



SOLUTION WONDER OF SCIENCE

7

Chapter 1 : Nutrition in Plants

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. Heteros means—Other.
2. Trophos means—Nourishment.
3. Synthesis means—To Combine.
4. Photo means—Light.

(C) Short Answer Questions:

1. Nutrition is the process of taking nutrients (food) and utilizing it to perform daily life process. Different organisms need different kinds of nutrients for their growth.
2. The factor responsible for green colour of leaves is the presence of green colour pigment called chlorophyll which is responsible for the green colour of leaves of a plant.
3. The tiny pores present on the lower surface of the leaves are called stomata. Its function is to absorb Carbon dioxide from the atmosphere by the leaves through tiny pores present on the lower surface of the leaves.
4. Xylem: Water and minerals are absorbed by the roots from the soil and transported to the leaves or other parts of the plant through pipe like structure called Xylem vessels. Phloem: The carbohydrates produced during the process of photosynthesis are transported to various parts of the plant body through channels called phloem.

(D) Long Answer Questions :

1. Green leaves of plants prepare their own food by the process of photosynthesis and the three things required by the plant are Sunlight, Air, Water, and Minerals. Green plants are also known as the kitchen of the plants. The Raw material required by the plant in the process of photosynthesis is as follows:

- (i) **Sunlight** : Sun is the only source of sunlight for the process of photosynthesis. The presence of green colour pigment called chlorophyll traps the sunlight and helps in the process of making food. The rate of photosynthesis depends upon the sunlight, the lower the sunlight the lower the rate of photosynthesis.
 - (ii) **Air** : Carbon dioxide is absorbed and oxygen gas is released during the process of photosynthesis. Carbon Dioxide is absorbed from the atmosphere by the leaves through tiny pores present on the lower surface of the leaves is called stomata.
 - (iii) **Water and Minerals** : Water and Minerals are absorbed by the roots from the soil and transported to the leaves or other parts of the plant through pipe-like structures called xylem vessels. After the photosynthesis reaction, the excess water is expelled from the leaves by the process called transpiration.
2. The basic modes of Nutrition are divided into two main types:
- (i) **Autotrophic mode of Nutrition** : The word autotrophic is made up of two words that are Auto and trophos means self and trophies means nourishment. Therefore a living being which makes its own food is called an autotroph. All green plants and bacteria show autotrophic mode of nutrition.
 - (ii) **Heterotrophic mode of Nutrition** : The word heterotrophic is made up of two words that are Heteros and trophos. Heteros means other and trophies means nourishment. All animals and non-green plants show the heterotrophic mode of nutrition, most of the microorganisms are heterotrophic.
3. **Differentiate between :**
- (i) **Symbiotic and Parasitic Plants.** Symbiotic plants are the plants that live live and share nutrition together and both benefit each other. Examples of Symbiotic plants are lichens and leguminous plants.
Parasitic Plant is a plant that derives its food from the body of another plant. The Parasite plant thrives on the body of another green plant which is known as a host plant. Examples of parasitic plants are cuscuta or Dodder plant and mistletoe.
 - (ii) **Carnivorous and Saprophytic Plants.** The plants which eat insects to get their proteins are called Carnivorous or insectivorous plant. Insectivorous plants are grown in nitrogen-deficient soil so they eat insects to meet their protein need. Examples of carnivorous plants are Sundew bladderwort, Pitcher plant, and Venus flytrap.
Living plants who take nutrition from dead remains of plants and animals are called saprotrophs. Saprophytes are plants that obtain their nutrition from the decaying plant matter like rotting leaves and twigs. The roots of saprophyte contain fungi that are capable of digesting the dead and decaying matter, which can be converted into useful material for the plant. Examples of saprophyte plants are fungi like mold, mushroom, yeast and many kinds of bacteria also.
4. Leguminous plants like kidney beans and peas need nitrogen in a soluble form as they cannot use nitrogen directly from the atmosphere. Rhizobium is bacteria that lived in the nodules of the roots of the leguminous plants that provide them nitrogen and in return the leguminous plants provide food and shelter to rhizobium. In this way, both organisms benefit each other.

5. The animals and non-green plants need nutrition from other plants because these show the heterotrophic mode of nutrition. Non-green plants do not have chlorophyll and cannot prepare their own food. Such plants depend on the food prepared by other plants. Human beings, animal and non-green plants depend directly or indirectly on green plants for food.

(E) Fill in the blanks with suitable (given) words :

1. carbohydrate 2. Bacteria 3. nutrients 4. harms 5. Mushroom

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

1. Chlorophyll—green colour of leaves
2. Stomata—Tiny pores on the lower surface of leaves.
3. Kitchen of plant—green leaves
4. Carbohydrate—simple sugar
5. Auto—self

(H) Activity :

Do yourself.

Chapter 2 : Nutrition In Animals and Human Beings

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

1. (b) 2. (a) 3. (b) 4. (a) 5. (a)

(B) Answer the following questions in very short :

1. Length of large intestine—1.5 Metre long.
2. Number of milk teeth—20.
3. Number of teeth an adult has—32.
4. Front four teeth of the upper jaw—Incisors.
5. Total number of molar teeth—12

(C) Short Answer Questions:

1. Animals on the basis of their eating habits can be classified as herbivores, carnivores and omnivores.
2. Herbivores animal bring back food in their mouth to chew again because the nutrients are remain locked mostly in cellulose cannot be digested by these animals and thus, the bacteria present in rumen helps in digestion of cellulose.
3. **Ingestion :** It is the process of taking food inside the body by an organism. The method of taking food inside the body is different for different organisms.
Egestion : The elimination of waste material (undigested or unutilized food) from the body is called egestion.
4. **Amoeba :** Amoeba is a microscopic single-celled organism found in pond and water. It has a cell membrane, a rounded, dense nucleus and many small bubbles like vacuoles in its cytoplasm.

5. Food is taken from the mouth and from there it passes through a number of organs in the body. These organs together form a food canal called the alimentary canal or digestive system or digestive tract.

(D) Long Answer Questions :

1. **Human digestive system:** Humans have well developed digestive system. Food is taken from the mouth and from there it passes through a number of organs in the body. These organs together form a food canal called alimentary canal or digestive system or digestive tract. Mouth, and mouth cavity, oesophagus, stomach, small and large intestines, rectum and anus are parts of alimentary canal. The other associated digestive glands with this system are salivary glands, liver and pancreas. These glands secrete digestive juices, which convert complex food substances into simpler ones. The process of breaking down food or digestion in both a mechanical and chemical process. Chemical digestion may primarily be attributed to enzymes which are basically proteins released by the body itself.
2. **Nutrition in amoeba:** Amoeba is a microscopic single-celled organism found in pond water. Amoeba feeds both on plants as well as microscopic animals making it an omnivore. It feeds on bacteria, minute algae, diatoms, microscopic animals like protozoa and nematodes and even dead organic matter. The Amoeba simply takes in food by the pseudopodia and then absorbing it through the cell wall. The indigested food is acted upon the digestive juice released by the food vacuole and broken down to assimilable nutrients. These nutrients directly mix with the cytoplasm and are used for the growth, maintenance, and reproduction of the organism.
3. Herbivores like buffaloes, cows, and other grass-eating animals chew continuously even when they are not eating grass. Some herbivores have a special structure in their stomach which is called the rumen. These animals quickly gather food, chew it rapidly, mix with saliva and swallow it hurriedly and then store it in rumen. The food is sent back to mouth in small bits and the animals chew the food. This process is called rumination and these animals are called ruminants.

The working of the ruminants complicated stomach consisting of four chambers – rumen, reticulum, omasum and abomasum. The first three chambers of the stomach help in the fermentation of cellulose. They contain a sac-like structure called Caecum at the junction of the small and large intestine. It contains certain bacteria that digest cellulose present in the food. Abomasum constitutes the real stomach where as rumen, reticulum, and omasum are considered as a part of the food pipe.
4. **Teeth :** Teeth are hard structures that are rooted in separate sockets in the gums. There are different types of teeth present in our mouth which are classified into different groups on the basis of their structure and functions:
 - (i) **Incisors :** The numbers of incisors are 8. 4 are present in front part of the upper jaw and 4 in the lower jaw. They are flat in shape. They help in biting and cutting of food and are known as cutting teeth.
 - (ii) **Canine :** They are 4 in numbers. Two canines are present on the upper jaw and 2 are present on the lower jaw and are arranged on either side of the incisors in each jaw. They are sharp and pointed in shape they are known as tearing teeth.
 - (iii) **Premolars :** They are 4 in numbers in each jaw and are present next to Canine making a total of 8 in numbers. They are broad and have almost flat surfaces.

They are also known as crushing or grinding teeth as they help in grinding and breaking food it into small pieces.

(iv) **Molars** : They are broader than premolars and are 12 in numbers. They are present on either side of premolars making 6 in numbers in each jaw. These teeth also help in grinding and crushing the foods.

(v) **Holozoic Nutrition** : The mode of nutrition that involves feeding on solid food by ingestion which is subsequently digested and absorbed is known as holozoic nutrition. Examples of Holozoic Nutrition are Protozoa such as Amoeba and all the animals like deer, cow, tiger, fox dog cat, pig, monkey, etc.

(E) **Fill in the blanks with suitable (given) words :**

1. amoeba 2. unicellular 3. cavity 4. four 5. liver

(F) **Say whether the following statements are True or False :**

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

(G) **Match the Following :**

1. Canines—4 in number
2. Milk teeth—20
3. Small intestine—coiled structure
4. Tongue—strongest muscle
5. Liver—largest gland

(H) **Activity :**

Do yourself.

Chapter 3 : Fibre to Fabric

(A) **Multiple Choice Questions :**

Tick (✓) the correct answer :

1. (b) 2. (c) 3. (b) 4. (c) 5. (c)

(B) **Answer the following questions in very short :**

1. Combination of synthetic and natural fibre—Rayon.
2. Fibre manufactured in Labs—is Synthetic Fibers.
3. Heart of spinning—Carding.
4. The process of making yarn from fibre—is pinning.
5. Rearing of silkworm—Sericulture.

(C) **Short Answer Questions:**

1. Silk is obtained from the silkworm and when a silkworm is going to turn into the moth it makes a protective wall around it which is called a cocoon. After it comes out to it, the cocoon shell is used as raw material to make silk. The rearing of silkworms for obtaining silk is called sericulture.
2. The sheep are sheared only once a year because sheep grow a wool coat once a year and the sheep do not need that much heavy coat on his body to remain cool in summers.
3. **Uses of Wool:**
 - (i) To make clothing
 - (ii) Used in carpets and furniture

- (iii) Wool is an excellent fiber to use in pads to soak up oil following a spill
- (iv) Used in heat insulators

4. Uses of Flax:

- (i) It is made for making papers similar to use in cigarettes which are very fine in quality
- (ii) It is also used for making ropes and bags.
- (iii) Flax seeds are used to obtain Linseed oil.

5. There are three types of Fibre:

Natural Fibre: Plant and Animal Fibre.

Artificial or Synthetic Fibre

Mixed Fibre

(D) Long Answer Questions :

1. Difference between Fibre and Fabrics :

- (i) Fibre is a basic filament from which yarn is spun. Fibre is further woven and molded into the term fabrics.
- (ii) A fibre is converted to yarn and yarn is converted to fabric.
- (iii) A yarn is threaded made out of fibre after due processes of combing and stretching. The thread is made (which is yarn) it is used to make fabric by the process of weaving.
- (iv) Fibres can be natural like cotton, flax, wool, silk, or synthetic such as polyester, nylon, etc. Fabrics around us are foot mats, carpets ropes, bags, etc.

2. The process of converting wool into the fabric: The major steps which are necessary to process wool from the sheep and convert that into the fabric are :

- (i) **Shearing**—The process of shearing takes place in summers or spring because sheep not need that much heavy coat on his body to remain cool in summer. Wool has air gaps, air trapped between them which keeps sheep warm that is a necessary thing for cold weather. The process of removing hairs is similar to the process of removing hairs from our heads.
- (ii) **Scouring**—The sheared skin with hair is thoroughly washed in tanks to remove grease, dust and dirt. This is called scouring. That is essential because sheep pick up contaminants such as dirt and also releases sweat and grease.
- (iii) **Sorting**—After the process, of scowing, the process of sorting takes place. In this process the hairy skin is sent to a factory where the hair of different textures are separated and sorted.
- (iv) **Carding**—It is also called the Heart of spinning. A set of processes is required to convert that tangled mass of scoured wool into a nice even smooth yarn. Aligning of wool fibers is done so they will be parallel to one another. This is done using a coarse comb. Carded wool to be used for woollen yarn sent directly for spinning.
- (v) **Spinning**—The process of making yarn twisting together of drawn out strands of fibers to form yarn. Spinning for woollen yarns is typically done on a mule spinning machine. The last step in producing yarn is what we call spinning two single yarns together by twisting them together to form say a two fold yarn or

higher increase the strength of the yarn weaving, dyeing and knitting are some other processes that fall into the queue in process of making woollen clothes.

3. The stages in the life cycle of a moth (silkworm) are the female silk moth lays 300 to 400 eggs at a time from which hatch larvae which are called caterpillar or silkworms. This is called the larval stage. The silkworm feeds on mulberry leaves. The silkworm secretes fine filaments from two glands on its head. The filaments are made of a protein that hardens to form silk fibers when exposed to air. The silkworm deposits filaments in layers around its body, through the figure of eight movements of the head forming a structure called cocoon the silkworm takes three to seven days to prepare the cocoon, formed about 20-39 concentric layers of a single thread.
4. **History of Clothing:** It is believed that clothing was invented more than 75000 years ago, for covering the bodies in ancient times people used to cover leaves, barks of the trees and the animal skins. It is not definitely known when human started to wear clothes but the uses of cotton have been found from early civilizations like Harappa and Nile river valley. Initially, people did not know how to stitch cloth and they use to wear unstitched clothes. Around 30,000 years ago man designed to make needle and started to stitch cloth. It was believed that China started to use of silk about 8,000 years ago. It was also believed that India and Egypt cultivated cotton around 4,500 to 5,000 years ago. In India, stitched clothes mainly came with Mughals. Today we wear stitched clothes in our daily life. Later with the advancement in technology and invention of various machines, the cloth starts getting prepared in various textures, colour and styles. Now has become a fashion and clothing industry called the textile industry.
5. Animals keep themselves warm in the extreme cold weather : They stay warm by growing a thick layer of fat, which acts as an insulator. This is due to the insulating properties of a layer of blubber (fat) under the skin. Blubber insulates in water, fur and feathers insulate in air. In the air, the skin temperature will often rise as it needs to lose heat.

(E) Fill in the blanks with suitable (given) words :

1. textile 2. natural 3. 9th 4. spinning 5. Laddakh

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

- | | |
|------------------------|--------------------------|
| 1. Wool—Sheep | 2. Flax seed—Linseed oil |
| 3. Cotton—Plant | 4. Silk—Silkworm |
| 5. Synthetic—Chemicals | |

(H) Activity :

Do yourself.

Chapter 4 : Heat

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. The phenomena of trade winds and ocean current is convection Currents.
2. Device to measure temperature—Thermometer.
3. Formula for converting °C to °F— $F = \left(\frac{9}{5} \times C\right) + 32$.
4. Thermometer used for measuring body temperature—Clinical.
5. A (liquid) good conductor of heat—is Mercury.

(C) Short Answer Questions:

1. **Convection Current :** The phenomenon of transfer of heat from hotter to colder place in liquid or gases is called convection of heat. This continuous process results in the formation of a current called Convection current.
2. **Temperature :** The temperature is the degree of coldness or hotness of the body. Temperature can also be considered as a quantity that determines the direction of the flow of heat when one hot body is kept in contact with cold or less hot body.
3. The clinical thermometer is used is designed to measure the temperature of the human body fever.
4. **Changes due to heat :** Heat caused expansion in all three states of matter. This is due to on increase in intermolecular space. Molecules in gases are arranged at a further distance from each other so the expansion will be the maximum at gas state. Liquid expands more on heating than solid as the arrangement of molecules is more spacious.
5. **Insulators :** Those substances that do not allow heat energy to flow through them are called bad conductors of heat and are called insulators. Substances like glass, plastic; rubber, wood etc. are examples of insulators.

(D) Long Answer Questions :

1. **Transfer of heat :** The flow of heat from a body at a higher temperature to another body or to another part of the same body at a lower temperature is called the transfer of heat.
 - (i) While cooking when we put a pan on the burning flames of the gas burner, the pan starts heating. This shows the transfer of heat from one body to another.
 - (ii) Take a spoon, hold it with bare hands from the top and put the lower part on the burning flames. After sometimes you will feel the spoon is getting hot. This shows the transfer of heat to another part of the body.

The transfer of heat takes place through different processes in different situations. The transfer of heat takes place in three modes: Conduction, Convection, and Radiation.

2. The three modes of transfer of heat with their applications are—

Application of Conduction : Handles of cooking utensils are made of bakelite, wood, rubber etc. because these insulators do not get hot and allow easy handling of hot utensils. Cooking utensils are made of metals such as brass and aluminum so that heat can easily get transferred to food. Mercury is used as a thermometric fluid. Woolen clothes in winter trap airfare between them providing insulation and do not

allow the body heat to escape out. Coils of the refrigerator and air conditioners are made of copper to conduct away heat.

Application of Convection currents : Convection current causes the phenomena of trade winds and oceanic currents. Ventilators and exhaust fans are usually near the ceiling of a room because the air we breathe out is warmer and lighter than ordinary air. It rises up and escapes through the ventilator or exhaust fan and cold fresh air enters through the windows. The oil we used in water boilers are central heating uses the principle of a convection current.

In nature convection current can be observed in the form of Sea Breeze and Land Breeze.

Application of heat radiation:

- (i) Light coloured clothes in summer keep us cool as they absorb less heat and keep our body cool.
- (ii) The dark coloured clothes are ideal for winters as they absorb heat and keep our body warm.
- (iii) The backs of the refrigerator are coloured dull black to radiate heat effectively and cool down the refrigerator pipes.
- (iv) Electric hot plates are coloured dull black to radiate maximum heat.
- (v) The outer base of a cooking utensil is painted black so that it absorbs more and more heat from the burner.

3. **Thermometer :** The temperature of an object or a body is measured by a device called thermometer. Thermometers are available in various currents and ranges but the most commonly used is mercury in glass for the clinical thermometer.

Laboratory Thermometer : Laboratory thermometers are mainly used in Laboratories. It is a long thin, uniform tube, bigger than a clinical thermometer and is mostly filled with Mercury. The range of the laboratory thermometer is generally from -10°C to 110°C . This thermometer is generally used in a vertical position and the bulb is not allowed to touch the base of the vessel.

Clinical Thermometer : Clinical thermometer is used to measure the temperature of the human body only. A clinical thermometer consists of a long, narrow, uniform glass tube. It has a bulb at one end. This bulb contains mercury. The rating scale from 35°C to 42°C is marked on the thermometer.

4. Converting the temperatures into Fahrenheit: we use the formula: $F = \left(\frac{9}{5} \times C\right) + 32$
- 1. 42°C —Solution $F = (9/5 \times 42) + 32 \rightarrow F = 75.6 + 32 \rightarrow 107.6^{\circ}\text{F}$
 - 2. 90°C —Solution $F = (9/5 \times 90) + 32 \rightarrow F = 162 + 32 \rightarrow 194^{\circ}\text{F}$
 - 3. 78°C —Solution $F = (9/5 \times 78) + 32 \rightarrow F = 140.4 + 32 \rightarrow 172.4^{\circ}\text{F}$
5. Converting the temperatures into Celsius: we use formula: $C = \frac{5}{9} (F - 32)$
- 1. 213°F —Solution $C = 5/9 \times (213-32) \rightarrow C = 0.555 \times 181 = 100.555^{\circ}\text{C}$
 - 2. 150°F —Solution $C = 5/9 \times (150-32) \rightarrow C = 0.555 \times 118 \rightarrow 65.555^{\circ}\text{C}$
 - 3. 33°F —Solution $C = 5/9 \times (33-32) \rightarrow C = 0.555 \times 1 \rightarrow 0.5555^{\circ}\text{C}$.

(E) Fill in the blanks with suitable (given) words :

1. fuel 2. water 3. radiation 4. three 5. laboratories

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

1. Oceanic currents—convection
2. Lord Kelvin—Kelvin scale
3. Radiation—no medium
4. Sun—natural source of energy
5. Laboratory thermometer—scientific purpose

(H) Activity :

Do yourself.

Chapter 5 : Acids, Bases and Salts

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. Salt used in photography—Silver Nitrate.
2. Acid produced in stomach—Mild.
3. A spice used as a natural pH indicator—Acidic or basic nature.
4. Red and blue litmus papers used as natural Indicator—Yes.
5. Lactic and uric acid—Organic acid.

(C) Short Answer Questions:

1. **Acid** : The word acid came from the Latin word *acere* which means sour. The substances that have sour taste generally contain acids in them like Lemon.
2. **Base** : The substance which is bitter in taste and feels soapy or slippery is called bases. The nature of these substances is called basic. If we touch baking soda will feel slippery and soapy.
3. **Indicators** : Indicators are substances that are used to test whether a substance is acidic or basic or neutral in nature. They change their colour when added to a solution containing an acidic or basic substance.
4. The natural indicators around us are—
 - (i) **Litmus** : Litmus is the acid- base based indicator. It is also the most commonly used natural indicator.
 - (ii) **Turmeric** : It is a spice. Turmeric is an example of a natural pH indicator.
 - (iii) **China rose**: It is a Natural Indicator which is used to check the solutions or substance whether it is acidic or basic in nature.
5. **pH scale** : pH scale is used as the measure of acidic or basic nature of a substance .and the results are written in the form of pH value. The pH value range from 1 to 14,

where 1 is considered the most acidic substance and 14 is being considered the most basic substance while 7 is considered as a neutral substance.

(D) Long Answer Questions :

1. The Difference between Acid and Bases are as follows :

| S.No. | Acids | Bases |
|-------|---|--|
| 1. | Acid is sour to taste. | Bases are bitter to taste. |
| 2. | Acids turn blue litmus red. | Bases turn red litmus blue. |
| 3. | Acids do not change the colour of red litmus | Bases do not change the colour of blue litmus. |
| 4. | With china's rose indicator, acids give dark pink color. | With china rose indicator, bases give dark pink color. |
| 5. | Acids do not change the colour of the turmeric indicator. | Bases turn the colour of turmeric indicator red. |
| 6. | Acids contain Hydrogen Ions (H^+) | Bases contain Hydroxyl Ions (OH^-) |

2. **Litmus :** Litmus paper is the acid- base based indicator. It is also the most commonly used natural paper indicator. The main use of litmus is to test whether a solution is acidic or basic. The litmus can be found in different species of lichens. It has a violet colour in distilled water. A natural dye extracted from lichens is dissolved in distilled water to obtain a litmus solution. Litmus Paper used as an indicator to check acidic and basic natures of a substance, when it is added to an acidic solution it turns red and when added to basic solution it turns blue. It is available in the form of a solution or in th form of strip of paper known as litmus paper. Generally, it is available as red and blue litmus paper.

3. The acids available around us can be categorized as—

- 1. Mineral Acids :** Mineral acids are also known as inorganic acids, which are derived from one or more inorganic compounds. It is a substance that produces hydrogen ions (H^+) in water solution and from which hydrogen may be displaced by a metal to form a salt. Some examples are Hydrochloric acid (HCl) and Nitric acid (HNO_3).
- 2. Organic Acids :** Organic acid is an organic compound that is characterized by weak acidic properties and does not dissociate completely in the presence of water. Examples of organic acids are Lactic acid, Acetic acid, Formic acid, Citric acid, Amino acid, etc. These acids found in citrus fruits, milk, curd, vinegar, etc.

Types of Bases are:

- 1. Strong Base :** A strong base is one that fully dissociates to give ions in solution. Strong bases have pH 10–14. Strong bases are highly reactive. The solution of a strong base has a higher electrical conductivity than that of a weak base.
 - 2. Weak Base :** Weak bases have pH of 7.3–10. Weak bases are less reactive than strong ones. The solution of a weak base has a lower electrical conductivity than that of a strong base.
4. **Neutralisation:** Neutralisation reaction is a reaction between an acid and a base. In this reaction both acid and base cancel each other's effect. Acid and base nullify each

other's effect and produce a salt and water. During this reaction, energy in the form of heat is evolved. Formula:



For example : When Sodium Hydroxide (NaOH) is added to Hydrochloric acid (HCl), Sodium Chloride (NaCl) and water (H₂O) are obtained. Formula: $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{Heat}$ where Na is used for sodium, O is for oxygen, Cl is a symbol for chlorine, H is for hydrogen.

5. When an acid reacts with a base. In this reaction both acid and base cancel each other's effect. Acid and base nullify each other's effect and produce a salt and water. During this reaction, energy in the form of heat is evolved.

Example : When Sodium Hydroxide (NaOH) is added to Hydrochloric acid (HCl), Sodium Chloride (NaCl) and water (H₂O) are obtained. $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{Heat}$ where Na is used for sodium, O is for oxygen, Cl is the symbol for chlorine, H is for hydrogen.

(E) **Fill in the blanks with suitable (given) words :**

1. acere 2. ammonia 3. artificial 4. lichens 5. pH

(F) **Say whether the following statements are True or False :**

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

(G) **Match the Following :**

1. Acid—sour
2. Base—bitter
3. Neutral—pure water
4. Natural indicator—turmeric
5. pH scale—1 to 14 range

(H) **Activity :**

Do yourself.

Chapter 6 : Physical and Chemical Changes

(A) **Multiple Choice Questions :**

Tick (✓) the correct answer :

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

(B) **Answer the following questions in very short :**

1. Changes in appearance only—Physical changes.
2. New substance is formed in—Chemical changes.
3. Process of digestion is—Digestive Process.
4. Photosynthesis is—to convert light energy into chemical energy.
5. Reversible change is property of—Physical Changes.

(C) **Short Answer Questions:**

1. There are mainly two types of changes are Physical Change and Chemical Change.

2. The mixing of salt and water together is a physical change because salt and water can be separated from each other.
3. The process of cooling a hot, concentrate solution of a substance to obtain crystals is called crystallisation. The process of crystallisation is used to obtain large crystals of a pure solid substance from the impure solid substance.
4. The solid particles having flat surfaces, straight edges and regular shapes are called crystals.
5. **Equation of Rusting :** The process of rusting can be represented by the following equation:

$$\text{Iron (Fe) + Oxygen (O}_2\text{) (From air) + Water (H}_2\text{O) } \rightarrow \text{Rust (Iron oxide, Fe}_2\text{O}_3\text{)}$$

(D) Long Answer Questions :

1. The need of making stainless steel because of rusting of ships is a major problem in the shipping industry as the body of a ship is always in contact with water and the air around it is also very humid. The salt in water speeds up the process of rusting. Rusting of iron can be prevented by using alloy of iron in making of ships. Stainless Steel is made by an alloy of Iron, Chromium, Manganese, Nickel, etc. These can be mixed in any proportion on the basis of the requirement. They together make Stainless steel.
2. The differentiate between Physical and Chemical Changes are as follows :

| S.No. | Physical Changes | Chemical Changes |
|-------|--|--|
| 1. | The molecular composition of a substance remains the same. | The Molecular composition of a substance completely changes. |
| 2. | No new substance is formed. | A new substance is formed or more than one substance is formed. |
| 3. | Physical change is reversible. It can be reversed. | Chemical change is irreversible. |
| 4. | Physical change is a temporary change. | Chemical change is a permanent change. |
| 5. | Physical change involves very little to no absorption of energy. | During chemical reaction, absorption and evolution of energy take place. |
| 6. | Physical change affects only physical properties. | Chemical change affects both physical and chemical properties. |

3. **Rusting of Iron :** Rusting is occurs in the presence of both oxygen and water. The more humid the air, the faster the rusting occurs. When an iron object is left exposed to moist air, it chemically reacts with oxygen and water in the air to form a red brown flaky substance called rust.

Prevention of Rusting : Rusting can be prevented by not allowing the iron to come in contact with moisture and air. The simplest method is to coat the iron with oil, grease or paint. These coats should be applied regularly to prevent rusting. Galvanisation is another method by which we can prevent iron from corroding and it is very effective and a proven scientific method. A coat of another metal such as zinc or chromium is put on iron.

4. The evaporation (to dryness) is not a good technique of separation because:
1. The soluble impurities do not get removed in the process of evaporation of a salt solution. So the salt obtained by evaporation is not pure.
 2. The crystals of salt obtained by the process of evaporation are small and the shape of crystals cannot be seen clearly.
 3. Large crystals of pure substances can be obtained from their solutions by the process of Crystallisation.
5. The sign of Physical and Chemical Changes are
- (i) **Physical Changes :** The change in a substance does not occur on its own. There is always a cause that brings about a change in a substance. Physical changes are the changes in appearance only, a new substance is not created and no chemical bond is formed or broken. Properties such as shape, size, colour, and state of a substance are called its physical properties and changes in such properties are called as Physical change. For example Ice does not melt on its own to form water. Ice must be given some heat to melt and change into water. Thus, heat is the cause of the changing state of ice from solid to liquid.
 - (ii) **Chemical Changes :** The changes which are chemical changes, on the other hand create a new substance it involves breaking or making chemical bonds between atoms. The internal properties of a substance are known as chemical properties. For example curd is the product of milk but the internal properties of milk and curd are completely different. The changes in a temperature change without heating or cooling, a change in colour, formation of a solid (ashes) as residue are the indicator of chemical change.

(E) Fill in the blanks with suitable (given) words :

1. melting 2. heat 3. salt 4. chemical 5. alloy

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

1. Iron—Fe
2. Oxygen—O₂
3. Water—H₂O
4. Rust—Fe₂O₃
5. MgO—magnesium oxide

(H) Activity :

Do yourself.

Chapter 7 : Weather, Climate, and Adaptation to Climate

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. Long sleep in winter—Hibernation.
2. Long sleep in summer—Aestivation.
3. Instrument to measure rain—Millimetres (MM).
4. Instrument to measure humidity—Hygrometer.
5. Earth rotates on its—Axis.

(C) Short Answer Questions :

1. Difference between weather and climate:

- (i) **Weather :** The condition of the atmosphere at a particular place and at a particular time is known as weather.
- (ii) **Climate :** Climate is an average condition of the weather in an area for a period of years.

2. Migration : Migration is the movement of either people or animals from one area to another. Migration can be used for the journey from one place to another.

The reason for the migration of birds and animals: The birds migrate to other areas in the extreme winter season to survive. These birds are called migratory birds.

3. Hibernation : The animals like a frog, fall into a sleep—like state in winter, which is known as hibernation.

Reason for Hibernation. The animal's body temperature drops to match the outside temperature and a way to adapt to their surroundings. They have to be able to survive the cold weather. They hibernate to escape the cold and because the food is scarce in cold season.

4. Aestivation : It spends most of the hot summers sleeping away called aestivation i.e. state of animal dormancy.

Reason for the Aestivation. The animals living in a hot and dry climate in deserts or tropical areas and as well as due to the lack of food and water in those dry regions goes to sleep for the summer period.

5. There are several primary conditions of the atmosphere known as elements of weather. The temperature, humidity, wind and other factors are the elements of weather.

(D) Long Answer Questions :

1. The Need for Adaptation: An adaptation is a modification or change in the organism's body or behaviour that helps it to survive. The natural habitats of animals learn to adapt to live in places they are adapted to. Some of the adaptations are as follow :

Adaptation of Animals in Polar Regions—The areas near the North and South poles of the earth are known as Polar Regions. These regions are covered with snow for most of the time in a year and are extremely cold. Animals living there adapted to these severe conditions. Animals like polar bear, penguin, seals etc. are found in those regions.

Adaptation of Animals in Tropical Rainforest—These regions get heavy rainfall and are therefore called Tropical rainforests and because of the availability of plenty of water and food a large number of animals live in the rainforest. Due to the large variety of animals present, there is intense competition for food and shelter. So in order to get food, to hide and to protect themselves, they need to have some adaptations. **For example** Lion, tiger, deer, snake, frog, insects, birds, etc. are found in a tropical rainforest.

Adaptation of Animals in Desert Regions—The climate of desert is very hot and dry. There is a scarcity of water in the desert region because it receives a very little amount of rainfall. There is a scarcity of water. Hardly any trees are found in desert regions because of the scarcity of water. **For example** Camel, ground squirrel, desert snake, etc.

2. **Adaptive feature of polar bear :** The polar bear's body is covered with dense, fine fur that traps air and creates insulation. They have a thick layer of fat under their skin called blubber. On hot days they swim to keep them cool and are good swimmers. They can close its nostrils and remain underwater for a long time Polar bears have adapted mainly to carnivores food habit because no plant are available in polar regions. Polar bears have a good sense of smell that helps them to catch their prey.
3. The tropical regions are located between the Tropic of Cancer and Tropic of Capricorn. These regions get heavy rainfall and are therefore called Tropical rainforests and because of availability of plenty of water and food a large number of animals live in the rainforest. Due to large variety of animals present, there is intense competition for food and shelter. So in order to get food, to hide and to protect themselves, they need to have some adaptations.
4. The Sun is a huge sphere of hot gases at a very high temperature. Sun rays fall vertically near the equator. The equator receives more sunlight throughout the year. If a particular area is closer to the equator it receives more sunlight and an area farther from the equator it receives less sunlight. Places near the equator are warmer and places far from the equator are cooler.
5. The weather forecast reports tell us about the conditions of the day like rainfall, hot and sunny day, cloudy weather or the freezing temperature. The prediction made by the Meteorologists by reading and understanding the movement of clouds and air current over the earth, by the satellite is called Meteorology. These weather predictions help us prepare for future events accordingly.

The weather forecast includes not only high or low temperature conditions but it also includes predictions about the cyclones, floods, drought, tornado, thunderstorm, lighting and other natural disasters also. These weather forecasts also give the timings of sunrise, sunset, moonrise and moonset.

(E) Fill in the blanks with suitable (given) words :

1. sun 2. venus 3. flightless 4. western 5. ears

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

1. Penguins—flightless birds
2. Elephant—trunk
3. Polar bear—white colour
4. Rainfall—rain gauge
5. Aestivation—ground squirrel

(H) Activity :

Do yourself.

Chapter 8 : Wind and Natural Disaster

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. Natural disaster—Earthquakes, drought, flood etc.
2. Instrument for measuring atmospheric pressure—Barometer.
3. Thin layer of air surrounding our Earth—Air Pressure.
4. Only planet supporting life—Earth.
5. Fast moving air—Wind.

(C) Short Answer Questions:

1. **Barometer :** The speed of the wind is measured in kilometers per hour (kph) and the instrument used to measure atmospheric pressure is called a barometer.
2. **Wind :** The moving or free—flowing air is called wind or breeze.
3. **Atmosphere :** Air is a natural resource. We cannot see or touch air but we can feel it around ourselves. Earth is surrounded by a thin layer of air which is called the Atmosphere.
4. **Natural disaster :** The sudden change in nature that brings large scale of destruction to life and property is termed as Natural disaster. Destruction can be caused by earthquakes, tornados, cyclones, floods, droughts, etc.
5. The best way to save your self during a tornado is a tornado shelter, which is an underground room with no windows.

(D) Long Answer Questions :

1. The Monsoons are a result of the uneven heating of land and sea surfaces due to the rising and falling wind currents. In India the summer heating of the Indian mainland brings in the moisture-laden wind from the Indian Ocean. Most of Indian agriculture is based on showers. In winters the cold air from the northern plains makes way for the moisture laden warmer air from the Arabian Sea and the Bay of Bengal.
2. **Generation of Wind Currents :** Wind current sare generated due to uneven heating on the earth. Wind current is generated under the following two situations:

The first situation for the generation of wind currents is uneven heating between the equator and the poles. The rising warm air and the falling cool air leads to a low pressure area near the Earth's surface, leading to the development of convection currents.

The second situation for the generation of wind currents is uneven heating of land and water. Land and sea breeze is created due to the wind currents. The land gets heated up faster than the sea, thus heating the air above the sea is cooler than the land and so is the air above it flows in towards the land occupy the low pressure area created by the warm land breeze.

3. The gases in the atmosphere constantly exert pressure on the surface of the earth which is termed as atmospheric pressure. **For example:** When we fly a kite, the wind coming from our back helps the kite to fly higher and higher. When the balloons filled with airburst, the air inside them is released with a loud sound. The air exerts pressure in all directions.

- (i) **Air pressure and wind**—The greater the difference in air pressures, the faster the air moves. The movement of air from the higher pressure area to the low pressure area causes wind currents. Air pressure depends upon the speed of the wind.

- (ii) **Air pressure and temperature**—Air pressure depends on temperature. Air expands on heating and became lighter. This air is less dense than the air at cooler temperatures. This air therefore, exerts less pressure.

4. The differentiate between cyclone and tornado are mentioned below—

Cyclone—The term cyclone is associated with the circulatory movement of fast moving air that is wind in the tropical region. A cyclone is a huge revolving storm caused by very high/speed winds blowing around a central area of low pressure zone over the ocean. A large cyclone is violently rotating mass of air in the atmosphere, 10 to 15 kilometre high. Cyclones are powerful storms and so huge that they can wipe out cities at a go. Usually, tornado is formed over the area on land where there is warm and moist air near the ground and dry cold air above it.

Tornado—A tornado is a violently rotating column of air extending from a thunderstorm to the ground. A tornado is a dark funnel shaped cloud that reaches from the sky to the ground. The narrow end of the funnel will move over the earth whipping back and forth like tale. The most violent tornadoes are capable of tremendous destruction with wind speed of up to 162 to 480 kilometres per hour. A tornado can destroy a whole city within seconds. Cyclones usually occur in the latter part of the summer season in tropical regions.

5. **Thunderstorm**—Thunderstorm is a severe atmospheric disturbance that caused high speed stones accompanied by lightning. Thunderstorms most frequently occur in the tropical climate. The high temperature in these areas produces strong upward rising winds and carries water droplets with them. These water droplets freeze in the upper atmosphere and fall down. The simultaneous movement of falling down of frozen water droplets along with the rising of air causes lightning. Lightning heats the air in the path so quickly that a loud sound is produced that we hear as thunder. The upward movement of hot air and downward movement of cold air lead to stormy winds along with rainfall, lightning and thunder, together called as a thunderstorm.

Precautions—Do not lie on the ground. Do not take the shelter under an isolated tree. If you are in a forest take shelter under a small tree. Make distance with metallic materials like umbrellas. Stay inside the house during lightning and stay away from water.

(E) **Fill in the blanks with suitable (given) words :**

1. life 2. wind 3. surface 4. Richter 5. flood

(F) **Say whether the following statements are True or False :**

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

(G) **Match the Following :**

1. Disaster warning system—DWS
2. Atmosphere—mixture of gases
3. Speed of wind—kph
4. Fast moving air—wind
5. Earthquake—a natural disaster

(H) **Activity :**

Do yourself.

Chapter 9 : Soil

(A) **Multiple Choice Questions :**

Tick (✓) the correct answer :

1. (b) 2. (c) 3. (c) 4. (b) 5. (c)

(B) **Answer the following questions in very short :**

1. Overgrazing by cattle causes—Soil Erosion.
2. Soil is dark in colour because of—Humus.
3. Soil suitable for pottery—Clayey soil.
4. Sandy soil is found in—Desert.
5. Layer under the horizon C—Bedrock.

(C) **Short Answer Questions:**

1. Soil is very important for plants. The vertical section of soil showing different layers of composition is known as the soil profile.
2. The mineral presents in the soil are nitrate, sulphate, phosphate, sodium, potassium, magnesium and iron.
3. **Soil erosion :** Soil can be blown away by wind and can be washed away by the flood. This is called soil erosion. The large scale of deforestation many areas are suffering from soil erosion.
4. The difference between clayey and loamy soils are as follows—

Clayey Soil : Clay is the smallest particle in the soil. Clay soil has a high proportion of smaller particles. Soil rich in clay particles is known as heavy soil. It can retain water for a long time and remain wet. This soil is most suitable for making toys and pots.

Loamy Soil : This soil is a mixture of sand, clay and silt. It has an equal amount of all the particles. This soil is rich in nutrients and minerals and can hold water. This soil is considered suitable for agriculture.

5. **Soil Pollution :** Human activities are causing an increase in pollution of soil. Increasing pollution makes the soil too acidic or too basic for agriculture. Dumping of non- biodegradable waste like plastic and polythene pollutes the soil and air as well.

(D) Long Answer Questions :

1. **The properties of soil are as follows—**

- (i) **Colour—**The more humus, the darker the colour of the soil. Loamy soil is dark in colour because it is rich in humus which is suitable for agriculture purpose, whereas clay soil is grey in colour indicating the absence of minerals and nutrients.
- (ii) **Absorption of Water—**Sandy soil cannot hold much water because of the large spaces between the soil particles. Clay soil holds a lot of water. Clay soil results in waterlogging. Waterlogging is the collection of stagnant water above the soil whenever it rains.
- (iii) **Retention of Water—**The most important property of soil is that it can retain water. For good soil it should not only retain water but also it should allow water to percolate and does not let the water to stagnate. The amount of water that can pass through the soil is the percolation rate of the soil. For ideal soil, water should be absorbed easily as well as held by the soil. The water under the ground is collected by the rainwater that percolates through the soil.

2. **Soil erosion and its Prevention—**Soil can be blown away by wind and can be washed away by flood is called soil erosion. The roots of trees hold the soil tightly and prevent soil erosion. In the absence of plants, soil becomes loose. Soil erosion is one form of soil degradation along with soil compaction, low organic matter, loss of soil structure, poor internal drainage and overgrazing by cattle on a particular place also result in soil erosion. Soil erosion can be prevented by planting more and more trees.

3. The maximum amount of water that a given soil can retain is called field capacity, whereas a soil so dry that plants cannot liberate the remaining moisture from the soil particles is said to be at wilting point. The process by which soil absorbs water and water drains downwards is called percolation.

4. **Humus—**Small plants like mosses, ferns and lichens grow in small pieces of rocks. When they die, they mix with the soil and are decomposed by a microorganism. Micro-organism help information about soil and enriching its nutrient value. Decomposed plant and animal remain mix with broken particles and form Humus. Humus makes the soil fertile and improves the water holding capacity of the soil.

5. Soil is very important for plants. Plants not only take water from the soil but also take minerals from soil. Soils in different places have different compositions. The vertical section of soil showing different layers is known as the soil profile. Each different section of the soil is called a horizon.

Horizon A—The uppermost layer of the earth is known as topsoil. This layer is composed of organic materials which are composed of dead remains of plants and animals. The humus is rich in minerals and nutrients and is very essential for the

growth of the plants. This layer is generally dark in colour and is loosely packed. It is also the habitat for many tiny creatures such as earthworms, rodents, beetles and moles.

Horizon B—This layer is below the topsoil and is known as subsoil. It is lighter in colour due to the absence of humus. In this layer the soil is more tightly packed and is comparatively harder. It contains more stones and sand particles which is not suitable for the growth of plants.

Horizon C—This is the lowermost layer of soil. It is also called parent rock. It consists of small lumps of rocks with cracks. It lacks any organic matter and plant roots cannot penetrate this layer. Under this layer, the layer is the bedrock which is solid and non-porous. It is composed of very tightly packed rocks.

(E) Fill in the blanks with suitable (given) words :

1. breaking 2. top 3. sandy 4. tightly 5. air

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

1. Horizon A—uppermost layer
2. Horizon B—Subsoil
3. Horizon C—Parent rock
4. Clayey soil—Pottery and toys
5. Soil formation—Weathering

(H) Activity :

Do yourself.

Chapter 10 : Respiration in Organisms

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. Fishes respire through—Gills.
2. Earthworms respire through—Skin.
3. Amphibians respire through—Lungs.
4. Respiration in presence of oxygen—Breathe.
5. Respiration in absence of oxygen—No life.

(C) Short Answer Questions:

1. Breathing rate refers to the number of breaths (inhalation and exhalation) per minute. One inhalation and one exhalation constitute one breath.
2. Stomata are made of two guard cells. The expansion and contraction of guard cells cause the opening and closing of the stomata.

3. Alike all other living cells of the plant, the root cells also need oxygen to generate energy. The tiny hair called root hair which is present on the root takes up the oxygen present in between soil particles by the process of diffusion.
4. In Aerobic respiration, there is complete oxidation of glucose because it happens in the presence of oxygen. A higher amount of energy is released during aerobic respiration and it is a better mode of respiration in terms of efficiency.
5. In Anaerobic respiration, there is incomplete oxidation of glucose because it happens in the absence of oxygen. A less amount of energy is released during anaerobic respiration and it is a lesser efficient mode of respiration.

(D) Long Answer Questions :

1. The difference between breathing and cellular respiration—

Breathing : It is the external respiration. It is the exchange of gases the breathing in of oxygen and breathing out of carbon dioxide. Breathing is necessary and is a continuous process for the survival of the living organism. Breathing mainly consists of two steps: Taking out of air rich in oxygen into the body from the external environment is called inhalation. Taking out of air rich in carbon dioxide from the body to the external environment is called exhalation.

Cellular Respiration : It is internal respiration and the utilization of oxygen at every cell for the oxidation of food. Cells are the building blocks of all living organism. A cell carries out all the basic life processes that are essential for the survival of an organism. The body continuously carries out respiration at the cellular level even while we are in sleep. In order to perform these functions cell need energy. The glucose obtained as the end product of digestion combined with oxygen and is broken down into carbon dioxide and water along with the release of energy.

2. **Human Respiratory System**—The human respiratory system is composed of the following organs like nasal cavity, pharynx, larynx, trachea, bronchi, and lungs.

Nasal cavity—The hollow space inside the nose is called the nasal cavity. We breathe air through the nose. There are numerous hairs inside the nasal cavity that trap dust and prevent them from entering further. The nasal cavity secretes mucus to keep itself wet.

Pharynx—It comes after the nasal cavity. There is a common opening for the pharynx and buccal cavity. This is a kind of safety mechanism because it allows breathing even in the case of a blocked nose.

Larynx—The larynx comes after pharynx.

Trachea—Trachea is composed of a cartilage ring and starts from the throat. Because of the cartilage, trachea does not collapse in the absence of air in it. The trachea is also called the wind pipe.

Bronchi—Trachea is further branched into two bronchi, with each bronchus going to a lung.

Lungs—There are two lungs, viz. the left and the right lung. The Lung is a big sac-like structure and is pink in colour. Inside the lungs, bronchus if further divided into many bronchioles. Bulbs like air sacs are found at the end of bronchiole. Air sacs are called alveoli. Alveoli are made of very thin members because of this oxygen readily

goes to blood and carbon dioxide readily from blood to alveoli. Each lung contains about 300 million alveoli.

3. **Respiration of plants :** Plants are the source of oxygen on earth. They produce oxygen through the process of photosynthesis. But like all living organisms plants also carry out respiration. The exchange of gases in plants takes place at stomata present in the leaves. This occurs due to the supply of moisture and light. Plants do not need much oxygen for respiration helps the rate of respiration in plants is slower than that in animals. Like animals plants also release carbon dioxide, water and energy as by-products. The stems of woody plants have a special opening called lenticels for gaseous exchange.
4. The increase in physical activity during exercise and muscle cells respire more than they do when the body is at rest. The heart rate increases during exercise. The rate and depth of breathing increases and this make sure that more oxygen is absorbed into the blood, and more carbon dioxide is removed from it.
5. **Earthworms**—Earthworms use their moist skin as a respiratory organ the gases are transported in and out of its body through a system of capillaries.

Amphibians—Amphibians like frogs can breathe through lungs as well as moist skin. On land, they respire through the lungs and when they are in the water they respire through their skin.

(E) Fill in the blanks with suitable (given) words :

1. food 2. oxygen 3. cells 4. nasal 5. moist skin

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

- | | |
|------------------------|-------------------|
| 1. Cockroach—spiracles | 2. Plants—stomata |
| 3. Snake—lungs | 4. Fish—gills |
| 5. Earthworm—skin | |

(H) Activity :

Do yourself.

Chapter 11 : Respiration in Plants

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. Fluid component of blood—is blood plasma.
2. Solid component of blood—are red blood cells (RBC).
3. Arteries, veins and capillaries—are blood vessels.
4. Red pigment in RBC—hemoglobin.
5. Loss of excess water in plants—called transpiration.

(C) Short Answer Questions :

1. **We need materials for transportation** because all living organism need food, water and oxygen for survival. To stay alive, they need to transport food, water and oxygen from one part of body to another. Food and oxygen are transported to all the cells in the body for respiration and growth.

2. The difference between Arteries and Veins are as follows—

Arteries—Arteries are the blood vessels that carry blood from the heart to the various parts of the body. All arteries except the Pulmonary artery carry oxygen—rich blood. These are deep seated in the skin and are not easily seen.

Veins—Veins are blood vessels that carry blood from all parts of the body back to the heart. Always accept pulmonary vein carry carbon dioxide – rich blood. These are located closer to the surface of the skin. The greenish blue line in our arms and legs we observed our veins.

3. The heart is divided into four chambers. The upper two are called Auricles and the lower chambers are called ventricles.

4. **Advantages of transpiration**—During night stomata remain close and it is very little or no water loss occurs. Transpiration helps water to rise from the xylem of the roots up to the tip of the plant. It also helps in removing excess of water absorbed and provides a cooling effect to the plant.

Disadvantages of transpiration—During the daytime, the stomata remain open and therefore the loss of water through the process is called transpiration. The excess loss of water on the increased rate of transpiration reduces the rate of photosynthesis and growth of plant. If excess water loss occurs on the leaves, stem and flowers to drop.

5. **The blood consists of two components**—

(i) Fluid component—blood plasma.

(ii) Solid Component—Blood cells which include red blood cells (RBC), white blood Cells (WBC) and platelets.

(D) Long Answer Questions :

1. **Transportation system in Plant**—Plants need water, mineral and food to survive. They absorb water and minerals from the soil through roots. These are transported to the leaves for the preparation of food by the process of photosynthesis. In plants, therefore two types of substances are transported—water and minerals from the soil through the routes into the plant body and movement of food prepared in the leaves to other parts of a plant. The plants have a well-developed vascular system with pipe like conducting tubes all the xylem and phloem. Xylem transports water and phloem transports food throughout the plant body. The medium of transportation in the plant cells is a whitish fluid called sap. The water enters the roots through a semi permeable membrane. The upward movement of water and mineral salts is called ascent of sap and the food is transported in all direction and all the sides to various plant parts called translocation.

2. The various life processes take place in the body. Our body produce a large amount of waste. The processes such as cellular respiration that use a food digested by the digestive system, required chemical reactions. These chemical reactions also produce waste that has to be thrown out of the body. These waste products are very harmful to the body if not excreted.
3. **Structure of Heart**—It is a pumping organ, located in the chest cavity almost in the middle, with a slight tilt towards the left. It is the size of the fist and beats to pump blood. The heart is divided into four chambers. The upper two are called Auricles and the lower chambers are called Ventricles.

Functioning of heart. The functioning of Heart is the right auricle receives carbon dioxide rich blood from various body parts. It also brings blood to the right ventricle. Left auricle received oxygen rich blood from the lungs and pumps blood to the left ventricle. The right ventricle pumps blood to the lungs and the exchange of gases takes place at the lungs. The left ventricle pumps the oxygenated blood to the rest of the body. The valves between them flow of blood. A thick valve called the septum divides the left and the right side of the heart preventing the mixing of blood.

4. **Blood :** Blood is a red coloured fluid that flows in blood vessels. The main constituents of blood are as follow—
 - (i) **Blood Plasma**—The fluid part of the blood is called plasma. It is yellowish in colour and contains about 90% of water, and the remaining 10% consists of various dissolved matter. It takes about 55% of the total blood.
 - (ii) **Red Blood Cell (RBC)**—The red blood cells are disc-shaped. The red blood cells are red in colour due to the presence of a red pigment called hemoglobin. It absorbs oxygen and transports it to the cells all over the body. It binds with oxygen and forms a compound called oxy-hemoglobin.
 - (iii) **White Blood Cell (WBC)**—They are slightly bigger in size than red blood cells. There are fewer in number than red blood cells and colorless.
 - (iv) **Platelets**—They are tiny, irregular, square or star shaped structures formed in the bone marrow. They are the smallest in size. Whenever there is a bound on the body they help in the clotting of the blood. They block the flow of blood and prevent blood loss.
5. **Human excretory system :** The wastes apart from carbon dioxide are carried to the urinary system. The controlling centre of the urinary system is the kidneys. There are located just above the waist, on either side of the backbone. The kidneys contain very fine capillaries that contain a large number of nephrons. These nephrons are the filtering units of the kidney. Blood passes through these nephrons, which reabsorb salts, water and other useful substances from this blood and passes the waste in the form of urine. The urinary bladder collects the urine through the ureter and it is thrown out of the body through the urethra.

(E) **Fill in the blanks with suitable (given) words :**

- | | | | | |
|------------|----------|--------|-----------|----------|
| 1. survive | 2. xylem | 3. 3—5 | 4. plasma | 5. sweat |
|------------|----------|--------|-----------|----------|

(F) **Say whether the following statements are True or False :**

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

(G) Match the Following :

1. Loss of excess water—transpiration
2. Yellowish colour—plasma
3. Transports food—phloem
4. Blood cell—RBC
5. Transport water—xylem

(H) Activity :

Do yourself.

Chapter 12 : Reproduction in Plants

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

1. (a) 2. (c) 3. (a) 4. (a) 5. (c)

(B) Answer the following questions in very short :

1. An agent of pollination—Wind, Water, Birds, insects.
2. An agent of seed dispersal—by Water, Animal, Wind, Explosion.
3. Another name of sepals—Calyx.
4. Fusion of gametes results in—Rise of a new plant only.
5. Coconut is dispersed by—Water.

(C) Short Answer Questions :

1. The ability to produce new young ones is called reproduction. Reproduction is a process by which an organism produced its own kind of individual.
2. **Agents of pollination :** Aspirants are not mobile so they need help from agents of pollination to facilitate cross pollination. Some of the agents of pollination are – wind, insects, water and bird.
3. **Germination :** Germination gives rise to a new plant only if the conditions are favourable, or else it stays in a dormant state.
4. All living beings reproduce to continue their race. Reproduction is essential for every species to maintain its number.
5. **Fertilization**—The process of fusion of male gamete with female gamete is called fertilization.

Germination—A seed can be germinated or give rise to a new plant if the conditions are favourable, or else it stays in a dormant state.

(D) Long Answer Questions :

1. **Pollination**—The transfer of pollen grains to the stigma of the pistil is known as pollination. It is carried out by many agents of pollination. There are two kinds of **pollination** : Self-Pollination and Cross Pollination.
 - (i) **Self-Pollination**—A type of pollination in which the pollen grains are transferred to the stigma of the pistil of the same flower.

- (ii) **Cross Pollination**—The process in which the pollens are transferred from the anther of one plant to the stigma of another plant.

Dispersal of seeds—In nature, a large number of seeds are produced by a plant. Therefore, seeds need their dispersal to grow into new plants at new places. There are many agents of seed dispersal that carry seeds over a wide area. Animals, water wind and self-explosion are some of the agents of dispersal of seed.

- 2. **Asexual Reproduction** : In asexual reproduction, vegetative plant parts produce a new offspring. There is no gamete formation during asexual reproduction. Some methods of asexual reproduction of plants include budding, fragmentation, spore formation, and vegetative propagation.

- (i) **Budding** During budding small bud arises from the mother cell. The bud grows and breaks off from the mother cell. The bud grows in size until it forms a full grown organism and then separate from the parent plant. The separated bud then leads a separate independent life. Budding is seen in many unicellular plants.

- (ii) **Fragmentation**—It is a mode of reproduction in lower plants such as green algae where the body of the parent breaks into smaller pieces, each of which grows into a new organism.

- (iii) **Spore formation**—The non-flowering and seedless plants like mosses and many fungi by the formation of spores. Spores are tiny, spherical, single-celled bodies that have a thick protective coating. When the condition becomes favourable, that thick coating break upon and the spores germinate to produce a new plant. These spores are very light and get easily dispersed to distant places with air.

- (iv) **Vegetative propagation**—When the new plant arises from one of the vegetative parts of the plant, it is called vegetative propagation. Roots, stem or leaves are the vegetative parts of the plant used for reproduction. Natural and artificial are two methods of vegetative propagation.

- 3. **Sexual Reproduction** : In sexual reproduction, reproductive plant parts produce a new offspring. Sexual reproduction involves the formation of male and female gametes and the fusion of those gametes leads to the formation of a zygote which gives rise to the new plant. In sexual reproduction characters from two different parents convert to create an offspring it can lead to the emergence of variations and the emergence of a new species. There are two types of flowers – bisexual flowers and unisexual flowers.

- (i) **Bisexual Flowers**—Bisexual flowers also known as complete or hermaphrodites have both the male and the female parts on them. Mustard, China rose, sunflower and pea produce bisexual flowers.

- (ii) **Unisexual Flowers**—The unisexual flowers also known as incomplete flower has only the male or female reproductive organs. Corn, papaya, mulberry and cucumber produce unisexual flowers.

- 4. **Formation of seed and Fruits**—When the pollen falls on the stigma, the pollen grains germinate and pollen tubes are developed. Pollen tube smock down into the ovary and one pollen tube reaches the ovule. The female gamete is present inside the

ovule. Finally, the male gamete fuses with the female gamete thus fertilization occurs. After the formation of a zygote, the other parts like sepals, petals, stigma and stamen fall off. The flower loses its bright colour. Only the ovary persists. The ovules containing stored food convert into seeds. The seed develops from the ovules contain an embryo enclosed in a protective seed coat. As the seeds form the ovary begins to swell and becomes a fruit. Thus the fruit is a matured ovary. Some fruits show a single seed while many others show multiple seeds.

(E) Fill in the blanks with suitable (given) words :

1. antheridium 2. mother 3. gamete 4. oxygen 5. zygote

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

1. Eyes—potato
2. Yeast—bread mould
3. Fertilization—fusion of male and female gametes
4. Sexual reproduction—higher plants
5. Asexual reproduction—lower plants

(H) Activity :

Do yourself.

Chapter 13 : Motion and Time

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

1. (b) 2. (b) 3. (c) 4. (c) 5. (b)

(B) Answer the following questions in very short :

1. Total Distance covered/Total time taken—Speed
2. Speed = Distance/Time.
3. Devices near to the steering of the car is named as—Speedometer.
4. Bob swings in which motion—Oscillatory or Periodic motion.
5. A pendulum consists of—Small Matallic Ball.

(C) Short Answer Questions :

1. **Speed** is a measurement of how fast an object moves relative to a reference point. Speed is a scalar quantity because it can be measured in a numerical value. The basic unit of speed in the metric system is metre per second (m/s).
2. **Sundial**—It used the position of the sun to depict time. In a sundial, the movement of the shadow of a rod that is stuck upright in the ground is used. Its shadow changes direction with the movement of the sun, across the sky.

3. **Velocity**—Velocity is defined as a vector measurement of the rate and direction of motion or the speed at which something moves in a particular direction. For example, a car is going at about 50 miles per hour in the right direction.
4. **Sand clock (hourglass)**—It uses sand to measure time. The hourglass consists of 2 rounded glass bulbs connected by a narrow neck of the glass. The top bulb is filled with sand and measures the amount of sand streamed down from the top bulb to the bottom bulb.



5. **Nano-second**—The clock can measure time in Nano-second. Nano-second is one billionth part of the second.

(D) Long Answer Questions :

1. **Uniform Motion**—When an object is moving at a constant speed in a straight line is called a uniform motion. For example: if a car manages to move at a speed of 10 km/hr. for a distance of 50 kilometre through its motion irrespective of the hurdles and all the uneven surfaces.

Non-Uniform Motion—When an object covers unequal distances in equal interval of time throughout its motion is called non-uniform motion. For example: The car manages the speed, up and down at many places throughout its motion irrespective to cross the hurdles and all the uneven surfaces.

2. There were different types of time measuring devices that were used to measure the time. Some of them are :
 - (i) **Sand clock (hourglass)**—It uses sand to measure time. The hourglass consists of two rounded glass bulbs connected by a narrow neck of the glass. The top bulb is filled with sand and measures the amount of sand streamed down from the top bulb to the bottom bulb.
 - (ii) **Sun dial**—It used the position of the sun to depict time. In a sundial, the movement of the shadow of a rod that is stuck upright in the ground is used. Its shadow changes direction with the movement of the sun, across the sky.
 - (iii) **Water Clock**—It uses water to measure time. The steady rise and fall of water level in a vessel with marking on the inside surface were used to measure the passage of time.
 - (iv) **Pendulum Clock**—It uses a pendulum to measure time. It was made by swinging weight on a string.
 - (v) **Quartz Clocks**—They have an electric circuit that works with the help of cells.
3. The pendulum consists of a small metallic ball. The metallic ball or any ball is called the bob of the pendulum. Bob swings in oscillatory or periodic motion when someone holds its and moves it to one of the sides from its initial or rest position. The bob is said to have a complete oscillatory motion when it reaches the position from

where it is started to swing, which is one of the sides from where we released it. The time taken by the pendulum to complete one oscillation is called period time. The unit to measure Time Speed –

Time—Second (s), Minutes (min), Hour (h)

Distance—metre (m), kilometer (km)

Speed—metre/second (m/s), kilometre/hour (km/h).

4. Distance-Time Graph—The graph used to plot the distance and time to find out the speed of a vehicle is called the Distance-Time Graph. The example to show and explain the Distance-Time Graph phenomenon using a graph paper:* (Figures on Page 90)

- (i) Draw a horizontal line OX (x-axis) and a vertical line OY (y-axis) at right angles to each other.
- (ii) Write time (min) on the x-axis and distance (km) on the y-axis and put arrows with them.
- (iii) The scale to be used for showing time can be 10min = 1 cm and mark the time values 0, 10, 20, 30, 40, 50 and so on till 120 on the line OX.
- (iv) The scale to be used for representing distance values on the graph can be 20km = 1 cm and mark the time values 20, 40, 60, 80 and so on till 240 on the line OY.
- (v) The point O (called origin) represents the 0 (Zero) values for time and distance.

The interpretation from the trend :

- (i) If the curve is going in a straight line then this means that the speed is increasing but at a constant rate.
- (ii) If the slope is curved and going upwards along with the y-axis then this would be showing a non-uniform speed.
- (iii) If the slope is parallel to the x-axis then it means that with the increase in time there is no increment in the distance, this means that the object is stationary.

5. Speed can be figured by the formula: $\text{Speed} = \frac{\text{Total Distance}}{\text{Time}}$ or $s = \frac{d}{t}$
 $\text{Speed} = \frac{120 \text{ km}}{2 \text{ hours}} \rightarrow \text{Speed} = \frac{120}{2} \rightarrow \text{Speed} = 60 \text{ km/hour.}$

(E) Fill in the blanks with suitable (given) words :

1. sundial 2. speed 3. huygens 4. microseconds 5. time period

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

1. Non-static objects—car, buses, trains
2. Pendulum watch—bob of the pendulum
3. Speed—Velocity
4. 60 Minute—1 Hour
5. Nanosecond—one billionth part of the second.

(H) Activity :

Do yourself.

Chapter 14 : Electric Current and Its Effect

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. Most convenient source of energy is—Electricity.
2. Circuits are of two types—Closed circuit and open circuit.
3. DC stands for—Direct current.
4. A holder has two—Terminals.
5. Single cell provides a voltage of—1.5 volt of electricity.

(C) Short Answer Questions:

1. The most convenient source of energy is electricity. The energy we get from the flow of electric charge is called electrical energy.
2. **Closed Circuit**—The closed circuit means there is no gap or break in the path, which is made for the flow of current between the two terminals of the cell.

Open Circuit—An open circuit means that there is a break (or gap) in the circuit. If the circuit fails to flow the current through it or if the circuit is fail to complete its path.

3. **Resistance**—The degree to which the material present in the conductor of the wire through which current is passing is called resistance of the material.
4. **There are two types of Electricity**—Static Electricity and Current Electricity.
 1. **Static Electricity** : Static Electricity is made by rubbing together two or more objects and making friction.
 2. **Current Electricity** : Current electricity is the flow of electric charge across an electrical field.
5. **Battery Figure on Page No 95 from text book.**

The symbol of battery: It consists the symbol similar to the cell by many symbols joined together to form the symbol of battery because the positive terminal of one cell is connected to the negative terminal of the next cell. Such a combination of two or more cells is called battery.

(D) Long Answer Questions :

1. **Electric Circuit**—The path through which electric charge moves is called electric circuit. An electric circuit is a path through which electrons start flowing from one terminal to the other end of the terminal. The current flows through the circuit only when it is closed or if all the components in the circuit are present and the path through which electrons flow is all complete and not broken. An electric circuit is the circuit that provides a complete path for electricity to pass (or current flow) between the two terminals of an electric cell or terminals.
2. The energy we get from the flow of electric charge (movement of electrons in one direction is called Electrical Energy. Electric energy can be found in two different forms:
 - (i) Direct Current (DC).
 - (ii) Alternating Current (AC).

Electricity is useful because it can be converted easily into various other forms of energy such as heat energy, light energy, mechanical energy, and magnetic pull. Most of the devices and machines work only when electric current flows through them like electric iron, oven, room heater, refrigerator fan, etc.

3. Electric Circuit Diagram on Page No 95 from textbook.

Circuit Diagram : A circuit diagram is a diagrammatic or graphical representation of different components that are essential and necessary in a circuit to form it. In such diagrams or representations, we use symbols of different components of diagrams or appliances rather than using the pictures because in this way making circuits would be an easy process and efficient also. It will take less time in making an easy to understand diagram and give uniformity in making circuit diagrams.

4. When an electric current passes through a wire, the current-carrying wire behaves like a magnet. This is called the Magnetic Effect of Electric Current. The quantity of electric current is used for many purposes from making electrical equipment like electric bells, loudspeakers, electric motor and also electronic beams are used in T.V. The magnet made by using electric current is called electromagnet it works on the magnetic effect of current.
5. **Electric Bell**—Electric Bell is composed of two rows of cast iron. The coil is made around the iron rods. A metallic strip is placed parallel to the coils. The metallic strip is fitted with a hammer at one end. Another end of the strip is connected to the circuit. A gong is placed in a position so that it can hit by the hammer. When current flows in the circuit, the cast iron rods become electromagnet and attract the metallic strip. The metallic hammer hits the gong. Once the metallic strip is pulled towards the electromagnet, it gets disconnected from the point and there is a break in the circuit.

(E) Fill in the blanks with suitable (given) words :

1. electrical 2. open 3. tungsten 4. metallic 5. argon

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

1. An electric bell—electromagnet.
2. Heating effect—electric iron
3. Tungsten—filament of bulb
4. Complete circuit—closed circuit
5. Single cell provides—1.5 volt of electricity

(H) Activity :

Do yourself.

Chapter 15 : Light

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. The speed of light is—30,00,00,000 M/S or 3×10^8 metre / second
2. The polished and smooth surface is called—Mirror
3. Spherical mirror whose reflecting surface is curved inwards—Concave mirror
4. An arc of seven colours seen in the sky is known—Rainbow
5. The lens which is curved inwards—Concave lens

(C) Short Answer Questions :

1. **Luminous object :** An object that emits light and gives out its own light is a source of light is called a luminous object such as lamps, a candle or maybe a torch.
2. **Non luminous object :** The things that are not a source of light are called non-luminous objects such as things like a book, a door, a chair, table which cannot emit light are non-luminous objects.
3. **Diverging Lens :** A concave lens is called a diverging lens because is curved inward. It has wider edges and a thinner centre and it reflects the light that travels through it in different directions.
4. The seven colours of a rainbow are red, orange, yellow, green, blue, indigo and violet. These colours are sometimes abbreviated as VIBGYOR.

| | | |
|--------|--------|-----|
| Violet | Green | Red |
| Indigo | Yellow | |
| Blue | Orange | |

5. **Newton's Disc :** The Newton's disc can be obtained by dividing a disk into 7 partitions and painting each of them with the seven colours of the rainbow. When the disc is rotated at a fast pace in daylight all the colours tend to mix together and the disc appears whitish in colour.

(D) Long Answer Questions :

1. **Source of Light**—The biggest source of light is the Sun. We can store the light energy come from the Sun by using solar cells and panels in the batteries and later we can use it as a source of power when we needed. We manufactured an artificial source of light like bulbs, led bulbs, candles, lamps, etc. are some examples. So we can say that the sources of light are of two types:
 - (i) Natural source of light.
 - (ii) Artificial sources of light/Man-made source of light or manufactures source of light.
2. **Reflection of Light**—Reflection of light can be defined as the phenomenon of an object throws back the light that falls on it. Hence the reflection of light changes its path. In simple words when light rays fall on a highly polished smooth surface and return to the same medium, it is called reflection of light. That polished and smooth surface is called a mirror. Reflection of light helps us to see most of the things around us. Reflection of light by a surface depends on the nature of the surface the reflection of light can vary.
3. **Types of mirrors**—There are two different types of mirrors are :
Plain Mirrors : Plain mirrors are those mirrors that have a flat and smooth shiny

surface and they simply reflect the beam of light that falls onto the surface of them without changing the direction of them.

Spherical Mirrors : These are such kinds of mirrors whose surfaces are not flat and they do not reflect the light in the same direction. In the case of spherical mirrors, the reflected surface is curved. There are two types of spherical mirrors :

- (i) **Concave Mirrors :** Concave mirrors whose reflecting surface is curved inward.
 - (ii) **Convex Mirrors :** Convex mirrors whose reflecting surface is curved outward.
4. A rainbow is a natural phenomenon in which the light rays of the sun are reflected and refracted by the water droplets present in the atmosphere. A rainbow which usually appears after the rain and must have seen as an arc of seven colours seen in the sky is known as the rainbow. The seven colours of a rainbow are red, orange, yellow, green, blue, indigo and violet. These colours are sometimes abbreviated as VIBGYOR. The pattern which is formed by all these seven colours is known as Spectrum of colours.
5. **Uses of Convex Lens :**
- (i) A convex lens is used in a simple magnifying lens.
 - (ii) The microscope uses two lenses namely eyepiece and objective lens.
 - (iii) Used in cameras.
 - (iv) It is used as the lens in the projector.
 - (v) All telescopes are powered by a convex lens.

Uses of Concave Lens :

- (i) Used in flashlights.
- (ii) Used in binoculars.
- (iii) It is also used in the Peepholes of the doors.

(E) Fill in the blanks with suitable (given) words :

1. straight 2. star 3. right 4. virtual 5. curved

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

- 1. Speed of light—30,00,00,000 m/s
- 2. Always inverted—Real images
- 3. Convex lens—Converging lens
- 4. Colour of Rainbow—VIBGYOR
- 5. Irregular surface—Diffused reflection

(H) Activity :

Do yourself.

Chapter 16 : Forest

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Answer the following questions in very short :

1. Plant layers at different heights—understoreys
2. Roof formed by branches of tall trees—canopy
3. Branchy part of tree above the stem—Craon of the tree
4. Cutting down of trees in large number—Deforestation
5. Decomposers convert dead plants and animals into—Humus

(C) Short Answer Questions:

1. **Forests :** A very large area with a high density of trees is known as a forest. A forest is a home to a wide variety of mammals, insects, birds and wild animals.
2. Small seeds can be carried on the feet of birds and other animals. Fruits with hooks and barbs, e.g. the burdock fruit are carried in the hair, fur and wool of animals.
3. Biotic component of a forest are producers, decomposers and consumers. Some examples of biotic components are green plants, shrubs, herbs, mosses, fungi, very small microorganism, etc.
4. **Biotic Components :** Abiotic components are any non-living factor that is present in ecosystems. It includes things like rain, wind, temperature, altitude, soil, pollution, nutrients and sunlight.
5. Herbivores are the primary consumers as they are plant eaters. Carnivores make the secondary and tertiary consumers part because carnivores eat herbivores animals and indirectly the carnivores are feeding on plants.

(D) Long Answer Questions :

1. **Structure of Forest**—A forest is an area rich in diverse forms of flora and fauna proving a rich bio-diversity to our home land. Forest consists of various types of trees such as sal, teak, sandalwood, neem, bamboo, etc. In forest trees form the uppermost layer followed by shrubs. The herbs form the lowest layer of vegetation. The trees are also covered with different types of creepers and climbers. The sun is only visible through the leave of trees, making it quite dark inside the forest. The floor of the forest is mostly covered with decaying leaves. The forest floor is moist, warm and rich in nutrients to favour the growth of seeds that are dispersed off. The branches of tall trees form to roof over other plants in forest.
2. **Food Chain and Food Web**—A food chain is a simple chain of events in which energy from plants is passed to primary consumers and is then passed on to secondary consumers. Sun is the ultimate source of energy. Plants prepare their own food using sunlight. Herbivores eat plants for their survival and then carnivores consume the herbivores. Each organism that is consuming a plant or a herbivore is actually utilizing the solar energy for its life process. The interlinking of various food chains forms a web known as a food web. In the food chain grass is eaten by a deer and deer is eaten by a lion. In food web, grass is eaten by mouse, grasshopper and rabbit. The mouse is eaten by snake and grasshopper is eaten by a lizard. Then lizard, rabbit and snake become the food of hawk. In this way, the food chains get interlinked and form a food web.
3. The Interdependence of plants and animals on each other—

Dependence of animals on plant :

- (i) Plants help in the respiration of animals. Plants release Oxygen which is essential for all living things.

- (ii) Plants maintain Carbon Dioxide and Oxygen balance in nature.
- (iii) Trees are homes to many birds and animals. Birds make their nests on trees. Animals protect themselves against rain and sunlight under the trees.
- (iv) Plants provide food to birds and animals.
- (v) Plants have medicinal value and are a great source of medicines.

Dependence of plants on animals:

- (i) Animals help in the dispersal of seeds.
 - (ii) Microorganism decomposes the dead plants and animals into humus. Humus acts as a natural fertilizer for plants.
 - (iii) Animals release Carbon Dioxide gas which helps plants in making food.
4. **If no plant is left on the planet Earth :** We would have no oxygen to breathe as this gas required for all living organisms to breathe to stay alive as plants gave us oxygen and all living organisms would die. The green plants also make food and without plants, there would be no food to eat.
5. **The importance of conservation of natural resources :** Afforestation is a solution and the need of the hour. Preserving our forests is an important for preserving the ecological balance. The government has taken many steps to preserve the flora and fauna in the country. The government has categorized many forests as reserve forests and sanctuaries. Wildlife sanctuaries are places where endangered animals get special attention so that they do not become extinct. Apart from the government, saving the forest is also our duty and responsibility. We should not cut trees. We should plant more and more trees and should take care of them. Saving forests will maintain the balance of oxygen and carbon dioxide in nature. We will get fresh air to breathe. Planting trees will improve the weather condition and will help in reducing the temperature. We should follow three R's include reduce, reuse and recycle methods for saving the forest.

(E) Fill in the blanks with suitable (given) words :

1. forest 2. herbivores 3. medicines 4. habitat 5. afforestation

(F) Say whether the following statements are True or False :

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

(G) Match the Following :

- 1. Microorganisms—decomposers
- 2. Natural fertilizer—humus
- 3. Secondary consumers—carnivores
- 4. Producers—all green plants
- 5. Primary consumers—herbivores

(H) Activity :

Do yourself.

