

1 Food : Where Does it Come From?



EXERCISE

Section-I

A. Tick (✓) the correct answer (MCQs) :

- Ans.** 1. c. fruit 2. b. Carrot
 3. d. Wheat 4. b. near the sea

B. Fill in the blanks :

- Ans.** 1. **Food** is one of the basic necessities of life.
 2. Any drink other than water is called a **beverage**.
 3. **Sugar** is obtained from sugar cane and sugarbeet.
 4. Animals that eat both plants and animals are called **Omnivores**.
 5. **Scavengers** are animals that live on dead and decaying food.

C. Write true or false :

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

D. Match the following :

- | | |
|--|--|
| <p>Ans. 1. Herbivores</p> <p>2. Carnivores</p> <p>3. Omnivores</p> <p>4. Scavengers</p> <p>5. Pulses</p> <p>6. Spices</p> | <p>a. Crow, woodpecker</p> <p>b. Ginger, turmeric</p> <p>c. Cow, Goat</p> <p>d. Peas, gram</p> <p>e. Lion, tiger</p> <p>f. Vulture, hyenas</p> |
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Section-II

A. Very Short Answer Type Questions :

- Ans.** 1. Plants give us cereals, vegetables, pulses, fruits, spices, oils and beverages.
 2. We use spices because these add flavour to our food.
 3. Carnivores eat the flesh of other animals.
 4. Any substance that provides an organism with nourishment is called food.

B. Short Answer Type Questions :

Ans. 1. **Functions of Food**

- Food helps us to grow.
 - Food gives us necessary energy to do our work, and to carry out a number of activities.
 - Food gives us the necessary strength in order to keep our body in good health.
2. A grasshopper eats a green plant, a frog eats the grasshopper, the frog is eaten by a snake, and the snake is eaten by an eagle. This chain of events is called a food chain.

3. a. Cow, Goat b. Lion, Wolf c. Dog, Crow.
4. a. Seed b. fruit c. stem d. leaf
5. Scavengers are animals that live on dead and decaying Eg :- Vulture, hyenas and jackals. They eat dead animals and clean the environment.

C. Define the following :

- Ans.**
1. **Omnivores :** Animals that eat both plants and animals are called omnivores. eg:- Human beings, Bear and crow.
 2. **Food chain :** A grasshopper eats a green plant, a frog eats the grasshopper, the frog is eaten by a snake, and the snake is eaten by an eagle. This chain of events is called a food chain.
 3. **Beverages :** Any drink other than water is called a beverage.
 4. **Scavengers :** Scavengers are animals that live on dead and decaying food.

D. Long Answer Type Questions :

- Ans.**
1. **Plants as food source**— Many plants or plant parts are eaten as food by humans. These are either eaten raw like cucumber or cooked before eating like potato.

Cereals— Cereals are the food grains produced by crops like wheat, barley, millet, maize, rice, etc. Wheat is used for making chapatis, breads and cakes. Barley is used for making chapatis, breads, beverages, etc. Rice is used for preparing idlis, dosas, and the like.

Vegetables— We eat many leafy vegetables. The leafy vegetables are the leaves of the plants. For example, spinach (palak or saag) are the leaves of the plant which we eat as a vegetable. We also eat some other vegetables such as brinjal, lady finger, capsicum, bitter ground etc.

Fruits— There are some plants which store food in their fruits. So, we eat the fruits of such plants as food. For example, apple, orange, peach, mango, pears, banana, plums, grapes, guava and pomegranate, etc.,

Pulses— Pulses or dals that we eat are plant seeds. Kidney beans (*rajma*), pigeon tea (*arhar*), black gram (*urad*), peas, grams (*chana*), etc. are pulses.

Oils— We use different kinds of oils for preparing our meal. Plants are the main source of edible oil. Coconut, mustard, sunflower, soyabean and olive oils are the most commonly used seed oils.

Spices— Spices are substances derived from plants that add flavour to our food. Asafoetida (*heeng*), red chillies, turmeric (*haldi*), cumin seeds (*jeera*), mustard seeds (*sarson*), cloves (*laung*), ginger (*adrak*) and coriander (*dhania*) are some of the spices used in our houses.

Beverages— Any drink other than water is called a beverage. The most common beverages are tea and coffee. Tea is obtained from the leaves of the tea plants and coffee from the beans of the coffee plant.

Sugar— Sugar is obtained from sugar cane and sugarbeet.

2. Different animals eat different types of food. An animal's mouth, teeth and body structure helps it to eat a certain type of food.

Herbivores— Animals that eat only plants and plant products are called herbivores. Their teeth are designed to chew plants and their stomachs to digest them. There are many different types of herbivores like cows, buffaloes, sheep, goats, etc. Some herbivores eat only specific parts of plants.

Carnivores— Carnivores are animals that eat the flesh of other animals. Carnivores are also called predators and the animals they kill are called prey. Their prey could be herbivores or other smaller carnivores. Just like herbivores, carnivores also come in all shapes and sizes and with different food tastes like tigers, lions, pythons, wolves, etc.

Omnivores— Animals that eat both plants and animals are called omnivores. Land animals like bears, foxes, dogs and of course humans are all omnivores. There are also many omnivorous birds like crows and sparrows and aquatic animals like sharks and whales.

E. Higher order Thinking Skills (HOTS) :

- Ans.** 1. No, he/she is not eating enough food for work and play for the whole day. We get energy from the food that we eat. In the growing stages of our life, we need to eat food in a sufficient quantity as the energy requirement of our body is diverse in this period.
2. Energy is also required while sleeping because there are various functions in the body that are being carried out while sleeping and energy is required to perform those functions.

2 Components of Food



EXERCISE

Section-I

A. Tick (✓) the correct answer (MCQs) :

- Ans.** 1. c. protect it from diseases 2. d. Roti, Dal, Salad, Vegetables
3. a. Fats 4. b. Iodine

B. Fill in the blanks :

- Ans.** 1. **Food** is the basic necessity of life.
2. Deficiency of vitamins in our regular diet may result in diseases called **deficiency diseases**.
3. **Roughage** is the undigestible fibrous material of food.
4. **Water** is essential for human survival.
5. The food which a person takes is called a **diet**.

C. Match the following :

Ans.	Column I	Column II	Column III
1.	Beri-Beri	a. Swelling in neck	A. Protein and carbohydrates
2.	Anaemia	b. Bending of bones	B. Iodine
3.	Marasmus	c. Stopping of growth	C. Iron
4.	Goitre	d. Weak muscles	D. Vitamin B
5.	Scurvy	e. Weakness	E. Vitamin D
6.	Rickets	f. Bleeding gums	F. Vitamin C

Section-II

A. Very short Answer Type Questions :

- Ans. 1. Nightblindness, Scurvy.
 2. Milk and eggs.
 3. Diseases that are caused due to the lack of carbohydrates, proteins, vitamins or minerals in the diet are called deficiency diseases.
 4. Fruits and vegetables.

B. Short Answer Type Questions :

- Ans. 1. The main components of food are carbohydrates, fats, proteins, vitamins and minerals.
 2. The different sources are :
 Glucose, Fructose, Sucrose (cane sugar or sugar), jaggery, Rice, Wheat, Potatoes, Maize, Roughage
 3. Fat also provide us energy.
 4. Proteins are essential for repair and maintenance of our body.
 5. Lack of proper nutrition, caused by not having enough to eat, not eating enough of the right things or being unable to use the food that one does eat is called malnutrition.
 6. Water helps our body to absorb nutrients from food. It helps to keep our body cool and healthy, keeps our skin smooth and glowing and helps in removal of waste in form of sweat and urine.

C. Compare and Contrast :

- Ans. 1. **Carbohydrates** : Carbohydrates are the compounds made up of carbon, hydrogen and oxygen. Carbohydrates are formed in plants during photosynthesis.
 Glucose ($C_6H_{12}O_6$), Sugar ($C_{12}H_{22}O_{11}$), and Starch [$(C_6H_{10}O_5)_n$] are typical carbohydrates.
Vitamins : In addition to carbohydrates, proteins and fats, our body also requires another kind of compounds called vitamins for its proper functioning and good health. However, these are required by the body in minute quantities. In addition to keeping our eyes, skin, bones, etc. healthy, vitamins also protect our body against many diseases.
 2. Some kinds of food give energy to us these food are known as energy giving food. These foods are carbohydrates and fats. The food items rich in carbohydrates and fats are rice, wheat, maize, potato, butter, ghee, etc.

Protective food : Some kinds of food protects our body from diseases are known as protection food. These foods are vitamins and minerals. The food items rich in vitamins and minerals are fruits and vegetables.

3. **Proteins :** These are the chemical substances containing nitrogen, carbon, oxygen and hydrogen and are essential for growth, repair and maintenance of our body. Some common foods rich in protein include pulses, beans, nuts, milk, cheese, eggs, fish etc. We get proteins from plants as well as animals.

Minerals : Our body also requires some elements like iron, calcium, potassium, sodium, magnesium, chlorine, iodine etc. for proper growth and functioning. These are called minerals are contained in different foods in the form of their salts.

D. Long Answer Type Questions :

Ans. 1. **To test for the presence of protein :-**

Take some food item and crush it or grind it. Put small quantity of food in test tube and add 10 drops of water. Now add 2 drops of copper sulphate solution and 10 drops of caustic soda solution to it. Shake it well. After sometimes violet colour appears which indicates the presence of protein.

To test for the presence of starch (a carbohydrate) in a food material.

Procedure : Take a small piece of food and crush it with a small quantity of water. Boil it for a minute and cool.

Add a drop of dilute iodine solution to this boiled food sample. If a deep blue colour appears in the solution, then the food contains starch.

If no blue colour appears, then the food does not contain starch.

To test for the presence of fats in a food material

Take a food sample, wrap it in a paper and press it. Take care that the paper does not tear. Now hold the paper against light. If you see a oily patch on the paper, it shows that the food item contains 'fat'.

2. **Carbohydrates** are especially important for the normal functioning of the central nervous system, brain and red blood cells. Fiber, an indigestible form of carbohydrate found in whole grain foods, fruits, and vegetables, helps to maintain normal bowel movement that reduces risk of constipation, hemorrhoids, diverticulosis and colon cancer. By increasing excretion of cholesterol, fibre may decrease risk of heart disease, and by providing a feeling of fullness, which may help reduce risk of obesity.

The proteins in our body carry out many functions, ranging from forming organ issues to making antibodies that fight infection. They are present in every cell of our body, including muscles, bones, skin, nails and hair and are critical for synthesis of hormones, enzymes, DNA and RNA. Proteins enable normal growth and development of children and teens.

3. The food which a person takes is called a diet. A diet which contains all nutrients in proper amount/proportion as is required by our body for normal growth and functioning is called balanced diet. It includes energy

C. Write true or false :

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

D. Encircle the odd-one out. Give reason for your choice :

- Ans.** 1. **Impurities** : It is a mixture of many unwanted substances where as all others are pure substances.
2. **Muddy water** : It is not a method of purification. Rest are part of purification processes.
3. **Water** : It is liquid whereas rest are solids.

E. Write answer in a word :

- Ans.** 1. A substance that dissolves in a liquid. **Solute**
2. The method used to obtain salt from sea-water. **Evaporation**
3. The liquid that dissolves a solid in it. **Solvent**
4. A method used to separate lighter components of a mixture by wind. **Winnowing**

Section-II

A. Very Short Answer Type Questions :

- Ans.** 1. a. Winnowing b. Sedimentation and decantation
2. a. Salt and sugar b. Sand and gravel
3. The substances are made up of only one kind of particles (molecules or atoms) are known as pure substances e.g., silver, copper, hydrogen, etc.

B. Short Answer Type Questions :

- Ans.** 1. A mixture is made up of two or more elements or compounds (constituents) and shows the properties of its constituents, e.g., sea water is a mixture of salts, the air you breathe is a mixture of gases, soil is a mixture of humus, minerals and rocks, etc.
2. **Threshing** : It is the process of separating the grains from the plant. Traditionally plants were placed on a stone and beaten by stick to remove the grain.
3. The sieving of sand is done during the construction of buildings also, so that it forms a smooth mixture with cement and can hold pieces of bricks together. It also used at home to separate husk particles from the wheat flour.
4. A solution in which no more solute can be dissolved at a fixed temperature is called a saturated solution.
5. **Handpicking** : This common method is employed to remove undesirable substances from eatables. Housewives often remove small pebbles, dirt, etc, from pulses and food grains by handpicking.

C. Define the following terms :

- Ans.** 1. **Filtration** : Filtration is used to separate insoluble and solid from a liquid in a solid-liquid mixture.
2. **Sedimentation** : When a mixture of sand particles and water is left undisturbed in a container, sand particles settle down and pure water

- remains over the layer of settled sand. This is called sedimentation.
3. The act of passing something through a sieve is called sieving.
 4. **Condensation** : The process by which vapour of any liquid is converted into liquid by cooling is called condensation.
 5. **Evaporation** : When a solution is heated gently, the solvent evaporates from the surface of the liquid and the solid will be left behind. This process is called evaporation.
 6. **Solubility** : The property of a substance to dissolve.

D. Long Answer Type Questions :

Ans. 1. Methods of Separation

- **Handpicking** : This common method is employed to remove undesirable substances from eatables. Housewives often remove small pebbles, dirt, etc, from pulses and food grains by handpicking.
- **Threshing** : It is the process of separating the grains from the plant. Traditionally plants were placed on a stone and beaten by stick to remove the grain.
- **Winnowing** : After threshing farmers use this method to remove husk or chaff from grain.
Winnowing is based on the property that grains are heavier than husk and hay. This method is used when there is a difference in weights of the components of a mixture. Here heavier and lighter components are separated by wind or by blowing air.
- **Magnetic Separation** : This method is used to separate magnetic component of a mixture from non-magnetic components,. When a magnet is passed over such a mixture, the magnetic components get stuck to the magnet whereas the non-magnetic components are left behind.
- **Sieving** : This process is based on the difference in the size of the different components of the mixture. You all might have seen your mother passing wheat flour through a sieve. By this process, the bigger particles are collected on the sieve while the smaller particles pass through.
- **Sedimentation and Decantation** : When a mixture of sand particles and water is left undisturbed in a container, sand particles settle down and pure water remains over the layer of settled sand. This is called sedimentation. The water can be poured gently into another container without disturbing the sand layer. This process is called decantation.
- **Loading or Coagulation** : This process of improving the settling property of solid particles by the addition of special chemicals like alum is called loading or coagulation. Alum is a coagulating agent.
- **Distillation** : Distillation is used to separate a solvent from a solution.
- **Filtration** : Filtration is used to separate insoluble and solid from a liquid in a solid-liquid mixture.

- **Evaporation and Condensation :** When a solution is heated gently, the solvent evaporates from the surface of the liquid and the solid will be left behind. This process is called evaporation.
The process by which vapour of any liquid is converted into liquid by cooling is called condensation.
 - **Centrifugation :** The method of separating lighter and heavier particles from the liquid by rotating the liquid in a machine is called centrifugation.
2. **Evaporation and Condensation :** When a solution is heated gently, the solvent evaporates from the surface of the liquid and the solid will be left behind. Eg: In some parts of the world, salt is obtained by evaporating sea-water trapped in salt pans. Heat of the sun gradually evaporates the water from the pans and the salt is then piled to dry.
The process by which vapour of any liquid is converted into liquid by cooling is called condensation.
Eg: Droplets of water falling from the clouds during rains. This is because water vapour in the air gets closer and form clouds. When the clouds enter a colder region, the water vapour gets cool and forms water droplets. These droplets come down as rain.
 3. A solution in which no more solute can be dissolved at a fixed temperature is called a saturated solution.

Making of a saturated solution of sugar in water.

Take a beaker and fill 100 mL of water in it. Now, add tablespoonful of sugar in it. Stir it well. Sugar gets completely dissolved in it. Now add one more tablespoonful of sugar in it. What do you find? Sugar still dissolves completely in it.

So, we can say that 100 mL of water with 1 tablespoonful of sugar is an unsaturated solution, as it is able to dissolve more sugar in it.

Proceed further; keep on adding sugar in this solution till you reach a point when no more sugar gets dissolved in it.

This is called saturation point and the solution is called saturated solution.

We will find that in spite of stirring, a few sugar particles will always be left undissolved at the bottom of the beaker containing saturated solution.

4. By increasing the temperature the solubility of a substance be increased. This doesn't work for every chemical but for most solids into liquids. If we increase the temperature of gases and liquids the gases solubility will decrease.

E. Higher Order Thinking Skills (HOTS) :

- Ans.**
1. Take some quantity of chalk from chalk jar and dissolve it in a glass of water. Chalk will not soluble in water. Now take some quantity of salt from salt jar and dissolve it in another glass of water. Salt will soluble in water. By this experiment without tasting we will find what which one has.
 2. The solubility changes with the temperature. Ice is cold and if she will put ice first, sugar can't dissolve in Lamonade. So, she should add sugar first.

patsun. Jute yarn is extensively used in making the packaging cloth.

Jute yarn is extensively used in making jute sacks. Jute fibre is used for making ropes. High quality jute fibre is used for making carpets and curtains. These days fine quality jute is used for making fancy dress materials and cheap ornaments.

4. Jute is grown in alluvial soil in the delta region of the Ganga and Brahmaputra rivers.
 - Jute is cultivated during the rainy season. It bears yellow flowers in 3-4 months. Jute plants are usually cut at the flowering stage. A good quality fibre is obtained from plants cut at the flowering stage. Jute obtained from a matured plant is harder. After the dry leaves have fallen, the bundles of dry plants are kept in a pond for a few days. During this period, the gummy skin rots out to separate the fibres. This process is called retting. The jute fibre is obtained from the retted jute by jerks and pulls of the hand. These fibres are then tried and sent to mills in bundles, where they are woven to form yarns of varied thickness.
5. Most cloth is made from fibres. There are two kinds of fibres—natural and synthetic. Natural fibres are obtained either from plants, e.g. cotton and jute, or from animals, e.g. wool and silk. Synthetic fibres are made from other materials, mainly petroleum. In addition leather and fur are materials that are not fibres, from which clothes are made. Leather and fur are obtained from animals.

C. Differentiate between the items of each pair :

Ans. 1. **Cotton :** It is a natural fibre. Cotton is a fibre which grows around the seed of the cotton plant. It is considered the best fibre to make clothing material for hot and humid climate as it is soft, allows air to pass through and absorbs sweat easily.

Nylon : It is a synthetic fibre. Nylon was invented in 1935 by Wallace Carothers, an American chemist, at Du Pont. Nylon is also known as polyamide (PA). It is synthesised from coal. Nylon fibres were earlier used to make fabrics and ropes. Nylon is used for making meat wrappings, sausage and sheaths.

2. **Ginning :** Ginning is the process of removing fibre from seeds.

Spinning : Spinning is the process of making yarn from fibre.

3. **Warp :** The yarn is placed lengthwise on the frame of the loom. It is called warp.

Weft : Yarn is wound on wooden reels and placed in the shuttle of the machine. The thread in the shuttle moves back and forth with the help of the machine and this is called weft.

D. Define each of the following :

Ans. 1. **Lind :** Lint is the deseeded cotton.

2. **Cotton Silver :** Machine converts the combed and straightened fibres

into a rope-like strands of cotton fibre called cotton silver.

3. **Yarn** : Yarn is the thread which is used to making clothes.
4. **Ginning** : Ginning is the process of removing cotton seeds from raw cotton.
5. **Shearing** : Cut the wool off from the body of sheep or other animals is called shearing.
6. **Retting** : Retting is the process of loosening the jute fibre from its stalk by immersing it in stagnant water for a few days.

E. Long Answer Type Questions :

Ans. 1. **Natural Fibres**—Fibres which we get from the nature are known as natural fibres. Natural fibres are obtained either from plants, e.g., cotton and jute, or from animals, e.g. wool and silk.

Synthetic Fibres— The fibres which are synthesised by man are called synthetic fibres. They are also called artificial or man-made fibres. They are not found in nature. Most of the synthetic fibres are actually plastics obtained from petroleum.

Common synthetic fibres include rayon, nylon, terylene, acrylic and polyester.

2. Lint or cotton fibres undergo the following processes during the manufacture of clothes:—

i. Carding : The raw cotton of the bales or lint is beaten into shreds to form a fluffy mass. This process of beating lint is called carding. The carded lint is cleaned to remove straw, dried leaves, etc.

ii. Combing : The carded and cleaned cotton is fed into a machine which combs and straightens the fibres.

iii. Formation of sliver : Another machine converts the combed and straightened fibres into a rope-like strands of cotton fibres called sliver.

iv. Sliver is spun into yarn : Sliver is pulled and spun in another machine and thus converted into a strong yarn.

v. The yarn (or thread) is wound on big reels called bobbins.

vi. Yarn is used for making cloth.

F. Higher Order Thinking Skills (HOTS) :

Ans. 1. Jute fibres normally not used to make clothes because it is hard and cheap type of fibre and can't fold easily.

2. Cotton and woollen clothes are rough to touch because cotton and wool contain air space in it.

Whereas silk, nylon and polyester are smooth to touch because these are processed and thus consist of finer threads.

5 Sorting Out Materials and Objects



EXERCISE

Section-I

A. Tick (✓) the correct answer (MCQs) :

- Ans.** 1. b. Copper 2. c. Bakelite
3. c. Silver 4. Nail

B. Fill in the blanks :

- Ans.** 1. **Classification** is the process of grouping things on the basis of some criteria.
2. The things which are found in nature are called **natural things**.
3. Air is a bad **conductor** of heat.
4. **Lustrous materials** are the objects which shine.
5. Non-magnetic materials are not attracted by **magnet**.

C. Write answer in a word :

- Ans.** 1. Name a gas which is soluble in water.
2. Name a good conductor of heat.
3. Name the hardest substance followed by sapphire.
4. Name a substance whose density is less than that of water.

Oxygen
Graphite
Diamond
Wood

D. Write true or false :

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

E. Match the following :

- Ans.** 1. Wood → a. Good conductor
2. Salt → b. Bad conductor
3. Plastic → c. Transparent
4. Glass → d. Opaque
5. Copper → e. Soluble

F. The table gives some properties of building materials. Put a thick in the box if the material has that property and a cross if it does not. One has been done for you :

Ans. Property	Transparency	Insulation
Brick	X	✓
Glass	✓	X
Copper wire	X	✓
Roofing Tiles	X	✓
Wood	X	✓
Liquid Plastic	✓	X
Water	✓	X

Section-II

A. Very Short Answer Type Questions :

- Ans.** 1. Classification is the process of grouping things on the basis of some

- criteria.
- Transparent-Water, Glass
Opaque-Wood, Stone.
 - Metals like copper, iron, silver, gold and aluminium have a common property they all shine. Similarly, wood or rubber have a common property they do not shine.
 - Wax and oil are the materials which do not dissolve in water and are lighter than water.

B. Short Answer Type Questions :

- Ans.**
- The mass per unit volume of a substance is known as density. A substance which is denser than water (iron, aluminium) will sink in water. A substance which is less dense than water (wood, cotton) will float on water.
 - Magnetism is defined as the force produced by charged particles of a magnet.
 - Transparent :** Air, cleanwater, glass
Opaque : sand, metal, butter paper, muddy water, wood
 - Magnetic :** Cobalt, Nickel, iron nails
Non-magnetic : Paper, eraser, wood, pencil
 - Salt remains in the water after it dissolves in water, it exists in ionized form.

C. Define the following :

- Ans.**
- Ductility:**—The property of materials due to which they can be drawn into wires is called ductility.
 - Malleability:**—The property of materials due to which they can be beaten into sheets without breaking up is called malleability
 - Diffusion:**—The intermixing of one substance with another is called diffusion.
 - Solubility:**—Solubility is the ability of a substance to dissolve in another substance.

D. Differentiate between the following pairs :

- Ans.**
- Soluble substances :** Substances which dissolve in water are called soluble substances. Salt, sugar, lemon juice, etc. are soluble substances.
Insoluble substances : Substances which do not dissolve in water are called insoluble substances. Metal, stone, wood, sand, etc. are insoluble substances.
 - Floating substances :** The substances which are less dense than water will float on water. These substances are called floating substances. For example : Wood, cotton.
Sinking substances : The substances which is dense than water will sink in water. These substances are called sinking substances. For example : iron, aluminium.
 - Good Conductors of Heat :** The substances which allow heat to pass

through them are called good conductors of heat, e.g., metals and graphite.

Bad Conductors of Heat : The materials which do not allow heat to pass through them are called bad conductors of heat, e.g., wood, cotton and plastic.

4. **Transparent Substances :** The materials which allow light to pass through them are called transparent materials. Glass, acrylic sheet, water and air are transparent materials.

Opaque Substances : The materials which do not allow light to pass through them are called opaque materials. Wood, stone, cardboard, metals, etc, are opaque materials.

E. Long Answer Type Questions :

Ans. 1. Anything which occupies space and has weight is called matter. All materials in the universe consist of matter. Whether, it is star, planet, rock, wood or plastic, everything is made up of matter.

2. **Properties of Matter :**

Some properties of the matter are of following : (i) Appearance (ii) Hardness (iii) Lustre (iv) Roughness and Smoothness (v) Density-Flsating and Sinking (vi) Conduction of Heat (vii) Transparency (viii) Magnetism (ix) Diffusion (x) Malleability (xi) Ductility (xii) Solubility

We can look through glass, but not through wood or a metal plate. Do you know why? This is because light can pass through glass, but not through wood or metal. The property of substances to allow light to pass through them is called transparency. Substances are classified into three groups, depending on the amount of light which can pass through them.

The materials which allow light to pass through them are called transparent materials. Glass, acrylic sheet, water and air are transparent materials.

The materials which do not allow light to pass through them are called opaque materials. Wood, stone, cardboard, metals, etc, are opaque materials.

Certain materials allow only a part of the light to pass through them. Such materials are called translucent materials. Oily paper or waxed paper, ground glass are translucent materials.

3. Diffusion in a gas is the random motion of particles involved in the net movement of a substance from an area of high concentration to an area of low concentration. Each particle in a given gas continues to collide with other particles. In regions of the gas where the particle density is the highest, the particles bounce off each other and the boundary of their container at a greater rate than particles in less-dense regions. That is the reason gases have the highest rate of diffusion.
4. On the basis of the capacity to conduct heat, substances can be classified as the following :

i. Conductors : The substances which allow heat to pass through them are called good conductors of heat, e.g., metals and graphite.

ii. Insulators : The materials which do not allow heat to pass through them are called bad conductors of heat or insulators, e.g., wood, cotton and plastic. Air is also a bad conductor of heat.

F. Higher Order Thinking Skills (HOTS) :

- Ans.**
1. Steel is the good conductor of heat. So, when we pour hot tea in it, it also become hot. That is why it is difficult to hold a steel glass containing hot tea.
 2. In case a person gets an electric shock, you should not try to pull that person away with bare hands because the person who gets the electric shock also touching ground then the current from the wire is flowing through him into the ground. If you will touch him the current also make a path to ground through your body. Wooden pole (broom) and wooden stick should be used to save such a person.

6 Changes Around Us



EXERCISE

Section-I

A. Tick (✓) the correct answer (MCQs) :

- Ans.**
- | | |
|--|-----------------------|
| 1. c. Rusting of iron | 2. c. chemical |
| 3. c. desirable change, as it releases gas | 4. a. chemical change |

B. Fill in the blanks :

- Ans.**
1. Many **changes** are taking place around us.
 2. **Reversible** changes can be reversed by reversing the conditions.
 3. The properties of the **substance** do not change in a reversible change.
 4. Burning of **paper** and **wood** is an irreversible change.
 5. **Heating** and **cooling** any object is a reversible change.

C. Write true or false :

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

D. Are the following changes physical or chemical?

- Ans.**
- | | |
|--------------------------------|-----------------|
| 1. Germination of seed | Physical |
| 2. Stretching of a rubber band | Physical |
| 3. Evaporation of water | Chemical |
| 4. Burning of coal | Chemical |

E. Encircle the odd-one out. Give reason for your choice :

- Ans.**
1. **inflating a balloon** All are reversible change but inflating balloon is a reversible change.
 2. **trying of potatoes** All are physical change but frying of potatoes is a chemical change.

Section-II

A. Very Short Answer Type Questions :

- Ans.** 1. Chemical change.
2. No.
3. Formation of water vapour after heating of water.

B. Short Answer Type Questions :

- Ans.** 1. Change is the nature of life. As days and nights go on, we see that things around us undergo changes. For example, germination of seeds, flowering of plants, melting of ice, evaporation of water, drying of clothes, burning of fuels, cooking of food, formation of curds, rusting of iron, dissolving of sugar in water, change in seasons and change of day and night are some changes around us.
2. **Physical change :** Melting ice, heating of water
Chemical changes : Burning matchstick, rusting of iron.
3. **Reversible Changes :** Glowing of an electric bulb, stretching of a rubber band.
Irreversible Changes : Burning of paper, change of milk into curd.
4. 'Boiling' and 'melting' are physical changes and not chemical changes because in both these changes only the physical appearance change. No new substance is formed in boiling and melting. These both changes are reversible. In these changes initial substance can be obtained in some physical form. In these changes properties of the initial substances are not lost even after the change.

C. Define :

- Ans.** 1. Chemical change is a change in which different kinds of substances could be transformed into new kinds of substance. Chemical changes take place due to chemical reaction of the initial substance changing into new substance.
2. The change which can be reversed by reversing the conditions is called a reversible change.
3. The change which cannot be reversed even by changing the conditions is called an irreversible change.
4. A physical change is a change in the form of substance but not in chemical identity.

D. Differentiate between the following pairs :

- Ans.** 1. **Reversible Change :** The change which can be reversed by reversing the conditions is called a reversible change. During a reversible change, the structure of molecules of the substance undergoing change does not alter. Nor do the properties of the substance change.
Irreversible Change : The change which cannot be reversed even by changing the conditions is called an irreversible change. During an irreversible change, the structure of a material changes. The molecules of one substance change to form molecules of a new substance.

2. **Melting** : Melting is the state of matter changing from solid form to liquid form.
Freezing : Freezing is the state of matter changing from liquid to solid form.
3. **Physical Change** : A physical change is a change in the form of substance but not in chemical identity.
Chemical Change : a chemical change is a change in which different kinds of substances could be transformed into new kinds of substance. Chemical changes takes place due to chemical reaction of the initial substance changing into new substance.

E. Long Answer Type Questions :

- Ans.** 1. The change which can be reversed by reversing the conditions is called a reversible change.
Some reversible changes are :
- a. Conversion of ice into water by heating and of water to ice on cooling.
 - b. Glowing of an electric bulb.
 - c. Stretching of a rubber band.
 - d. Ploughing a field.
2. A physical change is a change in the form of substance but not in chemical identity.

Characteristics of Physical change:—

Only the physical appearance changes. No new substance is formed. The change is not always reversible. Initial substance may be obtained in some physical form. The properties of the initial substances are not lost even after the change.

3. **Differences between of Physical and Chemical Changes**

Physical Change	Chemical Change
1. Only the physical appearance changes.	1. The initial substance is lost.
2. No new substance is formed.	2. An entirely new substance is formed.
3. The change is not always reversible.	3. The change is always irreversible.
4. Initial substance may be obtained in some physical form.	4. The initial substance can never be obtained.
5. The properties of the initial substances are not lost even after the change.	5. The properties of the initial substances are lost and properties of the new substances formed are entirely different from that of the initial substance.

4. In our daily life some changes can be noticed immediately but some other changes are noticeable after some time, while many changes go unnoticed. A change always has some cause which brings it about. These

D. Match the following :

- Ans.**
- | | | |
|------------------|---|----------------|
| 1. Gynoecium | → | a. Petal |
| 2. Seeds | → | b. Ovules |
| 3. Tap root | → | c. Banyan tree |
| 4. Calyx | → | d. Pistil |
| 5. Fibrous roots | → | e. Maize |
| 6. Androecium | → | f. Sepal |
| 7. Stilt roots | → | g. Mango |
| 8. Corolla | → | h. Stamen |
| 9. Prop roots | → | i. Grass |

E. Answer in one word :

- Ans.**
- | | |
|--|-----------------------|
| 1. What are the leaves which do not have a petiole called? | Sessile leaves |
| 2. What are the fine particles found inside an anther called? | Pollen grains |
| 3. Name a leaf modified for vegetative propagation. | Bryophyllum |
| 4. What is a flat, broad, green part of a plant called? | Lamina |
| 5. Name the roots which support the branches of a banyan tree. | Prop roots |

F. Encircle the odd-one out. Give reason for your choice :

- Ans.**
- | | |
|--|---|
| 1. <input type="text" value="Soil"/> | All are parts of a plant except soil. |
| 2. <input type="text" value="stamen"/> | All are parts of a female reproduction organ except stamen. |
| 3. <input type="text" value="sugar cane"/> | Sugarcane is a modification of stem but all others are plant is called translocation of food. |

Section-II

A. Very Short Answer Type Questions :

- Ans.**
1. The female part of flower is pistil.
 2. The transport of food by stem is called translocation of food.
 3. Stigma, the part of the pistil traps pollen grains.
 4. Shrubs.

B. Short Answer Type Questions :

- Ans.**
1. Structurally there are two types of root systems—tap root system and fibrous root system.
Storage roots—Carrots, beet, turnip.
Supporting roots—Banyan.
Nodulated roots—Pea, beans, groundnut.
 3. The process of loss of water through leaves is called transpiration.
Transpiration cools the plant. It also creates a 'pull' in the plants due to which water and minerals are moved up to stem from roots. Therefore transpiration helps in transport of nutrients inside a plant.
 4. **Spines :** In desert plants like Opuntia, leaves are modified into spines to reduce loss of water by transpiration.
Food storage : In an onion bulb, fleshy leaves store food.
 5. The transfer of pollen grains from an anther to a stigma is called pollination. After pollination, the ovules change into seeds.

C. Draw neat and labelled diagrams of the following in your exercise book :

Ans. Do yourself.

D. Differentiate between each pair :

- Ans.**
- Ovary :** The lower broader portion of the pistil is called ovary.
Ovule : The ovary contains female sex cells called ovules.
 - Node :** The point from where a leaf grows is called the node.
Internode : The portion of the stem between two nodes is called internode.
 - Stamen :** Many little stalks with swollen tops around the centre of the flower are called stamens. Stamens are the male parts of the flower.
Carpel : A flask-shaped structure in the centre of the flower is called pistil, (or carpel). It is the female part of the flower.
 - Apical bud :** The bud at the terminal end of the stem is known as apical bud. The stem grows at this bud.
Auxiliary bud : The buds which give rise to branches are called axillary buds.
 - Tap roots :** In plants like mango, neem, rose, etc, there is a thick main root from which many thinner branches arise. This root system is called **tap root system**.
Fibrous roots : In plants like grasses, rice, palms, etc, there is no main root. Instead a number of roots of equal thickness arise in a cluster. This kind of root is called fibrous root.

E. Long Answer Type Questions :

- Ans.**
- Some plants such as cucumber and watermelon have very weak stems. They creep along the ground, and are called creepers. Some weak-stem plants need support to stand erect and climb up. They are called climbers. Plants of pea, grapevine and beans are climbers. Creepers and climbers belong to stem category.
 - Functions of the Stem**
The main functions of stem are :
 - Support :** Stem supports branches, leaves, flowers and fruits. It keeps leaves spread out so that they can get enough sunlight.
 - Conduction of Water and Food :** Stem transports water and minerals absorbed by the roots to different parts of the plants. It also conducts food manufactured in leaves to other parts of the plant.
 - Modifications of the Stem**
In certain plants, the structure of stem is changed in a natural way. Such stems are called modified stems.
Some modified stems can store food : Potato, onion and ginger plants, stem becomes underground and stores food materials. They have nodes and internodes.
In potato, the spherical-shaped structure which we consume very often as a part of our food, is a modified stem. It has several markings on its surface. These markings are the dormant buds which are commonly called 'eyes'.

In onion, the stem is highly reduced into a disc-like structure. The upper end of this stem has a terminal bud which is surrounded by two types of scale leaves. The inner scale leaves are modified. These are fleshy and store food and water, while the outer ones are dry. Axillary buds are present in the axils of leaves.

Some modified stems can make food : Plants like cactus and prickly pear can perform all the functions of leaves by their modified stems.

4. The basic structure of a flower contains following parts :

Sepals : The outermost green-leafy structures in a flower are called sepals. Sepals protective flower at the bud stage. Sepals are the most important part in an open flower.

Petals : The leaf-like coloured parts next to the sepals are called petals. In most flowers, petals give pleasant fragrance. The bright colour and fragrance of the petals attract insects that help plants in reproduction.

Stamens : Many little stalks with swollen tops around the centre of the flower are called stamens. Stamens are the male parts of the flower.

Each stamen consists of a thin green stalk called filament with a bag-like top, called anther. The anther carries several pollen grains. Pollen grains are dust-like particles and take part in reproduction.

Pistil (or carpel) : A flask-shaped structure in the centre of the flower is called pistil, (or carpel). Pistil is the female part of the flower. The lower broader portion of the pistil is called ovary.

The narrow upper portion of pistil is called the style. The sticky end at the top of the style is called stigma. The ovary contains female sex cells called ovules.

F. Higher Order Thinking Skills (HOTS) :

- Ans.** 1. The fleshy underground part of the ginger plant is a stem.
2. Having trees in a field make it difficult for harvesting and planting. Its an obstacle which we would have to around. Having a clear field makes it much easier to move back and forth. So, it is not descramble to have big trees like mango that provide shade, in wheat or paddy fields.

8 Body Movements



EXERCISE

Section-I

A. Tick (✓) the correct answer (MCQs) :

- Ans.** 1. a. femur 2. a. skull
3. d. All of these 4. c. skull bones

B. Fill in the blanks :

- Ans.** 1. Animals possess **definite** organs of locomotion.
2. **Skull** is the part that protects the brain.

3. **Femur** is the largest bone in the human body.
4. Snail has an **exoskeleton** composed of shell.
5. Birds have hollow bones filled with **air**.

C. Write true or false :

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

D. Match the following :

Ans.

1. Snake	→	a. Vertebrates
2. Snail	→	b. Ribs, scales and muscles
3. Fish	→	c. Exoskeleton
4. Mammals	→	d. Streamlined body

E. Write answer in one word or two :

Ans.

1. Which part of the human skeleton protects the spinal cord? **Vertebral Column**
2. A change in the position of only a part or parts of the body. **Movement**
3. Which is the only movable bone in the skull? **Lower jaw bone**
4. Name the group of animals which has backbones. **Vertebrates**

F. Encircle the odd-one out. Give reason for your choice :

Ans.

1. **excretion** All are body parts except excretion.
2. **ankle** All are parts of arms except ankle.
3. **fish** All animals crawl except fish.

Section-II

A. Very Short Answer Type Questions :

Ans.

1. The framework of bones and cartilages which supports the body of an animal or human is called its skeletal system.
2. Femur.
3. Heart and lungs are the organs are protected by chest bones.

B. Short Answer Type Questions :

Ans.

1. Animals need to move to get food and get away from danger.
2. There are some additional parts of the skeleton that are not hard as bones and which can be bent. These are called cartilage. This is not as soft as lobe and not as hard as bone. We can bend it. This is cartilage. Cartilage is also found in the joints of the body. It makes the ends of the bones smooth and reduces the friction between them during movement.

3. Functions of the Skeletal System

The skeletal system performs the following functions in the body :

- (i) It provides form and shape to the body.
- (ii) It protects the delicate internal organs of the body.
- (iii) It helps in the movement of body parts as it provides a surface to which the muscles are attached.
- (iv) The process of formation of red blood cells takes place in the bone marrow. Bone marrow is a soft and spongy substance present inside the bones.

4. The forelimbs of birds are modified into wings. Birds fly by flapping their wings up and down. Each flapping includes a downstroke and an upstroke.

Fish swim in water with the help of fins and tails. They gain power for forward movement by swimming their fins from side to side while curving the rest of their body alternately to the left and to the right. The vertebrae column has to be to bend, to allow the fish's body to curve and swim in the water.

5. Snails have a protective shell on their back. When in danger, they hide their whole body inside their shell.

C. Define the following :

- Ans.**
1. Bones are attached to each other at joints by strong bands of tissues called ligaments.
 2. Locomotion is the act of moving from place to place.
 3. The place where two or more bone meet is called a joint.
 4. When many organs work together for one major life function, they form an organ system.

D. Distinguish between each of the following :

- Ans.**
1. **Vertebrates and Invertebrates :** Those that have a backbone are called vertebrates. Those that do not possess one are invertebrates.

2. **Pivot Joint :** In this joint, a cylindrical bone rotates in a ring. It can also twist from one side to another. The joint where our neck joints our head is a pivotal joint. Due to this joint, we can turn our head from left to right and also bend our head forward and backward.

Ball and socket joint : In these joints, the rounded head of one bone fits into the cup like cavity of the other bone. It allows rotation in a complete circle. Our shoulder and hip joints are examples of these kind of joints.

3. **Gliding joints :** Gliding joints allow a little movement of bones. For example, joints of backbone, carpals, etc.

Hinge joint : These joints allow back and forth movement in one direction only. They work just like the hinges on the doors and windows. Our knee joint and elbow joint are examples of hinge joint.

4. **Tendon :** Just like the skeletal system, our body has another system called the muscular system which consists of muscles which joined to the bones by tendons.

Ligament : Bones are attached to each other at joints by strong bands of tissues called ligaments.

E. Long Answer Type Questions :

- Ans.**
1. The place where two or more bone meet is called a joint.

Immovable Joints— They are also called fibrous joints. They do not allow any movement of bones and are called fixed joints. In these joints the bone are interlocked with one another. For example, the bones of skull, the joint between the upper jaw and the rest of the head etc.

Slightly Movable Joints— Also called gliding joints or planar joints, they allow a little movement of bones. For example, joints of backbone, carpals, etc.

Movable Joints— These allow the bones to move freely. They contain a fluid for smooth movement of bones called synovial fluid, so they are also called synovial joints.

2. a. **Functions of the Vertebral Column or backbone :**
 - It gives support to the body.
 - It assists in maintaining erect posture.
 - It helps in the movement of neck and in the bending of the body.
 - It protects the spinal cord.
- b. **Functions of ribs:**— The rib cage protects the heart and the lungs. It also protects parts of the stomach and kidneys.
- c. **Functions of the Skull**
 - It encloses the brain and protects it from external shocks and jerks.
 - The lower jaw is movable, thus it enables us to chew food and talk.
 - It encloses and protects the sense organs like eyes, ears, nose and tongue.
3. The human skull consists of bones which surround and protect the brain. It has 22 bones of which 8 flat bones are joined together to form the cranium. Cranium is the upper part of the head that protects the brain. The face and jaws have the remaining 14 bones. Teeth are fixed in the jaw bones. The lower jaw bone is the only bone in the skull which can move.
4. All living organisms show some type of movement. Animals, however, move more freely.

The act of moving from place to place is known as locomotion. It involves the movement of the whole body, as in walking, running, swimming or flying. Movement is the change in position of only a part of the body, as movement of stem towards light in plants.
5. Animals have specific organs of locomotion which are known as locomotory organs.
 - i. **Earthworm :** The body wall of an earthworm has circular and longitudinal muscle fibres. Locomotion is brought about by contraction and relaxation of the body muscles. The movement of these muscles pushes blood in the direction of movement and hence, the animal moves forward.
 - ii. **Insects :** Insects have two pairs of wings and three pairs of walking appendages (legs) for locomotion.
 - iii. **Snail :** Snail is a delicate terrestrial air-breathing gastropod. It has an exoskeleton composed of shell. It has a flat foot for locomotion.
 - iv. **Fish :** Fishes are vertebrates, i.e., they have bones to support the body. They have fins that play a major role in locomotion. A fish has muscles on either side of its backbone. These muscles contract on one side and expand

Section-II

A. Very Short Answer Type Questions :

- Ans.** 1. The capacity of an organism to produce its own kinds is called reproduction.
2. A plant which has leaves reduced into spines is cactus.
3. The process in which wastes are removed from the body is called excretion.
4. The living things whose bodies consist of more than one cell is called multicellular organisms.

B. Short Answer Type Questions :

- Ans.** 1. We see Rats and cockroaches can also be seen in a home. The garden in our neighbourhood has many types of plants. It may also have a sparrows, crows, pigeons and squirrels. Dogs and cats are also found in most of the places. Thus, we can say that living things are found everywhere.
2. Plants are fixed in the soil. They can exhibit only slight movements, e.g., the touch-me-not plant (*Mimosa pudica*) curls up its leaves when it is touched. Flowers like daisy and lily close at night and open in the morning. The sunflower always faces towards the Sun.
3. The period during which an organism completes its life-cycle is called life span.
4. The bending of stem in the direction of sunlight is called **phototropism**. The response of roots towards gravity is called **geotropism**.
5. Terrestrial plants—rose, apple tree
Aquatic plants—waterlily, lotus.
6. The penguin is adapted to its extremely cold habitat. It has either dense fur or thick fat-filled skin to protect itself from severe cold.

C. Define :

- Ans.** 1. **Amphibians**—The animals which are adapted for surviving both on land and in water are called amphibians.
2. **Respiration**—Production of energy by oxidation of food in living cells is called respiration.
3. **Hydrophytes**—Hydrophytes are plants which grow in watery places or places which remain very wet throughout the year.
4. **Excretion**—Removal of waste products from the body is called excretion.

D. Give three differences between each of the following :

- Ans.** 1. **Hydrophytes** : Hydrophytes are plants which grow in watery places or places which remain very wet throughout the year. They have poorly developed root system. Leaves become broader to do maximum transpiration.
Xerophytes : Xerophytes are the plants which survive in desert habitats or dry places where there is scarcity of water, e.g., cactus, asparagus, euphoria and yucca. They have very well developed root system. Leaves convert into spines to slow down the process of transpiration.
2. **Adaptation** : Most organisms are found in one type of habitat and are

unable to survive in other habitats, e.g., a lotus plant grows in an aquatic habitat and cannot survive in deserts or hot sandy areas. Plants and animals develop some special characteristics which help them to survive in a particular habitat. These characteristics are known as adaptations, e.g., wings of birds are an adaptation which help them to fly.

Hibernation : Hibernation is animal sleep to escape cold weather during winter. During this period animals body temperature drops, heartbeat, breathing and metabolic rate slows down to conserve energy. For example, snake.

3. **Aquatic animals** : Animals living in water are called aquatic animals, e.g., fish, octopus, whale, crabs and lobster. They developed gills to respire in the water.

Xeric animals : Desert animals such as camels, desert foxes, kangaroo rats, etc., have special adaptations to live in extremely hot climate. Many desert animals are nocturnal (active at night) to avoid the heat of day time. They excrete concentrated urine and dry faeces.

4. **Respiration** : Production of energy by oxidation of food in living cells is called respiration. In this process, carbon dioxide is produced. Respiration is of two types (i) are robic (ii) ancerobic respiration.

Breathing : Taking in oxygen from the air and giving out carbon dioxide is called breathing. It take place in aerobic respiration only.

E. Long Answer Type Questions :

Ans. 1. • Living and the Non-living Things

All living and non-livings differ variously from each other because of their different characteristics. Before we take up a comprehensive study of the living organisms, let us first understand how living things are different from non-living things.

Different between the living and non-living things

- Living things grow; non-living things do not grow. A child grows into and adult when cells grow and multiply. This is unlike the increase in the size of a ball made fo clay are lumped together.
 - Living organisms show movement; non-living things do not. Thus, a tiger moves, but a stone does not.
 - Living beings respire; non-living things do not.
 - Living beings eat food and excrete the wastes; non-living things do not.
 - Living beings produce offsprings; non-living things do not.
2. Non-living or abiotic components include a number of factors like sunlight, temperature, water, air and soil. They influence living things in various ways.
- i. Sunlight**— Green plants utilise sunlight to make food by the process of photosynthesis. All animals depend on plants for food, either directly or indirectly.
- ii. Temperature**— The degree of heat or coldness is called temperature.

Temperature is measured by a thermometer. The Sun is the main source of light and heat on the Earth. Different parts of the Earth do not get equal amounts of sunlight and heat. Therefore, the temperature varies from place to place. Temperature affects the varieties of plants and animal life in a particular habitat.

iii. Water— Nearly three-fourths of the Earth's surface is covered with water. Only 3% of this water is fresh water found in rivers, lakes and streams. The remaining 97% water is found in seas and oceans.

iv. Air— We are surrounded by a thick layer of air called the atmosphere. Air is a mixture of several gases like oxygen, carbon dioxide, nitrogen, etc.

v. Soil— Soil forms the uppermost layer of the Earth's crust. Soil is a mixture of the following :

- i. Minerals, stones, gravel, sand, silt, clay.
- ii. Humus (organic matter).
- iii. Water and air.
- iv. Certain organisms like algae, fungi, bacteria and earthworm.

Roots of plants remain fixed in the soil. Plants absorb water and minerals from the soil.

3. The organisms living in water are called aquatic organisms and their habitat is called aquatic habitat or water habitat. It includes oceans, seas, rivers, ponds, lakes, pools, etc.

Seas and oceans with saline (salty) water from the marine habitat. The organisms living there are called marine organisms. Whales, seals, turtles, starfishes, sharks, etc. are marine animals.

Ponds, pools, lakes and rivers form the freshwater habitat.

4. Desert animals such as camels, desert foxes, kangaroo rats, etc., have special adaptations to live in extremely hot climate. Many desert animals are nocturnal (active at night) to avoid the heat of day time. They excrete concentrated urine and dry faeces. When water is not available, camels do not produce urine at all. When it is available, they rehydrate themselves by drinking up to 80 litres of water in 10 minutes.

F. Higher Order Thinking Skills (HOTS) :

- Ans.**
1. Herbivores because green plants are called producers because they do not depend on others for food and are self sufficient. Herbivores totally depend on producers and carnivores directly or indirectly depend on them. So chances of herbivores is likely.
 2. Camels live in deserts. We know there is very less water present in deserts. Camels have adapted for living in the deserts. They can live without consuming a drop of water for a week and drink 46 litres of waters in one session. Camels sweat less and excrete in the form of hard pellets to preserve water and survive in the desert. This way has helped camels to survive in a desert.

10 Measurement and Motion



EXERCISE

Section-I

A. Tick (✓) the correct answer (MCQs) :

- Ans.** 1. a. linear motion 2. a. metre
3. b. curvilinear motion 4. b. A person sitting on a rocking chair.

B. Fill in the blanks :

- Ans.** 1. **Measurement** is the comparison of an unknown quantity with a known fixed quantity.
2. A **Standard Unit** should be commonly used throughout the world.
3. The SI unit used for **length** is metre.
4. There are many kinds of **motion**.
5. A stretched string produces **sound** when it vibrates.

C. Write true or false :

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

D. Classify the following motions into different types of motion :

- Ans.** 1. Motion of the hand of a clock. **Periodic Motion**
2. Motion of a swing. **Oscillatory motion**
3. Motion of a child of a see-saw. **Oscillatory motion**
4. The motion of a falling apple. **Translatory motion**
5. Motion of the spinning wheel. **Rotatory or Circular motion**

E. Encircle the odd-one out. Give reason for your choice :

- Ans.** 1. **handspan** All are proper unit of measurement of length except handspan.
2. **television** All do motion except television.
3. **area** All are physical quantity of measurement except area.
4. **metre** All are personal units of measurement of length except metre.

Section-II

A. Very Short Answer Type Questions :

- Ans.** 1. Handspan is not a proper unit of measurement of length because it is not give exact measurement, since the size of body parts vary from person to person.
2. Linear motion.
3. An object is said to be in motion if its position changes with time with respect to its surroundings.

B. Short Answer Type Questions :

- Ans.** 1. Different body parts used earlier to measure length are fingers, hands, arms and feet.
2. After using hand feet and fingers for measurement of length, must have understood that such kind of measures are not completely dependable.

They do not give exact measurement, since the size of body parts vary from person to person. This difficulty created a need for finding a more appropriate way of measurement because the study of science requires exact measurement of objects. So we need to fix units of measurement.

3. Some commonly used multiples of measurement are Metre, Kilogram, Second, Kelvin etc.
4. We can say that if an object changes its position continuously with respect to the stationary objects around it, it is said to be in motion.
5. This to and fro motion of an object about a mean position along the same path is known as oscillatory motion. A child on a swing, the pendulum of a clock and the needle of a sewing machine exhibit this type of motion.

C. Define the following :

- Ans.**
1. **Vibratory motion**—When you pluck the string of a guitar or sitar, it moves to and fro very fast. Such fast or rapid oscillatory motion is called vibratory motion.
 2. **Motion**—An object is said to be in motion if its position changes with time with respect to its surroundings.
 3. **Periodic motion**—The motion which repeats itself after a fixed interval of time is known as periodic motion.
 4. **Oscillatory motion**—This to and fro motion of an object about a mean position along the same path is known as oscillatory motion.
 5. **Rectilinear motion**—The movement of a body along a straight line is called linear motion. Linear motion is also called rectilinear motion.

D. Distinguish between each of the following :

- Ans.**
1. **Translatory Motion** : The motion in which a body moves as a whole and every point on it moves the same distance is called translatory motion.
Rotary motion : The motion in which a body moves about a fixed axis without changing its position is known as rotatory or circular motion.
 2. **Rectilinear Motion** : The movement of a body along a straight line is called linear motion. Linear motion is also called rectilinear motion.
Curvilinear Motion : When an object moves along a curved line, it is said to be in curvilinear motion.
 3. **Oscillatory Motion** : This to and fro motion of an object about a mean position along the same path is known as oscillatory motion.
Vibratory Motion : When you pluck the string of a guitar or sitar, it moves to and fro very fast. Such fast or rapid oscillatory motion is called vibratory motion.

E. Long Answer Type Questions :

- Ans.**
1. We can not use our body parts as standard unit of length because these it are not given exact measurement, since the size of body parts vary from person to person. This difficulty created a need for finding a more appropriate way of measurement because the study of science requires exact measurement of objects.

2. To measure length of an object accurately, we should follow the following suggestions :

- The scale should be placed along the length to be measured. The scale should be placed very close to the object to be measured.
- Keep our eye in line with the point of measurement. If the eye is not in line with the point of measurement, the measured length will be either shorter or longer than the actual length.
- Do not start measurement from the worn out or damaged end of the scale. If the zero end of the scale is damaged, start measurement from some other mark of the scale. Then the actual length of the object is equal to the difference between the readings at the two points.

3. An object is said to be in motion if its position changes with time with respect to its surroundings.

An object is said to be at rest if its position does not change with time with respect to its surroundings.

Thus, we can say that if an object changes its position continuously with respect to the stationary objects around it, it is said to be in motion.

Conversely, if the object does not change its position with respect to the stationary objects around it or if the moving object stops moving, it is said to be at rest.

4. The different types of motion are :

Translatory Motion— The motion in which a body moves as a whole and every point on it moves the same distance is called translatory motion. The motion of a car or that of a falling apple is called translatory motion.

Rotatory or Circular Motion— The motion in which a body moves about a fixed axis without changing its position is known as rotatory or circular motion, e.g., a moving fan, spinning top, wheel of a sewing machine, a giant wheel, etc.

Oscillatory Motion— When we swing, we move to and fro on the same path, over and over again.

This to and fro motion of an object about a mean position along the same path is known as oscillatory motion. A child on a swing, the pendulum of a clock and the needle of a sewing machine exhibit this type of motion.

Vibratory Motion— When we pluck the string of a guitar or sitar, it moves to and fro very fast. Such fast or rapid oscillatory motion is called vibratory motion.

Periodic Motion— The motion which repeats itself after a fixed interval of time is known as periodic motion. Heartbeat is also a periodic motion.

Uniform and Non-uniform Motion— When an object, like car, covers equal distance in equal intervals of time, then the motion of the object is said to be uniform motion.

On the other hand, if an object, like car, covers unequal distances in equal

as a magnet.

2. When two magnets are brought near each other, like poles repel and opposite poles attract.
3. A powerful magnet can induce magnetism which is retained even after the removal of the magnet. Such a magnet is called a permanent magnet. Artificial magnets made by passing electricity are called electromagnets.
4. Poles of a bar magnet are located at its two ends.
5. If a bar magnet is broken into two pieces, each piece behaves like a whole magnet with its own north and south poles.

C. Define the following :

- Ans.**
1. **Magnetic Induction**—When a magnet is brought close to an unmagnetized piece of iron, the piece of iron becomes a magnet. This is known as magnetic induction.
 2. **Magnetic Equator** : It is an imaginary vertical line which divides the bar magnet into two equal halves. The force of attraction is lowest at the magnetic equator line.
 3. **Electromagnet**—Artificial magnets made by passing electricity are called electromagnets.
 4. **Demagnetisation**—Magnets have a tendency to lose their magnetism. This is called demagnetisation.
 5. **Magnetism**—Magnetism is a physical phenomenon produced by the motion of electric charge, which results in attractive and repulsive forces between objects.

D. Differentiate the following :

- Ans.**
1. **Temporary Magnet** : Magnetism can be induced in non-magnetic materials such as iron bars. However, if the magnet kept near the iron bar is removed, the iron bar loses its magnetism. Such a magnet which loses its magnetism is known as a temporary magnet.
Permanent Magnet : A powerful magnet can induce magnetism which is retained even after the removal of the magnet. Such a magnet is called a permanent magnet. Most of the permanent magnets are made of steel. Steel is an alloy of iron and a little carbon.
 2. **Natural Magnet** : A naturally occurring magnet and is not made by any artificial means is called a natural magnet. Magnetite is the only ore of iron which is natural magnet.
Artificial Magnet : A substance to which properties of the natural magnet are imparted by artificial means is called artificial magnet. The examples are iron, steel, cobalt or nickel.

E. Long Answer Type Questions :

- Ans.**
1. Materials which get attracted towards magnets are called magnetic materials, for example, copper, iron.
Non-magnetic materials, are those materials such as wood, paper, plastic and most metals, that do not get attracted towards magnets.

2. Properties of a Magnet

William Gilbert of England studied and recorded the properties of a magnet in his book 'The Magnet'. Important properties of magnets are as follows :

- **Poles of a Magnet**— The two ends of a magnet where the magnetic force is the greatest are known as the poles of a magnet.
 - **Directional Property**— A freely suspended magnet always aligns itself in the north-south direction. One end of the freely suspended magnet always points towards the geographic north. It is called the north pole of the magnet. The other end which always points towards the geographic south is called the south pole of the magnet.
 - **Attraction and Repulsion between Two Magnets**— Like poles of any two magnets repel each other, while unlike poles attract each other.
 - **Magnetic poles cannot be isolated**— If a bar magnet is broken into two pieces, each piece behaves like a whole magnet with its own north and south poles. If these pieces are broken again, each broken piece would be a whole magnet. We, therefore, conclude that :
 - Poles always exist in pairs.
 - We can never have an isolated north or south pole.
3. Magnets have a tendency to lose their magnetism. This is called demagnetisation. A magnet can lose its magnetism by the following activities :
- heated,
 - hammered, or
 - falls from a height.
4. Take a flat circular aluminium box at the base of which are marked directions like north, south, east, west, north-east, north-west, etc. From its centre, rises a sharp needle, over which is placed a magnetic needle. 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. Now our magnetic compass is ready to work.

F. Higher Order Thinking Skills (HOTS)

- Ans.**
1. No, because same poles of magnets repel each other.
 2. Suppose A and B are the poles of the horseshoe magnet. Take a bar magnet and bring its N pole near one pole of the horse shoe magnet. If there is a repulsion between A and N then. A is North pole and B is south pole of the horseshoe magnet. If B and N repel each other the B is north and A is south of the horseshoe magnet.

3. Position of two magnets	Behaviour of magnet observed
S-S	Repulsion
N-S	Attraction
N-N	Repulsion

produce the light on its own.

3. The area of darkness behind the opaque object is called the shadow of the object.
4. There are two types of eclipses-solar eclipse and lunar eclipse.

B. Short answer Type Questions :

- Ans.**
1. "Light is a form of invisible energy which gives us the sensation of sight."
 2. A source of light is an object which gives the light.
 3. Light also travels in a straight line. This property of light is called the rectilinear propagation of light.
 4. When an opaque object is kept in the path of a light, the shadow of object is formed.
 5. It depends upon shape of the object—It increases or decreases in the same ratio of shape of object.
Source of light—The source of light is spherical or plane parallel rays.
Position of object—The formation of shadow also depends upon position of object means it as at finite or infinite distance.
 6. When a ray of light bounces back from a surface it is called reflection of light.

C. Define the following :

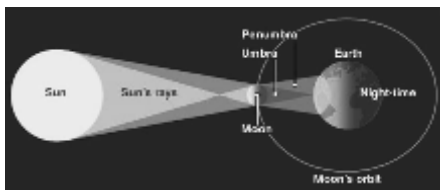
- Ans.**
1. Reflection of light. The bouncing back of light from a surface.
 2. **Umbra:** Umbra is the dark inner region of a shadow.
 3. **Luminous Object :** Such objects which emit light of their own are called luminous objects. Sun and bulb are luminous objects.
 4. **Light:** "Light is a form of invisible energy which gives us the sensation of sight."
 5. **Eclipse:** During the revolutions of the Earth and Moon, it so happens sometimes that the Sun, the Earth and the Moon come in a straight line. In this case light from the Sun is obstructed by the Earth or the Moon. As a result, a shadow is formed. This phenomenon is called an eclipse.
 6. **Image :** An image is formed when light is reflected by a mirror.

D. Distinguish between each of the following :

- Ans.**
1. **Umbra :** The dark inner region of a shadow.
Penumbra : The pale border of a shadow.
 2. **Luminous body :** Such objects which emit light of their own are called luminous objects.
Non-luminous body : Bodies which do not have and do not emit light of their own. Such bodies are called non-luminous bodies.
 3. **Reflection of light :** When the ray falling on the second optical medium at an angle, may be bounced back by the second medium at a different angle. This phenomenon is called reflection of light.
Refraction of light : The ray may pass through the second optical medium, with a change in the angle. This phenomenon is called refraction of light.

E. Long Answer type questions :

- Ans.**
- Those objects which emit light of their own are called luminous objects. Sun and bulb are luminous objects. Sun and bulb are luminous objects. Bodies like a stone, a building, a tree or a chair, which do not have and do not emit light of their own. Such bodies are called non-luminous bodies.
 - A pinhole camera consists of a rectangular cardboard box such that its one side is made of ground glass 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.
 - There may be two situations when the Sun, the Moon and the Earth fall in a straight line.

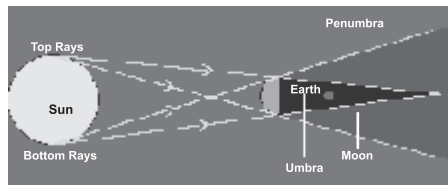


Solar Eclipse

The Moon comes in between the Sun and the Earth. The Sun behaves as a source of light, the Moon as an opaque object and the Earth as a screen, so that the shadow of the Moon falls on the shadowed part of the Earth try to see the Sun,

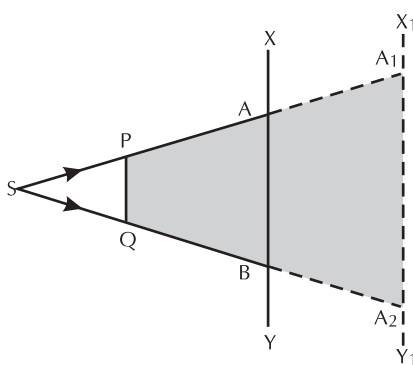
the view of the Sun is eclipsed, i.e., partially or completely blocked for some time. This situation is known as solar eclipse.

The Earth comes in between the Sun and the Moon. In this case, the Sun behaves as a source of light, the Earth as an opaque object and the Moon as a screen. The shadow of the Earth falls on the Moon and the view of the Moon gets partially or completely blocked for some time. This situation is known as lunar eclipse.



Lunar Eclipse

4.



Let S be the point source of light. PQ is an opaque body and XY is the screen placed in a dark room. Rays SP and SQ fall on the screen XY at points A and B, respectively. The points between A and B do not receive any rays of light and hence AB is the umbra region. If the screen XY is moved to position X_1Y_1 , the shadow becomes bigger. If the distance between the screen and the opaque body is decreased, the shadow

becomes smaller.

- When an image is formed in the plane mirror, the left hand side of the object appears as the right hand side and vice versa. This phenomenon is known as *lateral inversion*.
- Aim :** To prove that light travels in a straight line
Fix a lighted candle on a table. Take a rubber



pipe. Bend the pipe and try to look at the candle flame through it. Can you see the flame? Now straighten the pipe and try again. Can you see the flame of the candle?

This activity proves that light travels in a straight line.

F. Higher Order Thinking Skills (HOTS) :

- Ans.**
- No, In a completely dark room no image will be formed, because image by a mirror is formed due to reflection of light from the object and since there will be no light in a completely dark room, no image will be formed.
 - In a day and night match, players have many shadows because there are lights all around the ground shining on them from different angles.

13 Flow of Electric Current



EXERCISE

A. Tick (✓) the correct answer (MCQs) :

- Ans.**
- b. electric
 - c. series combination
 - d. any insulator
 - b. switch is in 'on' position
 - a. source of electric current, a conducting wire forming unbroken closed loop with source
 - d. to protect from electricity so you should not get shock

B. Fill in the blanks :

- Ans.**
- The combination of two or more cells is called a **battery**.
 - An electric bulb has **two** terminals.
 - Electricity** is one of the most important and useful forms of energy.
 - Solar cells are used in **wrist watches** and **calculations**.
 - Solar cell** is a non-conventional source of electricity.

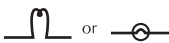




C. Write true or false :

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

D. Write answer in a word :

- The materials through which electric current cannot flow. **Insulators**
- A path through which electric current flows. **Circuit**
- A device which makes or breaks an electric circuit. **Switch**
- A type of cell used in satellites. **Solar cell panels**

E. Draw the symbols of the following :

- Ans.** 1. Bulb  or 
2. Battery 
3. A switch (open) 
4. An electric cell 

F. Encircle the odd-one out. Give reason for your choice :

- Ans.** 1. **Rubber** Silver and copper are the conductor but rubber is the insulator.
2. **Insulator** Bulb and filament produce light whereas insulator stop the current flow.
3. **hydro power plant** In it electricity is produced by water. In rest it is produced by cheaucals

Section-II

A. Very Short Answer Type Questions :

- Ans.** 1. The direction of flow of current in a dry cell is positive terminal to negative terminal.
2. By series combination of a dry cell we mean the arrangement of two or more cells in a way that the negative terminal of a cell is in touch with the positive terminal of another cell.
3. Electricity cannot flow in an open circuit because the path is not a complete circuit.
4. Solar cells are used in wrist watches, cameras etc.
5. Solar cell panels are used for producing electricity for use in space stations and artificial satellites.

B. Short Answer Type Questions :

- Ans.** 1. The electric circuit is a path which elections from a current source flow.
2. **Button Cell :** These are very compact and light weight cells. These are used in hearing aids, cameras, wristwatches and highly sophisticated portable electronic equipments.
3. Electricity can not flow in an open circuit because the path is not a complete circuit.
4. A switch is an important part of a circuit as it completes or breaks a circuit. When a switch is turned on, the gap in the circuit is bridged by a conducting material through which the current flows. When the switch is turned off, the circuit becomes incomplete (open) since a gap is formed in it, and hence, current does not flow.
5. Some differences between open and closed circuit are :
- Current cannot flow in an open circuit. Whereas, current can flow in closed circuit.

- In an open circuit the key is an OFF mode. In a closed circuit the key is in ON mode.
 - The circuit doesn't work when it is open. The circuit works when it is closed.
6. No, bulb will not glow in the circuit given below. The handle of screw driver is made up of plastic, which is an insulator. Current do not flow through the insulator so bulb circuit is not completed.

C. Define each of the following :

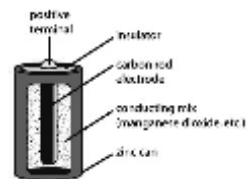
- Ans.**
1. **Electric Switch :** A switch is an important part of a circuit as it completes or breaks a circuit.
 2. **Terminals :** A dry cell has two terminals. Its flat end is the negative terminal (-) and the end which has a small, circular metal cap is the positive terminal (+).
 3. **Electric cell :** The electric cell is a device which uses chemical energy (the energy of molecules of chemicals) to produce electricity.
 4. **Current :** Electric current is the flow of electricity in a conductor.
 5. **Battery :** The combination of two or more cells is called a battery.
 6. **Battery :** The materials which do not allow electric current to pass through them are called insulators.

D. Distinguish between each of the following :

- Ans.**
1. **Open Circuit :** The complete path is sometimes called complete electric circuit or closed electric circuit.
Closed Circuit : An electric circuit in which the path of electricity is broken at some point is called incomplete electric circuit or open electric circuit.
 2. **Cell :** The electric cell is a device which uses chemical energy (the energy of molecules of chemicals) to produce electricity.
Battery : The combination of two or more cells is called a battery.
 3. **Conductors :** The materials which allow electric current to pass through them are called conductors.
Insulators : The material which do not allow electric current to pass through them are called insulators.
 4. **Cell :** The electric cell is a device which uses chemical energy (the energy of molecules of chemicals) to produce electricity. The electric cell which is normally used in torches is a dry cell.
Electric Circuit : The complete path from one terminal of an electric cell through the bulb and back to the other terminal of the electric cell is called electric circuit.

E. Long Answer Type Questions :

- Ans.**
1. A dry cell has two terminals. Its flat end is the negative terminal (-) and the end which has a small, circular metal cap is the positive terminal (+). The outer cover of a dry cell is made of zinc, which also serves as a negative terminal. There is a rod of carbon

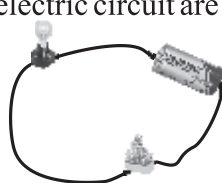


Internal structure of a dry cell

in the centre with a metal cap. It is the positive terminal of the cell. The carbon rod is surrounded by a mixture of carbon and manganese dioxide. This mixture is surrounded by a paste of ammonium chloride. The dry cell consumes the chemicals stored in it to produce electricity. After some time, when its chemicals get exhausted, it stops working.

2. The components of an electric circuit are :

Cell
Battery
Bulb
Switch (open)
Switch (closed)
Diagram



Closed electric circuit



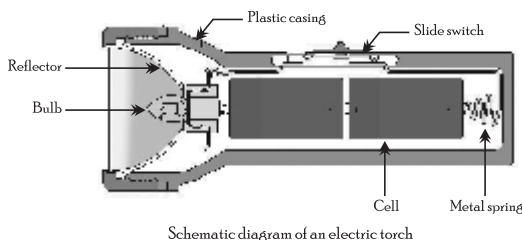
Open electric circuit

3. **Conductors** : The materials which allow electric current to pass through them are called conductors, e.g., metals, graphite, carbon, acid solutions in water and salt solution in water.

Insulators : The materials which do not allow electric current to pass through them are called insulators, e.g., rubber, plastic, wood, paper, mica, asbestos, petrol, kerosene, wax, alcohol and benzene.

The conductors are used to make various parts of electrical devices. Insulators are used to cover the conductors to avoid electric shock while handling electrical appliances.

- 4.



Schematic diagram of an electric torch

The working of a torch can also be shown by using a circuit diagram in which parts of a torch are represented by symbols. There are two cells connected to form a battery (positive terminal of second cell should

be in contact with negative terminal of first), a switch and a lamp. The lines in the diagram show the metal conductors which connect the system together. All the parts are kept in a plastic casing which can be unscrewed from both sides. There is a silver coloured reflector along with the bulb which increases the light of torch and points it in one direction.

In the torch, closing the switch completes the circuit and allows the current to flow.

Sometimes the metal parts of the torch do not make proper contact and the torch does not work. This is because the circuit is not complete.

F. Higher Order Thinking Skills (HOTS)

- Ans. 1. The use of electric circuit switch is to join or break a circuit. If we did not have an electric switch in a circuit we are not able to switch on or off the circuit.
2. We can turn this property to our advantage by using them as insulators so as to prevent the possibility of electric shock.

3. Drought is a condition of abnormally dry weather within a geographic region where some rain might usually be expected. The term drought is applied to a period in which an unusual scarcity of rain causes a serious hydrological imbalance water supply reservoirs get empty, wells dry up and crops get damaged. We can control drought by harvesting of water. We should not waste water.
4. Floods occur when soil and vegetation cannot absorb all the water. Water then runs off the land in quantities that cannot be carried in river channels or retained in natural ponds and constructed reservoirs held behind by dams
5. Following are the effects of drought.
 - Acute water crisis.
 - Crop failure.
 - Fall in production, especially in dairy, timber and fishery.
 - Spread of diseases, and in worst cases, epidemics take a toll on millions.
 - Widespread unemployment.
6. Due to over-usage of ground-water, the water-level is receding. To recharge the underground reservoirs of water, we must not allow the rain-water to flow down to oceans. This can be achieved by using the technique of rain-water harvesting.

C. Define each of the following :

- Ans.**
1. **Water table :** The level of ground-water is called the water-table.
 2. **Water conservation :** It is important to save water in every possible way. This is called conservation of water.
 3. **Rainwater harvesting :** A technique of storing rainwater so that it can be used in day to day life and also recharge groundwater.
 4. **Natural resources :** The resources which we get from nature is called natural resources. Such as water and minerals.
 5. **Global warming :** The rising of temperatures due to the greenhouse effect. It results in the melting down of polar ice caps.

D. Distinguish between the following :

- Ans.**
1. **Ground-water :** When rain falls, some of it immediately evaporates back into the atmosphere. Some runs off along the surface forming streams and rivers, and some passes through the soil into the non-porous rocks beneath. This is called underground-water or ground-water.
Surface water : Surface water consists of water present in :
 i. oceans and seas; and ii. rivers, lakes, streams and ponds.
 2. **Drought :** Drought is a condition of abnormally dry weather within a geographic region where some rain might usually be expected.
Floods : Floods occur when soil and vegetation cannot absorb all the water. Water then runs off the land in quantities that cannot be carried in river channels or retained in natural ponds and constructed reservoirs held

behind by dams.

E. Long Answer Type Questions :

Ans. 1. Water is important for the following reasons :

- a. Water is used for drinking, bathing and washing our clothes.
- b. Water is also used for cooking, cleaning of utensils and for other activities.
- c. Water is also needed for the germination of seeds and watering of plants.
- d. It is required by green plants for photosynthesis, i.e., making food.
- e. Water is required for irrigation of crops, which results in the growth of crop plants and production of food grains.

2. Effects of Floods

- a. Floods not only damage property and endanger the lives of humans and animals but have other effects as well.
 - b. Rapid run-off causes soil erosion as well as sediment deposition problems downstream. Spawning grounds for fish and other wildlife habitats are often destroyed.
 - c. High-velocity currents increase flood damage; prolonged high floods delay traffic and interfere with drainage and economic use of lands.
 - d. Bridge abutments, bank lines and other structures are damaged, and navigation and hydroelectric power are often impaired.
 - e. Financial losses due to floods commonly amount to crores of rupees each year.
3. Maintain three small plants in three different pots at your home. Keep them in a place containing open air and sunlight. Water one pot everyday with sufficient water but not the second one. Put excess water in the third pot. You will observe that in a few days, the watered plant will show growth, whereas the second and third pots plants will shrivel up. This shows that water is essential for growth of plants, but excess water fills up the pores of soil, making, the plant shrivel up.
4. Common techniques of rain-water harvesting are :

Roof-top Rain-water Harvesting— In this method, the rain-water from the roof-top is collected in a storage tank with the help of pipes. Here it is filtered and then sent into a pit. The water in the pit seeps (or percolates) slowly into the ground to recharge the ground-water.

Open Drain/Tank Water Harvesting— In this method, the water flowing on the roads, ground or lawns, etc, is collected in ponds, *kuchcha* drains and storage tanks. This water is allowed to penetrate (percolate) into the ground to recharge the ground-water.

F. Higher Order Thinking Skills (HOTS) :

Ans. 1. If water was not recycled by nature through water cycle, there would have been no climate change, all the water resources on earth would have been deplete.

Section-II

A. Very Short Answer Type Questions :

- Ans.** 1. **Breathing** : The relative proportion of oxygen and is about 21% and carbon dioxide is 0.03% in the air.
2. **Respiration** : Oxygen in the atmosphere is essential for respiration.
3. **Photosynthesis** : Oxygen.

B. Short Answer Type Questions :

- Ans.** 1. Air in motion is called wind.
2. The process by which food is oxidised in the presence of oxygen to produce water vapour, carbon dioxide and heat energy, is known as respiration.
3. Air containing oxygen and carbon dioxide enters through the stomata and gets used up in the process of photosynthesis and respiration.
4. Air is a mixture of gases, mainly containing nitrogen (about 78%) and oxygen (about 21%). It also contains about 0.9% of a gas called argon, 0.03% carbon dioxide, and small amounts of other gases.
5.
 - Air helps to separate husk from grains by the method of winnowing.
 - Air also helps aeroplanes, helicopters, gliders and yachts to move. Moving air blows on the sails of yachts to travel through the water.
 - Air helps birds to fly.
 - You pump air into your bicycle tyre. This helps in the movement of your bicycle.
 - Air helps in the dispersal of seeds and pollen grains of many flowers.

C. Define each of the following :

- Ans.** 1. The process by which living things inhale and exhale air is known as breathing.
2. The process by which food is oxidised in the presence of oxygen to produce water vapour, carbon dioxide and heat energy, is known as respiration.
3. Photosynthesis is the process in which green plants prepare their own food with the help of sunlight.

D. Long Answer Type Questions :

- Ans.** 1. Air is a mixture of gases, mainly containing nitrogen (about 78%) and oxygen (about 21%). It also contains about 0.9% of a gas called argon, 0.03% carbon dioxide, and small amounts of other gases. Varying quantities of dust and water vapour are also present in it. The amount of these components in the air, varies from place to place and from time to time.
2. Air has many uses. Some of them are discussed below :
- Air helps to separate husk from grains by the method of winnowing.
 - Air also helps aeroplanes, helicopters, gliders and yachts to move. Moving air blows on the sails of yachts to travel through the water.

E. Correct the following lists of wastes :

- Ans.** 1. Biodegradable wastes—banana peel, husk, glass, plastic, dried flowers, paper, flower pot, wax.
2. Non-biodegradable wastes—soap, sawdust, medicines, metals, fruit peels, plastic flowers, seeds, aluminium foil.

F. Unscramble the words to make meaningful words with the help of the clues given in brackets. Write a sentence on each of the following :

- Ans.** 1. GARBAGE 2. COMPOSTING 3. LANDFILL
4. OPEN DUMPING 5. NONTOXIC

Section-II

A. Very short Answer Type Questions :

- Ans.** 1. Fruits and vegetable peels, and paper.
2. Plastic cans and newspaper.
3. Biodegradable wastes.

B. Short Answer Type Questions :

- Ans.** 1. Waste is a material that has no longer any value to the person who is responsible for it.
2. Recycling of wastes is essential because it helps us to generate less waste.
3. We can help in the disposal of waste by throwing all our waste in dustbins meant for them.
4. We can recycle paper by giving our waste paper to junk dealer.

C. Define the following :

- Ans.** 1. **Biodegradable wastes :** Biodegradable waste is waste that will decay and mix with the soil.
2. **Commercial wastes :** The waste products from shops, malls, restaurants, hotels, hospitals, clinics, etc, are called commercial wastes.
3. **Recycling :** Recycling is the best way of managing waste. It is the process of converting waste into reusable material.
4. **Biogas :** Animal excreta (i.e., cowdung) is decomposed in biogas plants to produce cooking gas. The waste produced in these plants is used as fertiliser in agricultural fields. This is called biogas :
5. **Waste water :** Waste water is any water that has been adversely affected in quality by anthropogenic influence. It can originate from a combination of domestic, industrial, commercial or agricultural activities, surface run off or storm water, and from sewer inflow or infiltration.

D. Differentiate the following :

- Ans.** 1. **Biodegradable wastes :** Biodegradable waste is waste that will decay and mix with the soil. All waste derived from living matter is biodegradable. This includes food waste such as fruit and vegetable peels, meat and bones, leaves, flowers, paper and pencil shavings.
Nonbiodegradable : waste is waste that will not decay and mix with the soil. This includes plastics (e.g. bags and packaging material), metal (e.g. containers, cold drink cans) and glass (e.g. old bottles, broken glass

- pieces, bulbs).
- Recyclable wastes** : are the wastes which can be conserve into new reusable materials.
Non-Recyclable waste are the wastes which cannot be convert into new reusable material.
 - Recycling of Biodegradable Wastes** : Bio-degradable waste can be recycled by the method of composting. This is one of the oldest forms of disposal. It is a natural process that recycles the nutrients in the waste to yield manure or compost.
Recycling of Non-Biodegradable Wastes : Recycling of non-biodegradable waste involves the collection of used and discarded materials, and processing them to make new products. We ourselves can use a number of these items such as cans and bottles to store items at home. We can use plastic carry bags for keeping things we buy, instead of taking new bags from the shopkeeper.

E. Long Answer Type Questions :

- Ans.** 1. Wastes are generally harmful and even poisonous. We must find least harmful ways of disposing them.
Disposal of waste has become a great problem for humanity. The local governments are finding it difficult to keep the environment clean and hygienic. We, being responsible citizens, should co-operate with the government for managing waste effectively. To decrease the severity of the problem, we must adapt the 3R's, namely reduce, reuse and recycle.
- Advantages of Recycling**
 - It lessens the burden on natural resources.
 - It makes the natural surroundings clean and better.
 - It produces useful and reusable materials.
 - It provides an employment and a source of livelihood.
 - Segregation of waste before disposal is important as it makes. The recycling easy. Because we know that each type of waste have different mechanism to recycle. Waste segregation involves separating waste in Biodegradable and Non-biodegradable. Biodegradable waste includes organic waste includes waste e.g., kitchen waste, vegetables, fruits, flowers, leaves from the garden and paper. Non-biodegradable waste includes some recycable and no-recycable waste. Recyclable waste are—plastics, paper, glass, metal, etc. which are non-biodegradble and they follow various mechanism for recycling. So the segregation is important.

F. Higher Order Thinking Skills (HOTS) :

- Ans.** 1. I would prefer compost pits for small amount of wastes. This is so because it would recycle the wastes in a short period of time and would allow us to recycle more wastes in a specific time period.
- This is so because paper are made from trees. The more paper we waste, the more trees are to cut. Thus, to save paper it is recycled.