sugars)

B. 1. T 2. T 3. T 4. F 5. T

C. 1. Wheat

Reason: Wheat is a cereal, while the others are pulses.

2. Fish

Reason: Fish is a source of proteins, while the others are mainly carbohydrates or sugars.

### 3. Butter

Reason: Butter is an animal fat, while the others are plant-based and dry fruits or nuts.

### 4. Fats

Reason: Fats are nutrients that provide energy, while the others are minerals important for body functions.

D. 1. carbohydrates 2. more 3. rich 4. Children 5. high

E.1. Nutrients are the substances in food that our body needs to grow, stay healthy, and get energy. They include carbohydrates, proteins, fats, vitamins, minerals, water, and roughage.

2. To test for starch, add a few drops of iodine solution to the food item. If the food turns blue-black, it means starch is present.

3. Fats – Provide energy, keep the body warm, and protect internal organs.

Proteins – Help in growth, repair of body tissues, and building muscles.

Vitamins – Protect us from diseases and keep our body healthy.

4. Water helps in digestion, removes waste, regulates body temperature, and transports nutrients in the body.

5. Roughage helps in proper bowel movement, prevents constipation, and cleans the digestive system.

6. A balanced diet is a diet that contains all the essential nutrients in the right amounts needed for good health.

7. Deficiency diseases happen when a person does not get enough of a particular nutrient. They are caused by a lack of nutrients like vitamins, minerals, proteins, etc., in the diet.

8. Junk foods are unhealthy foods that are high in fats, sugar, and salt but low in nutrients. Examples include chips, burgers, and soft drinks.

F. 1. Because proteins help in their growth and development of muscles and tissues.

2. Because carbohydrates give quick energy needed for physical activities.

3. Because it contains almost all the essential nutrients like proteins, fats, vitamins, and minerals.

4. Because it can cause obesity and increase the risk of heart diseases.

5. Because exercise keeps our body fit, improves blood circulation, and prevents diseases.

G. 1. Vitamins 2. Fat 3. Iron 4. Iodine 5. Kwashiorkor

### **Assertion-Reason Questions**

1. Assertion is true and reason is false.

2. Both assertion and reason are true and reason is the correct explanation of assertion.

3. Both assertion and reason are true and reason is the correct explanation of assertion.

4. Both assertion and reason are true but reason is not the correct explanation of assertion.

5. Both assertion and reason are true and reason is the correct explanation of assertion.

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7. Both assertion and reason are true but reason is not the correct explanation of assertion.

### **Case based /Passage based Questions**

1. We should eat a nutrition-rich and balanced diet to protect ourselves from deficiency diseases, malnutrition, and other health problems. It helps keep our body healthy, provides energy, and boosts immunity.

2. The various groups of foods are:

- Fruits
- Vegetables
- Whole grains
- Lean proteins
- Healthy fats

3. Some causes of obesity are:

- Overeating
- Eating processed and junk foods
- Lack of physical activity
- Large meal portions
- Poor diet high in fats and starch

4. We can protect ourselves from obesity by:

- Eating a balanced diet with diverse nutrition.
- Controlling meal portions and avoiding overeating.
- Avoiding processed foods.
- Staying physically active.
- Drinking enough water to stay hydrated.

5. Two disadvantages of processed foods are:

1. They are low in nutrients.
2. They are high in unhealthy fats and starch.

### **HOTS Questions**

1. People living in very cold areas eat a lot of fats because fats provide more energy and help to keep the body warm by

producing heat. Fats also create an insulating layer under the skin, which protects them from the extreme cold.

2. Poor people suffer from deficiency diseases because they cannot afford a balanced diet. Their food lacks essential nutrients like vitamins, minerals, and proteins. Rich people often suffer from obesity and heart diseases because they overeat and consume junk and processed foods that are high in fats and sugars, but low in essential nutrients. They may also have less physical activity.

3. Milk is sometimes not considered a good food these days because:

- It may be adulterated (mixed with harmful chemicals).
- Some people are lactose intolerant, meaning they cannot digest milk properly.
- Packed milk may contain preservatives and lose nutrients during processing.
- Excess consumption of milk products may cause weight gain and other health issues.

### **WORD MAZE**

1. PAPAYA 2. TOMATO 3. APPLE 4. MANGO

AMLA is the richest source of vitamin C.

### **Chapter-3**

#### **Exercise**

A. 1. Ginning 2. Patson 3. Spinning 4. Weaving 5. Powerloom

B. 1. fibres 2. Chemicals 3. black 4. humid 5. Stems

C. 1. T 2. F 3. F 4. T 5. F

D. 1. Rayon

Reason: Wool, cotton, and linen are natural fibres, whereas rayon is a synthetic fibre.

## 2. Shirt

Reason: Saree, dhoti, and lungi are traditional unstitched garments, whereas shirt is a stitched garment.

## 3. Washing

Reason: Ginning, weaving, and spinning are processes involved in making fabric, while washing is not part of fabric production; it is a cleaning process.

E. 1. Cotton clothes are soft, breathable, and comfortable, especially in hot and humid weather, whereas synthetic clothes can be sticky, less absorbent, and uncomfortable.

2. The Deccan Plateau has black soil and a warm climate, which are ideal conditions for the growth of cotton plants.

3. These states have alluvial soil, heavy rainfall, and a hot and humid climate, which are perfect for growing jute.

4. Handloom products are often unique, eco-friendly, durable, and support traditional artisans, while factory products are mass-produced and may lack craftsmanship.

F. 1. Natural Fibres: These fibres are obtained from plants and animals (e.g., cotton, jute, wool, silk).

Synthetic Fibres: These fibres are man-made and prepared from chemicals (e.g., nylon, polyester, rayon).

2. Some special features of synthetic fibres are:

- They are strong and durable.
- They dry quickly.
- They are less expensive.
- They are easy to wash and maintain.
- They are lightweight.

3. Plants: Cotton, jute, flax.

Animals: Wool (from sheep), silk (from silkworms).

4. Cotton is mainly grown in Gujarat, Maharashtra, Madhya Pradesh, Andhra Pradesh, Telangana, Punjab, and Haryana.

5. Cotton gins are used to separate cotton fibres from the seeds easily and quickly.
  6. Jute is mainly grown in West Bengal, Assam, Bihar, Odisha, and Tripura.
  7. The stems of the jute plants are cut and soaked in water for a few days to soften. Then, fibres are separated from the stem by hand through a process called retting.
  8. Early Indians wore clothes made of cotton, wool, and sometimes animal skins or bark fibres.
- G. 1. Polyester 2. Maharashtra 3. Alluvial soil 4. Jute 5. Mahatma Gandhi

### **Assertion-Reason Questions**

1. If both assertion and reason are true and reason is the correct explanation of assertion.
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6. If both assertion and reason are true but reason is not the correct explanation of assertion.

### **Case based/Passage based Questions**

1. Cellulose fibres are fibres that are made from plant-based materials, mainly from cellulose, which is the natural substance found in the cell walls of plants.
2. The three common cellulose fibres are:

- Cotton
- Flax
- Jute

3. Rayon is considered a cellulose fibre because it is made from wood pulp, which contains cellulose. Even though rayon is man-made, its raw material is natural cellulose.

4. Rayon is called artificial silk because it has a silky shine, smooth texture, and soft feel, which makes it look and feel similar to natural silk, even though it is made from wood pulp.

5. The raw material used for making rayon or viscose is wood pulp.

### **WORD MAZE**

1. MONKEY 2. PEACOCK 3. GIRAFFE 4. SNAIL 5. IGUANA 6. SILKWORM

MERINO is breed of sheep that gives us best wool.

## **Chapter-4**

### **Exercise**

A. 1. T 2. T 3. F 4. T 5. T

B. 1. Oxygen 2. less 3. a transparent 4. easier 5. hard

C. 1. Transparent objects: Glass, Clear plastic, Clean water

2. Translucent objects: Butter paper, Frosted glass, Thin cloth

3. Opaque objects: Wood, Stone, Metal

D. Group II- 1 and 3 are edible. 2 and 4 are non-edible.

Group III- 1 and 3 are made of wood. 2 and 4 are made of metal.

Group IV- 1 and 4 are non-spherical. 2 and 3 are spherical.

E. 1. Metals react with air, water, and moisture, forming a layer of rust or tarnish on their surface, which makes them lose their shine.

2. Water contains dissolved oxygen, which fish absorb through their gills to breathe and survive.

3. Though steel is heavy, ships are designed with hollow shapes that distribute weight over a large area, making them less dense than water, so they float.

4. Grouping items makes it easier for customers to find things quickly and keeps the store organised.

5. Glass is transparent, which allows light to pass through while keeping out dust, rain, and wind.

F. 1. Stone

Reason: Iron, gold, silver, and copper are metals, whereas stone is a non-metal.

2. Ship

Reason: Rose, tulip, lotus, and jasmine are flowers, while ship is a vehicle.

3. Sun

Reason: Car, bus, van, and truck are vehicles, whereas sun is a celestial body.

4. Sand

Reason: Water, ice, snow, and steam are different forms of water, but sand is not.

5. Pen

Reason: Chair, bed, table, and cupboard are furniture, while pen is a stationery item.

G. 1. Grouping means arranging or keeping similar things together in sets based on their common properties.

Advantages of grouping:

- It makes it easy to find things quickly.
- It helps in keeping things organized and tidy.

2. Gold and wood are very different materials:

- Gold is a metal, shiny, soft, heavy, and can be melted and shaped easily.
- Wood is non-metallic, rough, light, and cannot be melted or shaped like metals.

The property of high malleability and lustre (shiny appearance) of gold makes it perfect for making jewellery.

3.

Miscible Liquids	Immiscible Liquids
Liquids that mix completely to form a single solution.	Liquids that do not mix and form separate layers.
Example: Water and vinegar	Example: Oil and water

4. Buoyancy is the upward force exerted by a liquid that helps objects to float.

- Things float if their density is less than water and buoyant force is greater than their weight.
- Things sink if their density is more than water and buoyant force is less than their weight.

5.

Transparent Objects	Opaque Objects
Objects that allow light to pass through them.	Objects that do not allow any light to pass through.
Example: Glass, clear plastic	Example: Wood, metal

H. 1. Sponge 2. Water 3. Wax 4. Muslin cloth 5. Wood

### HOTS Questions

1. When you open a cold drink bottle, fizzing bubbles come out because the drink contains a gas called carbon dioxide (CO<sub>2</sub>), which is dissolved under high pressure.

2. Oil makes the paper translucent, allowing some light to pass, so you can see the bulb partially.

### **Assertion-Reason Questions**

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### **Case based/Passage based Questions**

1. Sorting of rocks is important because it helps us understand the Earth's history, the processes that have shaped its surface, and the conditions under which different rocks were formed. This knowledge is useful for studying natural resources, construction materials, and understanding past climates and geological events.
2. The three major types of rocks are:
  - Igneous rocks
  - Sedimentary rocks
  - Metamorphic rocks
3. Rocks are sorted based on factors such as:
  - Texture
  - Mineral content

- Environment of formation (like alluvial, marine, or desert environments)

4. Sedimentary rocks can be grouped based on the environment of formation, such as:

- Alluvial (formed by rivers and streams)
- Marine (formed in seas and oceans)
- Desert (formed in dry, sandy areas)

## **WORD MAZE**

DIAMOND is the hardest substance in nature.

### **Revision Time-1**

A. 1. Honeybees 2. Tuber 3. Fat 4. Iodine 5. Carbon dioxide

B. 1. Root 2. Stem 3. Leaves 4. Flower 5. Seed

C. 1. Carbohydrate 2. Proteins 3. Vitamin D 4. Photosynthesis  
5. Kwashiorkor

D. 1. Because water exerts an upward force called buoyant force, which reduces the weight of the object.

2. Because sunlight is required for photosynthesis, and there is no sunlight at night.

3. Because proteins help in growth and development of muscles, tissues, and organs.

4. Because excess fats can cause obesity, heart diseases, and other health problems.

5. Because transparent containers allow customers to see the items clearly, making them attractive and easier to select.

## **Chapter-5**

### **Exercise**

A. 1. Evaporation 2. Saturated solution 3. Solvent 4. Threshing 5. Winnowing

B. 1. F 2. T 3. F 4. T 5. F

C. 1. Threshing is the process of separating grains from the stalks after harvesting.

2. Sedimentation is the process in which heavier particles settle down at the bottom of a liquid.

3. Filtration is the process of separating insoluble solids from a liquid using a filter.

4. Evaporation is the process in which a liquid changes into vapour on heating.

5. Condensation is the process of changing water vapour into liquid water on cooling.

D. 1. Handpicking, winnowing, and sieving 2. Filtration and evaporation 3. Magnetic separation, dissolution, and

filtration 4. Sieving and winnowing 5. Separating funnel

E. 1. Because alum helps in settling down the fine suspended particles by coagulating them.

2. Because oil is lighter than water and does not mix with it.

3. Because distilled water is pure and free from impurities and germs.

4. Because river water does not contain enough dissolved salt like sea water.

5. Because it has high amounts of dissolved salts, which are harmful to health.

F. 1. Sieving is a method of separating particles of different sizes using a sieve.

Usefulness: It is used in our daily life to separate impurities from flour or grains.

2. Filtration is the process of separating insoluble solids from a liquid using a filter.

Example: Separating tea leaves from tea using a strainer.

3. Distilled water is prepared by heating water until it evaporates. The vapour is then cooled and collected as pure water, leaving behind impurities.

4. Solute: The substance that dissolves (e.g., salt).

Solvent: The liquid that dissolves the solute (e.g., water).

Solution: A uniform mixture of solute and solvent.

To increase dissolving capacity: Stir the solution, heat the water, or crush the solute into smaller particles.

5. Sea water is collected in shallow ponds and left under the sun. Water evaporates, leaving behind salt, which is then collected and purified.

G. 1. Filtration 2. Distilled water 3. Water 4. Temperature 5. Wind

### **Assertion-Reason Questions**

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### **Case based/Passage based Questions**

1. Iron, Steel, Nickel, and Cobalt.
2. Non-magnetic materials are those materials that do not get attracted to magnets. They do not stick to magnets and have no magnetic properties.
3. A mixture of sand and iron filings.
4. Plastic, Wood, Glass, Rubber, and Paper.

### **HOTS Questions**

1. We can separate sugar from wheat flour by sieving. The sugar crystals are larger in size than wheat flour particles, so when passed through a sieve, the flour will pass through, and sugar will remain on the sieve.
2. First, allow the bucket to stand undisturbed for some time so that the heavier mud particles settle down at the bottom (this is called sedimentation). Then, slowly pour out the clear water from the top (decantation), or filter the water to remove any remaining particles.
3. Alisha should add sugar first because sugar dissolves faster in warm water than in cold water.  
If she adds ice first, the water will become cold, and the sugar will take longer to dissolve.

## **Chapter-6**

### **Exercise**

- A. 1. Moon 2. Reversible change 3. Touch-me-not (Mimosa)  
4. Reversible change 5. Solution
- B. 1. T 2. T 3. F 4. T 5. T
- C. 1. increases 2. an irreversible 3. A reversible 4. temporary  
5. solute

D. 1. A change that can be reversed to get the original form back.

Examples: Melting of ice, folding of paper, boiling of water, and dissolving sugar in water.

2. Chemical changes produce an entirely new substance.

3. Dissolving sugar in water, melting butter.

4.

Physical Change	Chemical Change
No new substance forms	New substance forms
Usually reversible	Usually irreversible

5. Heat and pressure.

E. 1. To allow space for expansion of metal rails in hot weather.

2. Water expands on freezing, which breaks the glass bottle.

F. 1. Breathing, heartbeat, digestion, and growth.

Digestion is irreversible because food changes into new substances like nutrients and waste.

2. Solid (ice), liquid (water), gas (steam).

The change is physical because no new substance is formed and it can easily reverse.

3.

Slow Changes	Fast Changes
Rusting of iron	Bursting of crackers
Growth of plants	Burning of paper
Formation of mountains	Tearing of paper
Changing of a bud to flower	Mixing vinegar and baking soda

4. Physical Change:

- Temporary
- Reversible
- No new substance formed

Chemical Change:

- Permanent
- Irreversible
- New substance formed

5. Heating makes the rubber expand, making it easier to fit the tyre on the wheel rim.

G. 1. Changing of a bud into a flower 2. Ripening of fruits 3. Movement of the earth on its axis

### **Assertion-Reason Questions**

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### **Case based/Passage based Questions**

1. Water is a universal solvent because:
  - It is dipolar (has both positive and negative charges).
  - It has a small molecular size, which helps in the dissolution process.
2. A universal solvent is a substance that can dissolve a wide variety of other substances. Water is called a universal

solvent because it can dissolve many salts, acids, bases, and polar organic compounds.

3. A dipolar substance is a molecule that has two opposite charges (positive and negative) on different ends of the molecule.

4. Water can dissolve:

- Salts
- Acids
- Bases
- Polar organic compounds

5. Water cannot dissolve effectively:

- Oils
- Hydrophobic (water-repelling) compounds

### **HOTS Questions**

1. No, the change in POP cannot be reversed. When POP is mixed with water, it undergoes a chemical change and sets into a hard solid. Once it hardens, it cannot be converted back into its original powder form.

2. No, the change in the cement cannot be reversed. When cement reacts with water, it undergoes a chemical reaction and sets into a hard mass. Even if the water dries due to sunlight, the cement cannot return to its original powder form.

## **Chapter-7**

### **Exercise**

A. 1. Nodes 2. Lamina 3. Stomata 4. Climbers 5.

Photosynthesis

B. 1. T 2. T 3. F 4. T 5. T

C. 1. Roots 2. Stem 3. Leaves 4. Flower 5. Seed

D. 1. Trees: Mango, Neem, Banyan

2. Shrubs: Rose, Hibiscus, Cotton

3. Herbs: Mint, Coriander, Spinach

4. Creepers and Climbers: Money plant, Pumpkin, Pea

E. 1. Cuscuta 2. Pea plant 3. Opuntia (Cactus) 4. Peas

F.1. The stem is called the backbone of a plant because it supports the plant and helps in transporting water, minerals, and food to all parts of the plant.

2. The leaves are called the 'kitchen of the plant' because they prepare food for the plant through the process of photosynthesis.

3. Some plants (insectivorous plants) eat insects to fulfill their nitrogen requirement, as they grow in soil that is poor in nutrients.

4. Algae make food on their own because they contain chlorophyll and perform photosynthesis.

5. Fungi cannot make food on their own as they do not have chlorophyll and depend on dead or decaying matter for their nutrition.

G. 1. Difference between root system and shoot system:

- Root system: Underground part that absorbs water and anchors the plant.
- Shoot system: Above-ground part that includes stem, leaves, flowers, and fruits.

2. Venation is the arrangement of veins in the leaf blade (lamina).

3. Carbon dioxide, water, sunlight, and chlorophyll.

4. Exchange of gases in plants takes place through tiny openings called stomata present on leaves.

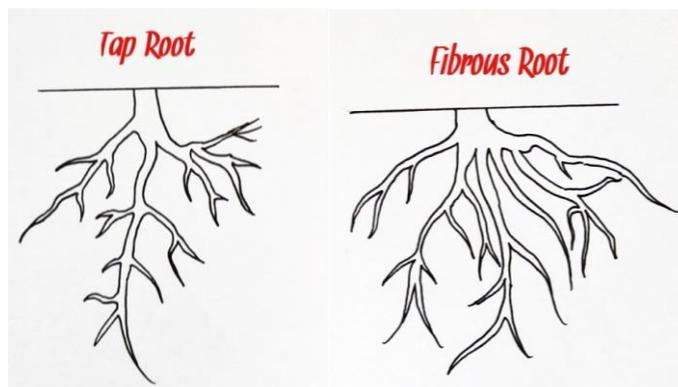
5. Difference between complete and incomplete flowers:

- Complete flower: Has all four parts — sepals, petals, stamens, and pistils.
- Incomplete flower: Lacks one or more of these parts.

H. 1. Tap root: One main root with smaller branches.

Example: Mango.

Fibrous root: A group of roots of similar size. Example: Grass.

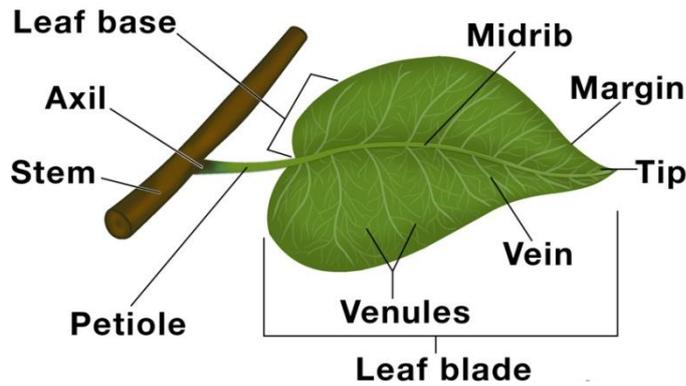


2. Main functions of the stem:

- Supports leaves, flowers, and fruits.
- Transports water and minerals from roots to other parts.
- Carries food from leaves to the rest of the plant.
- Stores food in some plants (like sugarcane).

3. Parts of a leaf:

- Lamina: The flat part.
- Petiole: The stalk that attaches the leaf to the stem.
- Veins: For transporting food and water.
- Midrib: The central thick vein.

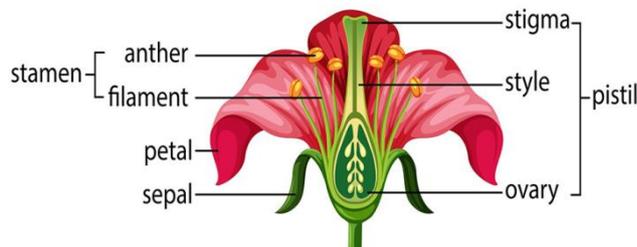


#### 4. Activity to show leaves lose water:

- Cover a leafy branch with a plastic bag.
- After some time, water droplets appear inside the bag.
- This shows water is lost through transpiration.

#### 5. Parts of a flower:

- Sepals: Protect the bud.
- Petals: Attract insects.
- Stamens: Male part (anther and filament).
- Pistil: Female part (stigma, style, ovary).



I. 1. Banyan 2. Rhizome 3. Petals 4. Stamens 5. Sunflower

#### Assertion-Reason Questions

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3. Both assertion and reason are true, but reason is not the correct explanation of assertion.

4. Both assertion and reason are true, and reason is the correct explanation of assertion.
5. Both assertion and reason are true, and reason is the correct explanation of assertion.
6. Both assertion and reason are true, and reason is the correct explanation of assertion.

### **Case based/Passage based Questions**

1. Rose is considered one of the oldest plants because a 35-million-year-old fossil of a rose was discovered in Colorado, which proves its ancient existence.
2. Most natural species of roses have five petals.
3. Rose petals are rich in Vitamin C, making them nutritionally beneficial.
4. Uses of rose petals include:
  - Making rose eye drops to soothe the eyes.
  - Preparing Gulkand, which is used in Unani medicine as a cooling tonic.
  - Making perfumes due to their fragrance.
5. The pleasant and strong fragrance of roses makes them ideal for use in the perfume industry.

### **WORD MAZE**

1. CARROT 2. CABBAGE 3. CAULIFLOWER 4. LADYFINGER 5. APPLE 6. GRAPES 7. RADISH 8. BRINJAL 9. ORANGE
- RAFFLESIA is the biggest flower of the world.

### **HOTS Questions**

1. Most leaves are flat and broad to trap maximum sunlight. This helps the leaf to absorb more sunlight, which is needed for the process of photosynthesis to make food for the plant.

2. Most flowers have bright colours to attract insects like bees and butterflies. These insects help in pollination, which is the transfer of pollen from one flower to another, allowing plants to produce seeds and fruits.

## Chapter-8

### Exercise

A. 1. Hard 2. Synovial fluid 3. 22 4. Vertebrae 5. 12

B. 1. shoulders 2. ligaments 3. lower jaw bone 4. S-shaped 5. floating ribs

C. 1. T 2. F 3. T 4. T 5. T

D. 1. Shoulder and hip 2. Elbow and knee 3. Neck (between the skull and the first two vertebrae) 4. Wrists and ankles

E. 1. An earthworm has many hair-like bristles on its body to help it grip the ground and move easily through the soil.

2. A bird possesses hollow and light bones to make its body lighter, which helps it fly easily.

3. A fish has a streamlined body to reduce water resistance and help it swim smoothly.

4. A snake always moves in a curve manner because it has no limbs and moves by creating loops or curves in its body to push against the ground.

F. 1. Joints are places where two or more bones meet and allow movement.

The main joints in the human body are:

- Ball-and-socket joint
- Hinge joint
- Pivot joint
- Gliding joint

2. The skull protects the brain from injuries and also gives shape to the head and face.

3. The rib cage is a bony structure made of ribs, the backbone, and the sternum. It protects the heart and lungs.
  4. Muscles work in pairs because when one muscle contracts, the other relaxes to create movement.
  5. The pelvic girdles support the lower body, protect internal organs, and help in standing and walking.
- G. 1. Ball-and-socket joint: This joint allows movement in all directions. It is found in the shoulder and hip.
- Hinge joint: This joint allows movement in only one direction, like opening and closing a door. It is found in the knee and elbow.

*(Diagram suggestion: A simple drawing showing the ball-and-socket joint in the shoulder and the hinge joint at the elbow.)*

2. An earthworm moves by using its muscles and tiny bristles called setae. It contracts and stretches its body by using circular and longitudinal muscles. The bristles grip the ground and help it push forward.
3. Birds have several features that help them fly:
  - Light and hollow bones
  - Strong chest muscles
  - Wings with feathers
  - Streamlined body shape
  - Air sacs to store extra oxygen

4. The elbow has a hinge joint, which allows the arm to bend and straighten in one direction, like opening and closing a door.

*(Diagram suggestion: Show the upper arm (humerus), the lower arm (radius and ulna), and the hinge joint at the elbow.)*

5. A snake moves by creating loops or curves in its body. It pushes against the ground with its scales and muscles, sliding forward. This movement is called slithering.

H. 1. Arm 2. 33 3. Femur 4. Arm 5. Shell 6. Bird

### **Assertion-Reason Questions**

1. Both assertion and reason are true, and the reason is the correct explanation.
2. Both assertion and reason are true, and the reason is the correct explanation.
3. Both assertion and reason are true, and the reason is the correct explanation.
4. Both assertion and reason are true, and the reason is the correct explanation.
5. Both assertion and reason are true, but the reason is not fully correct because the rib cage mainly protects the heart and lungs, not the liver and spleen.
6. Assertion is false (the hip girdle is not the single strongest bone; the femur is considered the strongest bone), and reason is true.

### **Case based/Passage based Questions**

1. A muscle cramp is a sudden, involuntary tightening or contraction of one or more muscles, causing intense pain and difficulty in movement.
2. The calf muscles are most commonly affected, but muscles of the thigh can also experience cramps.
3. Some common causes of night leg cramps include:
  - Sedentary lifestyle (lack of physical activity)
  - Improper sitting positions
  - Prolonged standing

- Ageing (more common in older adults)
4. Muscle cramps in the legs can be prevented by:
- Regular stretching and exercise
  - Maintaining good posture while sitting and standing
  - Staying hydrated
  - Avoiding sitting or standing in the same position for too long
  - Doing light stretches before bedtime

### **WORD MAZE**

STAPEDIUS is the smallest muscle in your body.

### **HOTS Questions**

1. The difference is:

- Birds' wings are made of feathers attached to their arm and hand bones.
- Bats' wings are made of a thin skin membrane stretched over their long fingers.

So, birds use feathers for flying, while bats use skin stretched between bones.

2. If we had only one long bone instead of small vertebrae:

- Our back would become stiff and inflexible.
- We would not be able to bend, twist, or move our back easily.
- Small vertebrae allow flexibility and movement, but a single bone would make us rigid.

### **REVISION TIME-2**

1. Water 2. Onion 3. Stamens 4. 206 bones 5. Arms

B. 1. True 2. True 3. False 4. True 5. True

C. 1. Solution 2. Reversible change 3. Sepals 4. Yeast 5. Backbone (Vertebral column)

- D. 1. Salt is obtained from sea water by evaporation. The water evaporates due to the heat of the sun, leaving the salt behind.
2. A reversible change is a change that can be undone or reversed to get back the original form, like melting of ice into water and freezing back into ice.
3. Venation is the arrangement of veins on a leaf. It helps in the transport of water and food within the leaf.
4. A leaf needs sunlight, carbon dioxide, water, and chlorophyll to make food through photosynthesis.
5. The skull protects the brain and gives shape to the head and face.

### **MODEL TEST PAPER-1**

Self attempt.

### **Chapter-9**

#### **Exercise**

A. 1. Amphibians 2. Bat 3. Proboscis 4. Conifers 5. Acacia

B. 1. T 2. T 3. T 4. F 5. T

C. 1. living 2. aquatic 3. aerial 4. dense 5. prehensile

D.

Living things	Breathing organs
Plants	Stomata
Scorpions	Book lungs
Humans	Lungs
Insects	Spiracles
Fish	Gills

E. 1. Desert animals like fennec fox and jerboas have big ears. They have big ears to release extra body heat and keep their bodies cool in the hot desert climate.

2. Conifers do not produce flowers. Conifers do not produce flowers because they reproduce using cones instead of flowers and seeds inside fruits.

3. Wildebeest usually live in large groups or herds. They live in large groups to protect themselves from predators, as staying together increases their safety.

4. Water lily and lotus have long, hollow, and light stems. Their stems are long, hollow, and light to help them float on water and support the leaves and flowers above the surface.

5. Hookworms and tapeworms do not have proper digestive organs. They don't need digestive organs because they absorb digested food directly from the host's intestine where they live.

F. 1. Biotic components are the living things in an environment (plants, animals, humans).

Abiotic components are the non-living things like air, water, sunlight, soil, and temperature.

2. Adaptation is a special feature or behaviour that helps a living thing survive in its habitat.

3. Ephemerals are plants that complete their life cycle very quickly, often during short wet seasons in deserts.

4. Living things grow, move, need food, breathe, reproduce, respond to stimuli, and die.

5. Animals reproduce either by laying eggs (like birds and reptiles) or by giving birth to young ones (like mammals).

G. 1. Camels have thick skin to bear heat, long eyelashes to protect eyes from sand, humps to store fat, and can drink large amounts of water at once. Their wide feet help them walk on sand without sinking.

2. Cacti have thick, fleshy stems to store water, spines instead of leaves to reduce water loss, and a deep root system to absorb water from underground.
  3. Deer have strong, slender legs for running fast, brown skin for camouflage, sharp ears to hear predators, and large eyes for a wide field of vision.
  4. Aquatic animals have streamlined bodies to swim easily, gills for breathing underwater, fins for movement, and scales to protect their bodies.
  5. Frogs have lungs to breathe on land and moist skin to absorb oxygen in water. Their strong hind legs help them jump on land and swim in water.
- H. 1. Bacteria 2. Butterfly 3. Fats

### **Assertion-Reason Questions**

1. If both assertion and reason are true and reason is the correct explanation of assertion.
2. If both assertion and reason are true and reason is the correct explanation of assertion.
3. If both assertion and reason are true and reason is the correct explanation of assertion.
4. If both assertion and reason are true and reason is the correct explanation of assertion.
5. If both assertion and reason are true but reason is not the correct explanation of assertion.
6. If both assertion and reason are true and reason is the correct explanation of assertion.

### **Case based Questions**

1. Honeybees communicate the location of nectar through a special movement called the "waggle dance." This dance tells

other bees where the nectar is, including the direction and distance from the hive.

2. Honeybees sense the Earth's magnetic field to help them navigate and find their way back to the hive, even over long distances or when the sun isn't visible.

3. Honeybees detect electromagnetic waves and subtle changes in the atmosphere, which help them sense when a thunderstorm or bad weather is coming, so they can return to the hive in time.

4. Worker honeybees release pheromones to warn other bees of danger, guide them, or organize activities inside the hive like defence or foraging.

### **WORD MAZE**

1.VULTURE 2. PIGEON 3. HORSE 4.BUTTERFLY 5. STARFISH  
VIRUS

### **HOTS Questions**

1. Most creatures in deep oceans have light organs (called bioluminescent organs) because sunlight cannot reach the bottom of the ocean. These light organs help them to see in the dark, attract prey, find mates, and escape from predators.

2. Monkeys have big claws and prehensile tails because they live on trees. Their claws help them grip branches, and their tails act like an extra hand to hold onto branches, which helps them balance, swing, and move safely through the trees.

## Chapter-10

### Exercise

A. 1. cm 2. cm 3. mm 4. m 5. km

B.

Column I	Column II
1. Distance between two stars	b. Light year
2. Distance between Delhi and Jaipur	d. Kilometre
3. Width of a pencil box	e. Centimetre
4. Thickness of a coin	a. Millimetre
5. Length of a fabric	c. Metres

C. 1. T 2. T 3. T 4. F 5. F

D. 1. 'Angul' and 'handspan' are not used as standard units because these measurements vary from person to person, so they are not accurate or reliable for standard use.

2. The diameter of a tree cannot be measured by a meter rod because a meter rod is straight, and the tree trunk is circular, so we cannot wrap a straight rod around a round object to measure its diameter properly.

E. 1.

Rest	Motion
An object is said to be at rest if it does not change its position with time.	An object is said to be in motion if it changes its position with time.
Example: A parked car.	Example: A moving train.

2.

Rectilinear Motion	Curvilinear Motion
Motion in a straight line.	Motion along a curved path.
Example: A car on a straight road.	Example: A ball thrown in the air.

3. Two instances where we observe combinations of motion are:

A rolling football (rotational + translational motion).

The hands of a clock moving while the clock is fixed on a wall (rotational + no translational motion).

4. We need to measure distance:

To know how far two places or objects are from each other.

For planning travel, construction, or making maps accurately.

5. Precautions to measure the length of a book:

Place the scale along the edge of the book properly.

Start measuring from the zero mark of the scale.

Keep your eyes straight above the reading to avoid errors.

6. Use a thread to trace the curved line from start to end.

Then straighten the thread and measure its length with a scale.

F. 1. 2650 m 2. 21.5 m 3. 1.49 m, 1490 mm

G.1. cm and mm 2. Metre 3. 1000

### **HOTS Questions**

1. A top rotates in a manner similar to the earth because:

- Both spin around a fixed axis.
- The earth rotates on its axis from west to east, just like a top spins around its own central line.

A steering wheel spins but its axis is horizontal and is usually rotated by hands for turning, so it is not similar to the earth's rotation.

2. The bicycle wheels are showing rotational motion.

- The bicycle as a whole is in translational motion (moving from one place to another).
- The pedals are also in rotational motion.

- The legs of the rider are making periodic motion as they move up and down while pedaling.

So, riding a bicycle is an example of combined motion (rotational + translational + periodic).

### **Assertion-Reason Questions**

1. Both assertion and reason are true and reason is the correct explanation of assertion.
2. Both assertion and reason are true and reason is the correct explanation of assertion.
3. Both assertion and reason are true but reason is not the correct explanation of assertion.
4. Both assertion and reason are true and reason is the correct explanation of assertion.
5. Both assertion and reason are true and reason is the correct explanation of assertion.
6. Both assertion and reason are true and reason is the correct explanation of assertion.

### **Case based Questions**

1. The desire to have a universal unit of length evolved during the French Revolution in 1789.
2. The seconds pendulum was rejected because its length varied from place to place due to differences in gravity at different locations on Earth.
3. During the French Revolution, there was a push to replace old systems, including traditional units of measurement, with universal and standard units. This led to the creation of the metre, originally defined as one ten-millionth of the distance from the North Pole to the Equator, measured along a meridian through Paris.

4. The length of the path travelled by light in vacuum during a time interval of  $\frac{1}{299\,792\,458}$  of a second.

## Chapter-11

### Exercise

A. 1. presence 2. an opaque 3. bigger 4. straight 5. Parallel

B. 1. Non-luminous 2. Non-luminous 3. Luminous 4. Non-luminous 5. Luminous 6. Non-luminous 7. Luminous 8.

Luminous 9. Non-luminous 10. Luminous

C. 1.

Luminous Objects	Non-luminous Objects
Objects that produce their own light.	Objects that do not produce their own light.
Example: Sun, Candle, Torch.	Example: Moon, Book, Chair.

2.

Opaque Objects	Transparent Objects
Objects that do not allow light to pass through them.	Objects that allow light to pass through completely.
Example: Wood, Stone.	Example: Glass, Clear Water.

3.

Lunar Eclipse	Solar Eclipse
Happens when the Earth comes between the Sun and the Moon.	Happens when the Moon comes between the Sun and the Earth.
Occurs on a full moon night.	Occurs on a new moon day.

4.

Shadow	Image
It is formed when light is blocked by an opaque object.	It is formed when light is reflected from a surface like a mirror.
It is always dark.	It has the same color and features as the object.

D. 1. The Moon does not produce its own light; it reflects the light of the Sun, which makes it shine at night.

2. Shadows are formed when an object blocks light completely. Only opaque objects can block light, which creates a shadow.

3. A mirror has a smooth, shiny surface that bounces back (reflects) most of the light falling on it, allowing us to see clear images.

4. A rough surface scatters light in different directions, so the reflected light doesn't form a clear or sharp image.

E. 1. Two natural sources of light are Sun and stars.

2. Two artificial sources of light are electric bulb and candle.

3. Activity:

- Take three cardboard pieces and make a small hole in the middle of each.
- Place the cardboard pieces in a straight line.
- Look through the holes; you will see a candle flame placed on the other side.
- Now, move one cardboard out of line — the flame is no longer visible.

Conclusion: Light passes through the holes only when they are in a straight line.

4. Features of a shadow are:

- A shadow is always dark.
- It is formed only by opaque objects blocking light.
- It forms on the opposite side of the light source.
- It shows the shape of the object but not its color or details.

5. A pinhole camera is a simple device to capture images using a small hole instead of a lens.

Working: Light passes through the tiny pinhole and projects

an inverted image of the object onto the screen inside the camera box.

6.	Smooth Surface (Mirror)	Rough Surface (Wall)
	Reflects light in one direction.	Scatters light in many directions.
	Forms clear images.	Does not form clear images.

#### 7. Activity:

- Darken a room and place a mirror on a table.
- Shine a torch light onto the mirror.
- Observe how the light bounces off the mirror onto the wall.

Conclusion: The mirror reflects the light in another direction.

8.

Mirror Image	Shadow
1. A mirror image shows <b>all details</b> like colour, shape, and features of the object.	1. A shadow is always <b>dark</b> and shows only the <b>outline or shape</b> of the object.
2. A mirror image is formed due to <b>reflection of light</b> .	2. A shadow is formed when an object <b>blocks light</b> from a source.

F. 1. Earth 2. Beam 3. Sundial 4. Colour 5. 8½ minutes

#### HOTS Questions

1. Shadow

2. We prefer to wear white cotton clothes on a hot day because white colour reflects most of the sunlight and does not absorb heat, keeping us cool. Also, cotton absorbs sweat and helps it evaporate, making us feel comfortable.

### **Assertion-Reason Questions**

1. Both assertion and reason are true and reason is the correct explanation of assertion.
2. Both assertion and reason are true and reason is the correct explanation of assertion.
3. Assertion is true and reason is false.
4. Both assertion and reason are true and reason is the correct explanation of assertion.
5. Both assertion and reason are true and reason is the correct explanation of assertion.
6. Both assertion and reason are true and reason is the correct explanation of assertion.

### **Case-based Questions**

1. The maximum limit of a total lunar eclipse is approximately 1 hour and 40 minutes.
2. The partial phases of an eclipse can last for about an hour or more on either side of the total eclipse.
3. The totality of an eclipse depends upon the viewer's location and how close they are to the centre of the path of totality.
4. The longest lunar eclipse of the 21st century occurred on July 27, 2018, and lasted for 1 hour and 43 minutes.

*(Note: The eclipse mentioned in the question on July 22, 2009 refers to the longest solar eclipse of the 21st century, which lasted 6 minutes and 39 seconds.)*

## **Chapter-12**

### **Exercise**

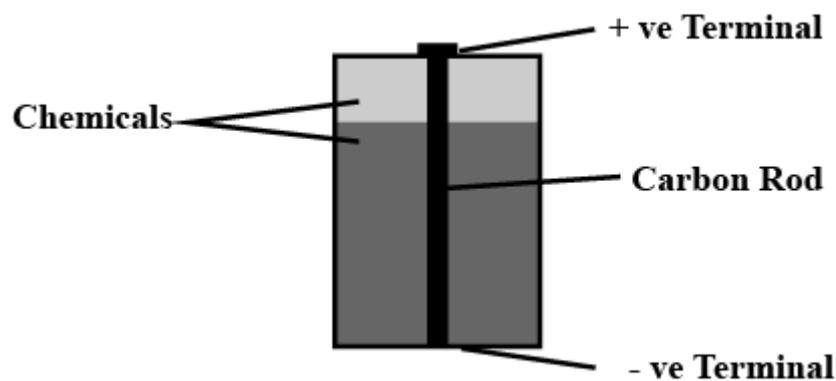
- A. 1. two 2. chemical energy 3. filament 4. fused 5. good conductors

B. 1. T 2. T 3. F 4. F 5. T

C. 1. Conductor 2. Conductor 3. Insulator 4. Insulator 5. Conductor 6. Conductor 7. Conductor 8. Insulator 9. Conductor 10. Conductor

D. 1. dry cell 2. incomplete 3. arrows 4. key 5. rubber

E. 1.



- The positive terminal is the metal cap on top.
- The negative terminal is the metal disc at the bottom.

2. An electric circuit is a complete path through which electric current can flow. It usually consists of a cell (or battery), wires, a switch, and a device like a bulb.

3. The current flows from the positive terminal of the cell to the negative terminal through the circuit.

4. An electric switch is used to open or close a circuit.

- ON (closed circuit): Current flows.
- OFF (open circuit): Current stops.

5.

Closed Circuit	Open Circuit
The path of current is complete.	The path of current is broken.
Current flows through the circuit.	No current flows.
The bulb glows.	The bulb does not glow.

6. A cell has two terminals (positive and negative) to create a flow of electric current. A bulb also has two terminals so that

electric current can enter through one end and exit through the other, making the filament glow.

7. A torch has a switch to control the flow of current:

- When the switch is ON, the circuit is complete, and the bulb lights up.
- When the switch is OFF, the circuit is broken, and the bulb goes off.

8.

Conductors	Insulators
The materials that allow electric current to pass through them are called <i>conductors</i> .	Those materials which do not allow electric current to pass through them are called <i>insulators</i> .
Examples: Copper, Iron, Silver.	Examples: Rubber, Plastic, Wood.

F. 1. A fused bulb does not glow because in a fused bulb, the filament is broken, which causes a break in the circuit.

Without a complete path, electric current cannot flow, so the bulb does not glow.

2. Copper wire is generally used in a circuit. Copper is a good conductor of electricity. It allows electric current to pass through it easily and has low resistance, making it ideal for electrical circuits.

3. Electricity does not flow in an open circuit. In an open circuit, the path for the current is broken or incomplete, so electricity cannot flow through it. A complete loop is necessary for current to pass.

4. Metal wires are covered with plastics. Metals are good conductors of electricity, while plastics are insulators.

Covering metal wires with plastic prevents electric shocks and keeps the current safely inside the wire.

5. We should not touch electrical appliances with wet hands. Water is a good conductor of electricity. Wet hands can allow electricity to pass through your body, which may cause a dangerous electric shock.

G. 1. Coal 2. Chemicals 3. ●—● 4. Mercury

### **Assertion-Reason Questions**

1. Both assertion and reason are true, and reason is the correct explanation of assertion.
2. Assertion is true, and reason is false.
3. Both assertion and reason are true, and reason is the correct explanation of assertion.
4. Both assertion and reason are true, and reason is the correct explanation of assertion.
5. Both assertion and reason are true, and reason is the correct explanation of assertion.
6. Both assertion and reason are true, and reason is the correct explanation of assertion.

### **Case based Questions**

1. Photovoltaic cell
2. Because it produces electricity (photo) and voltage (voltaic) when exposed to light.
3. A solar panel is a device made up of many solar cells connected together to produce more electricity from sunlight.
4. Silicon

## **WORD MAZE**

1. THORIUM 2. URANIUM 3. NITROGEN 4. GERMANIUM 5. SODIUM 6. TITANIUM 7. ERBIUM 8. NICKEL  
TUNGSTEN metal is used to make the filament of a bulb.

## **HOTS Questions**

1. The human body contains water and minerals (salts), which allow electric current to pass easily, making it a good conductor of electricity.
2. An electric shock is a sudden flow of electric current through the body, which can cause pain, muscle spasms, burns, or even be life-threatening depending on the strength of the current.
3. Birds sitting on a single electric wire do not complete a circuit, so electricity does not flow through their bodies. For a shock to happen, there must be a difference in potential (voltage) across two points of contact, which is not the case when birds sit on just one wire.

## **Revision-3**

- A. 1. deserts 2. amphibians 3. book 4. beam 5. 8½ minutes  
B. 1. True 2. True 3. True 4. False 5. False  
C. 1. Response 2. Excretion 3. Periodic motion 4. Opaque objects 5. Conductors  
D. 1. A habitat is the natural environment where an organism lives and grows. Examples: Desert and Ocean.  
2. Ephemerals are plants that complete their life cycle in a very short period, usually within a season. They are adapted to survive in harsh environments like deserts.  
3. Rest: An object is said to be at rest if it does not change its position with respect to its surroundings over time.

Motion: An object is said to be in motion if it changes its position with respect to its surroundings over time.

4. Reflection is the phenomenon where light bounces off a surface and changes direction without passing through it.

5. Conductors are materials that allow electric current to pass through them easily. Examples: Copper, Silver, Aluminium.

## Chapter-13

### Exercise

A. 1. Lodestone 2. Two 3. North-South 4. Compass 5. No

B. 1. T 2. T 3. F 4. T 5. F

C. 1. N 2. M 3. M 4. N 5. N 6. M

D. 1. Magnetite is a naturally occurring magnetic mineral composed of iron oxide ( $\text{Fe}_3\text{O}_4$ ). It is one of the strongest naturally magnetic substances.

2. The poles of a magnet are located at its two ends, where the magnetic force is the strongest.

3. Maximum magnetism is found at the poles of a magnet.

4. The directive property of a magnet, which allows it to align itself with the Earth's magnetic field, is used in making a compass.

5. To restore a magnet's properties:

Stroke method: Rub a strong magnet over the weakened magnet in one direction.

Electrical method: Pass an electric current through a coil wrapped around the magnet.

Proper storage: Store magnets with keepers (soft iron bars) to maintain their strength.

E. 1. You suspend a magnet freely. It will align itself in the north-south direction due to the Earth's magnetic field.

2. You bring like poles of two magnets close to each other. They will repel each other because like poles repel.
3. You cut a magnet into pieces. Each piece will become a new magnet with its own north and south poles; you cannot separate the poles.
4. You rub a rod of iron with a magnet. The iron rod will become magnetized and start attracting small iron objects.
5. You drop a magnet from a height. The magnet may lose some of its magnetism due to the disturbance in its internal structure.

F. 1. The discovery of magnets dates back to ancient Greece, where a shepherd named Magnes is said to have found that his iron-tipped staff stuck to a black rock. This rock was later named magnetite due to its magnetic properties.

The Chinese also discovered that lodestone (a naturally occurring magnet) always pointed north when suspended freely, leading to the development of the magnetic compass.

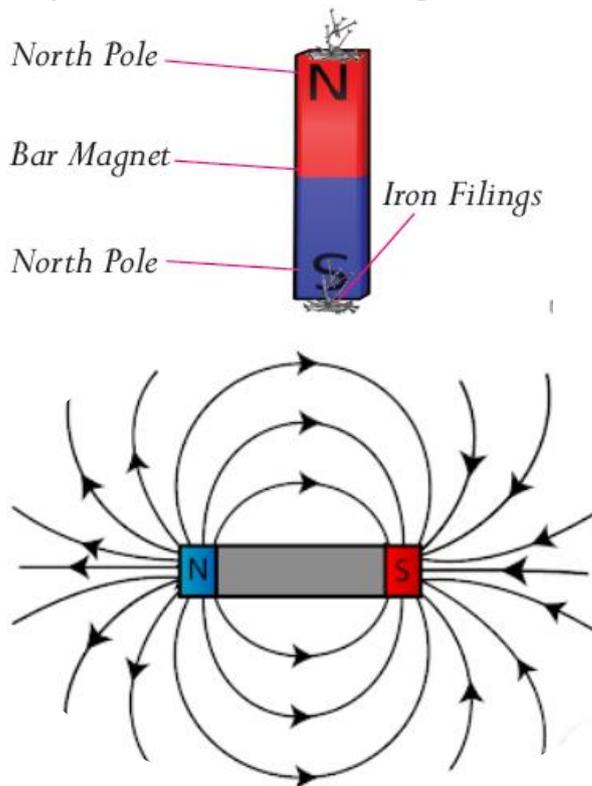
2.

Magnetic Materials	Non-Magnetic Materials
Materials that are attracted to a magnet.	Materials that are not attracted to a magnet.
Contain iron, nickel, or cobalt.	Do not contain iron, nickel, or cobalt.
Examples: Iron, Steel, Nickel.	Examples: Plastic, Wood, Rubber.

3. Explanation:

- The magnetic field lines emerge from the North Pole and enter the South Pole.
- The concentration of field lines is highest near the poles, indicating the strongest magnetic force.

- In the centre of the magnet, the field lines are more spread out, meaning the force is weaker.



#### 4. The method of making a magnet:

##### By Stroking:

Take an iron bar and a strong magnet.

Stroke the magnet along the iron bar in one direction repeatedly.

The iron bar will gradually turn into a magnet.

##### By Electrical Method:

Wrap a coil of insulated wire around an iron rod.

Connect the wire to a battery.

The iron rod will become an electromagnet as long as the current flows.

#### 5. The various uses of magnets are:

- In compasses for navigation.
- In electric motors to convert electricity into motion.
- In medical applications like MRI machines.

- In refrigerators to keep doors closed.
- In magnetic levitation (Maglev) trains for high-speed transport.

G. 1. Asia 2. Lodestone 3. Rubber 4. north-south 5. ATM card

### **Assertion-Reason Questions**

1. Both assertion and reason are true, and reason is the correct explanation of assertion.
2. Both assertion and reason are true, and reason is the correct explanation of assertion.
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### **Case-based Questions**

1. The Earth's magnetic field exerts a force on the compass needle, aligning it in the north-south direction.
2. The north pole of a magnet is attracted to the Earth's magnetic south pole, which is located near the geographic North Pole.
3. The south pole of a magnet is attracted to the Earth's magnetic north pole, which is located near the geographic South Pole.
4. No, they are not the same. The geographic North Pole is a fixed location based on Earth's axis, whereas the magnetic

north pole is the point where the Earth's magnetic field lines point vertically downward and shifts over time.

### **WORD MAZE**

The atoms of a magnet are called DOMAINS.

### **HOTS Questions**

1. Suspend the magnet freely using a thin thread. The magnet will align itself along the north-south direction due to Earth's magnetic field. The end that points towards the geographic north is the north pole of the magnet, and the end pointing towards the geographic south is its south pole.
2. The blade of the sharpener is made of iron or steel, which are magnetic materials. Even though the body is plastic (a non-magnetic material), the blade contains iron, which gets attracted to the magnet.

## **Chapter-14**

### **Exercise**

- A. 1. Rainwater 2. Sunlight 3. Winter 4. Flood 5. Conserve
- B. 1. T 2. T 3. T 4. F 5. F
- C. 1. evaporation 2. drought 3. floods 4. 100 , 0 5. transpiration
- D. 1. It evaporates and turns into water vapour.  
2. It contracts and eventually freezes into ice at 0°C.  
3. It condenses to form water droplets (leading to dew, clouds, or rain).  
4. It melts into liquid water at 0°C.
- E. 1. Pure water does not exist in nature. Water naturally dissolves minerals, gases, and impurities from the air and land, making it impure.

2. Water does not show extreme changes in temperature as compared to land. Water has a high specific heat capacity, meaning it takes longer to heat up or cool down compared to land.

3. We cannot use water of the sea and oceans. Seawater is salty and contains high amounts of dissolved salts, making it unfit for direct consumption or irrigation without desalination.

4. Groundwater level has drastically gone down in many areas. Due to excessive water extraction, deforestation, lack of rainfall, and urbanization, groundwater is being used faster than it is replenished.

F. 1. Condensation 2. Evaporation 3. Condensation 4. Evaporation 5. Evaporation

G. 1. The various properties of water are:

- Water is colourless, odourless, and tasteless.
- It is a universal solvent, dissolving many substances.
- It has high surface tension and high specific heat capacity.
- It can exist in three states: solid (ice), liquid (water), and gas (vapour).

2. The various uses of water are:

- Drinking and cooking
- Agriculture (irrigation of crops)
- Industries (cooling, processing, and manufacturing)
- Hydroelectric power generation
- Cleaning and sanitation

3. The main sources of water are:

- Rainwater
- Surface water (rivers, lakes, ponds)
- Groundwater (wells, tube wells, springs)

- Glaciers and ice caps
- Seas and oceans (though not directly drinkable)

4. Water evaporates from water bodies due to heat. The water vapour rises and cools, leading to condensation into tiny water droplets. These droplets combine to form clouds.

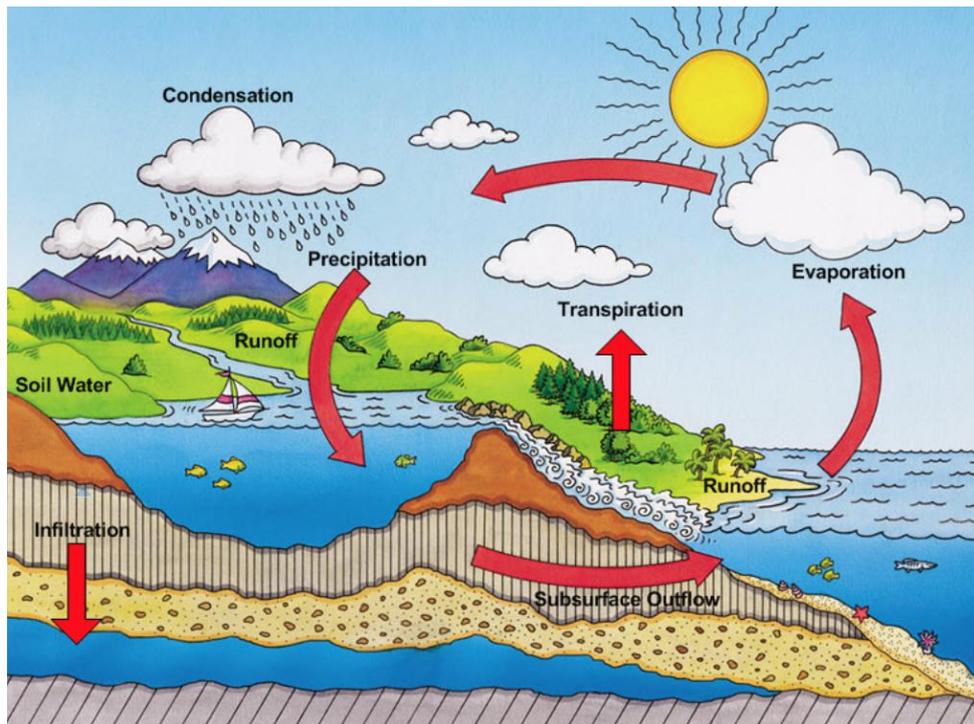
5. A drought occurs when there is little or no rainfall for a long period. It leads to water scarcity, drying up of water bodies, and crop failure.

H. 1. Water vapour enters the atmosphere through evaporation from oceans, rivers, lakes, and other water bodies. Transpiration from plants and respiration from animals also release water vapour into the air. Water from wet surfaces also evaporates and rises into the atmosphere.

2. The various features of water formed due to evaporation and condensation in the atmosphere:

- **Evaporation:** The process in which water changes into water vapour due to heat from the sun.
- **Condensation:** The process where water vapour cools and turns into tiny water droplets, forming clouds, fog, dew, and mist.
- **Precipitation:** When condensed water droplets become heavy, they fall as rain, snow, sleet, or hail.
- **Dew and Frost:** Water condenses into dew on cool surfaces, and if the temperature is very low, it freezes into frost.

3.



4. A drought occurs when there is no rainfall for a long time. Rivers, lakes, and wells dry up, causing water scarcity. Crops fail, leading to famine and food shortages. Animals and humans suffer due to a lack of drinking water.

5. Two methods of water conservation are:

- Rainwater Harvesting: Collecting and storing rainwater for later use in tanks, pits, and reservoirs.
- Drip Irrigation: A technique used in agriculture where small amounts of water are supplied directly to plant roots, preventing wastage.

1. stomata 2. dew 3. 0 °C 4. It is sweet 5. rain

### Assertion-Reason Questions

1. Both assertion and reason are true, and reason is the correct explanation of assertion.
2. Both assertion and reason are true, and reason is the correct explanation of assertion.
3. Both assertion and reason are true, but reason is not the correct explanation of assertion.

4. Both assertion and reason are true, and reason is the correct explanation of assertion.
5. Both assertion and reason are true, and reason is the correct explanation of assertion.
6. Both assertion and reason are true, and reason is the correct explanation of assertion.

### **Case-Based Questions**

1. Trees add moisture to the atmosphere through transpiration, where water from leaves evaporates into the air. They also retain moisture in the soil, reducing evaporation from the ground.
2. Transpiration releases water vapour into the air, increasing humidity. This water vapour cools and condenses to form clouds, leading to rainfall.
3. Forests absorb heat, creating temperature differences that drive air movement. They help in the formation of clouds and allow moisture-laden winds to move to drier areas.
4. The advantages of forests in relation to rainfall are:
  - Increase in Rainfall: Forests contribute to cloud formation, leading to more rainfall.
  - Humidity Regulation: Trees make the air more humid, preventing excessive drying of land.
  - Prevention of Drought: By modifying air movement, forests help bring moisture to dry areas, reducing the chances of drought.

### **WORD MAZE**

1. GANGA
2. YAMUNA

## HOTS Questions

1. When people breathe out, their breath contains water vapour and is warmer than the glass. When this warm air touches the cooler surface of the glass, the water vapour condenses into tiny water droplets, making the glass appear wet. This process is called condensation.
2. When the temperature drops in winter, the water in lakes and rivers loses heat to the surroundings. As the temperature reaches  $0^{\circ}\text{C}$  (freezing point of water), the water starts to freeze. Ice is a poor conductor of heat, so once a thin layer of ice forms on the surface, it insulates the water below, slowing down further freezing.

## Chapter-15

### Exercise

- A. 1. Nitrogen 2. Oxygen 3. Wind vane 4. Barometer 5. Carbon dioxide
- B. 1. T 2. T 3. T 4. T 5. F
- C. 1. pleasant 2. sea level 3. energy 4. nitrogen 5. light
- D. 1. Mountaineers and space travellers carry oxygen cylinders with them. At high altitudes and in space, oxygen levels are very low, making it difficult to breathe. Oxygen cylinders help them breathe properly and avoid suffocation.
2. Carbon dioxide is used in fire extinguishers. Carbon dioxide does not support combustion and helps to cut off the oxygen supply needed for fire. It is heavier than air, so it quickly settles over the flames and puts out the fire.
3. We should always breathe in through our nose. The nose has tiny hair and mucus that filter dust, germs, and pollutants from the air. It also warms and moistens the air before it enters the lungs, making it safer for breathing.

4. Dolphins and whales come to the surface of the water regularly. Unlike fish, dolphins and whales are mammals and breathe through lungs, not gills. They need to come to the surface to inhale oxygen through their blowholes.

5. Earthworms come out of the soil during heavy rains. Heavy rain fills the soil with water, reducing the oxygen supply underground. Earthworms come to the surface to breathe properly and avoid suffocation.

E. 1. Air is composed of 78% nitrogen, 21% oxygen, and 1% other gases (including carbon dioxide, argon, and water vapour).

2. Light a candle and place a glass jar over it. The flame will go out after some time because the oxygen inside the jar gets used up. This proves that oxygen is necessary for burning.

3. Take a glass of water and heat it slowly. You will see tiny bubbles forming on the inner surface of the glass. These bubbles are dissolved air escaping from the water, proving that air is present in water.

4. Aquatic animals use gills or their skin to absorb dissolved oxygen from the water.

5. Windmills (generate electricity), Sailboats (move using wind power), Hot air balloons (rise due to heated air) and Kites (fly with the help of wind)

6. Take an empty glass and invert it into a bowl of water. Water will not enter the glass because the air inside exerts pressure. This proves that air exerts pressure and prevents water from filling the space.

7. Oxygen is essential for breathing (respiration).

- It is needed for burning fuels.
- It is used in hospitals for patients with breathing problems.

- It is used in space missions and deep-sea diving.
8. Blow air into a test tube containing lime water. The lime water turns milky, proving the presence of carbon dioxide in the air we exhale.
  9. Animals get nitrogen indirectly by consuming plants that absorb nitrogen from the soil. Bacteria in the soil convert nitrogen into a usable form for plants, which then pass it on to animals.
  10. Plants take in carbon dioxide and release oxygen during photosynthesis. Animals and humans breathe in oxygen and release carbon dioxide during respiration. This natural cycle maintains the balance of oxygen and carbon dioxide in the atmosphere.
- F. 1. 21% 2. Breeze 3. Nitrogen 4. 78% 5. Glider

### **Assertion-Reason Questions**

1. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
2. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
3. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
4. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
5. Both assertion and reason are true, and the reason is the correct explanation of the assertion.
6. Both assertion and reason are true, and the reason is the correct explanation of the assertion.

### **Case-Based Questions**

1. The advantages of air from the above paragraph.

- Air insulates the Earth, preventing extreme temperatures.
- The ozone layer in the atmosphere protects us from harmful UV rays.
- Air burns meteoroids before they reach the Earth's surface.

2. Meteoroids are small pieces of rock from space that enter the Earth's atmosphere.

3. When meteoroids come in contact with air, they burn due to friction and often disintegrate before reaching Earth.

4. Ozone (O<sub>3</sub>) gas in the atmosphere protects us from harmful ultraviolet rays.

## **WORD MAZE**

1. HELIUM 2. PLANTS

## **HOTS Questions**

1. At high altitudes, the oxygen level in the air is lower than in the plains. To compensate for this, the human body produces more red blood cells (RBCs) to carry enough oxygen to different parts of the body. This helps them survive in low-oxygen environments and prevents altitude sickness.

2. The oxygen level on Earth remains balanced due to the oxygen-carbon dioxide cycle. Plants and trees produce oxygen through photosynthesis by using carbon dioxide from the air. Animals and humans breathe in oxygen and release carbon dioxide through respiration. The continuous exchange between plants and living beings ensures that we do not run out of oxygen.

## Chapter-16

### Exercise

A. 1. Yes 2. Cholera 3. Non-biodegradable waste 4. Acid rain  
5. Air purification

B. 1. T 2. T 3. T 4. T 5. F

C. 1. daily 2. liquid 3. sulphur dioxide 4. air 5. Paper bags

D. 1. The three main kinds of waste are solid waste, liquid waste, and gaseous waste.

2. Biodegradable waste: Waste that can decompose naturally through the action of microorganisms (e.g., food scraps, paper, plant waste).

Non-biodegradable waste: Waste that does not decompose easily and remains in the environment for a long time (e.g., plastic, glass, metal).

3. The various methods of disposing of solid wastes are:

- Landfilling
- Composting
- Incineration
- Recycling
- Open dumping

4. Incineration is the process of burning waste materials at high temperatures to reduce their volume and convert them into ash, gases, and heat energy.

5. Vermicomposting is the process of using earthworms to break down organic waste into nutrient-rich compost, which can be used as a natural fertilizer.

E. 1. Yes, all methods of waste disposal have advantages and disadvantages:

- Landfilling can cause land pollution and groundwater contamination.
- Incineration leads to air pollution.
- Open dumping harms the environment and spreads diseases.
- Recycling and composting are better alternatives as they reduce waste production and environmental harm.

## 2. Various methods of disposal of liquid waste:

- Sewage treatment plants: Treat wastewater before releasing it into the environment.
- Soak pits: Used for small-scale wastewater management.
- Chemical treatment: Used in industries to neutralize harmful chemicals.
- Recycling: Wastewater can be treated and reused for irrigation and industrial purposes.

## 3. Acid rain is harmful to mankind:

- It damages buildings and monuments (especially those made of marble).
- It harms crops and reduces soil fertility.
- It pollutes water bodies, affecting aquatic life.
- It causes respiratory issues and skin irritation in humans.

## 4. Recycling reduces landfill waste, conserves natural resources, and decreases pollution.

Materials that can be recycled: Paper, plastic, glass, metal, and electronic waste.

## 5. The Rock Garden in Chandigarh, created by Nek Chand, is unique because it is built entirely from industrial and household waste materials.

- Individuals can manage waste by:
- Reducing waste production.

- Recycling and reusing materials.
- Properly segregating waste.
- Spreading awareness about waste management.

F. 1. Diarrhoea 2. Bacteria and Fungi 3. Cards 4. Iron 5. Polythene

### **HOTS Questions**

1. Earthworms improve soil quality by aerating it and breaking down organic matter into nutrient-rich compost, making the soil more fertile.
2. Composting is the better option because:
  - It enriches the soil with nutrients.
  - Burning leaves causes air pollution and releases harmful gases.
3. Yes, because a kabadiwala (scrap dealer) collects and recycles waste materials like paper, metal, and plastic, reducing waste pollution and conserving resources.
4. Plastic bags are lightweight and non-biodegradable, leading to littering, blocking drains, and harming animals. Other plastic products like TV cabinets and buckets are more durable and less likely to be discarded frequently.

### **Assertion-Reason Questions**

1. Both assertion and reason are true, and reason is the correct explanation of assertion.
2. Both assertion and reason are true, and reason is the correct explanation of assertion.
3. Both assertion and reason are true, and reason is the correct explanation of assertion.
4. Both assertion and reason are true, and reason is the correct explanation of assertion.

5. Both assertion and reason are true, and reason is the correct explanation of assertion.

6. Assertion is true, but reason is false.

### **Case-based Questions**

1. By refusing to buy excessively packaged products, we reduce plastic and other waste, decrease pollution, and lower the demand for single-use plastics, which harm the environment.

2. We can reduce garbage at home by:

- Avoiding food wastage.
- Using reusable containers, cloth bags, and metal water bottles instead of disposable ones.
- Composting organic waste like fruit and vegetable peels.
- Donating old clothes and items instead of throwing them away.

3. Repurposing means modifying a discarded item to use it for another purpose instead of throwing it away. For example, turning old jeans into a bag or using glass jars as storage containers.

4. Recycling is the process of converting waste materials into new products to prevent waste accumulation and conserve natural resources. For example, melting old plastic to make new plastic items or recycling paper to make new sheets.

### **Revision Time-4**

A. 1. Two 2. Eraser 3. 0°C 4. Rain 5. 21%

B. 1. ends 2. repel 3. condensation 4. winter 5. floods

C. 1. T 2. T 3. T 4. F 5. T

D. 1. A magnet always points in the north-south direction. This property is used in making a compass for navigation.

2. Properties of water are:

- Water is a universal solvent (dissolves many substances).
- Water has a high specific heat capacity, which helps regulate temperature.

3. The main sources of water are rain, rivers, lakes, glaciers, groundwater, and oceans.

4. The main gases in the air are nitrogen (78%), oxygen (21%), and other gases like carbon dioxide, argon, and water vapour (1%).

5. Vermicomposting is the process of using earthworms to break down organic waste into nutrient-rich compost that improves soil fertility.

## **MODEL TEST PAPER-2**

Self Attempt.