# SCIENCE-6 (ANSWERS)

## CHAPTER-1 : SOURCES OF FOOD

**A. Answer the following questions :**

1. We need food to stay alive. It provides us energy and helps us to grow.
2. Plants and animals are main sources of our food. Food obtained from plants are cereals, pulses, vegetables, fruits, oils, spices and beverages. Food items that we get from animals are milk, meat, fish, eggs and honey.
3. Some plants provide us various kinds of food grains, which are known as cereals. Wheat, maize, rice, barley, etc. are some cereals.
   Wheat is used for making chapattis, bread, cakes, etc.
   Rice is used to make idlis, pulao, etc.
   Barley is used for preparing chapattis.
4. Food obtained from plants can be divided into the following categories :
   Cereals, pulses, vegetable, fruits, edible oils, spices and beverages.
5. Indian cuisine is as diverse as its culture, geography and climate. People of different states have different food habits. Food habits are affected by food production and supply. Farmers of different states grow different kinds of crops. So, people in a particular state eat what they get easily and at cheaper rate. For example, people living in northen states eat mostly chapattis, vegetables, etc., because in there states wheat is grown on a large scale. Some of the popular food items in different Indian states are given below :

   *Andhra Pradesh :* Hot and spicy biryani, arhar dal, upma, dosa, rasam.

   *Tamil Nadu :* Sambhar, rice, idli, dosa, banana chips.

   *Punjab :* Sarson ka saag, makki ki roti, chole, gajar ka halwa.

   *Gujarat :* Chapatti, rice, dal, thepla, dhokla, khandri.

   Thus it is clear from the above discussion that the food habits of people differ in different Indian states with culture, geography and climates.
6. Milk, eggs, meat, honey, fish, are some examples of food obtained from animals.
7. Human-beings are omnivores because they eat both plant products animals. Bears and crows are omnivores.
8. Carnivores are animals that eat the flesh of other animals. Lion, tiger, wolf, snake, eagle, etc. are carnivores.

**B. Define the following terms :**

1. *Dinner :*The food that we eat at night is known as dinner.
2. *Spices :* We add some plant products to our food to give flavour. These are called spices. They have no food value.
3. *Beverages :* Drinks other than water are called beverages.
4. *Milch animals :* Animals that give us milk are called milch animals.

5. *Herbivores :* Animals that eat only plants are called herbivores.
6. *Carnivores :* Animals that eat the flesh of other animals are called carnivores.
7. *Ruminants :* The animals that first eat the food and later bring the swallowed food back into mouth and chew it completely are known as ruminants.
8. *Omnivores :* Animals that eat both plants and animals are called omnivores.
9. *Scavengers :* Animals that live on dead and decaying food are called scavengers.

**C.**

| S. NO. | Food Product | Source |
|---|---|---|
| 1. | Milk | Cow, buffalo, goat |
| 2. | Honey | Honeybees |
| 3. | Meat | Sheep, goat, pig, etc. |
| 4. | Egg | Hen, duck |
| 5. | Cereals | Wheat, maize, barley, and rice plants. |
| 6. | Spices | Pepper, cardamom, ginger, cloves, turmeric, fenugreek plants. |
| 7. | Oils | Seeds of cotton, groundnut, mustard, coconut, soyabean and sunflowers etc. |

**D. Fill in the blanks :**

1. Food 2. Wheat 3. Pulses 4. Plants 5. Sheep, Goat, Pig 6. Chew, Digest 7. ruminant.

**E. Classify the following fruits and vegetables under suitable heads :**

Fruits : Berry, apple, grapes, litchi, cucumber, lemon muskmelon, drumsticks, banana.

Leaves : Spinach

Roots : Carrot, turnip, sweet potatoes.

Stems : Potato, onion

Flowers : Cauliflower, Broccoli

**F. Write 'T' for true and 'F' for false**

1. F 2. T 3. F 4. T 5. F 6. F 7. F

## CHAPTER 2 : COMPONENTS OF FOOD

**A. Answer the following questions :**

1. Our food has some important components or substances that provide nourishment to our body. They are called nutrients.
2. Foods that are rich in carbohydrates are wheat, rice, potato and honey.
3. Simple carbohydrates are soluble in water while complex carbohydrates are insoluble in water.

   Examples of simple carbohydrates are glucose, lactose and sucrose.

   Starch and cellulose are examples of complex carbohydrates.

4. **To test for the presence of starch in food**

   Take a sample of given food item. Place it on the table. Now, put a drop of iodine solution on it. If the portion of the food sample where iodine solution is put, turns into blue-black in colour, it indicates the presence of starch in the given food item.

5. **To test for the presence of fats in food.**

   Rub the sample of the given food item on a piece of white paper. Let the paper dry. Hold it in front of a source of light. If the paper seems smooth, oily and partial transparent, it shows presence of fats in the given food item.

6. Protein-rich foods are essential for our body because they help in the growth of the body. They help in the formation of new cells and the repair of body cells and tissues. They also help the body to fight against infections and regulate the body functions. Milk and eggs are protein rich food items.

7. (a) Apricots, raisins, figs and bananas (b) Meat, fish and eggs
   (c) Eggs, meat, green vegetables specially spinach and apples
   (d) Milk and milk products and eggs.

8. Vitamins and minerals are neither body-building nor energy-giving foods, but are very important for the proper functioning of our bodies. Both vitamins and minerals are required by the body in very small quantities.

9. **Importance of water for human body**

   Water is very important for human body. About 70% of human body weight is that of water. Water is the medium for a number of reactions that take place in the human body. It helps in transporting various substances from one part of the body to the other. It helps in the removal of waste from the body. Besides, it helps in maintaining constant body temperature.

10. The deficiency of proteins along with the carbohydrates in the food leads to malnutrition in the body which is called Protein Energy Malnutrition (PEM).

**B. Define the following terms :**

1. **Nutrients** : Our food has some important components or substances that provide nourishment to our body which are called nutrients.
2. **Balanced Diet** : A balanced diet is the one which contains all the nutrients our body require and that too in adequate quantities.
3. **PEM** : The deficiency of proteins along with the carbohydrates in the food leads to malnutrition in the body which is called Protein Energy Malnutrition (PEM).
4. **Obesity** : Overnutrition results in overweight called obesity.
5. **Marasmus** : It is disease that occurs due to prolonged deficiency of both proteins and carbohydrates simultaneously in the diet.

6. **Minerals** : Minerals are elements that are needed in very small quantities for the proper functioning of our bodies.

**C. Fill in the blanks :**

| | | |
|---|---|---|
| 1. Carbon dioxide, energy | 2. humps | 3. body-building |
| 4. elements, complex | 5. Roughage | 6. age, health, occupation |
| 7. Obesity | 8. Proteins | |

**D. Tick (✓) the correct option :**

1. b 2. c 3. b 4. d

**E.** 1. **Name of the disease** : Goitre

**Symptoms of Goitre** : Swelling up of thyroid gland, abnormal metabolism.

**Cause of Goitre** : Deficiency of iodine in diet.

**Cure / prevention of Goitre** : Tacking iodine-rich food items like common salt and sea food.

2. **Name of the disease** : Kwashiorkor

**Symptoms of Kwashiorkor** : Stunted growth, swelling of face and limbs, discolorations of hair, protruding belly, dark and scaly skin, thinning of legs, mental retardation and loss of appetite.

**Cause of kwashiorkor** : Deficiency of protein in diet

**Cure / prevention of kwashiorkor** : Eating protein-rich food items like eggs, milk, fish, meat, cheese, etc.

3. **Name of the disease** : Rickets

**Symptoms of Rickets** : Bones get softened and deformed.

**Cause of Rickets** : Deficiency of vitamin D, phosphorus and calcium in diet.

**Cure / Prevention of Rickets** : Eating food rich in vitamin D and minerals phosphorus and calcium like milk, green vegetables, cod liver oil, meat, fish, etc.

**F. Write 'T' for true and 'F' for false :**

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

## CHAPTER 3 : CLEANING FOOD

**A. Answer the following questions :**

1. **Separation** means removing one thing from the other or separating one substance from the other.

   Separation is needed to remove undesirable substance from the desirable one.

2. **Threshing** is a process of separating grain from chaff. It is done by following methods :

   (a) **By using wooden sticks** : Women hold wooden sticks about 0.5m in length and beat the harvested crop to separate the grain from the earheads. This is usually performed on an earthen floor.

   (b) **By spreading the earheads on roads** : The earheads are spread on the road where machines run over them and the grains are separated.

(c) **By using bullock carts and rollers** : In this method, the harvested crops are spread out in a threshing yard. Bullocks pulling a stone roller are allowed to trample the harvested produce. The grains get separated as the stone roller runs over the earheads.

3. **Winnowing** is a method used by farmers to separate husk from grain.

   Winnowing is used to separate heavier and lighter components of a mixture by wind or by blowing air. The mixture of wheat and husk is allowed to fall from the height. When it falls, the husk (being lighter) blows away and grain (being heavier) form a heap on the ground from where it is collected.

4. **Sieves** are wooden of metallic frames having a wire meshed bottom.

   Sieves are used to remove dust, immature seeds, stones, etc. from the threshed grain.

5. When we want to separate one substance from the other then we use the filtration method.

   For example, when we prepare tea, we separate the tea leaves from the water by using a filter such as a wire mesh strainer.

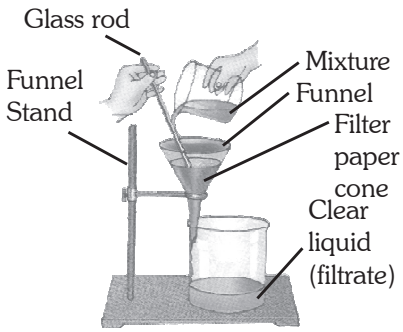
6. The process of transferring the upper liquid without disturbing the settled solid particles is known as *decantation*.

   We will separate a mixture of sand and water by sedimentation and decantation.

   Sand and water are immiscible substances i.e., they do not dissolve in each other and hence can be separated. After the sand settles at the base of the container, we can gently pour water into another container, so that sand is separated from water. Thus, sedimentation and decantation are methods of separating the sand from water.

7. (i) **Filtration** is method of separating substances from one another by passing them through a filter is called filtration. The insoluble solid left on the filter is called the residue and the clear liquid which is collected below is called the filtrate.

   When we prepare tea, we separate the tea leaves from the water by using a fiber such as a wire-mesh strainer.

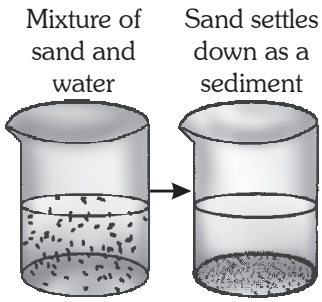


Folding of filter paper to make a cone

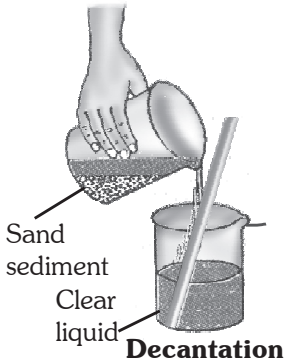
   (ii) **Sedimentation and decantation**

   **Sedimentation** is a process in which heavier matter (mixed with some liquid) is allowed to settle down.

   The process of transferring the upper liquid layer without disturbing the settled solid particles is known as *decantation*.



Sedimentation



Decantation

8. Pure salt is obtained from mixture of sand and salt by combining different methods of separation. It is purified by first crushing it, then dessolving it in water, then filtering the mixture so that sand is separte out. Evaporate the filtrate and finally crystallise it.
9. Water filters are used to remove undesirable materials or impurities from water. Water filters clean the water and make it safe for drinking. The undesirable and harmful substances do not pass through the filters and only clean water gets separated as filtrate.

   These special types of filters also have some materials like resins that remove solid particles from the water. This water is then passed through another filter in which UV rays act upon harmful microbes present in the water and kill them.

   The water thus obtained is pure and safe for drinking.

**B. Write the method you would use to separate the following :**

1. Winnowing, filteration and evaporation.
2. Sedimentation and decantation.
3. Seiving, Winnowing.
4. Sedimentation, decantation and evaporation.
5. Filtration

**C. Match the following :**

1. c  2. a  3. d  4. b

**D. Fill in the blanks :**

1. undesirable, desiroble
2. threshing
3. sedimentation and decantation
4. evaporation
5. Water filters
6. Common salt

**E. Write 'True' or 'False' :**

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

**F. Complete the crossword :**

1. Sieve  2. Threshing  3. Sedimentation  4. Winnowing
5. Filtrate  6. Residue  7. Evaporation

## CHAPTER 4 : MATERIALS OF DAILY USE

**A. Answer the following questions :**

1. Fibre is the raw material that is long, strong and pliable enough to be spun into yarns and woven into fabrics.
2. Fibres obtained from plants or animals are called *natural fibres*.
3. Fibres made by human beings are called *synthetic fibres*.
4. Cotton grows best where warm and sunny weather stays for at least half of the year. Cotton is grown in abundance in China, Southern United States and in India.

   Cotton plant requires warm temperature ranging between 21°C to 27°C with sunny and dry weather at the time of harvesting. Rainfall between 50cm to 80cm is another conducive condition for its growth.

   Black soil which has the ability to retain moisture is best suited for cotton cultivation.
5. The main sources of wool are sheep, goats and camels. The main sources of silk are silkworms.
6. The matured cotton bolls are hand-picked from the plants. After harvesting the cotton is deseeded. Then ginning is done by passing the harvesting cotton through roller gins. The Cotton seeds separate out. The fibrous material, called lint, in then tied and pressed in the from of bales which are easier to transport to the cotton processing mills. In the industries fibres are twisted to form a yarn. This yarn is then turned into cloth.
7. **Uses of Cotton** :

   (a) Most of the cotton is used in the manufacture of cotton textiles and undergarments. These days the cotton yarn is blended with polyester to form fine fabrics which are crease resistant.

   (b) Carded raw cotton is sterilised and then used as adsorbent in hospitals.

   (c) Cleaned and carded cotton is used as fillers in pillows, quilts and mattresses.

   (d) Superior grade cotton is used in the manufacture of rayon and superior paper use for printing currency notes and Government stamp papers.

   (e) As cotton can absorb a large amount of water, inferior grade cotton fabrics are used as “mops” in the household cleaning.

   **Uses of Jute** :

   (a) Jute is used chiefly to make cloth for wrapping pales of raw cotton.

   (b) It is used to make sacks and coarse cloth.

   (c) The jute fibres are woven into curtains, chair coverings, bags, carpets, hessian cloth, etc.

   (d) These days methods have developed to produce fine quality jute which is used in making fancy jute fabrics and cheap jute ornaments.

8. Two man-made fibres are rayon and nylon.

**Uses of Rayon** :

(a) It is used for making rugs, tire cord and paper.

(b) It is used as substitute for cotton in clothing.

**Uses of Nylon** :

(a) It is used for making hosiery, lingerie, sports garments, soft-sided luggages, upholstery, tyres, ropes, seat, belts, parachutes, fishing lines and nets.

**B. Fill in the blanks :**

1. Winds, heat, rain, cold, insects 2. ginning
3. Charkhas 4. Cashmere 5. takli 6. Carding

**C. Define the following terms :**

1. **Sericulture** : The process of raising silkworms is called sericulture.
2. **Spinning** : The process of making yarn from fibers is called spinning.
3. **Ginning** : The process of removing cotton seeds from the cotton fibre is called ginning.
4. **Carding** : The clean cotton is fed into a machine in which fibres are combed and straightened out by a process called carding.

**D. Write short notes on :**

1. **Cultivation of cotton** : Cotton plant gives us cotton fibre. Cotton grows best where warm and sunny weather stays for at least half of the year. Cotton is grown in abundance in China, southern United States and in India.

   Cotton plant requires warm temperature ranging between 21°C to 27°C with sunny and dry weather at the time of harvesting. Rainfall between 50cm to 80cm is another conducive condition for its growth.

   Black soil which has the ability to retain moisture is best for cotton cultivation.

   The main cotton producing states in India are Maharastra, Tamil Nadu, Madhya Pradesh, Andhra Pradesh, Haryana, Punjab and Gujarat. Cotton seeds are planted in the early spring in well prepared fields at a distance of 1m from each other. Cotton seeds grow steadily and within span of two months become bushes measuring 1m to 2m. They Pear yellow or white flowers, which turn pink within a week. At this moments the pink petals gradually drop leaving week. At this moments the pink petals gradually drop leaving behind tiny green pods which may contain two or more seeds.

   The pods then grow into spherical shaped structure of the size of walnut, which are commonly called *cotton balls*.

   The white fibers are obtained from these cotton balls are used in making clothes.

2. **Natural Fibres** : Fibres obtained from the plants or animals are called natural fibers.

   Fibres obtained from plants are called *plant fibres*. Some of the common plant fibres are cotton, jute and coir.

Many animals provide natural fibres for cloth. Sheep gives us wool. We get cashmere from kashmiri goats which is another well known clothing fibre. Silkworm gives silk. Mink, beaver and rabbits gives fur that can also be used in clothing

3. Almost 85% of the world's jute cultivation is concentrated in the Ganges delta. This fertile geographic region is shared by both Bangladesh and India (West Bengal). Jute is sown during the rainy season. Its plant is 8-10 feet high. It bears yellow flowers, when it is 3-4 months old.

   In India, almost all jute is produced in the states of West Bengal, Bihar, Assam, Orrisa, and Meghalya.

   Jute is a plant fibre obtained from the stem of this plant called patsun which is used for making carpets, bags, curtains etc.

4. **Fibre to fabric** : The process of making yarn from fibres is called *Spinning.* In this process fibres are twisted to from a yarn.

   A simple device called *takli* was used to spin cotton yarn. Today spinning of yarn on a large scale is done with the help of spinning machines.

5. **Development of clothing materials** : Till 1800s people are using natural fibres like cotton, jute to make their clothes and other household things. Since the late 1800s People have had other fibre options to choose from called synthetic fibres which are man-made. Synthetic fibres include rayon, acetate, nylon, polyster, acrylic, etc.

6. **Man-made fibres** : Fibres made by man are called *man-made fibres* or *synthetic fibres*. They fall into two broad groups depending on where the fibre originated. One group of fabrics is made from natural fibre-forming materials such as cellulose. Cellulose comes from softwoods or the short fibres sticking to cotton seeds. Rayon and acetate are cellulose based fabrics.

   The second group of synthetics is formed chemically from products of the oil-refining process. These fibres can then be woven into cloth and are often mixed with natural by high temperatures. Petroleum based fabrics include kevlar, nylon. polyster, acrylic, polypropylene, olefin and spandex.

**E. Write 'True' or 'False' :**

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

**F.**

1. Kashmiri goats 2. Petroleom 3. Silkworms
4. Cotton plant 5. Jute plant 6. Sheep, goat, camel

**CHAPTER 5 : CLASSIFICATION OF MATERIALS**

**A. Answer the following questions :**

1. A material is a substance that is used for making objects. There are a number of materials that are used to make different things. Some of the materials that are used commonly are wood, glass, mud, paper, plastic, cotton, etc.

2. **Classification** is the process of arranging things into groups on the basis of their common properties.

   **Advantages** :

   (a) Classification of the objects helps in their identification.

   (b) Classification helps in the sorting of the objects. Otherwise, things get mixed up.

   (c) Classification makes study of different objects easy and more meaningful rather than studying each objects separately.

   (d) Classification helps to understand similarities and dissimilarities among the objects.

3. Matters are the materials having mass and occupy space. There are three different states of matter :

   (a) **Solid** : The matter that occupies a definite space and has a definite shape is called a solid.

   (b) **Liquid** : The matter that occupies a definite space but has no definite shape is called a liquid. Liquids flow and can be poured from one container to another. They take the shape of the container.

   (c) **Gas** : The matter that neither occupies a definite space not has a definite shape is called a gas. It occupies all the available space. When air is pumped into a football it takes the shape of the football and fills all the space inside it.

4. **Transparent** : Those substances or materials through which things can be seen are called *transparent*. For example glass.

   **Opaque** : Those substances or materials through which you are not able to see are called *opaque*. For example, wood, iron, stone and metals.

5. The materials that shines are called *lustrous materials*. For example, gold and silver.

   Metals such as copper and aluminium become dull when exposed to air for period of time because of action of air (oxygen) on them or due to a layer of dust or formed over them.

6. Kitchen utensils are made of metals because metals are good conductors of heat and their handles are made of plastic because plastic is a bad conductor of heat.

7. Diffusion is the movement of particles of a substance from a region of its higher concentration to a region of its lower concentration.

   When someone opens a bottle of the perfume in one corner of the room, then the smell of perfume reaches to the other corners of the room because of diffusion of perfume in air. Vapours mix with air and reach at corner due to diffusion. Gases diffuse very fast.

8. Materials that burn when heated on direct flame in the presence of air are called "*Combustible substances"*. For example wood, paper, and cotton.

**B. Define the following :**

1. **Volume** : The space occupied by matter is called *volume*.
2. **Translucent materials** : Materials through with things are only partially visible are called *translucent materials*.

3. **Hard materials** :Materials which are difficult to press are called *hard materials*. E.g. wood and coal.
4. **Soft materials** : Materials that can be pressed easily are called *soft materials*. E.g. cotton and wool.
5. **Conduction** : *Conduction* is a measure of how easily electricity can pass through a material.

**C. Fill in the blanks :**

1. Convenience 2. Similarities, dissimilarities 3. Mass, space
4. Attractive 5. Rusting 6. Good

**D. Write (T) for true and (f) for false :**

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

**E. Classify the following under suitable heads :**

Insoluble substances : a piece of iron, petrol, few drops of kerosene, cloth Iron, wood, chalk, sand , wax, cork.

Bad Conductors of heat : Wood, Cloth, Cork, Paper,

Materials that float on water : Wax, Petrol, Cork, Paper, Cloth, Petrol, few drops of Kerosene.

Materials that sink into water : A piece of iron, metal ball, stone.

Soluble substance : salt, sugar, alcohol, spirits.

## CHAPTER-6 : CHANGING MATERIALS

**A. Answer the following questions :**

1. **Slow changes :** The changes that take a long time to occur are called *slow changes*. They may take hours, days, months or even years to complete the process.

   Example, *rusting of iron*. When iron grills or nails come in contact with the moist air, they start rusting. This process occurs very slowly. Similarly, changing of seasons, germination of seeds, formation of curd are examples of slow changes.

   **Fast changes :** The changes that take place in a short time are called fast changes. These changes occur within seconds or minutes.

   Example, burning of a matchstick, squeezing of a rubber ball to change its shape, dissolving a spoon of sugar in water, bursting of a balloon etc.
2. When we heat some objects we observe the following types of changes :
   (a) Objects simply get hot, but no other change take place.
   (b) Objects expand and increase in size on heating.
   (c) Objects on heating get burnt and change their shapes and sizes.
3. A *physical* change is a temporary change in which no new substance is formed. It is easily reversible and the composition of the substance does not change. In such changes, there may be some changes in the physical properties of a substance such as colour, smell, state, etc.

   **Examples of physical changes :**
   (a) Dissolution of sulphur in carbon disulphide.
   (b) Dissolution of sugar in water.
   (c) Dissolution of rubber in petrol.

(d) Dissolution of resin in alcohol.

(e) Melting of ice or melting of wax or ghee, etc.

4. This is the chemical change. A chemical change is a permanent change in which a new substance is formed with different properties. The change is usually irreversible.

5. Comparison between physical and chemical changes.

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

6. Sugar is an example that may undergoes physical as well as chemical change.

**Physical change** : Dissolution of sugar is water.

**Chemical change** : Charring of sugar into charcoal on strong heating.

(a) **Solute** : A substance which dissolves in a liquid (normally water) is called *solute*.

(b) **Solvent** : A liquid (generally water) which dissolves a solute in itself is called *solvent*.

Apart from water alcohol, carbon disulphide, acetone etc. are some of other solvents. Different solvents are used to dissolve different solutes. Solvents have many uses. Some are used to remove stains that water will not wash out. Other are used in nail varnish, glues, paints and correcting fluid. Many solvents are harmful and must not be breathed in or come in contact with your skin.

(c) **Solution** : A homogeneous mixture obtained by dissolving a solute in a solvent is called *solution*.

For example, when common salt dissolves in water, it forms common salt solution. Similarly, copper sulphate on dissolving in alcohol forms iodine on dissolving in alcohol forms iodine solution and sulphur on dissolving in carbon disulphide form sulphur solution.

(d) ***Saturated solution*** : A solution which cannot dissolve more of a solute at a given temperature is called *saturated solution* at that temperature. For example, when common salt stops dissolving in water at room temperature, then salt solution so obtained is the saturated solution of common salt at room temperature.

(e) **Solubility of solute** : The amount of solute (in grams which) will dissolve in 100g of water at a given temperature, so as to form a saturated solution is called *Solubility of solute* at that temperature.

For example, if 40g of sugar dissolve in 100g of water at room temperature so as to form saturated solution, then solubility of sugar is 40g per100g of water at room temperature so as to form saturated solution. Then solubility of sugar is 40g per 100g of water at room temperature.

(f) **Effect of temperature on the solubility of a solute in a solvent**.

Solubility of a substance increases with the increases in temperature and decreases in temperature.

**B. Fill in the blanks**

1. Periodic 2. Irreversible 3. Metals 4. Chemical
5. Expands 6. Ash, Smoke 7. Energy

**C. Classify the following changes as physical or chemical changes :**

Ripening of fruit : Chemical change
Charring of sugar : Chemical change
Melting of wax : Physical change
Glowing of an electric : Chemical change
Dissolution of sulphur in carbon disulphide : Physical change
Evaporation of water : Physical change
Cooking of food : Chemical change
Respiration in animals : Chemical change
Formation of dew : Physical change
Photosynthesis : Chemical change

**D. Match the columns :**

1. (V) 2. (VI) 3. (IV) 4. (I)
5. (II) 6. (VII) 7. (III)

**E. Write (T) for true and (F) for false :**

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

## CHAPTER-7 : THE LIVING ORGANISMS AND THEIR SURROUNDINGS

**A. Answer the following questions :**

1. The things that have life in them are called *living things*, e.g., sparrow, snake, deer, pigeon, human beings, etc.

   The things that do not have life in them are called *non-living things*, e.g., table, chair, pen, pencil, etc.

2. Differences between the living and non-living things

| Living things | Non-living things |
|---|---|
| 1. Living things grow. | Non living things do not grow. |
| 2. Living things show movement. | Non-living things do not show movement. |
| 3. Living things respire. | Non-living things do not respire. |

| | |
|---|---|
| 4. Living things die. | Non-living things do not die. |
| 5. Living things eat food and excrete the wastes. | Non-living things neither eat anything nor excrete the wastes. |
| 6. Living things can feel and are sensitive. | Non-living things cannot feel anything. |
| 7. Living things produce their offsprings e.g. they reproduce. | Non-living things cannot reproduce. |

3. Living organisms need food to obtain energy so that they can grow and stay healthy.

   Green plants prepare their own food by the process of photosynthesis whereas animals get their food from plants and other animals.
4. All living and non-living things possess *mass, shape* and occupy *space*.
5. Both plants and animals grow. There is one basic difference between the growth of plants and animals. Animals do not grow after a particular age, but plants continue to grow throughout their life.
6. We can show the movement of plants with the movement of roots in a downward direction due to growth, and that of the stem and leaves upwards can be observed easily. Plants also move in the direction of sunlight. Some animals move on land, others in the air, and some others in water.
7. **Stimulus** – A change in the surrounding environment is called *stimulus*.

   **Sensitivity** – The activity of living organisms in response to stimuli is called *sensitivity*.
8. **Classification** is the grouping of living beings on the basis of their similarities and dissimilarities.

**Advantage of classification**

(a) Classification makes the study more systematic and organised.
(b) With the knowledge of one member of a group we can get knowledge about all the members of the group.
(c) Classification helps us to study similarities of organisms placed in the same group.
(d) It also helps us to get the knowledge about, the dissimilarities of living beings of different groups.

9. An organism lives in a place where it can get its food easily, so that it can grow and survive. Such a place is called its *habitat*.

   Habitat of an organism comprises of two main components. These are :

   (i) **Living or biotic components :** The living components consist of plants, animals including humans and decomposers (micro-organisms).

   Plants, particularly green plants, which produce their own food are called *producers*. Animals feed on plants directly or in directly and therefore may be *herbivores* (plant eaters), *carnivores* (animal eaters) or *omnivores* (both plant and animal eaters).

There is another category of living organisms which derive their food from dead and decaying plants and animals. These are called *decomposers*, as they decompose the dead organic matter.

(ii) **Non-living or abiotic components :** A number of factors influence the habitat and the survival of organisms. For example; temperature sunlight, air, water, soil, rainfall and altitude or slope of mountains of the habitat.

10. Many organisms are found in water. Water organisms are called aquatic organisms. Aquatic habitats can be further subdivided into the following :
    - *Marine habitats*, which refer to salt water habitats in seas and oceans. The organisms living in marine habitats are known as marine organisms. Examples are whales, sharks, sea turtles and sea weeds.
    - *Fresh water habitats*, which refer to lakes, rivers, ponds and streams. Examples of organisms living in these habitats are various types of fish, water bugs and water lilies.
11. Some of the terrestrial habitats are as follows :
    (a) *Desert habitats*, which get very little rain, and are hot and dry. Examples of organisms are camels and cacti.

    (b) *Grassland habitats*, which get moderate rain. Examples of organisms are grasses, zebras, giraffes and deer.

    (c) *Rainforest habitats*, which are hot and wet, and get plenty of rain. Examples of organisms are monkeys, snakes, lizards and hundreds of varieties of trees.

    (d) *Tundra habitats*, which are very cold and always covered with snow. Examples of organisms are polar bears, reindeer and some grasses.
12. *Adaptations* are the modifications of a part or the complete body of an organism that enable it to perform special functions and help it to face a particular environmental condition. These are those useful modifications which occur due to particular conditions of a habitat and disappear with the removal of those conditions.
13. *Hydrophytes* (meaning water plants) are plants that grow in excessively wet conditions or completely in water.
    (a) **Roots :** Roots and root hairs are poorly developed as water is not a problem.

    (b) **Stem :** Stem is thin and flexible so that it can sway (or bend) along with the water movement and pressure.

    (c) **Leaves :** Leaves in submerged plants like *Hydrilla* are long and thin so that the strong water currents are not able to tear them apart.
14. *Mesophytes* are the plants that grow in those places which are neither very dry nor very wet such as cultivated lands. These plants show adaptations in their roots, stems and leaves such as :

(a) **Roots :** Roots are well developed and much branched. Root hairs are abundant. Root caps are present.

(b) **Stems :** They are well developed, erect, strong and constitute the above ground support structure for plants. They can be woody or non-woody.

(c) **Leaves :** Leaves are larger and closer, and have abundant chloroplasts.

15. Plants living in dry conditions or water-scarce habitats such as deserts are called *xerophytes*.

These plants show following adaptations that help them to survive and grow in their habitat :

(a) *Roots* are very long so that water from deep layers of the soil can be absorbed.

(b) *Stem* becomes spongy so as to store water. It becomes green and takes over the functions of leaves. Thick waxy coating develops to prevent the loss of water because of intense heat.

(c) *Leaves* are reduced to spines in order to reduce the loss of water from the surface of leaves.

16. Adaptations in animals enables them to live in their habitats successfully and to carry on reproduction. These are three types of adaptations in animals :

(a) Terrestrial adaptations (b) Aquatic adaptations

(c) Aerial adaptations

17. Yes, there are special features which help predators in their routine activities that are discussed below :

(a) They have sharp teeth and long claws, in their front legs that can be withdrawn inside the toes.

(b) Their eyes are at the front of the head to judge size and distance.

(c) Their body colour helps them to hide in dry grasslands when they hunt for prey.

18. **Adaptations in xeric (desert) animals :**

(a) These animals have thick skin by which water loss from the body is prevented.

(b) Their feet have thick large soles making it suitable for walking on sand.

(c) They can go on without food or water at a stretch for many days.

(d) They are capable of adjusting its body temperature to that of the surroundings desert habitat and thereby the water loss by perspiration and other means is drastically minimised.

(e) They passes out very little wine when water is not available.

19. The adaptations of the aquatic animals are given below :

(a) **Gills :** Fishes and many other aquatic animals have gills for extracting oxygen dissolved in water. Each gill has numerous processes through

which water passes. The processes or filaments are richly supplied with blood vessels.

(b) **Streamlined body :** In fishes, the body is boat shaped or spindle like. It is broader in the middle, narrowing towards both ends. This minimises resistance during movement. In fishes, the body is laterally compresses. Fins are present to provide stability and prevent rolling. Tail helps in changing direction while swimming.

(c) **Body coverings :** The body is covered with mucus or slime which protect aquatic animals from rotting effect of water. The body surface in case of fresh water fishes are covered by impermeable scales which are also protective in nature.

(d) **Buoyancy :** Some aquatic insects trap air bubbles to get the required buoyancy, e.g. Giant water Bug (Gelostoma). Most fishes possess air bladder or swim bladder having enclosed air for providing buoyancy. Its size varies according to depth inside water.

20. Main adaptations in birds are as follows :
    (a) Bones are hollow and filled with *air cavities* to make the body lighter.
    (b) Feathers are present.
    (c) Forelimbs are modified into wings for flying.
    (d) Streamlined or spindle-shaped body for the easy and swift passage through air.

**B. Fill in the blanks :**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | molecule | 2. | cell | 3. | life span | 4. | excretion | | |
| 5. | sensitivity | 6. | systematic | 7. | similarities and dissimilarities | | | | |
| 8. | decomposers | 9. | terrestrial | 10. | webbed | | | | |

**C. Match the columns :**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | (iv) | 2. | (vii) | 3. | (v) | 4. | ((i) | 5. | (vi) |
| 6. | (ii) | 7. | (iii) | | | | | | |

**D. Write (T) for true and (F) for false :**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | F | 2. | T | 3. | T | 4. | F | 5. | F |

## CHAPTER-8 : PLANTS—FORM AND FUNCTION

**A. Answer the following questions :**

1. On the `basis os size, plants can be of three types —
    (a) **Small plants—**Herbs are small plants with a green soft stem. They do not grow more than three or four feet in height. Example : Mustard, pea.
    (b) **Medium-sized plant—**Shrubs are medium-sized plants with hard and woody stems. Shrubs do not grow tall. Examples : Lemon, china-rose, jasmine.
    (c) **Big plants—**Trees are big plants with hard and strong stem (trunk). The stems have branches in the upper part, much above the ground. They live for many years. Examples : Mango, neem, banyan etc.

2. **Climbers—**Plants having weak stems and cannot stand erect without support of other trees are called *climbers*. Examples : Pea, money plant, etc.

   **Creepers—**Creepers just creep on the ground and spread out. Examples : Pumpkin and watermelon.

3. Root system refers to the underground portion of the plants. Root system comprises of two types of roots—*tap root* and *fibrous root*.

   **Tap root :** The tap root is the main root of root system. It grows vertically down into the soil and then gives out branches.

   **Fibrous root :** Fibrous roots do not have any main root. There is a bunch of roots shooting from the base of the stem and growing underground.

4. **Functions of the roots :**
   (a) Roots of the plants absorb water and nutrients from the soil.
   (b) Roots bind the soil together. They do not allow the soil to be washed away when there are floods or when there are strong winds, hence check the soil erosion.
   (c) Roots help the plant to stand erect in the soil.
   (d) In some plants roots instead of spreading in the soil become swollen. These swollen roots store food, which we eat.

5. Soil erosion is the removal of upper fertile layer of soil. Roots bind the soil together. They do not allow the soil to be washed away when there are floods or when there are strong winds. In case there are no plants, there would be no roots and the soil would be eroded by floods and strong winds. Due to soil erosion, upper texture of the soil is lost which happens to be the most fertile component of the soil. Hence, we can say root checks the soil erosion.

6. **Shoot system** is the part of plant that grows above the soil. The name of its parts are stems, branches, leaves, flowers and fruits.

7. **Stems** froms the main axis of the plant body. The stem gives rise to a number of branches that bear leaves. It is divided into *nodes* and *internodes*. The point at which the branch comes out is called the node. The portion of the stem between two nodes is called the internode.

   The stem keeps on increasing in length and in diameter along with the growth of the plant. As it grows it becomes hard and woody. Auxiliary buds gives rise to branches and leaves.

   In a herb, the stem remains soft, green and tender. But in a tree, it becomes hard and woody and is called *trunk*. Trunk is the strongest part in a tree. It is no longer green. It becomes brownish in colour and is in fact covered with *bark*. The *bark* protects the inner parts of the tree.

8. **Functions of stem :**
   (a) The stem bears branches, leaves, flowers and fruits of a plant.
   (b) The stem keeps a plants straight and gives support to the plants.
   (c) The stem transports water, minerals food and other substances from the roots or leaves to all parts of the plant.

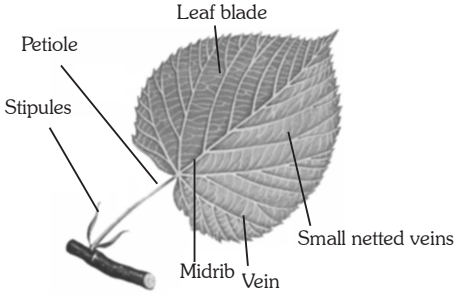
(d) In some plants the stem grows underground and functions as a store house of food.

(e) Stem modified into tendrils giving extra support for plants.

9. A leaf is a flattened green structure. It arises from the node of a stem or its branches.

**Parts of a leaf :**

(a) The flat green portion of the leaf is called *leaf lamina*. It is also called *leaf blade*. It shows *midrib*, the structure that runs almost in the middle of the leaf.



Parts of leaf

(b) The stalk of the leaf with the help of which it is joined to the stem is called *petiole*.

(c) *Veins* are the network of small, narrow tube-like structures on both sides of the midrib. The thick vein in the middle of the leaf is called the *midrib*.

10. The plants give out extra amount of water in the plant through stomata, in the form of vapours. This process is known as *transpiration*.

11. **Functions of leaves :**

(a) Leaves manufacture food for the plant body by the process of *photosynthesis*.

(b) Leaves carry tiny pores called *stomata*, through these pores plants take in gases for respiration and photosynthesis. The gases produced during these processes are also given out through stomata.

(c) Leaves may be variably modified into spines or tendrills or modified to trap insects as in pitcher plant.

12. **To prove that starch is formed in the leaves.**

Take a green leaf from a plant exposed to sunlight for about 8-9 hours. On a green leaf we will not be able to see how colour changes with iodine. The chlorophyll of the leaf which is given it green colour will have to be removed. This means the leaf will have to be beached. For this, boil the leaf in water and then soak it in warm alcohol as shown in the diagram. The chlorophall pigment will come out of the leaf cells and will dissolve in alcohol. Put this leaf on a white plate and pour a few drops of iodine on the leaf. The leaf turns blue black. This activity shows that starch is formed in the leaves.

13. A flower represents the reproductive part of a plant body. It is, the most important part meant for multiplication of the species.

14. **Pollination** is a process in which the pollen grains are transferred from the another to the stigma of either the same flower or of another flower of the same kind by wind, water or insects.

After pollination, the ovary swells up and changes into a fruit and the ovules change into seeds. A fruit is generally made up of a fruit wall and seeds.

15. Flowering plants are grown in gardens and in homes because of the bright colours and fragrance of the flowers. They, thus, beautify the surroundings and provide aesthetic value.

16. After pollination the ovules change into seeds. All seeds contain a baby plant called the *embryo*. The embryo contains the plumule which grows into the shoot, and the radicle which grow into the root. The seed leaves or cotyledons contain food for the baby plant. Generally a *seed coat* protects the seed.

    When the seed gets the right conditions of water, warmth, air and fertile soil, its embryo grows into a plant, which produces flowers. This process keeps on repeating.

**B. Fill in the blanks :**

1. root, shoot 2. bisexual 3. reproductive 4. Node
5. axillary 6. tendrils 7. insectivorous 8. carpel

**C. Give two examples of each of the following :**

1. Creepers : **Pumpkin, watermelon**
2. Shrubs : **Lemon, Jasmine**
3. Unisexual flowers : **Cucumber, gourd**
4. Plants having prop roots : **Banyan tree, Maize**
5. Insectivorous plants : Pitcher plant, bladder wort

**D. Write (T) for true and (F) for false :**

1. F 2. F 3. T 4. T 5. T 6. T 7. F

**E. Choose the most appropriate answer :**

1. b 2. a 3. c 4. b 5. a

**F. Select the odd one out giving reason :**

1. pea 2. lemon 3. Onion 4. cactus

## CHAPTER-9 : ANIMALS—FORM AND FUNCTION

**A. Answer the following questions :**

1. Locomotion helps animals move from place to place. It is helpful in many ways :
   (a) Animals can move away from an unfaourable environment to a favourable one.
   (b) They can escape from predators.
   (c) They can procure food and water from different places.
   (d) They can search and find partners for reproduction.
   (e) They can move to safe places for laying eggs and nurturing their youngones.

2. The amoeba move with the help of body extensions called pseudopodia. Paramecium has fine hair-like structures on its body called *cilia*. Euglena and Chlamydomonas move with one or two whip-like structures called *flagella*. Hydra moves with the help of its foot and *tentacles*.
3. In the middle of the back we feel the *spine (buckbone)*. It runs the full length of the back. The backbone is made up of 33 small ring-like bones. These run down the middle of the back from the base of the skull to the hip area. The backbone allows, us to twist and bend, and holds the body upright. It is also called the vertebral column.
4. **Rib cage** is the part of the skeleton that protects the heart and the lungs.
   Ribs are the curved bones on the side of our chest that extend from the backbone. They form a cage called the *rib cage* by joining with the breast bone in the front. There are ten pairs of ribs attached to the breast bone and two pairs which remain free, called the *floating ribs*.
5. The hard bones present at the top of our head form the skull, which protects the brain from injury and shock. Though the skull might look like a ball-shaped structure, the skull is actually made of 30 separate bones. These also make up the structure of our face. Beneath our eyes we can feel the ridge of the bone that forms the hole where the eye is located. We can feel cheek bones which give our face its distinct look. We can feel jaw bone. The only part of the skull that can move is the lower jaw bone.
6. See Ans. (4)
7. In the ball and socket joint the end of one of the bones is round like a ball. It fits into a hollow part (or socket) in the other bone. Such joints allow movement in all directions. Shoulder and hip joints are two examples of such joints in the human body.
8. To move the bone in one direction at least two sets of muscles are required because muscles are attached to the bones by means of tough bands called tendons. The muscles move the bones by their pull and muscles cannot push.
9. Importance of a good pasture :
   (a) Good posture makes it possible for the internal organs of the body to function properly.
   (b) If you maintain a good posture, it help you to move, stand, or sit with ease, without getting tired.
   (c) Proper development of your bones and muscles is possible only if you maintain a good posture.
10. (i) Incorrect sitting postures causes stresses and strains on the muscles and bones.
    (ii) Wearing high-heeled footwears can cause added postural problem, the balance of the person is thrown forward, changing, the normal centre of gravity, when one wears such foot wears. This causes excessive strain on the ankles and the arches of the feet.

11. **Following are the different types of fractures :**
    (i) **Simple fractures :** The broken bone does not protrude (stick out) through the skin.
    (ii) **Compound fractures :** The broken bone protrudes through the skin and much blood can be lost.
    (iii) **Incomplete fractures :** The bone is cracked but not broken.
    (iv) **Chip fractures :** A piece of bone is broken off or chipped.
    (v) **Stress fractions :** A bone is strained in some way, so as to cause a weakness in it. Stress fractures happen through the repeated use of some part of the body. Sports, figures and dancers are frequently victims of stress fractures in the legs and feet.
12. If we see the structure of bird we will find that, it is covered with feathers. The streamlined shape of a bird allows it to move easily through the air. The bones are light, many of them are hollow with air spaces but yet they are very strong. The bony parts of the forelimbs are modified as wings. The powerful muscles are attached to the breast bone which make the wings beat rapidly for flight. The lungs have air sacs which not only makes the body light and buoyant but also increases the oxygen supply when flying.

    The wing and tail in birds are reinforced with variuos types of feathers which provide an extended surface. This extended surface allows the wings to develop enough lift to completely cross the downward pull of gravity.

    Hence, we can say that bird's bodies are well suited for flying.
13. **The two main movements of the feathers of a bird when it flies are :**
    (i) **Downstroke :** On the downstroke the wings move downwards and forwards. The feathers push the air down, giving the necessary lift to the bird.
    (ii) **Upstroke :** On the upstroke, the feather twist open and the air passes between the feathers. Thus, the air is not pushed up. The upstroke, therefore, needs much less effort than the down stroke.

**B. Define the following :**

1. **Skeleton :** A skeleton is a framework of bones and cartilages that supports in animal's body.
2. **Joint :** The places in the body where two bones are joined together are called *joints*.
3. **Cell :** Cell is the smallest unit of an organism.
4. **Tissue :** A group of similar type of cells with same kind of function is called *tissue*.
5. **Organ :** The body part that is specialised to do important body activities is called *organs*.
6. **Organ System :** A set of organs which work together in a coordinated manner to carry out a major activity is called an *organ system*.

**C. Name the following :**

1. Bones, liver, eye
2. Muscular system, respiratory system, nervous system
3. Skull, spine, ribs, limbs 4. Carb, Cockroaches

**D. Differentiate between :**

1.

| Locomotion | Movement |
|---|---|
| Shifting of the entire body of the animals from one place to another in search of food, shelter and mate is called *locomotion*. | The term movement is used when only a part of the body move. |

2.

| Pivot joint | Gliding joint |
|---|---|
| Pivot joint is a joint in which one of the bones ends in a rounded or conical surface that fits into a dent in the other bone.<br>Example, neck joint | These joints allow side to side as well as backward and forward movement.<br>Example, wrist or ankle joint |

3.

| Fracture | Dislocation of a bone |
|---|---|
| A fracture is a break in the bone. The break may be of a hair line crack or serious break in one or more points or broken away. | In dislocation, the bones at the joint are dislodged from their normal position. The ligaments may be torn apart. |

4 .

| Exoskeletons | Endoskeletons |
|---|---|
| The skeleton present outside the body of living being is called *exoskeleton*.<br>Example, exoskeletons present in crabs, cockroaches | The skeleton present inside the body of living being is called *endoskeletons.*<br>Example, endoskeletons is present in human. |

**E. Identify the picture and explain the mode of locomotion in that living creature.**

1. This is a picture of cockroach. Cockroach has three pairs of jointed legs attached to the breast region. These help in walking.

   Cockroach has two modes of locomotion :

(a) **Running :** The cockroach has three pairs of legs : Prolegs, Mesolegs and Metalegs. The cockroach runs on the front portion of its legs. In the act of walking or running, the prolegs pull the body forwards and the metalegs give it a push from behind.

(b) **Flying :** Cockroach flies by beating the hindwings with special muscles. They are beaten up and down alternately. The beat is oblique and not vertical. At each down stroke, the wings push the air downwards and backwards. This propels the body upwards and forwards. During flight, the forewings are held at right angles to the body but do not beat. Flight is, however, very rare in cockroach.

2. This is the picture of snake. Snakes do not have legs there are three ways in which a snake can move. In the desert, with poor support from the sand, snakes turn on their side and move sideways. Snake also twist their head from side to side with the help of strong muscles which makes the rest of their body twist as well and propels them forward. The most effective snake movement involves thousands of muscles, bones and the scales on their body. The scales are lifted above the ground by the muscles and are then forward at an angle, propelling the snake forward.
3. This is the picture of **snail**.

   Locomotion is extremely slow in snail. It is brought about by the foot. A series of rippling waves of contraction pass over the foot and force it forwards. The rest of body enclosed in the shell is dragged after it.
4. This is the picture of **earthworm**. Locomotion in earthworm is brought about by contraction and relaxation of body long and thin while its hind (posterior) end become short and thick. This is due to the contraction and expansion (relaxation) of muscles.

**F. What functions do the following perform :**

1. **Skeleton**

   Skeleton provides hard framework and holds us upright. The bones protect the soft organs of our body. Because of skeleton we are able to move our arms, legs and many other parts of our body. Bone marrow present inside the bones make blood cells.
2. **Soft cartilage present at the ends of bones**

   Cartilage acts as a shock absorber and reduces friction between the bones.

## CHAPTER 10 : MOTION AND MEASUREMENT OF DISTANCE

**A. Answer the following questions :**

1. When the position of an object changes with the passage of time, the object is in the state of motion.
2. The advantages of using a scale for measuring length are as follows :
   (i) The scale can be easily taken from one place to another.
   (ii) The scale does not change during measurement.
3. Handspan, cubic, arm length and footstep are conventional units of measurement. They are not normally used because conventional

measurements have only been approximate measurements differing from person to person.

4. The standard unit of length is metre.
5. The following precautions should be taken to measure the length of the table top accurately :
   (i) The scale must he placed properly from one end to the other end of the table top.
   (ii) It must he measured from zero (0) mark of the scale.
   (iii) In case of edge of the scale showing zero (0) is broken, some other digit can be taken as the initial reading.
   (iv) One should be remembered to subtract initial reading from the reading at the other end to get the accurate length of the object.
6. We can measure the length of the curved line using a string. The string is placed along the curved line and its ends are marked on the string. The length of the string between the marked points is measured with a ruler.
7. Error in reading measurement due to the wrong position of the eyes is called parallax error.
8. When an object moves from one position to another and changes direction in an irregular manner, it is said to be in a random motion.
9. A motion in which a body moves about a fixed axes without changing its position is called the rotatory motion.

**B. Differentiate between :**

1. Differences between rectilinear motion and curvilinear motion :

| Rectilinear motion | Curvilinear motion |
|---|---|
| (i) When a body moves along a straight line, the motion described by the body is called rectilinear motion. | (i) When a body moves along curved line, the motion described by the body is called curvilinear motion. |
| (ii) Examples : (a) A car moving on the straight road. (b) A freely falling stone. | (ii) Examples : (a) A car or train moving along a curved road. (b) A ball thrown upward at an angle. |

2. Differences between rotatory motion and revolution :

| Rectilinear motion | Revolution |
|---|---|
| (i) A motion in which a body moves about a fixed axis without changing its position is called the rotatory motion. | (i) When an object as a whole moves around a fixed centre, it is said to be revolving. |
| (ii) Example : (a) A spinning top (b) the hands of a clock. | (ii) Example : (a) Earth revolving around the sun in a definite orbit. (b) Moon revolving around earth. |

3. Differences between oscillatory and vibratory motion :

| Oscillatory motion | Vibratory motion |
|---|---|
| (i) Oscillatory motion is that in which a body moves to and fro about its mean position without any change in shape.<br>(ii) Example : (a) A child siting in a swing going back and forth. (b) Pendulum of a wall clock moving left and right. | (i) The vibratory motion is a kind of oscillatory motion in which the moving object under goes change in shape or size.<br>(ii) Example : (a) Vibrations produced by violin, sitar, drums, etc. are vibratory motions. |

4. Differences between periodic and non-periodic motion :

| Periodic motion | Non-periodic motion |
|---|---|
| (i) If a motion repeats itself after equal intervals of time, it is called periodic motion.<br>(ii) Example : The to and fro motion of a pendulum. | (i) Any type of motion that does not repeat itself after equal intervals of time is non-periodic.<br>(ii) Example : A car moving on a road. |

5. Different between uniform and non-uniform motion :

| Uniform motion | Non-uniform motion |
|---|---|
| (i) When a body covers equal distance in equal time interval, then the motion of the body is called uniform motion.<br>(ii) Example : A flying aeroplane in a particular direction at a constant speed. | (i) When a body covers unequal distance in equal intervals of time then the motion of the body is called non-uniform motion.<br>(ii) Example : Cycling in a particular direction at varient speed. |

**C. Give two examples for each of the following :**

1. (a) Gas diffuses in a random manner.
   (b) A foot ball player moves in random manner in the playground.
2. (a) A train moving on a straight rail track.
   (b) A free falling stone.
3. (a) A ball thrown upward at an angle.
   (b) A car or train moving along a curved road.

4. (a) Pendulum of a wall clock moving left and right.
   (b) A person sitting on a rocking chair.
5. (a) Motion shows by a string of a musical instrument.
   (b) Motion produced by a empty steel jug when it is stricken with a spoon.
6. (a) The motion of a swing.
   (b) The movement of the lungs during breathing.
7. (a) Football player running in the field is performing non-periodic motion as sometimes he runs fast and sometimes slowly.
   (b) Cricket ball rolling down the ground gradually slows down and finally stops, hence is performing non-periodic motion.
8. (a) A flying aeroplane in a particular direction at a constant speed.
   (b) A moving car in a particular direction at a constant speed.
9. (a) A moving car covering unequal distance in equal interval of time.
   (b) A scooterist covering unequal distance in equal interval of time.
10. (a) Handspan (b) Footstep
11. (b) Metre (b) Gram
12. (a) Centimetre (b) Millimetre

**D. Fill in the blanks :**

1. Travelling 2. Measurement 3. Standard Unit
4. Ten millionth (1/10,000,000) 5. 1000 6. Millimetres
7. Curvilinear 8. Periodic 9. Oscillatory
10. Translatory, rotatory motion 11. Oscillates, rotates
12. Revolves, spins

## CHAPTER-11 : ELECTRIC CURRENT AND CIRCUITS

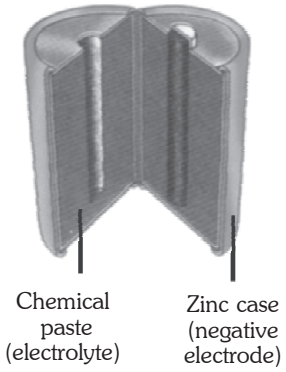
**A. Answer the following questions :**

1. The rate of flow of charges is called an electric current. Electrochemical cells, solar cells, electric generators or dynamos are used as source of electricity.
2. An electrochemical cell is an arrangement in which a chemical reaction proceeds at a steady rate so as to convert chemical energy into electrical energy. There are two types of electrochemical cells— Primary cells and Secondary cells.
3. The dry cell is used as the source of electric current in torches and transistors.

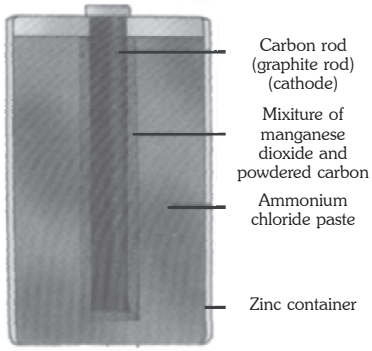
   **Construction of dry cell**

   The dry cell consists of a small metallic vessel of zinc. The zinc vessel acts as a negative electrode for the cell. A carbon rod, placed at the centre of the vessel, acts as positive electrode (cathode).

The mixture of ammonium chloride, zinc chloride, manganese dioxide and graphite is placed in the vessel around the carbon rod. The mixture of ammonium chloride and zinc chloride acts as the electrolyte. The electrolyte is in the form of paste. The cell is scaled from the top.



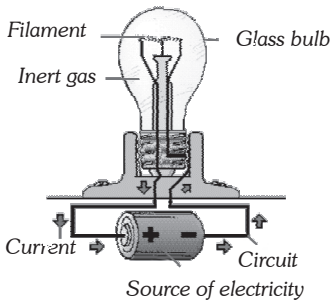

(a) Dry cell




(b) Dry cell

4. Advantages and disadvantages of dry cells :
   (i) They are light and can be carried easily.
   (ii) They do not contain any liquid that can be spilled over.
   (iii) They supply constant and steady electric current.
   (iv) They are not too expensive.
   (v) **Disadvantages :** One big disadvantage of a dry cell is that it has a very short life span.

5.




6. The complete path from one terminal of an electric cell through the lenth and back to the other terminal of the electric cell is called electric circuit.

   An electric circuit has two essential components. These are : (i) an electric source and (ii) connecting wires.

7. An LED is a Light Emitting Diode. In electronic circuit an LED allows the current to flow in only one direction through it and it produces light.

**B. Differentiate between :**

1. Difference between primary cell and secondary cell :

| Primary cell | Secondary cell |
|---|---|
| (i) Chemical energy is converted into electrical energy through an irreversible chemical reaction.<br>(ii) These cells cannot be recharged.<br>(iii) The total energy available from a primary cell is limited by the amount of reactants which is gradually used up. | (i) Chemical energy is converted into electrical energy through a reversible chemical reaction.<br>(ii) These cells can be reacharged.<br>(iii) As these cells can be recharged, they are accumulators. |

2. Difference between cell and battery cell.

| When two or more | Battery |
|---|---|
| An electrochemical cell is an arrangement in which a chemical reaction proceeds at a steady rate so as to convert chemical energy into electrical energy. The single piece of an electrochemical cell is simply called as cell. | cells are joined together, it is called a battery. |

3. Difference between conductor and insulator :

   The materials that allow electric current to pass through themselves are called conductors. On the other hand the materials which do not allow electric current to pass through themselves, are called insulators.

4. Difference between open electric circuit and closed 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. The complete path is sometimes called *closed electric circuit*. If the electric circuit is broken at any point in its path, then the bulb does not glow. Such an electric circuit in which the path of electricity is broken at some point is called *open electric circuit*.

**C. Define the following :**

1. **Electrolyte :** A substance which conducts electricity when it is in molten state or when it is dissolved in water is termed electrolyte.
2. **Electrodes :** The two metal plates of the cell are called electrodes. Two types of electrodes are anode and cathode. Anode is a negative plate, whereas cathode is a positive plate.

3. **Button cell :** A button cell is small almost the size of a button. It is used in small electronic devices such as wrist watches, calculators, hearing aids, etc.
4. **Solar cell :** A solar cell is a cell that directly converts solar energy into electrical energy. Many solar cells arranged together form a solar panel.
5. **Electric switch :** A device by which an electric circuit can be easily completed or broken is called an electric switch.

**D. Fill in the blanks :**

1. primary 2. anode, cathode 3. paste 4. leads, cable 5. volts 6. metals
7. Light Emitting Diode, it is 8. Constant, steady

**E. Write 'T' for true and 'F' for false :**

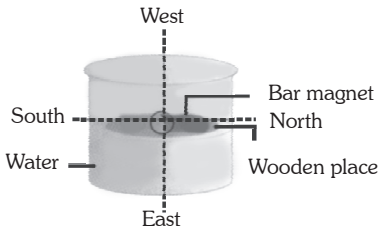
1. T 2. F 3. F 4. T 5. T

**CHAPTER-12 : MAGNETS**

**A. Answer the following questions :**

1. Discovery of the magnet :

   There used to live a shepherd boy, Manganous, in the town of Magnesia in Asia Minor (Greece). He used to carry a wooden staff provided with an iron sole. One day, he placed his staff on a black rock and its iron sole got stuck to it. He was terrified, he thought that there was a spirit under the rock, trying to hold back his wooden staff. But the reality was some what different. There was no spirit under the rock, that black rock was actually an ore of iron. It was called magnetite. The name of this rock came from the town of Magnesia, where it was discovered. As this rock attracted pieces of iron towards itself, any other substance which had similar properties was named a magnet. Magnetite is the world's first magnet.
2. In a magnet, the regions of strongest magnetism are near the ends. These are called poles of a magnet. When two magnetic poles are brought close together, they interact and behave as like poles repel each other while un like poles attract each other.
3. When a magnet is suspended freely it always aligns itself in north-south direction. Following activity will prove the point :




4. Some properties of magnets are as follow :
   (i) The magnetic force is strongest at its poles.
   (ii) A magnet always sets in north-south direction.

(iii) Like poles repel each other while unlike poles attract each other.

(iv) Magnetic poles always exist in pairs.

5. A magnetic compass is a simple device consisting of a magnetic needle which is free to rotate on a pivot at the centre of a round box. It is used by sailor and navigator to figure out the four directions. While navigating, with the help of a compass needle, this fact is taken into consideration to find the correct geographical directions.

6. **Earth's magnetism :** The earth itself is like a huge magnet with poles of its own. This imaginary magnet has its south pole pointing in the direction of the geographical north. One pole of any magnet is geographical north. One pole of any magnet is attracted to the Earth's magnetic north pole, and the other to the magnetic south pole. The pole of the magnet which is attracted to the earth's north pole is the south-seeking pole of the magnet and the pole of the magnet which is attracted to the earth's south pole is the north-seeking pole of the magnet. This is why a freely suspended magnet always points towards north-south direction.

**B. Differentiate between :**

1. Difference between magnetic and non-magnetic substances.

| Magnetic substance | Non-magnetic substance |
|---|---|
| 1. Substances that show magnetic property, are called magnetic substances.<br>2. Magnetic susbstances can be magnetized.<br>3. Examples : Iron, cabolt, nickel, etc. | 1. Substances that do not show magnetic property, are called non-magnetic substances.<br>2. Non magnetic substances cannot be magnetized.<br>3. Examples : Wood, paper, plastic, etc. |

2. Difference between natural and artificial magnets :

A magnet which occurs naturally and is not made by any artificial means is called a natural magnet.

A substance to which properties of the natural magnet are imparted by artificial means is called artificial magnet.

**C. Explain name the following :**

1. **Attractive property :** A magnet attracts small pieces of iron towards itself. This called attractive property.
2. **Directive property :** If a bar magnet suspended freely, it always points in the north-south direction. This is called directive property.
3. **North pole :** The end of the freely suspended magnet, which points towards the geographic north is called north pole of the magnet.
4. **South pole :** The end of a freely suspended magnet, which points towards the geographic south is called south pole of the magnet.

**D. Give reasons for the following :**

1. Natural magnet was derived from magnetite which is an ore of iron ($Fe_3O_4$). Magnetite is also know as leading stone or lodestone. Due to this reason natural magnet was called leading stone.
2. If a bar magnet is broken into pieces, each piece behaves as a whole magnet. If these pieces are broken again into finer pieces, each finer piece still remain a whole magnet with two opposite poles. Thus, the poles of a magnet cannot be separated.
3. Magnetic compass is used to figure out the geographic directions. Therefore, to find the correct directions sailors have to correct their reading while using a magnetic compass.

**D. Match the column I with the column II.**

1. (v) 2. (iv) 3. (vi) 4. (i) 5. (ii) 6. (iii)

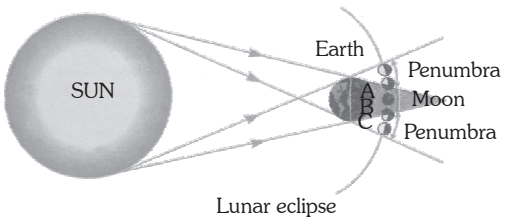
## CHAPTER-13 : LIGHT, SHADOWS AND REFLECTIONS

**A. Answer the following questions :**

1. An object which emits light is called a source of light.
2. Non-luminouns objects can be classified as transparent, translucent or opaque according to the way light behaves when it meets them.
3. Shadow is a dark path formed behind an opaque body placed in the path of light.

   Presence of a source of light and presence of an object capable of obstructing the path of light are necessary for a shadow to be formed.
4. **Characteristics of a shadow.**
   (i) The shadow is formed in the direction opposite to the direction of source of light.
   (ii) As the source of light moves, the shadow also moves.
   (iii) The length of the shadow changes according to the position of the source of light with respect to the object.
   (iv) The colour of the shadow is always black irrespective of the colour of the object.
5. Size and shape of a shadow varies with the change in position of the light source or position of the object. Therefore sometimes we get incomplete shadows.
6. When the shadow of the moon falls on the earth and the sun cannot be seen for a while the eclipse of the sun occurs.
7. During full moon day total eclips of the moon occurs.

   Lunar eclips can be explained by following diagram :



8. **To prove that light travels in straight lines**

**Materials required :** ◆ three stiff cardboards ◆ three wooden blocks ◆ a sharp pin ◆ geometry box ◆ cellotape ◆ candle ◆ matchbox

**Method :** Place the cardboards one upon another. On the uppermost cardboard draw diagonals as shown in the figure (a). Make a hole with the help of a sharp pin at the point of intersection of the diagonals through all the cardboards. Fix the cardboards along small wooden blocks with the help of cellotape.

Arrange the cardboard A, B and C in a straight line along the edge of the table. Towards the cardboard A, place a lighted candle such that the flame of the candle is at the same height as the hole in the cardboard. Look from the side of cardboard C. You will notice that the candle flame is visible.

Now, displace the cardboard B sideways. Again, look from the side of cardboard C. You will notice that now the candle flame is not visible. Why is the candle flame not visible ?

It is because light travels in straight lines. Thus, the light passing through the hole of cardboard A cannot bend and then pass through the holes of B and C.

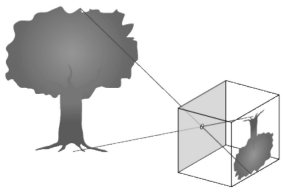
9. A pinhole camera is a box with a tinny hole on one wall and a white paper on the opposite inner wall. We can see images of brightly lit objects forming on this paper as light rays enter through the tiny hole.

**Principle of a pinhole camera.**

A pinhole camera is based upon the principle of rectilinear propagation of light.

**Working of a pinhole camera**

On placing a lighted candle in front of the pinhole, we get a clear inverted image of the flame on the screen or the photographic plate. The lighted candle or the photographic plate. The lighted candle acts as an object, as it gives out sufficient a mount of light and produces a light image. The top (A) of the flame sends out rays in all the directions but only a small portion of light rays pass through the pinhole. The rays passing through the pinhole make a small illuminated patch on the screen. A narrow beam from the bottom (B) of the flame also censes an illumination patch. Similarly, from every point on the object a narrow beam of light



passes through the pinhole and forms a complete image A' B' on the screen.

10. Differences between an image and shadow :

| Image | Shadow |
|---|---|
| (i) Image is formed when the light is reflected from a mirror or any shining object.<br>(ii) Image gives all the details of the objects such as its size, colour, etc. | (i) Shadow is formed when the path of light is obstructed by an opaque body.<br>(ii) Shadow is a dark outline of an object and gives no details of the object. |

**B. Define the following :**

1. **Light :** Light is an agent that stimulates sight and makes things visible.
2. **Scattering of light :** When the light falls on any object, it bounces off from the surface of the object in all directions. This is called scattering of light.
3. **Luminous objects :** The objects which produce their own light are called luminous objects.
4. **Umbra :** The complete shadows are known as umbra.
5. **Penumbra :** The partial or incomplete shadows are known as penumbra.

**C. Fill in the blanks :**

1. Natural, man-made 2. Non-luminous 3. Shadow 4. Complete
5. Opposite

**D. Write "T" for true and "F" for false :**

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

**E. Differentiate between :**

1. Difference between umbra and penumbra :
   The complete shadows are known as umbra and incomplete shadows are called penumbra.
2. **Difference between transparent and opaque :**
   Substances which allow light to pass through them easily and through which we can see clearly are said to be transparent. On the other hand, substances which do not allow light to pass through them are called opaque.
3. **Difference between solar eclipse and lunar eclipse :**
   When the shadow of the moon falls on the earth and the sun cannot be seen for a while, a solar eclipse occurs. On the other hand, when the shadow of the earth falls on the moon, the eclipse is said to be lunar.