

Food : Where Does It Come From?

I. Answer the following questions :

- Ans.**
1. Our body needs food because food provides us the energy required by our body. Food also provides the material needed for the Growth and development of the body. It helps to repair injured tissues. Lastly, it helps to build resistance against diseases and to fight infections helps the body to recover after illness.
 2. It is necessary to cook food it for two reasons :
(A) Cooking make the food digestable and also improves its taste.
(B) Cooking kills the germs that are sometimes present in the food.
 3. On the basis of their food habits animals can be classified into following three groups :
A. Herbivorous Animals : Animals which feed directly on plants or plant products are called herbivores. **For example :** Cow, buffalo, goat, horse, etc.
B. Carnivorous Animals : Animals that eat the flesh of other animals are called carnivores. **For example :** lion, tiger, eagle, etc.
C. Omnivorous Animals : Animals which eat both plants and flesh of animal are called omnivores. **For example :** man, pig, cockroach, etc.
 4. Food comes to us in many ways. Many food items grown in farms or fields cannot be eaten by us directly. For example, farmers grow wheat in their fields. When the wheat ripens, they harvest it. Some sell it to traders and some sell it directly to flour mills. From the mills ground wheat or 'atta' is transported to shops. We generally buy our supplies from shops. But fruits, vegetables and fish are transported directly to wholesale market from where retailers get their supplies. Since they need not to be processed in mills. Sugarcane and oilseeds, like mustard and groundnut are transported to sugar mills and oil mills respectively.
 5. The main steps to avoid wastage of food are :
 - (i) We must ensure that food produced is not get spoiled or eaten by animals like rats and squirrels.
 - (ii) We should take only that much quantity of food in our plate that we can eat with ease.
 - (iii) In parties or in our home we should not leave food uneaten in our plates.
 6. The food items that comes from plants are as follows :
 - (i) **Cereals :** Wheat, rice, maize, etc.
 - (ii) **Pulses :** Pea, bean, potato, tomato, brinjal, gram, soyabean, etc.
 - (iii) Vegetable.

(iv) **Fruits** : Mango, apple, bananas, etc.

(v) **Sugar**.

(vi) **Beverage** : Tea and coffee.

The food items that comes from Animals are : Milk, egg, meat, honey, curd, fish, etc.

II. Fill in the blanks :

Ans. 1. herbivores, 2. carnivores, 3. energy, diseases, 4. sugarcane, 5. proteins, carbohydrates and fats

III. Write whether the following statements are 'true' or 'false' :

Ans. 1. False, 2. True, 3. False, 4. True, 5. False

IV. Complete the following table :

S.No.	Food Product	Source (Name of animals providing the food product)
(i)	Milk	Cow, buffalo, goat
(ii)	Egg	Hen, duck
(iii)	Meat	Pig, hen, fish, sheep, goat
(iv)	Honey	Bus

V. Tick (✓) the correct answer :

Ans. 1. (d), 2. (d), 3. (d), 4. (b), 5. (d)

VI. Match the following columns :

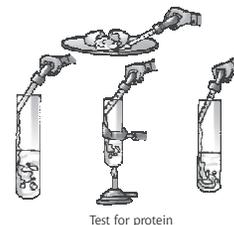
Ans. 1. (b), 2. (f), 3. (a), 4. (g), 5. (h), 6. (c), 7. (i), 8. (j), 9. (d), 10. (e)

2

Components of Food

I. Answer the following questions :

Ans. 1. To test the presence of protein in our food you can do the following activity. Take some of albumin in a test tube and add a few drops of concentrated acid, and heat. The white colour of albumin is change in yellow now, take the acid out of the test tube. Add a few drops of ammonium-hydroxide to the albumin. The colour change to violet, which shows the presence of starch.



2. Many children in our country do not get a balanced diet due to ignorance or poverty. The Supreme Court of India has passed an order according to

which every child who goes to a primary school is entitled to a nutritious, cooked mid-day meal. These meals (100g/day) provides children with at least the minimum requirement of carbohydrates and proteins each day at school. Such type of meal provided by the government schools to the children is called mid-day meal.

3. Water is very essential for the all the living beings. Water plays an important role in our lives. It is required to our body for the following vital functions.
 - (i) Water helps to carry digested food around the body.
 - (ii) It also carries waste, to be thrown out of the body in the form of sweat and urine.
 - (iii) As an important constitute of blood, it helps to carry chemicals and gases throughout
 - (iv) It regulates our body temperature through the process of sweating.
 - (v) It is an essential part of blood and digestive juices etc.

ORS or Oral Rehydration solution is a home made recipe to treat dehydration (loss of lot of water from the body).

4. Food contains various chemical substances required by our body. These chemical substance are called nutrients. Its classified into five groups as carbohydrates, proteins, fats, minerals and vitamins.

Carbohydrates : Carbohydrates are the energy giving food. They are the main source of energy for us.

Proteins : Proteins are required for growth and repair in our body. They help in building the new tissues in our body. Also they help indigestion.

Fats : Fats are also high sources of energy. They add taste and flavour to our food.

Minerals : Minerals are needed only in small quantities, They are very essential for the growth and proper functioning of our body. Also they are essential for chemical reactions in the body.

Vitamins : Vitamins are also essential for the healthy functioning of our body. Only traces of these compounds are needed by the body.

5. A diet is said to be balanced when it provides the proper amount and proportion of calories, protein, minerals, vitamins, water and roughness to maintain a healthy body called balanced diet. A balance diet should contain 50% carbohydrates, 12% protein, 35%, fats 3% minerals and vitamins and sufficient roughage and water.
6. The diseases that occur due to lack of nutrients over a long period are called deficiency diseases. For example, stunt growth, swelling of face, skin diseases, diarrhoea and discolouration of hair. Deficiency of vitamins and mineral may also cause diseases and disorders.
7. Water is vary essential for the continuity of life. We take water not only directly by drinking but also as part of food. Water accounts for about 70% of our body weight. It is important for us for the chemical reactions in our body; digestion; transport and excretion. Roughage is the fibrous part of fruits vegetable and cereals that contain cellulose. Although we cannot digest roughage, it is useful for us. It helps in digestion and prevent constipation.

II. Fill in the blanks :

Ans. 1. aminoacids, 2.fatty acids, glycerol 3. Vitamin B, C, 4. Rickets,
5. Vitamin A, 6. Balanced

III. Match the following columns :

Ans. 1. (g), 2.(e), 3. (a), 4. (h), 5. (b), 6. (c), 7. (d), 8. (f), 9. (i)

IV. Write whether the following statements are 'true' or 'false' :

Ans. 1. False, 2. False, 3. True, 4. False, 5. True, 6. False, 7. True

V. Select the odd one giving reasons :

Ans. 1. **Aminoacids** : Amino acids is source of protein, while calcium phosphorus and iron are sources of minerals.
2. **Dehydration** : Dehydration is caused by the loss of a lot of water in our body, while Rickets, Scurvy, Beri-Beri are caused by the vitamins.
3. **Papaya** : Papaya contains vitamin A while amla, orange, lemon are sources of vitamin C.
4. **Fats** : Fats are different energy giving food whereas glucose, sucrose and starch are carbohydrates.
5. Water is not a part of nutrients while carbohydrates, fats, proteins are part of nutrients.

VI. Tick (✓) the correct option :

Ans. 1. (a), 2. (a), 3. (c), 4. (c), 5. (b), 6. (b)

Clothes and Fibres

I. Answer the following questions :

Ans. 1. The people used to cover their bodies, before the invention of clothes, with the big leaves of trees and skin of animals.
2. According to the source materials, fibres are classified in following three kinds :
(i) **Natural** : These are obtained from plants and animals. Examples : cotton and wool
(ii) **Artificial or synthetic** : These are made in the laboratories with the help of chemicals. Examples : nylon and polyster.
(iii) **Mixed** : These made by combining two different type of fibres. Examples : Teryline + wood and cotton + silk.

3. The fibres which are obtained by mixing man-made fibre with other plant or animal fibre; or a natural fibre with another one is called a mixed fibre. For example, terylene + cotton and cotton + wool.
4. Uses of cotton are :
- (i) Cotton in combination with other fibres is used in the manufacture of textiles.
 - (ii) Cleaned cotton is used as absorbent in hospitals.
 - (iii) Cotton is used as a raw material for the manufacture of rayon and paper industry.
 - (iv) Due to high water absorption quality, clothes made of cotton are used as mops in household and for cleaning machines in the industries.
5. • Spinning is the process by which small pieces of fibres are joined together to make long threads called yarns. Spinning also increases the strength of fibres by twisting them together.
- Dyed or undyed yarns are wound on reels called bobbins and made into cloth by a process, this is called weaving.
6. Jute fibre is obtained from the Jute plant which is cultivated in the rainy parts of India. The fibres are separated from the stems of Jute plants by hand. The fibres are collected, spun and woven into textiles. Jute fibres are very long but not very strong. They rot under certain conditions and weaken when bleached.
7. A loom is an apparatus for making fabric by weaving yarn or thread. On a loom a line of threads is laid lengthwise over the loom. Then other thread placed crosswise above and below this line of threads. Weaving is done manually on a handloom. A loom run on electric power is called a powerloom. In a loom the crosswise thread is attached to a shuttle, which move the thread forward and backward over the lengthwise threads. The lengthwise yarn is called the warp and the crosswise yarn the weft.

II. Fill in the blanks :

Ans. 1. yarn, 2. two sets, 3. Natural fibres, 4. Wool, 5. India, 6. more, 7. much faster

III. Write whether the following statements are 'true' or 'false' :

Ans. 1. True, 2. False, 3. True, 4. True, 5. True, 6. True, 7. True

IV. Match the following columns :

Ans. 1. (c), 2. (i), 3. (e), 4. (b), 5. (f), 6. (a), 7. (h), 8. (g), 9. (d), 10. (j)

V. Tick (✓) the right option :

Ans. 1. (d), 2. (a), 3. (a), 4. (d), 5. (d), 6. (a), 7. (a)

Classification of Materials

I. Answer the following questions :

- Ans.**
- The process of grouping things according to some common properties is called classification. Classification is helpful for us because it enables us to make a systematic study of anything. Classifying materials into different groups has made easier for us to choose the right materials to make certain products.
 - Conductivity is the ability of a material to conduct electric current. The materials, which allow the heat energy to flow through them are called good conductors of heat. All metals are good conductor of heat. Among them silver is the best conductor of heat followed by Copper and aluminium. The materials which do not allow the energy to flow them easily are called bad conductors of heat. Examples, wood, plastics, stone etc. Most of the liquids are bad conductors of heat but mercury a liquid metal is a good conductor of heat Air and all the other gasses are bad conductors of heat.
 - When molecules of different states of matter are intermixed, it is known as diffusion.
Examples :
 - Gas to Gas :** Flowers kept in a room spread their pleasant smell in the entire room.
 - Gas to liquid :** When a plate is brought near the steam, the vapour gets changed into droplets of water.
 - Solid to Gas :** Napthalene balls change directly from solid to gaseous state in air and its smell spreads in to the room.
 - Liquid Gas :** A drop of liquid perfume evaporates and fills the room with sweet smell.
 - Liquids to Liquid :** A drop of ink gently placed in water in a beaker spread slowly throw out water.
 - Solubility of solids in water :** When sugar is stirred in water, it, disappears. The sugar molecules mix with the water molecules so intimately that they cannot be distinguished. They get dissolved in water and forms a solution.
Solubility of Liquids in water : Most of the liquids are insoluble in water. However, some liquids such as alcohol, vinegar, lemon juice etc. dissolve in water, liquids soluble in water are called miscible liquids.
Solubility of Gases in water : Oxygen gas is slightly soluble in water. The dissolved oxygen enables the fish and other aquatic animals to breathe with the help of their gills. Carbon dioxide gas is also slightly soluble in water.
 - Classification of materials in three way :

- | Material | Properties | Classification |
|----------|------------|--|
| Wood | Hardness | Solid, opaque, insulator |
| Glass | Hardness | Solid, opaque hard |
| Paper | Softness | Combustible, translucent, non-magnetic |
| Iron | Hardness | solid, conductor, magnetic |
6. Some materials such as iron, steel, cobalt and nickel are attracted towards a magnet, this property is known as magnetic property of materials. This property of metals is used in making compasses, speakers, doors, knobs of refrigerators, etc.
7. The important properties of materials are :
- Appearance** : The material which has a special shine on them is said to be lustrous and the special shine on them is called luster. Some other materials do not shine at all.
 - Solubility in water** : Some materials are soluble in water while some are not.
 - Transparency** : Those substances through which things can be seen are called transparent and the phenomenon exhibited by these materials is called transparency. Some materials do not let light to pass through them whereas some let light to pass through them partially.
 - Conductivity** : The materials which allow the heat energy to flow through them are called good conductors of heat. But some materials do not let electricity to pass through them and hence are called insulators.
 - Combustibility** : The property by which certain substances catch fire when heated in air is called combustibility. Some materials do not catch fire at all.
 - Attraction towards Magnets** : Some materials are strongly attracted towards a magnet, such materials are called magnetic materials. Most of the materials are not attracted towards magnet.
 - Diffusion** : It is the property of materials in which molecules of different states of matter get intermixed.
 - Colour** : Some substances can be identified on the basis of their colour.
 - Taste** : A substance may be tasteless or may have sweet, salty, sour or bitter taste.
 - Ductility** : Some materials like silver, copper can be drawn into wires these substances are called ductile and this property is called ductility. Also some properties are volatility, roughness, elasticity, etc.

II. Fill in the blanks :

- Ans.** 1. soluble, 2. good conductor, 3. miscible, 4. conductor, 5. insoluble, 6. combustible, 7. lustrous

III. Write whether the following statements are 'true' and 'false' :

- Ans.** 1. True, 2. False, 3. False, 4. True, 5. True, 6. False, 7. False

IV. Solve the crossword puzzle by using the following clues :

Ans.

			3H			2L		1C
			A			U		H
			R			S		A
4C	O	N	D	U	C	T	O	R
								C
5S	O	L	U	B	L	E		O
								A
								L

V. Tick (✓) the correct option :

Ans. 1. (a), 2. (d), 3. (a), 4. (b), 5. (b), 6. (d)

VI. Match the following columns :

Ans. 1. (f), 2. (e), 3. (d), 4. (c), 5. (b), 6. (a)

VII. Select the odd one out giving reason :

- Ans.**
1. Wood : It is a good conductor while iron, stone, glass are bad conductors.
 2. Sand : It is incombustible whereas wax, oil, saw dust are combustible.
 3. Sand : It is not soluble in water while all the three are soluble in water.
 4. Stone : It is not fibres with all the other three are fibres.
 5. Wood : It does not shine whereas rest of the three shines.

5

Separation of Mixtures

I. Answer the following questions :

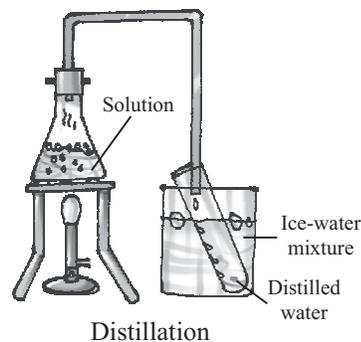
- Ans.**
1. A pure substance is the one in which all the molecules are similar to one another. It includes all such kinds of matter that cannot be separated into other kinds of matter by any physical process. Each pure substance has its own properties like melting point and boiling point. Which are different from any other pure substance.
 2. To separate a mixture of common salt, sand and iron-fillings following activity can be done.
 Spread the mixture on a sheet of paper and roll in it a powerful horse-shoe magnet. Remove the magnet from the mixture and scrape off iron filling from it. Repeat the procedure until no iron filling are left in the mixture.
 Dissolve the above mixture in 100 ml of water. The salt will dissolve but not the sand. Filter the mixture. The sand is left on the filter paper. The clear common salt solution collects as a filtrate. Wash sand with distilled water so as to remove any traces of salt. Dry the sand in hot air.
 Transfer the filtrate into a china dish and heat it over a Bunsen burner

flame. In a few minutes, water evaporates leaving behind dry common salt.

3. Melting and boiling point are physical properties of pure substances by which we can find out the purity of substance. For example : Sea water has a boiling point of more than 100°C . It freezes at a temperature which is lower than 0°C . Thus the purity of a substance can be found out by determining its boiling and melting points..
 4. Sea water contains large amount of common salt and the salts of other materials dissolved in it. Near the sea beach, the seawater is collected in shallow pit and allowed to evaporate in the sunshine, in a few days, the whole water evaporate leaving behind impure salt. The salt so obtained is collected and transported to big factories, where its purified and packed for consumption.
 5. **Heterogeneous Mixtures** : Mixtures in which particles of substance present can be easily seen are called Heterogeneous mixtures. For example : water + oil, chalk in water and iron and sulphur etc.
- Homogeneous Mixture** : Mixtures in which the particles of substance present cannot be seen are called homogeneous mixtures. For example : Sugar and salt in water, cold drink and syrup etc.
6. To separate cream and milk we use the method of centrifugation or churning. In it the milk is churned in a mixer grinder due to which the lighter float to the top surface of milk from where. They are ladled out. This happen because the butter being lighter floats up in the heavier milk.
 7. Distilled water can be prepared by the following :

A solution of salt or sugar is taken in the flask. The flask is heated gently so that the liquid boils. In no time, water starts collecting in the test tube. The water thus collected does not have the taste of salt or sugar. It is pure and is called distilled water. On distillation for sometimes all the water is distilled out and a white residue of salt or sugar is left in the flask.

By improving but similar method distilled water is prepared for laboratory and medicinal purpose.



II. Fill in the blanks :

- Ans.** 1. rock, 2. Ultra violet, 3. chlorine, 4. sedimentation, 5. solution, 6. sedimentation, 7. solid mixture

III. Write whether the following statements are 'true' or 'false' :

- Ans.** 1. False, 2. False, 3. True, 4. False, 5. True, 6. False, 7. True, 8. True

IV. Tick (✓) the correct option :

- Ans.** 1. (a), 2. (b), 3. (d), 4. (d), 5. (c)

I. Answer the following questions :

Ans. 1. Different between physical and chemical changes are as follows :

Physical Change	Chemical Changes
1. In a physical change only physical properties such as, colour, volume, texture, physical state etc., of a substance change but its chemical properties remain unchanged.	1. In a chemical change, the chemical composition and chemical properties of the reacting substances undergo a change.
2. The change is usually temporary. It can be easily reversed by reversing the conditions.	2. It is a permanent change. It cannot be reversed by just reversing the conditions.
3. No new substance is formed.	3. One or more new substances are formed.
4. There is no change in the mass of the substance.	4. The mass of the substance undergoing either decreases or increases.
5. Energy of some kind may or may not be absorbed.	5. Energy of some kind (usually heat or light) is either given out or absorbed.

2. There are various methods which can bring a change in substance. These are :

- (i) Physical change : In it a substance can be changed temporarily and can be reversed if the need arise. For example, switching a fan on or off.
- (ii) Chemical change : In this method a substance is changed permanently to get a new method. Such as forming curd from milk.
- (iii) Expansion and contraction : Sometimes a material is expand or contract and undergo a change. For example, a metal not expands on heating.
- (iv) Changes caused by pressure : Pressure also can change the appearance of a substance. For example, brittle solids(coal, biscuits, etc.) break under pressure.
- (v) Changes caused by mixing : By mixing various things we can create a change. For example, quick lime can be convert to slacked lime by mixing it with water.

- (vi) Endothermic change for Ex. : ripening of fruits.
- 3. Reversible change :** If a change can be reversed it is called reversible change for example : Ice melt on being heated and the water formed freezes when cooled, so melting of ice is a reversible changes.
- Irreversible changes :** If changes cannot be reversed by reversing the conditions are called irreversible changes. For example : when a paper is burnt burns, it change into ash and smoke, ash and smoke cannot be converted back into paper.
4. A solution that is not capable of dissolving anymore solute at a given temperature is called saturated solution.
5. A change during which heat is given out is called an exothermic change. For example : when it is very cold, people warm themselves by keeping some burning wood or heater nearby. A change during which heat is taken in (absorbed) is called Endothermic change. For example : Your tongue feels cold when you put some glucose on it, this is because glucose takes in heat from your tongue in order to dissolve in the saliva.
6. To make a systematic study of a change we must observe the nature of changes. Such as the changes that occur repeatedly and at regular intervals of time and whose occurrence can be predicted can be classified as Periodic changes. Earth's rotation on its axis, the earth' revolution around the Sun and hence causing day and night and season, summers, rainy, autumn and winter can be predicted because they are repeated every year after regular interval of time. All these are examples of periodic changes. Also phases of Moon, beating of heart, a swinging pendulum of a clock, formation of day and night, occurrence of high and low tides in the oceans are periodic changes.
Since the periodic changes repeat after regular interval of time, they can be used to measure time intervals. It was the periodic movement of a pendulum that led Galileo Galilie to develop a pendulum clock.
7. Object of metal expands on heating. Keep two wooden blocks of the same size in front of the wall. Place a metal rod over the wooden books so that one end of it touches the wall. Place a pencil on the block which is farther from the wall, so that the rod rests on the pencil. Attach a paper pointer on the lead of the pencil. Heat the rod with a burner spirit lamp and not the pointer. The pointer slowly rotates clockwise. This happens because the rod expands on being heated and rotates the pencil. Now stop heating and allow the rod to cool. The pointer now rotates anticlockwise. It happen because the rod contracts on being cooled and rotate the pencil the other way.

II. Fill in the blanks :

- Ans.** 1. energy, 2. saturated, 3. Changer, 4. chemical, 5. chemical, 6. periodic
7. occurs

III. Write whether the following statements are 'true' or 'false':

Ans. 1. False, 2. True, 3. False, 4. True, 5. True, 6. True

IV. Tick (✓) correct option :

Ans. 1. (b), 2. (d), 3. (b), 4. (d)

Unit – 4 Life Around Us

7

Living Organisms and Their Surroundings

I. Answer the following questions :

Ans. 1. There are millions of different things on the world. These things differ in many ways. Some of the objects have like in them and are called living things. Characteristics of living things are as follows :

1. Cellular organisation
2. Definite shape and size
3. Nutrition
4. Respiration
5. Growth
6. Excretion
7. Reproduction
8. Movement
9. Response to external stimuli
10. Life cycle.

2. The biotic components are related to a biotic components in the following ways :

(i) **Temperature** : Temperature is the measurement of degree of coldness or hotness. Most plants and animals grow well in warm place but some need a cold climate to live.

(ii) **Air** : All living organisms require oxygen to stay alive. Most of the organisms cannot respire in the absence of oxygen and cannot produce energy with the result they die.

(iii) **Light** : Green plants need sunlight to prepare food and grow. Animals such as earthworms, centipedes, millipeds don't like lights.

(iv) **Water** : All living things beings need water for their survival.

(v) **Soil** : Soil is important for the plant growth and in the absence of plants, other forms of life would not exist.

3. The place where living beings live is called habitat.

Characteristics of Mountainous and Aquatic habitat are as follows.

(i) Mountain is very special type of terrestrial habitat.

(ii) Animals such as Himalayan ibex, snow leopard, snow bear etc. live in bitter cold of snow-covered mountain peaks.

(iii) Goats, sheep, musk, deer, wolf, fox, water focal and yak live in the grass covered plateaus and slopes and forested valley of yellow mountain.

Aquatic :

(i) Aquatic habitat includes organism that live and propagate in water.

(ii) Plants living in water have poorly developed roots.

- (iii) Aquarium, lakes, ponds, rivers, seas etc. are different types of common aquatic habitats.
4. The components found on our earth naturally and do not have life in them are called abiotic components. Some of these are as follows :
- (i) Temperature : It is the degree of hotness and coldness of the surface, water or air.
 - (ii) Air : It is the basic component of life form on our planet. It is infact a mixture of gases in a particular proportion.
 - (iii) Light : It is a form of energy which work as a catalyst in the process of life.
 - (iv) Water : It is one of the most important abiotic component. In fact most parts of our earth is covered by water.
 - (v) Soil : It is termed as the basis of life forms as without it no plants can be grown.
5. On the basis of habitats, plants have the following different types of adaptations :
- I. Terrestrial Habitats
- (a) Deserts : Plants in desert region has under done following types of adaptations :
 - (i) They have extensive root system with long roots to draw water from the deep ground as the top layer of the soil is almost dry.
 - (ii) Their stem becomes thick and fleshy and green to store water and perform photosynthesis.
 - (iii) Their leaves are modified (reduced) to spines or thorns to minimise water loss through transpiration. The leaves have sunken stomata to reduce transpiration.
 - (b) Foresests or Grasslands : In these regions, plants has undergone following types of adaptations.
Here plants do not get sufficient sunlight so shade loving plants and a great variety of creepers grow here.
 - (c) Mountains : Here plants grow in low clumps to protect themselves from wind and cold.
- II. Aquatic Habitats :
- Plants which float have air cavities in their stems and leaves, to make them light and help them to float. Algae, and sea weeds are such floating plants. Their leaves are covered with a waxy substance, so that they do not decay. Submerged plants like hydrilla have thin, long leaves which can do with the faint light that reaches then. They have long, slender, spongy and flexible stems to resist strong water currents.
6. Some living organisms are very small to be seen with the naked eyes. They can be seen with the help of a powerful microscope only. Such tiny organisms are called micro-organisms.

Differences between Plant and Animals

- (i) **Nutrition** : By chlorophyll plants can prepare their own food using carbon-dioxide, water and sunlight. But animals do not have chlorophyll and so cannot make their own food. They depends on plants or other animals for their food.
- (ii) **Growth** : Plants have unlimited growth, they can grow throughout their lives. But Animals grow up to a certain age only and stop growing after that.
- (iii) **Locomotion** : Plants being fixed firmly to soil, cannot move from place to place. Animals can move from place to place in search of food and shelter.
- (iv) **Cell structure** : Plants cells are surrounded by a rigid cell wall. While animals do not have cell wall.

7. The plants and animals develop adaptation to live in different conditions this shows that there is a interaction between the biotic and the abiotic components of the habitat. Living components require nutrients for sustain life. Cycling of nutrients or minerals takes place from the biotic to abiotic components and vice-versa. The food produced by green plants enters a food chain. In a food chain, plants are eaten up by herbivorous animals thus making animal life possible. After the death of living organisms, decomposers act on the dead and decaying matter releasing the nutrients back to the soil and air.

Through interaction between biotic and abiotic components of the habitat, an equilibrium is maintained in the biological world.

II. Fill in the blanks :

Ans. 1. fish, 2. cactus, 3. fog, 4. Thermometer, 5. animal, 6. animals, 7. cell, 8. biotic

III. Write whether the following statements are 'true' or 'false':

Ans. 1. True, 2. False, 3. True, 4. False, 5. True

IV. Tick (✓) correct option :

Ans. 1. (d), 2. (c), 3. (b), 4. (b), 5. (b), 6. (b)

8

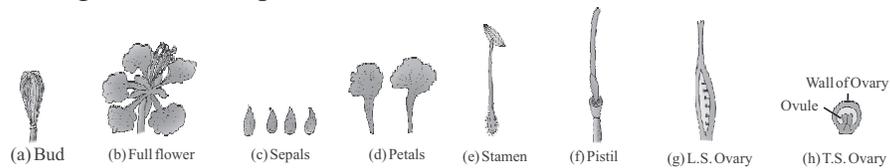
Plants : Forms and Functions

I. Answer the following questions :

- Ans. 1. Flowers of different plants vary in size, shape and colour but all flowers have the same basic parts. These parts are as follows :
- (i) **Pedical and Thalamus** : A typical flower has a stalk called pedicel with which it is joined to the stem. The uppermost part of the pedical

is wider and is known as the thalamus. The pedicel is some what swollen in shape.

- (ii) **Calyx or Sepals** : It is the first and outermost whorl of a water. It consist of leaf like structures called sepals.
- (iii) **Corolla or Petals** : It is the second whorl of a flower. Each segment of the corolla is known as a petal. Petals are usually brightly coloured due to the pigments present in them.
- (iv) **Androecium or Stamens** : It is the third floral whorl which is composed of one of more reproductive organs called stamens.
- (v) **Gynoecium or Pistils** : The fourth and last whorl of the flower is gynoecium. It is composed of one or more female reproduction organs called carpels.



Parts of a flower

2. Functions of Roots

- (i) Roots fix the plant firmly to the soil and provide support.
- (ii) Roots absorb water and mineral salts from the soil which are then conducted upwards to the stem and leaves.
- (iii) Roots help in holding the soil together, thus preventing erosion or blowing away of the soil particles.
- (iv) Some roots store reserve food for the plant in them. In some plants roots are modified to perform respiration.
- (v) Underground roots of leguminous plants fix atmospheric nitrogen with the help of symbiotic bacteria in their root nodules.

Functions of the Stem

- (i) A stem bears the leaves, flowers, fruits and seeds. It serves as a link between the roots, the leaves and flowers.
- (ii) The stem and its branches hold the leaves in such a manner that the leaves get the maximum amount of sunlight.
- (iii) When young, the stem manufactures food through the process of photosynthesis.
- (iv) It carries water and mineral salts from the roots to all the parts of the plant.
- (v) It carries manufactured food in the leaves to the roots and other parts of the plant body.
- (vi) In some cases, the stems may be modified to manufactured and support.

3. The stem of a cactus plant perform the function of a leaf because in a cactus plant the stem becomes fleshy green and leaf tube and stores water for long periods.
4. There are five parts of leaf :

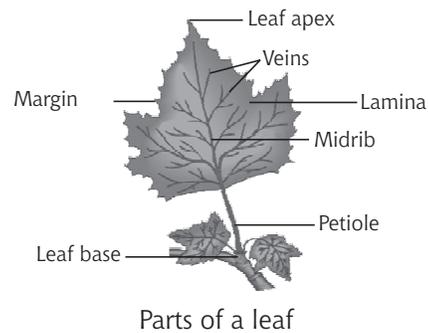
(i) **Leaf Base** : The end of the lamina joining the petioles is called the leaf base. The leaf remains attached to the stem by the leaf base.

(ii) **Petiole** : It is the stalk by which the leaf lamina is attached to the main stem.

(iii) **Stipules** : The leaf is borne on the stem at a node. It has a pair of very small leaves at the base of the petiole called the stipules.

(iv) **Leaf apex and Margin** : The tip of the leaf is called leaf apex and the side of the leaf is the leaf margin.

(v) **Midrib and Veins** : The continuation of stem into the leaf or lamina forms the midrib. The veins transport water and minerals to the leaf and take away food made by the leaves. The arrangement of leaf veins is called venation. It is different in different types of leaves.



Functions of the Leaves

- (i) **Manufacturing of Food** : The leaves manufacture food in plants with the help of carbon-dioxide, water and sunlight. This process is known as photosynthesis. The leaves are thus called the 'Food Factories' of the plants.
- (ii) **Transpiration** : The excess of water absorbed by the roots hair is lost through the stomata present on the lower surface of the leaves by transpiration process.
- (iii) **Gaseous exchange** : Exchange of gases occurs during respiration and photosynthesis. During photosynthesis carbon-dioxide enters the leaves and oxygen is given out. During respiration, oxygen is taken in and carbon-dioxide is given out. Therefore leaves maintain the balance of gases in nature.
- (iv) **Storage of Food** : Leaves help in the storage of food as in the case of onion where leaves become fleshy and store food.
- (v) **Vegetative propagation** : In some plants leaves have buds in the marginal notches from which new plants grow and develop.
5. There are two types of leaves. These are :
- A. Simple Leaves** : A leaf having a single or undivided lamina is called a simple leaf. It has an axillary bud in its axil. Mango, jamun, dahlia etc., are examples of simple leaves.

B. Compound Leaves : A compound leaf is that in which a number of leaflets are born on a single stalk. The stalk of a compound leaf is called rachis is which has an axillary bud. For example : Rose, Gram, Neem etc. Leaf perform additional function in some plants as manufacturing of food, Transpiration, Gaseous-exchange, storage of food, and vegetative propagation. They do so by undergoing certain adaptations.

6. The usually sweet tasting part of a tree or bush which holds seeds and which can be eaten are called fruits. A fruit may be defined as a mature or ripened ovary.

Functions of Fruits

- (i) Fruits enclose the seeds and thus, protect them from injury and unfavourable conditions.
 - (ii) Some fruits like mangoes, chikcoos, pears, apples etc., store food.
 - (iii) Some fruits are very good source of iron, vitamin and proteins and are very good for health.
 - (iv) Fruits are eaten by men and animals and thus, help in dispersal of seeds.
7. There are many ways of classifying flowering plants on the basis of their size, shape and life span. On this, plants are classified into three categories.

(i) **Herbs :** Herbs are small plants with soft, green stems which may or may not have branches. Most herbs live just for one season or two. They are known as annuals and biennials respectively. Rice, mustard and carrot are biennials. Some herbs have a weak stem which cannot stand erect. Such plants called creepers and climbers grow along the ground or climb with the help of a support.

(ii) **Shrubs :** These are medium-sized plants which can grow up to 8 to 9 feet. They look bushy because they have many branches, which start from the base of the stem and grow in every direction. The stem is hard and woody, unlike the stem of herbs, these plants are often grown as hedge plants. China rose, crepe, jasmine, henna, and rose are some examples of shrubs.

(iii) **Trees :** Trees are tall, perennial plants with a thick, hard woody stem called trunk. Branches arise from the trunk after a certain height. Mango, keekar, guava, neem, eucalyptus, banyan are some trees. Trees like these have branches arising from nearly the top of the stem. Trees like coconut and date palm do not have branches.

8. **Fertilization :** When pollen grains stick to the pistil a tube begins to grow from each pollen grain. The tubes grow downward through the pistil until they enter the ovary. Here the sperm cells (male sex cells) are released. The sperm cells and the egg cells fuse together. The fusion of sperm cell and egg cell is called fertilization. In due course of time, the ovule becomes a seed and the ovary a fruit.

II. Fill in the blanks :

Ans. 1. stamens, 2. stem, 3. fruits, 4. cotyledons, 5. venation, 6. Midrib, 7. storage, 8. fruit, 9. ovule

III. Write whether the following statements are 'true' or 'false' :

Ans. 1. True, 2. True, 3. True, 4. False, 5. True, 6. True, 7. True, 8. True, 9. False

IV. Tick (✓) correct option :

Ans. 1. (d), 2. (b), 3. (b), 4. (a), 5. (d), 6. (c), 7. (b)

9

Animals : Forms and Functions

I. Answer the following questions :

- Ans.** 1. To support the body organs and protect them from injuries a rigid supporting system is required. Such a system is called skeletal system. The human skeleton is divided into two parts called the : A. The Axial Skeleton and the Appendicular Skeleton.
2. **Backbone or Spinal Column :** The spinal column forms an axis that supports the other parts of the body. The skull is at the top of the backbone. The backbone consists of separate bones called vertebrae with fibrous discs between them. The cervical vertebrae (neck bones) are made-up of seven bones. The twelve thoracic vertebrae are at the back of the chest. The spine protects the delicate spinal cord. The main function of the backbone is to make the human stand erect.
3. The point at which two bones meet is called a joint. The movements of our whole body is possible because of these joints. We can classify joints, according to the movement they allow, into following three categories :
- (i) **Freely Movable joints :** These joints can be further classified as follows :
- (a) **Ball and socket joints :** In these types of joints, the rounded end of one bone fits into the hollow space of the other bone. Such a joint allows movements in all the directions. For example, the hip joint.
- (b) **Hinge joints :** These joints allow movement only in the plane like a door hinge and not more than 180°, e.g., the fingers, the knee, the elbow, etc. Our wrist is a double hinge joint.
- (c) **Pivotal joints :** This type of joints allow movements in many places e.g., up and down, to the side and all other planes. It is present between the first and second vertebrae of the neck. The

skull is joined to the first two vertebrae of the backbone like a ball on a stick.

(d) Gliding joints : These joints allow only a limited amount of moment which is due to the sliding nature of cartilages. For example, Joints of backbone.

(ii) Immovable joints : Immovable or fixed joints are those which do not allow movement. In an immovable joint bones are tightly held together. The dome of the cranium (skull) is a box made of bony plates. The plates must be immovable to protect the brain inside.

3. Partially movable joints : Partially movable joints are those which allow partial movement as seen in the case of vertebral column where one vertebra meets another. The joints where the ribs meet the breast bone at the front of the chest are also partially movable joints.

4. A muscle is a tough and elastic tissue that makes the body parts move.

Types of Muscles

1. Skeletal muscles.
2. Smooth or involuntary muscles.
3. Cardiac muscles.

The muscles perform these functions in the following way :

1. Muscles move by contracting i.e. by getting shorter.
2. Muscles can only pull. They cannot push.

5. Locomotion in fish is done by lateral contractions of the whole body with a final thrust by the tail.

During swimming, the front part of the body of a fish curves in one side and the tail remains in the opposite direction. It forms a loop. Then quickly the body and tail curve to the other side. This makes a jerk and pushes the body forward. A series of such jerks make the fish swim ahead. The fins of the tail aid in this. The paired and unpaired fins mainly help to keep the balance of the body and to keep direction.

6. The flying organs of birds are their wings : The birds can fly because their bodies are well-suited for flying. The body of a bird is covered with feathers. The streamlined shape of a bird enables it to move easily through the air. The bones are light, hollow, yet very strong with air spaces. The bony parts of the forelimbs are modified as wings and the bones of the hind limbs are typical for walking and perching. The powerful muscles are attached to the breast bone which make the wings beat rapidly for flight. The air sacs present in the lungs, make the bird's body light and buoyant and also increase the air supply when flying.

7. Difference between locomotion and movement : Movement is the change in position of only a part of the body without changing the position of the whole organism. Movement is quite common in plants.

The act of moving from one place to another is called locomotion.

Locomotion is found only in animals. They possess definite organs for locomotion. They locomote by walking, running, flying, swimming, hopping and jumping activities.

8. Locomotion in Earthworms : During movement the earthworm first extends its front body part, keeping the rear part fixed to the ground. Then it fixes the front end and releases the rear end. Then it shortens the body and pulls the rear end forward. The earthworm follows this process repeatedly to move ahead. This crawling movement in an earthworm is known as peristalsis.

In first position, the thick and short segments at the head of the worm anchor to the ground by bristles (longitudinal muscles contracted). In second position, because of the contraction of the circular muscles head segments move forward. Segments just behind the head and near the tail become thick and anchored and prevent the head from slipping backward. In third position, the head segments are thick again and anchored to the ground, well ahead of their starting point. The rear segments of the worm now release their hold from the ground and are pulled forward.

II. Fill in the blanks :

Ans. 1. Aquatic animals, 2. axial, 3. ventral scales, 4. pivotal,
5. bony parts of fore, 6. pseudopodia, 7. fin, 8. triceps, 9. 206

III. Write whether the following statements are 'true' or 'false' :

Ans. 1. True, 2. False, 3. True, 4. False, 5. True, 6. True, 7. False, 8. True

IV. Match the following columns :

Ans. Pseudopodia—Amoeba; Bone of forearm—Ulna;
Join bone to bone—Ligament; Join bone to muscle—Tendon;
Bone of the leg—Tibia; Brain case—Cranium;
Locomotion of—Moving from place to place;
Movement—Change in position of only a part of the body;
External organs—Ear, nose, eye, etc.

V. Tick (✓) correct option :

Ans. 1. (a), 2. (a), 3. (d), 4. (d)

Moving Things and Measuring Distances

I. Answer the following questions :

Ans. 1. We need standard units of measurements to communicate with others,

doing experiments, develop science and moving ahead on the path of progress. In fact accurate and precise measurements are the very basic of an experiment. Earlier people used to take help of their body parts to measure length etc., but they were not same for all the people, hence the need of standard measurement arise.

A unit which is acceptable to the majority of people as a basic unit of measurement is called a standard unit.

The fundamental unit of length is metre.

Its multiples and sub-multiples are as follows :

Sub-multiple	Prefix	Symbol	Sub-multiple	Prefix	Symbol
10^{-1} or $\frac{1}{10}$	deci	d	$10^{-1} =$	deka	de
10^{-2} or $\frac{1}{100}$	centi	c	$10^{-2} = 100$	hecto	h
10^{-3} or $\frac{1}{1000}$	milli	m	$10^{-3} = 1000$	kilo	K
10^{-6} or $\frac{1}{1000,000}$	micro	u	$10^{-6} = 1000,000$	mega	M
10^{-9} or $\frac{1}{1,000,000,000}$	nano	n	$10^{-9} = 1000,000,000$	giga	G

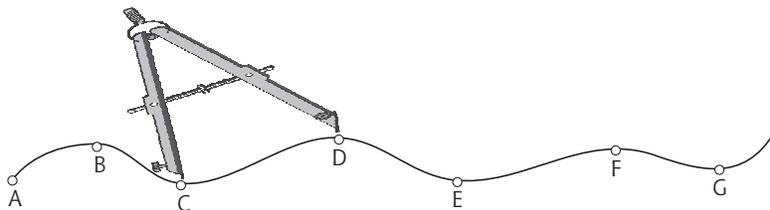
2. To measure the length of a curved line using a divider, we can do the following activity.

Materials Required : A white sheet of paper on which a curved line is drawn, a divider from a geometry box.

Method : Open the arms of the divider such that the distance between the two points is 4 mm. Place the pointed needle of one arm at point A on the curved line. Now place the pointed needle of the other arm on the line, at point B. Go on moving the divider along the curved line to the points C, D, E, F etc. Count the number of times the divider has to be taken along the curved line to cover its entire length. In this case the divider has moved five times from A to F. Thus, the length of the line from A to F is.

$$5 \times 4 \text{ mm} = 20 \text{ mm.}$$

Measure the distance FG by adjusting the arms of the divider. Let us assume that it is 3 mm. Thus, total length of the curved line is $(20 + 3 \text{ mm}) = 23 \text{ mm.}$



3. The different kind of motion :
- A. **Translatory Motion** : Translatory motion has two parts :
 - (i) **Rectilinear Motion** : The motion in which all the particles of a body move through the same distance in the same line is called translatory motion. For example (i) A car moving on a straight road (ii) A freely falling stone.
 - (ii) **Curvilinear Motion** : When a body moves along a curved line, the motion of the body is called curvilinear motion. For ex. (i) A ball thrown upward at an angle (ii) A car moving along a curved road.
 - B. **Rotatory Motion** : A motion in which a body moves about a fixed axis without changing its position is called rotatory or circular motion. For ex. (i) A spinning wheel (ii) A spinning top.
 - C. **Oscillatory Motion** : Some objects move as a whole, 'to and fro' or 'back to forth' the same path without any change in shape. Motion of such objects is called the oscillatory motion. For ex. (i) A boy on a swing (ii) The pendulum of a clock moving to and fro.
 - D. **Vibratory Motion** : In a vibratory type of motion a change in size and shape of the object takes place. For ex. (i) All musical instruments (ii) During breathing, when our chest expands or contracts.
 - E. **Periodic Motion** : A repetitive motion which repeats itself after a fixed interval (regular interval) of time is called the periodic motion. For ex. (i) The motion of a swing (ii) Movements of lungs during breathing.
 - F. **Non-Periodic motion** : A repetitive motion, which repeats itself, but not at fixed intervals of time is called non-periodic motion. For ex. (i) A cricket ball rolling down the ground gradually slow down and finally stops. (ii) When the brakes are applied to a moving vehicle.
 - G. **Uniform Motion** : When a body covers equal distances in equal intervals of time along a straight line, the motion is said to be the uniform motion. For ex. (i) A flying aeroplane in a particular direction at a constant speed. (ii) A train moving straight in a particular direction at a constant speed.
 - H. **Non-Uniform motion** : When a body covers unequal distances in equal intervals of time, along the same straight line, the motion is said to be a non-uniform motion. For ex. (i) A cyclist cycling on a busy street. (ii) When the brakes are applied to a fast moving car.
4. **Difference between circular and oscillatory motion** : In Circular motion, a body moves about a fixed axis without changing its position like a potter's wheel. whereas in oscillatory motion the object moves as a whole, to and fro or back to forth the same path without any change in shape. For Example : A boy on swing.
5. The motion in which all the particles of a body move through the same distances in the same line is called translatory motion.
The translatory motion along a straight path called Rectilinear Motion.
6. A body is said to be at rest (or in a state of rest) when it does not change its

position with respect to its surrounding objects. In other words, if the position of a body does not change with respect to any fixed point in its surroundings, it is said to be at rest or in a state of rest.

II. Fill in the blanks :

- Ans.**
1. The motion described by a simple pendulum is **periodic** motion.
 2. One metre contains **100** centimetres.
 3. Five kilometres contain **5000** metres.
 4. Motion of a child on a swing is called **oscillatory**.
 5. Motion of a needle of a sewing machine is **Periodic**.
 6. Motion of the wheels of bicycle is **Rotatory**.

III. Match the following columns :

Ans. Column 'A'

- A length equal to 1000 metres
- A length which is 1/1000th part of a metre
- A repetitive motion in which a moving object undergoes a change in shape
- A motion in which a body moves about a fixed axis without changing its position
- The motion which again and again occurs at a regular intervals of time
- The motion in which the particle of a body travel through the same distance

Column 'B'

- Kilometre**
- Millimetre**
- Non-periodic motion**
- Rotatory motion**
- Vibratory motion**
- Translatory motion**

IV. Write whether the following statements are 'true' or 'false' :

- Ans.** 1. False, 2. False, 3. True, 4. True, 5. True, 6. False

V. Tick (✓) the correct option :

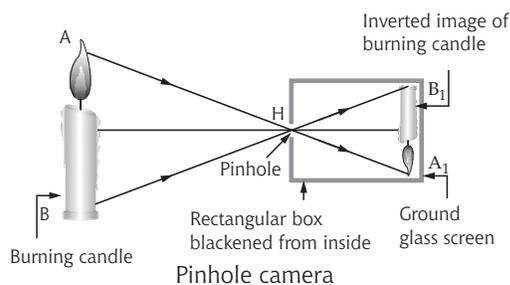
- Ans.** 1. (a), 2. (a), 3. (d), 4. (c)

I. Answer the following questions :

- Ans.** 1. Light is an invisible energy which causes in us the sensation of vision. When seeing a movie in a cinema hall, you might have noticed that the light from the projector appears to come in a straight line towards the screen. In a cinema hall, what you see is not light itself, but innumerable dust particles in the path of light which become visible when light falls on them. All these examples show that light travels in a straight line.

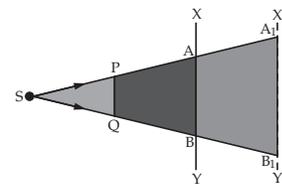
- A pinhole camera consists of a rectangular cardboard box such that its one side is made of ground glasses screen. Its opposite side has a hole in the middle, whose size is equal to the size of a head of a common pin. The box is blackened from inside so that it can absorb light that falls on its walls directly or indirectly.

Working of a Pinhole Camera : Keep a lighted candle AB in front of the pinhole camera. A ray of light starting from point A, along AH, after passing through the pinhole, falls on ground glass screen at point A_1 . Another ray starting from point B, along BH after passing through the pinhole, will fall on the screen at point B_1 . Thus, all the rays starting in between the points A and B, after passing through pinhole will meet the screen in between points A_1, B_1 . Thus A_1, B_1 , is the image of AB. The image formed is real i.e., it is formed on the screen. It is inverted and is usually smaller than the size of the object.



- A dark patch formed behind an opaque body when it is placed in the path of light is called shadow.

If the light is coming from a single point, that is, a point source of light, then we get complete shadows. In this case, we get only umbral shadows.



- When a ray of light, while travelling from one medium to another returns to the second optical medium with a change in angle by striking the surface, it is known as reflection. Usually smooth surfaces cause the reflection of light. We can prove this by the following :

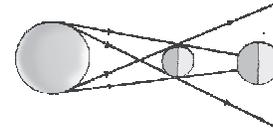
When we look at any shiny surface, it acts as a mirror. This is so because it reflects most of the light falling on its surface.

- The phenomenon due to which the left hand side of an object appears as the right hand side and vice-versa is called lateral inversion. All images formed in a plane mirror are laterally inverted. It can be shown by the following :

When you stand in front of a mirror and count your hair with your right hand, the image seems to do exactly the same thing but with its left hand. In general, the right side of an object becomes the left side of the image formed by a plane mirror and vice-versa.

- The most spectacular shadows are eclipses. They happen when a heavenly body casts its shadow on the other. Solar eclipse. When the shadow of the moon falls on the earth, the solar eclipse occurs. Solar eclipse is caused on a New Moon Day i.e., the day when the moon is not

visible on the night side of the earth. During their course of revolution, the sun, the moon and the earth happen to be in the same straight line and in the same plane, such that the moon is in the middle. At this time, the shadow of the moon falls on the earth. Thus, for sometime a part of the earth does not receive any light of the sun and becomes completely dark. At this moment total solar eclipse is said to have taken place at that particular place. However, if some light happens to reach the earth, then a part of the sun appears in the sky and a partial solar eclipse is said to have taken place. It has been found that total solar eclipse hardly lasts for five to ten minutes.



Solar eclipse (diagrammatic)



Solar eclipse (in actual) : A total solar eclipse occurs when the umbra of the moon's shadow falls on the earth.

II. Fill in the blanks :

Ans. 1. luminous, 2. invisible, the, 3. penumbra, 4. rectilinear, 5. 300,000,000 m/s, 6. shadow, 7. straight, 8. looking glass

III. Write whether the following statements are 'true' or 'false' :

Ans. 1. True, 2. False, 3. False, 4. True, 5. False

IV. Tick (✓) the correct option :

Ans. 1. (c), 2. (a), 3. (d), 4. (a), 5. (b)

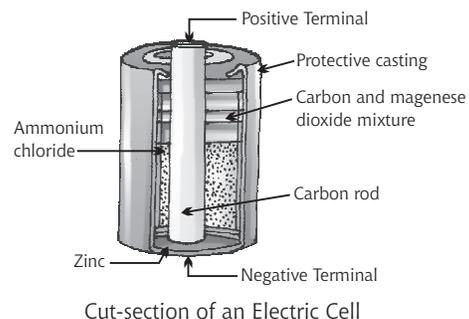
Unit – 7 How Things Work?

12

Electric Current and Circuits

I. Answer the following questions :

Ans. 1. Cells are of different sizes made to suit the requirement of a particular electric device. The cells are called dry cell because they do not contain any liquid electrolyte. The cell has a jelly like substance composed of ammonium chloride and starch. The positive terminal (+ve) consists of a carbon rod which is surrounded by a mixture of magnesium dioxide and carbons. This is placed inside a can made of Zinc. The zinc acts as the negative terminal (-ve). The top of the cell is sealed with a metallic disc.



When the positive and negative terminals are connected in a circuit, an electric current starts flowing through it. The cells stop producing electric current, when the cells are used up. The torch starts producing electricity again when the cell is replaced by a new one.

2. A device by which an electric circuit can be easily completed or broken is called a switch.

To construct a simple electric switch, do the following :

Materials Required : A small piece of soft wood or thermocol, a safety pin, two drawing pins (thumbtacks), three plastic coated copper wires with bare ends, a torch bulb, an electric cell, cellotape.

Take one of the drawing pins and to its pin tightly wind one bare end of the plastic coated copper wire. Pass the loop at the end of the safety pin through the drawing pin. Fix the drawing pin in the piece of soft wood tightly, such that the safety pin can just turn around.

Now take the second drawing pin and in it tightly wind the one end of another plastic coated copper wire. Fix this common pin in the wooden board in such a way that the safety pin can easily make contact with it as shown in the figure. Your switch is ready for use.

3. In a circuit, if the switch is opened or the wire is cut, the flow of current stops and the circuit is said to be open or incomplete. Thus, in an open circuit no current is drawn from the cell. In order to have the current flow from the circuit the path should be completed that is the circuit should be a closed one. The current from a cell can be drawn only in the case of a closed circuit. For this conductors, switch and cell should be placed at appropriate places. In the absence of any one of these, the circuit will remain as an open one.

4. To find conductors and insulators of electric current, do the following :

Materials required : A dry cell, three insulated copper wires with bare ends, cellotape, common solid materials (brass candle stand, a steel tumbler, a common pin, an eraser, a plastic mug, a rubber balloon etc. Set up the cell, bulb and wires. Touch the bare ends of the wire to brass candle stand, steel tumbler, common pin, an eraser, a plastic mug, a rubber balloon, one by one. You will notice that the bulb glows brightly in case of brass candle stand, steel tumbler and common pin. However, the bulb does not glow in case of an eraser, plastic mug or rubber balloon. It is because the eraser the plastic mug are insulators and do not pass electricity through them. The former allow the electric current to flow through them and hence are called conductors.

5. **The anatomy of Electric Bulb :** A bulb contains a tiny coiled wire, supported by two thick wires making a V-shape. This tiny coiled wire is called the filament. Two thick wires making the V-shape are called supporting wires. The lower end of one of these wires is connected to the

metal casing at the side of the bulb. The lower end of the second wire is connected to the metal tip at the base of the bulb. The metal tip at the base and the metal casing at its lower end acts as terminals of the bulb. When the electric current passes through the filament of the bulb through the terminal, it gets white hot and produces light.

The space in between the terminals of the bulb is filled with sealing wax. This prevents the terminal from making contact with one another. In order to light up a bulb with an electric cell perform the necessary activity.

A fused bulb is the one in which the filament is broke, thus, making it glowless.

II. Fill in the blanks :

Ans. 1. switch, 2. carbon rod, 3. conductor, 4. circuit,
5. George Leach Lanche, 6. cells, 7. terminal

III. Write whether the following statements are 'true' or 'false' :

Ans. 1. True, 2. True, 3. False, 4. True, 5. False, 6. True, 7. False

IV. Differentiate between the following :

Ans. (i) **Conductor and insulator :** Conductor allow an electric current to pass through it while an insulator not allow an electric current to pass through it.
(ii) **Battery and Cell :** A battery can be a single cell multiple cells connected together in a series whereas a cell is a single unit at the base voltage.
(iii) **Open and closed circuits :** The flow of current stops in an open circuits while in closed circuits current is drawn from the cell.
(iv) **Positive and Negative Terminal :** The positive terminal (+ve) consists of a carbon rod while the negative terminal (-ve) act by the Zinc.

V. Match the following columns :

Ans. 1. (b), 2.(e), 3. (a), 4. (c), 5. (d), 6. (g), 7. (f)

VI. Tick (✓) the correct option :

Ans. 1. (b), 2. (d), 3. (b), 4. (d)

13

Fun with Magnets

I. Answer the following questions :

Ans. 1. The discovery of natural magnet has an interesting story. There used to live a shepherd boy, Manganous, in the towns of Magnesia in Asia Minor (Greek). He had many sheeps and goats and used to take them to the nearby mountains for grazing. In order to control the herd of sheep and

goats, he had a stick in his hand. The stick's one end was tied with iron tip. By chance, once he rested his stick with iron mounted end on a stone, which got clung it immediately. In fact, the stone was a natural magnet which attracted the iron tip of his stick very strongly. This is the story behind the discovery of the natural magnets.

2. Magnetite (Fe_3O_4) is the world's natural magnet. It is also called a natural magnet. It has two very important properties.

- (i) **Attractive Property** : Magnetite attracts small pieces of iron towards itself. This is called attractive property.
- (ii) **Directive Property** : If shaped in the form of a needle and then suspended freely, it always points in the north-south direction. This is called directive property.

3. To make a magnetic compass from a magnetised needle do the following :
Material required : A bowl of water, a sewing needle and a magnet.

Procedure : Magnetize you needle by placing one end against the end of your magnet. Float the magnetized needle very carefully on the surface of the water. The end that you magnetized will point North or South, depending on how you magnetized it.

4. Magnetic poles are the ends of a magnet where the magnetic force is strongest. A magnet has two poles : North and South. The North end of a magnet would come together with the South end of another magnet. But two like poles wouldn't. In other words the North end of a magnet would not come together with North end of another magnet. So we can say that opposite poles of magnets attract each other while the same poles repel.

5. A freely suspended magnet always points in the north-south direction. It is because towards the geographic north pole on the earth lies the magnetic south pole of the earth. Similarly, towards the geographic south pole of the earth lies magnetic north pole of the earth. We also know that the opposite poles of magnet attract each other. Thus when a bar magnet is suspended freely, the north magnetic pole of the earth attracts the south magnetic field of the magnet and vice-versa. It is on account of this attraction of the earth's magnet that a freely suspended magnet's north pole points in the north direction.

6. **Magnetic Compass** : A magnetic compass is a simple device used by the pilots and navigators to find the direction in which their ship or aeroplane is going.

It consists of a flat circular aluminium box at the base of which are marked directions like north, south, east and west. East-west, north-east and north-west etc., directions are also marked on it. From the centre, rises a sharp needle, over which a magnetic needle is placed. The magnetic needle is completely free to move in any direction. On the top of the box, is fixed a circular glass plate. By looking at the north pole of the magnetic needle we can find the given direction.

There are two methods of making magnets. They are as follows :

1. Single Touch Method : Keep an iron bar AB which is to be magnetised on the table top. A strong bar magnet is kept nearly vertical with its pole touching one end of the iron bar. The magnet is moved along the iron bar to the other end. It is then raised and brought back to the starting position. The process is repeated 30-40 times, moving the magnet in the same direction. The bar is then turned upside down and treated similarly. The bar is tested by bringing it near some iron flinge. If the bar attracts the iron flinge, it shows that it has been magnetised. Thus, the iron bar becomes a magnet.

2. Electrical Method : It was discovered in 19th century by the scientist Oersted that an electric current flowing through the wire gives rise to a magnetic field surrounding the wire. Magnetised effects should be realised by electricity. The soft iron bar which is to be magnetised is kept inside a long coil of an insulated wire. Powerful electric current is passed through the coil. The bar gets magnetised. This phenomenon is called electromagnetism.

II. Fill in the blanks :

Ans. 1. North-South, 2. poles, 3. compass, 4. repels, 5. Magnetite, 6. magnet, 7. natural, 8. Earth

III. Match the following columns :

Ans. 1. (f), 2. (e), 3. (d), 4. (c), 5. (a), 6. (b)

IV. Write whether the following statements are 'true' or 'false' :

Ans. 1. True, 2. True, 3. True, 4. False, 5. True, 6. False, 7. True, 8. False

V. Tick (✓) the right option :

Ans. 1. (b), 2. (a), 3. (a), 4. (b), 5. (d)

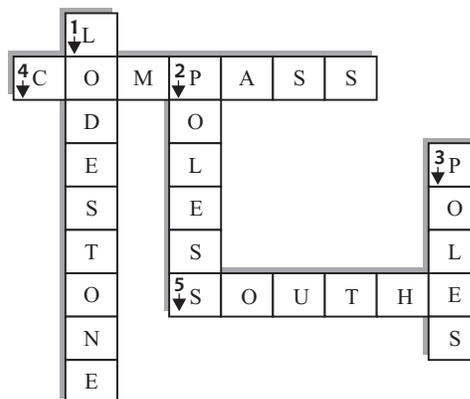
VI. Solve the crossword puzzle by using clues given below :

Down :

- Name of a naturally occurring magnet
- The end of a bar magnet where most of its strength is concentrated
- A rectangular bar of steel capable of attracting pieces of iron

Across

- A device used for finding geographic directions.
- The end of a freely suspended magnet, which points towards the geographic south pole.



The Nature's Gift : Water

I. Answer the following questions :

- Ans.**
- Water is vital for maintaining life on the earth. All animals and plants need water to survive. We use it for various purposes such as :
 - Water is used for bathing, cooking, drinking, cleaning and watering the plants.
 - Water is required for generating electricity and run machines in all industries.
 - Water is required for heating purposes and also to keep things cool.
 - Water is required for producing all types of crops and fibres like jute and cotton.
 - Water is required for all domesticated plants and animals and for all wild plants and animals.
 - In nature water exists in three different forms (states) solid (ice), liquid (water) and gaseous (water vapour or steam).

In solid state, water occurs as snow, frost, sleet, hail etc. When the snow gets compact, it is called ice. A large amount of fresh water is trapped in the form of ice in glaciers in Arctic Oceans and Antarctica.

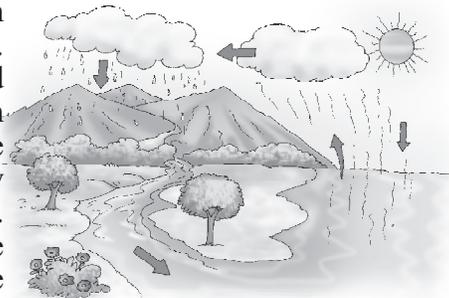
In liquid state, most of water occurs as sea water. However, a very small percentage of water occurs on the surface or land in the form of stream, rivers, lakes and underground water.

In the gaseous state, water occurs as water vapour present in the air. The amount of water present in the air varies depending upon the location of place and climatic conditions.
 - Drought and flood are called the two extremes because they take place only in the extreme conductions. When water in the rivers overflow its banks due to excessive rains, we call it flood. On the other hand when it does rain for a long period we call it drought. Thus both are the extreme points of the water, in particular, rains.
 - Conservation of water is the preservation of water that exist in limited quantity. It is the protection of natural resources.

The different was for the conservation of water are :

 - Use water judiciously at home for various activities.
 - Make use of water harvesting technique for collection and use of rain water.
 - Take shorter shower to save water.
 - Don't let the water run while brushing, shaving or washing hands, clothes and utensils.
 - Plan lawn, landscapes and garden to minimize water needs.

- (vi) Plant more and more plants and small trees to retain moisture in the soil.
 - (vii) Taps, water pipes and joints should not be left leaking.
 - (viii) Prevent overflow of overhead water storage tank.
5. All air contains water, but near the group it is usually in the form of an invisible gas called water vapour. When warm air rises, it expands and cools. Cool air can't hold as much water vapour as warm air, so some of the vapour condenses onto tiny droplet around each dust particle. When billion of these droplets come together they become a visible cloud.
6. The difference between evaporation and condensation is that evaporation is a process in which water is changed into gaseous forms such as vapour, steam, etc. It happens because of the heat energy. On the other hand condensation is a process in which the gaseous form of water is changed back into water droplets, due to the absense of heat energy.
7. In very high clouds, the water freezes into crystals of ice because it is very cold. These crystals fall as snowflakes when they become heavy. Sometimes rain passes through a very cold layer of air and freezes into hailstones.



II. Fill in the blanks :

Ans. 1. merged, 2. transpiration, 3. air, 4. flood, 5. drought, 6. saline, 7. Rain

III. Match the following columns :

Ans. 1. (c), 2. (d), 3. (g), 4. (b), 5. (e), 6. (f), 7. (a)

IV. Write whether the following statements are 'true' or 'false' :

Ans. 1. False, 2. True, 3. True, 4. False, 5. True, 6. False, 7. False

V. Tick (✓) the right option :

Ans. 1. (b), 2. (d), 3. (c), 4. (a), 5. (d), 6. (c)

I. Answer the following questions :

Ans. 1. The thick layer of air all a round the earth is known as atmosphere.

The uses of atmosphere are :

- (i) It protects us from the harmful rays of the sun. Without atmosphere we can be burnt by the radiations of the sun.

- (ii) The ultraviolet radiations from the sun are very harmful for us. They cause diseases like cancer. The atmosphere saves us from these harmful ultraviolet radiations.
 - (iii) It helps to keep the heat of the sun near the earth.
 - (iv) Without the atmosphere, the earth would go so cold at night that we would not be able to live on it.
2. Air is a mixture of gases. It is composed of:
- (i) Oxygen (21%) (ii) Nitrogen (78%) (iii) Water vapour (1%) (iv) Carbon-di-oxide (0.03%) (v) dust and smoke (in minute quantity)
- Uses of air :
- (i) Moving air helps in the dispersal of seeds and pollen grains of different kinds of plants.
 - (ii) Oxygen and nitrogen are separated from the air. Oxygen and nitrogen are separated from the air. Oxygen is used in hospitals for respiration and nitrogen is used for making fertilizers for agriculture.
 - (iii) Wind is used for running windmills. Windmills use the power of the wind to generate electricity. Windmills are used for drawing underground water, running flour mills also.
 - (iv) Wind helps in the winnowing of food grains.
 - (v) Air helps in drying agricultural products such as, cereals, pulses, dry fruits, spices etc.
 - (vi) Fast moving wind helps in the movement of sailing boats and gliders.
 - (vii) Air helps in the transmission of sound. We cannot hear without air. It is also useful for wind based musical instruments.
3. **To show that air contains dust particles :**
 Find a sunny room in your school/home. Close all the doors and windows of the room. Now open the door or window facing the sun in such a way that it allows sunlight to enter the room only through a slit. What do you observe? Do you see any tiny, shining particles moving rapidly in the slanting beams of sunlight. These are the dust particles present in the air. They appear shiny due to scattering of sunlight by them. You can see up to a long distance after rain because the dust particles in the atmosphere settle down to the ground with rain. Also the transparent glass of window, if not wiped off regularly appear. It is due to the deposition of dust particles on the glass of windows. This proves that dust particles are present in air.
4. When the air we breathe is not pure is called air pollution. The winds are produced by the moving air.
5. There are three main sources of air pollution :
- (i) **Automobiles** : The most widely well-known air-pollutants originate from automobile exhaust. Automobile contribute 60% of the air pollution. Due to combination of petrol and diesel, poisonous

gases are produced together with a large amount of oxygen of the atmosphere depleted.

(ii) **Industries** : Industries are a great source of air-pollution. Petrol refineries, chemical plants, steel plants, paper and pulp industries are main sources of air pollution.

(iii) **Smog** : Gases like sulphur-dioxide (SO_2), nitrogen-oxide (NO) and unburnt hydrocarbons are released into the air from aircrafts. When these gases combine with sunlight or ultraviolet radiations they form very harmful photochemical smog. In big cities smog formation is very common.

6. The water animals remove the oxygen dissolved in water with the help of their gills and use it for respiration.

Animals living in the soil also need oxygen for respiration.

Some animals live under the soil such as, in the roots of a plant. They respire by taking oxygen present in the soil. Some of animals living under the soil make deep burrows in the soil through which the air reaches them for respiration.

II. Fill in the blanks :

Ans. 1. sunlight, 2. oxygen, 3. Nitrogen, 4. wind, 5. Atmosphere, 6. fogs

III. Write whether the following statements are 'true' or 'false' :

Ans. 1. True, 2. False, 3. True, 4. False, 5. False, 6. True, 7. True

IV. Tick (✓) the correct option :

Ans. 1. (c), 2. (c), 3. (d), 4. (a), 5. (c)

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The Waste and Its Disposal

I. Answer the following questions :

Ans. 1. All the materials that are no longer needed and are discarded can be categorised as waste. All waste can be classified two following groups.

(i) **Biodegradable** : Biodegradable substances are the ones one which can be decomposed by the micro-organisms into simpler substances. For example : peels of fruits, vegetables, papers, cow dung, etc. These substance do not cause any harm to the environment.

(ii) **Non-Biodegradable** : Non-biodegradable substances are one which cannot be decomposed by the microorganisms into simpler substance. For example : Plastic bags, buckets etc. These substances cause severe harm to the environment.

2. Disposal of Solid Waste

The disposal of waste should be done scientifically.

There are different techniques of waste disposal, which depends on the nature of the waste.

In most countries about 10% of the solid waste is burnt in machines called incinerators. Waste can be burnt in huge incinerator or oven, at a high temperature. Hospital waste is disposed of this way. Burning waste reduces its volume and the ashes can be disposed of more easily than the huge amount of unburnt waste.

The other 67% of solid waste is collected and shifted to areas that have been specially set aside for such a purpose. These areas are called landfills.

3. Water and waste from drains and toilets is called sewage. The sewage travels to a sewage treatment plant where it is processed and then emptied into a water body. At the sewage treatment plant, the solid wastes are removed. Usually, harmful micro-organisms are also removed as well. Many treatment plants also remove dangerous chemicals and nutrients from the sewage. A problem with some sewage treatment is that not all the harmful substances are removed from it.

4. Waste is recycled and reused for the following purposes.

- (i) It slows down the depletion of many valuable resources.
- (ii) It reduces the volume of waste by up to 50%.
- (iii) It reduce the level of pollutants released into the air.
- (iv) It lessens the demand of raw materials and energy.
- (v) It helps in saving many hectares of valuable land which otherwise may be required for the burial of waste metals.

Thus, recycling is not simply reuse, it is collecting and reprocessing the materials in such a way that they can be made into new objects.

5. Municipality and village or Gram Panchayat are the two local agencies responsible to look after the cleanliness of the locality.

(A) Municipality : These are helpful for us in the following ways :

- (i) It looks after the health and cleanliness of the people.
- (ii) It sets up public hospitals for humans and animals.
- (iii) It runs schools, libraries and maintains them.
- (iv) It builds roads, bridges, drains and parks in the towns and maintains them.
- (v) It maintains the supply of clean drinking water and electricity for street lighting.

(B) Village or Gram Panchayat

- (i) It settles small disputes among the villagers.
- (ii) It looks after the cleanliness of the villages.
- (iii) It constructs the maintains roads and make provisions for light on these roads.

6. The waste can be harmful for our health in the following ways :
- (i) Solid wastes destroy the natural beauty of a place.
 - (ii) Garbage dump becomes a breeding place for flies and mosquitoes.
 - (iii) Drains often get choked with garbage especially plastic bags.
 - (iv) Overflowing sewage may contaminate drinking water.
 - (v) Garbage heap is a source of infection for many diseases.

II. Fill in the blanks :

Ans. 1. incinerator, 2. chemical disposed of, 3. garbage, 4. landfills,
5. vermi composting, 6. decomposed, 7. recycle

III. Write whether the following statements are 'true' or 'false' :

Ans. 1. False, 2. True, 3. False, 4. True, 5. True, 6. True, 7. True, 8. False

IV. Match the following columns :

Ans. 1. (b), 2. (d), 3. (c), 4. (a), 5. (e)

V. Select biodegradable, non-biodegradable, recyclable and reusable waste materials from the following list :

Ans. (a) reusable (b) biodegradable
(c) reuse (d) reusable
(e) reusable (f) biodegradable
(g) non-biodegradable (h) recyclable
(i) biodegradable (j) recyclable
(k) recyclable (l) reusable

VI. Select the odd one out giving reason :

Ans. (i) **Wrapping waste in polythene bags** : This will decrease the decomposition process while the rest will increase the decomposition process.
(ii) **Polythene** : Polythene is not non-biodegradable while all of three are biodegradable.
(iii) **Healthy environment** : Health environment is not cause a pollution while growing population and rapid industrials are causes of pollution.
(iv) **Raw banana** : Raw banana is a biodegradable while all the three are non-biodegradable.
(v) **Garbage** : Garbage is a form of waste whereas all the others are methods of waste disposal.

VII. Tick the (✓) correct option :

Ans. 1. (c), 2. (d), 3. (d), 4. (b), 5. (b)