Wave International
LUCKNOW

Science and Technology-VII (Solution)

Chapter 1 : Nutrients in Plants

(A) Multiple Choice Questions :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. carbon dioxide **2.**oxygen **3.** sun **4.** food **5.** coral roots

(C) Say wheather the following statements are True or False :

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

(D) Match the Following :

1. Dodder **2.** Fungi **3.** Energy **4.** Human **5.** Saprophytes

(E) Answer the following questions in very short :

1. Cuscuta plant is the example of parasite.

2. Mushroom and Bread mould are the example of saprophytes.

3. There are mainly two modes of nutrition in plants:
(a) Autotrophic Nutrition (b) Heterotrophic Nutrition

4. Plants use to make their own food by the photosynthesis method.

5. Pitcher plant is the example of insectivorous.

(F) Answer the following questions in short :

1. Autotrophic nutrition is the mode of nutrition in which organisms make food themselves from simple substances. It is also known as holyphytic nutrition.

2. Heterotrophic nutrition is the mode of nutrition in which all heterotrophic organisms derive their food from other organisms directly or indirectly.

3. Plants make their own food by the process of Photosynthesis. Photosynthesis is a process by which green plants can synthesize glucose from raw materials like carbon dioxide and water in the presence of sunlight and chlorophyll.

4. The organism which derives its nutrition from others is called parasites. They show parasitic mode of nutrition. All parasitic plants feed on other plants as either partial parasites. Doddar, sends suckers, Cuscuta are some examples of partial parasites.

5. Saprophytes obtain their food from dead and decaying organic matter of dead plants, dead animals and other things etc. Saprophytes are more generally plants, fungi or micro-organisms more accurately called micro heterotroph.Mushroom, bread mould and many bacteria are the example of saprophytes.

(G) Answer the following questions in long :

1. Plants make their own food by the process of photosynthesis. Photosynthesis is a process by which green plants can synthesize glucose from raw materials like carbon dioxide and water in the presence of sunlight and chlorophyll. Photosynthesis involves the conversion of solar energy into chemical energy to synthesize starch.

In this process, the parts of the green plant mainly leaves play a vital role. Leaves are the food factories of plants.Leaves appear green because they contain green pigment called chlorophyll that traps energy from sunlight. Chlorophyll is present in the cells organelles called chloroplast. It is a light absorbing pigment from the sun. Leaves use water from the soil and carbon dioxide from the air. The food made by this combination of components is a sugar called glucose. Glucose is used by the plant for growth and repair of its parts. Glucose can be stored in special areas in roots and stems. The plants release the oxygen which is used by the humans in breathing.

$$\text{Carbon dioxide} + \text{water} \xrightarrow[\text{Chlorophyll}]{\text{Light(Sun)}} \text{glucose} + \text{oxygen}$$

(From air) (From soil)

In photosynthesis, carbon dioxide enters the leaves through the stomata. Stomata are opening in the surface of leaves. Oxygen to pass out of the leaf into the air by stomata.

2. Heterotrophic plants do not possess chlorophyll. These plants can not make their own food and depend on others for their food are called Heterotrophs nutrients. Hence they take their food from dead and decaying matter. All heterotrophic organisms derive their food from other organisms directly or indirectly. Such mode of nutrition is called heterotrophic nutrition. A heterotrophs are not producers thus they are consumers. Heterotrophic plants obtain food from other plants by following either a parasitic, saprophytic or symbiotic mode. Parasites, saprophyte, insectivorous, symbosis are the different types of heterotrophic nutrition.

3. There are mainly two types of nutrition in plants :

(A) Autotrophic Nutrition : The mode of nutrition in which organisms make food themselves from simple substances is called autotrophic nutrition. The other name of autotrophic nutrition is holophytic nutrition. The plants are the autotrophs because they make their own food by using the energy of the sun directly. Plants also use water, carbon dioxide, minerals and other materials in making their food. These materials are present in their surrounding. The process through which autotrophs make their own food is called autotrophic nutrition. The process of making food by plant is known as photosynthesis.

(B) Heterotrophic Nutrients : Heterotrophic plants do not possess chlorophyll. These plants can not make their own food and depend on others for their food are called Heterotrophs nutrients. Hence they take their food from dead and decaying matter. All heterotrophic organisms derive their food from other organisms directly or indirectly.
Such mode of nutrition is called heterotrophic nutrition. A heterotrophs are not producers thus they are consumers. Heterotrophic plants obtain food from other plants by following either a parasitic, saprophytic or symbiotic mode.

(H) Science puzzle :
(1) VITAMIN (2) CARBOHYDRATE (3) ANEAMIA (4) FOOD
(5) HEAMOGLOBIN

Chapter 2 : Nutrition in Animals

(A) Multiple Choice Questions :
Tick (✓) the correct answer :
1. (b) **2.** (b) **3.** (a) **4.** (b)

(B) Fill in the blanks with suitable words :

1. autotrophs **2**. carnivorus **3.** calcium **4**. babies **5.** permanent

(C) State the following statements are True or False :

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

(D) Match the Following :

1. saliva **2.** thirty two **3.** Oesophagus **4.**pseudopodia

(E) Answer the following questions in very short :

1. There are four types of teeth : Incisors, Canines, Premolars, Molars.

2. The taste buds on the tongue are stimulated by food and cause continuous secretion of saliva from the glands.

3. The animals are wholly depend for their food on plants only is called the herbivorus. Cow, rabbit, deers, goat and sheep etc are the example of herbivorus.

4. Omnivorus are those animals who eat both plants and animals as their food. Bears and humans etc are the example of omnivorus.

5. Scavengers are those animals who feed on the remains of dead and decaying animals. Crows and jackal etc. are the example of scavengers.

6. These animals are eat the flesh of other animals is called the carnivorus animals. Lion, dogs, wolves etc. are the example of carnivorus.

(F) Answer the following question in short :

1. Mouth is the part of human body. It is covered by two lips. The process of taking food into the body is called ingestion. Which you eat the piece of bread in your mouth probably watered that response occurs because the human mouth contains the salivary glands. Salivary glands release a liquid known as saliva which helps moisten the food. Teeth, tongue, salivary glands are some part also consist in the mouth.

2. When the food reaches the stomach it is churned and broken down into smaller pieces and it forms a semi-solid paste called chyme. Stomach is a thick walled bag. Its shape is like flattened U. The glands present in the walls of stomach secrete gastric juice which contains hydrochloric acid, pepsin (enzyme) and mucus. Proteins are made simpler by the action of enzymes present in the gastic juice.

3. **Tongue :** The tongue moves the food around the mouth and saliva and rolls it into a ball. It is an organ of taste. It has taste buds to sense different kinds of taste. Saliva also contains an enzyme called salivary amylase that digests starch to sugar.

Oesophagus : It is the part of alimentary canal that runs from mouth to the stomach. Oesophagus is a 25 centimetre long tube which transports food down in stomach. The shape of is this organ is J–shaped. These movements help in pushing the food into the stomach.

4. The methods of obtaining food for feeding are diverse. The way food is digested or processed is generally same. The two important component processes are digestion and absorption. Animals are heterotrophs. Their method of taking in the food or ingestion is of holozoic type. Holozoic nutrition : It is a process by which animals take in their food. It involves different steps namely, ingestion, digestion, absorption, assimilation and egestion.

5. The large intestine is about 1.5 meter length. The small intestine continues into the large intestine. It is wider and shorter than small intestine. The large intestine absorbs water and salts from the undigested from material. The undigested food material is temporarily stored into the rectum. It is then removed through the anus in form of faeces. This process is called digestion.

(G) Answer the following question in long :

1. A ruminant is an even toed animal that has the ability to make the once swallowed partly digested food from the stomach return to the mouth. It chews the food finely before swallowing in the second time. Grass is rich in a carbohydrate called cellulose. Common characteristics found in most of the ruminants are four nipples, sweat glands only on the muzzle and between the toes and horns that may be permanent or shed periodically. They have a special stomach called compound stomach. It has four chambers. The quickly eaten food goes to the first chambers, rumen, broken down by bacteria a soft pulp. When the herbivore is in safety it ruminates or chews the cud In this process the food is sent to the reticulum where it is rolled into balls. By a reverse pumping action, these balls are sent back to the mouth. The herbivore now chews the food throughly at leisure and swallows. This food now passes the third chamber, omasum from the third chamber the food enters the fourth chamber. Abomasum or true stomach. Rest of the alimentry canal and digestion process of the ruminants is similar to that of man.

2. Small intestine is about 6 metre long coiled tube. As the food enters the small intestine, it comes into contact with a liquid called bile. The primary part of small intestine called duodenum. Here bile from the liver and pancreatic juice from pancreas are mixed with food. As a result of digestion food is converted into simple form protein turned into amino acids, carbohydrates into glucose and fat into fatty acids. The partially digested food, reaches the lower part of the small intestine called ileum. Small intestine also absorbs the simple digested form of the food it is called villi. These villi increase the surface area for absorption of digested food. The absorbed food is carried by blood to all other parts of the body. It is used for growth, development and to perform all vital functions of the body. Protein forms new cells and tissues. Excess of glucose is stored in liver. This is assimilation of absorbed food.

3. Nutrition in Amoeba involves five steps :

Ingestion : Ingestion involves taking in of food. Amoeba do not have mouth. Therefore, food intake may take place from any part of the body, but it usually takes place at the advancing end, i.e., pseudopodia. This process of obtaining food is called phagocytosis.

Digestion : Digestion is the breakdown of complex food molecules into simpler molecules through a series of chemical reactions carried out by various enzymes. In Amoeba, the digestion of food occurs within food vacuoles which, thus act as temporary stomach. Digestive enzymes secreted by the cytoplasm are stored in the lysosome. calcium.

Absorption : Absorption means taking up digested nutrient molecules into the cells of living organisms. In amoeba, the soluble foods resulting from digestion diffuse through food vacuoles into the surrounding cytoplasm. As absorption proceeds, the food vacuoles decrease in size till only the indigestible matter is left in them.

Egestion : The removal of the undigested food is called egestion. In amoeba, egestion may occur in any part of the body. The indigestible matter left in the food vacuoles is denser than the surrounding endoplasm. Such vocuoles called a contractile vacuole finally come in contact with the plasmalemma.

Assimilation : The process of utilization of absorbed food, such as glucose, amino acids, fatty acids and glycerol is called as assimilation. Energy needed for various activities is obtained from glucose. Glucose is broken in the cells in the presence of

oxygen to synthesize energy in the form of ATP. Amino acids are used for building and repairing body parts. Fatty acids and glycerol are stored in the adipose tissue and under the skin for future use.

(H) Formative assessment :

Do yourself

(I) Creative activity :

Do yourself

Chapter 3 : Fibre to Fabric

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. natural **2.** merino **3.** couch covers, bedspreds **4.** cocoon **5.** wool , silk

(C) State the following statements are True or False :

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

(D) Match the following :

1. Leaves **2.** Kinds of sheep **3.** Variety of silk **4.** Animal fibre

5. Winter season

(E) Answer the following question in very short :

1. Ship, camel, goat and yak gives us wool.

2. Wollen clothes are wear in winter season.

3. China discovered the silk.

4. The best wool fibre resists crushing. It is elastic i.e. it uncurls stretched but returns to its original state when released.

5. Wool comes mostly from sheep. The best wool comes from the fleece of the specially bred sheep.

(F) Answer the following question in short :

1. Silk is natural fabric. It comes from the cocoons of certain insects, such as the mulberry silkworm. When the insects create their cocoons, harvesters extract the fibers and spin them into thread.

2. Shearing is a process of the removing the wool from the coat of an animal. A sheep is usually sheared of its coat once in a year. In olden days sheep were clipped by hands, but after the invention of electric razors, it becomes very easy and possible for farmers.

3. Scouring is a process of properly washing the fleece in tanks to remove dirt, dust and grease. After washing, the wool it is squeezed between rollers to remove excess water.

4. There are three typrs of wool : **Virgin wools** a wool that has never been used before. **Reprocessed wool** is a wool that has been knitted into unsold products and then respun. **Reused wool** is a wool that has been made up and used or worn, then respun.

5. Wool and silk are the natural fibre. Wool is obtained from sheeps, camel, goat and yaks while the silk is obtained by the cocoon.

(G) Answer the following question in long :

1. There are a lot of steps involved in the processing of fibre into wool than clothes. These are following steps :

(i) **Shearing :** It is a process of the removing the wool from the coat of an animal. A sheep is usually sheared of its coat once in a year. In olden days sheep were clipped by hands, but after the invention of electric razors, it becomes very easy and possible for farmers.

(ii) **Scouring :** It is a process of properly washing the fleece in tanks to remove dirt, dust and grease. After washing, the wool it is squeezed between rollers to remove excess water.

(iii) **Sorting :** The process of separating the long fine quality fleece from the remaining inferior quality or broken pieces is called sorting.

(iv) **Combing :** The process of removing the burrs from the fleece is called combing.

(v) **Dyeing and Carding :** After the scouring, the wool is dyed in different colours. The natural fleece of sheep is black, brown or white in color. The fibres obtained after combing is dyed in various colors. The wool may be suitably oiled to restore its resilience. The wool fibres are straightened by passing through heavy metal rollers. This process is called carding. They are further combed and rolled into yarn.

(vi) **Roving and Weaving :** The yarn is wound in the balls of wool. These balls are used to make sweater and other warm clothes, the strong firm cloth is called worsted result. If the combing is light, a soft, fuzzy yarn is made. The straightened fibres are spun or twisted together to make yarn. The wool yarn is then used to knit woolen fabrics, sweaters etc. It is a process of properly washing the fleece in tanks to remove dirt, dust and grease. After washing, the wool it is squeezed between rollers to remove excess water.

2. **Life Cycle–Silk Moth:** Actually silkworms are not worms, but the larvae or caterpillars hatched from the eggs of the silk moth. The life history of a silk moth starts when a female silk moth lays eggs. The larvae or caterpillars hatch from the eggs of the silk moth. These silkworms feed on fresh mulberry leaves. The silkworm grows in size and then becomes a pupa. In the pupa stage, it weaves a net to hold itself. It then swings its head from side to side, secreting a fibre that hardens on contact with air. This fibre is made of a protein and becomes the silk fibre.

The caterpillar covers itself completely with silk fibre and turns into a pupa, this covering is known as the cocoon. The moth continues to develop within the cocoon. The silk thread or yarn is obtained from the silk moth's cocoon.

3. Chinese legend has it that Empress Si-lung-Chi was worried about the damaged mulberry leaves in her garden. Emperor Huang-ti found out that the white worms were eating up the mulberry leaves and spinning shiny cocoons. A cocoon accidentally dropped into the empress's cup of hot tea, and the delicate tangle of threads separated from the cocoon, thus leading to the discovery of silk..

4. Sericulture, or silk farming, is the rearing of silkworms for the production of raw silk. Silkworms are reared under suitable conditions of temperature and humidity to obtain silk threads from their cocoons. The female silk moth lays hundreds of eggs. These are stored on strips of cloth or paper. Mulberry leaves are the staple diet of silkworms. When the mulberry tree bears a fresh crop of leaves, the eggs are warmed suitably so that the larvae hatch from them.The larvae, caterpillars or silkworms are then stored in clean bamboo trays and are fed freshly chopped mulberry leaves. They eat day and night, and grow to enormous sizes. The bamboo trays are provided with small racks or twigs to which the cocoons can be attached.This happens usually after

25 to 30 days when the caterpillars stop feeding and move to the twigs to spin cocoons. The silk moth develops inside these cocoons.

5.

S. No	Wool	Silk
1.	Wool is natural fibre which obtained from hairy animals like sheep, goat, yak and camel.	Like a wool silk is natural fibre which obtained by the cocoon.
2.	Wool fibre resist crusing. It uis elastic,it uncurls stretched cut returnsto its original state when released.	Mulberry silks, erisilk, tassar silk, mooga silk,are some types of silk and it is very comfortable to wear.
3.	Wool cannbe used to make clothing materials, rugs, audio speaker coverings and much more.	Silk fibres are used for making dress materials, scarves, saree, jackets, gloves and carpets.

(H) Formative assessment :

Do yourself

(I) Creative activity :

Do yourself

Chapter : 4 Heat Flow or Transfer and Temperature

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. 1000 calories **2.**Mercury **3.** 100°c **4.** vaccum flask **5.** Sir James Dewar

(C) State the following statements are True or False :

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

(D) Match the following :

1. Thermometer **2.** Good conducter **3.** vaccum flask **4.** Day **5.** Night

(E) Answer the following question in very short :

1. The temperature of human body is 98° in Fahrenheit and 37° in Celsius scale.

2. Heat is form of energy which makes any object hot or cold.

3. The temperature of a substance or body is a measure of the degree of hotness or coldness of the substance or the body.

4. The SI unit of heat is Joule.

5. The unit of temperature are Fahrenheit, Celsius, Kelvin.

6. The substances that do not allow heat to pass through them easily are called the insulators. Wood, plastic, thermocole, glass, water etc are the some example of insulators.

(F) Answer the following question in short :

1. The substances that allow heat to pass through them easily are called the conductors. Mostly metals are good conductors of heat. Iron, copper, aluminium, mercury, silver etc. are the example of conductor.

Uses of conductors : The cooking utensils are made of good conductors as metals and alloys. They are good conductors of heat, they transfer the heat quickly so that the flame is conducted to the food inside quickly and efficiently.

2.

S.No.	Heat	Temperature
1.	It is form of energy.	Indicates how much hot or cold the substance.
2.	SI unit of heat is joule.	SI unit of temperature is kelvin
3.	The direction of transfer of heat does not depend on the quantity of heat.	The direction of transfer of heat depends on the tempearture

3. We use wollen clothes in winter. Wool is the insulator of heat thus wollen clothes do not allow the heat of our bodies to escape. wool keeps people warm as it has air gaps within the fibers. These air gaps act as a barrier and prevent loss of body heat to the surrounding cold air. Woolen fibers absorb water and allow people to stay warm

4. Heat flows from hotter objects to colder objects. When an object is at a temperature different from its surroundings, heat transfer takes place such that the body and the surroundings reach the same temperature. For example, when milk is boiled and the flame is off, the milk slowly transfers heat to the surroundings and becomes cooler.

5. A land breeze, also called an offshore breeze, is created when land starts cooling off in the evening, causing the wind to blow from the land over the sea. A sea breeze, or onshore breeze, develops over the water due to rising land temperatures. This usually occurs during the day.

(G) Answer the following question in long :

1. A substance, on being heated, may change its state. Water can exist in all the three states solid (ice), liquid (water), and gas (Vapour or steam). When we heat the ice, the ice coverts to water and on boiling it changes into the vapour . The process of change from one state to another state is called the change of state. When a solid changes into liquid, the process is called melting. The temperature at which a solid melts is called its melting point. When a liquid changes into the vapour, the process is called evaporation and the temperature at which a liquid starts boiling is called its boiling point.

2. Conduction is the process of flow or transfer of heat energy in solid objects from places of higher temperature to places of lower temperature. The molecules are strongly catched to each other in solids on absorbing heat, the molecules of solid vibrate at a faster about their mean position and collide with neighbouring molecules. This process keeps on going through all molecules. Thus gradually the heat energy flows from the they are joined together. The conduction of heat stops when a uniform temperature is achieved.

3. Radiation is the mode of transfer of heat in which energy is directly transferred from one place to another place. Radiation does not require a solid, liquid or gas as a medium. When this radiant energy falls on objects, it is partly transmitted and partly absorbed. The absorbed part raises the temperature of the receiving object. All objects take in and give out heat all the time. This depends on the temperature and surface of the object.

4. Thermos flask is used to keep liquid hot (coffee) or cold (ice water) for long time. In 1872, English scientist Sir James Dewar invented the thermos flask. Thermos flask is also known as vacuum flask. In is a double-walled glass vessel. The inner side of outer wall and the outer side of the inner wall are silvered to reduce that transfer by radiation. Vacuum is created between the two walls by pumping out the air. After creating vacuum the glass bottle is sealed. The vacuum between the two glass walls stops the transfer of heat by conduction and convection. For example, if a hot liquid is stored, the small amount of radiation from the hot inside wall is reflected back across the vacuum by silvering on the outer wall. Thus a hot liquid remains hot and a cold liquid remains cold for a long time in the thermos flask.

5. This type of thermometers are used to measure the temperature of the human body, at homes, clinics and hospitals. All clinical thermometers have a kink that prevents the mercury from flowing back into the bulb when the thermometer is taken out of the human the bulb of the thermometer under the tongue and hold it gently for about a minute. If the thermometer is cracked by your teeth mercury is enter your stomach and your life is be in danger. Now we take the thermometer out from the mouth. We observe the upper end of the thread of mercury and read the temperature marking against it. This is body temperature.

Chapter 5 : The Natural resource Soil

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. Uppermost **2.** Soil profile **3.** plants **4.** Earth **5.** Black cotton soil

(C) State the following statements are True or False :

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

(D) Match the following :

1. Black cotton soil **2.** Uttar Pradesh **3.** Iron oxide
4. A- Horizon **5.** Soil Erosion

(E) Answer the following question in very short :

1. Aullivial soil, Lateritic soil, Black soil, Red soil, Desert soil, Mountain soil are found in India.

2. There are three main types of soil (a) Sandy soil (b) Clayey soil, (c) Loamy soil.

3. A - Horizon is the uppermost layer of the soil. It is made up of humus and minerals and makes the soil fertile.

4. Bedrock is the bottom layer of the soil

5. 50% sand and 5% of clay is the mixture of loamy soil.

6. In India the red soil is found in Andhra pradesh, Tamil nadu, Meghalaya, Assam, Manipur, Bihar etc

(F) Answer the following question in short :

1. The each layer of soil is different from in the texture of soil particles, colour and chemical substance. Layer of soil is called soil profile.The layers of soil are as follows :

(i) Top soil or A - Horizon (ii) Middle layer or B - Horizon

(iii) C - Horizon (iv) Bed rock

2. Air molecules are also present in between the soil particles. The air present the soil particles is very important for the respiration by roots of plants and soil organisms.
3. Black soil is typically of deccan trap region spread over north-west deccan plateau and lava floors. These soils are clayey, deeper, fine grained and black. This type of soil is suitable for growing cotton. It is found in Madhya Pradesh, Gujarat, Maharashtra, Andhra Pradesh and Karnataka.
4. Forestry is the method and the tools of the trees in a forest help to bind the soil together and prevent soil erosion. Foresters plant and care for young trees and select trees for felling. The management of forests in this way is essential to conserve natural resources.
5. Soil is formed when rocks are broken down by action of wind, water and climate. This process is called weathering. The characteristic feature of a soil depends upon the rocks from which it has been formed and kind of plants that grown in it.

(G) Answer the following question in long :

1. **Constituents of soil : Soil Water :** The soil holds the water in the space present between the particles. Water moves down in these capillaries and is easily available to the plant roots. The water is known as capillary water. Sand holds less water while clay holds much.

   Air : Air molecules are also present in between the soil particles. The air present the soil particles is very important for the respiration by roots of plants and soil organisms.

   Humus : Humus is found on the topmost layer of the soil. It is a mixture of microganisms like bacteria, fungi etc, act on dead animals and their wastes, plants etc. and change the complex matter into simple organic molecules. This organic matter is called humus which mixes with soil particles to give a black brown colour and provides nutrients to the plants.

   Living Organisms : Soil has many variety of living organisms as well. Animals like snake, rabbit, make borrows and holes and other animals such as earthworm, beetles ants, spider etc. which swallow the soil and make it loose and soft. Micro-organisms like as fungi, bacteria etc. are present in the soil which help in the process of decay of dead animals and plants.
2. Many types of soil are found in India; some are given below :
   1. **Alluvial Soils :** Alluvial soil is most wide spread. This type of soil is formed due to the deposition of sediment by the river, in India, the entire northern plains are Punjab, Haryana, Uttar Pradesh. West Bangal, Assam, Bihar formed of it.
   2. **Lateritic Soil :** This type of soil is developed by leaching on upland and hills. This soil mainly contains iron oxide having red colour. These are found in easten and western Ghats and in the north-eastern states. It is very good for tea, coffee, coconut and rubber.
   3. **Black Soil** : This type of soil is typically of deccan trap region spread over north-west deccan plateau and lava floors. These soils are clayey, deeper, fine grained and black. This type of soil is suitable for growing cotton because they are rich in chemical properties and very fertile. Black soils are also known as black cotton soils because of their colour and suitability for growing cotton . It is found in Madhya Pradesh, Gujarat, Maharashtra, Andhra Pradesh and Karnataka.

4. **Red Soils** : The colour of this soil is due to the presence of iron oxide. These soils are developed as a result of breaking up of crystalline igneous rocks. This soil is found in Andhra Pradesh, Tamil Nadu, Meghalaya, Assam, Manipur, Bihar etc. in the parts of India.
5. **Desert (Sandy) soils** : These type of soil are found in dry regions of Rajasthan, Gujarat, Ladakh and Haryana. This soil cannot hold water because it is sandy. The desert soil is highly pervious and has a low density.
6. **Mountain Soils :** Mountain soils are found in the Himalayan region. They are rich in humus and the colour of this soil is brown. They are sandy with gravel and porous. These soils are good for growing tea.

3. The Conservation of soil are :

(i) Use terrace farming : In this method the ground is cut into large steps called terraces. On each level suitable crops are grown. This reduces the speed with which water flows down, water stops at each level. In this way higher terrace will get enough water and soil erosion is reduced.

(ii) Contour Ploughing : This type of ploughing is also beneficial in reducing the flow of water down the slope and involves ploughing at right angles to the natural slope of land.

(iii) Strip Farming : It is a method of farming which involves cultivating a field partitioned into long, narrow strips which are alternated in a crop rotation system. It is used when a slope is too steep or when there is no alternative method of preventing soil erosion.

(iv) Forestry : Forestry is the method, the tools of the trees in a forest help to bind the soil together and prevent erosion. Foresters plant and care for young trees and select trees or felling. The management of forests in this way is essential to conserve natural resources.

4. Sandy Soil : Sand soil contains the sand particles along with some clay and silt particles. Since the particles have large space between them, the air spaces are big which makes this soil dry and light. Water seeps through sand quickly. It can hold only a little water. It is not suitable for the growth of plants because it lacks essential nutrients.

Clayey Soil : This type of soil mainly contains the clay particles. Clay particles are very small, fine and sticky, clayey soil has no air or space between the particles. Clay particles hold more water and causes damage to the crop plants, because due to its small pore-size the water holding capacity is very good. It is also rich in nutrients and it is used mainly for making pots and toys.

5.

S. No.	Black Soil	Red Soil
1.	Black soil is typically of deccan trap region spread over north-west deccan plateau and lava floors.	The colour of this soil is red due to the presence of iron oxide. These soils are developed as a result of breaking up of crystalline igneous rocks.

2.	This type of soil is suitable for growing cotton because they are rich in chemical properties and very fertile	The testure may vary from gravel to loamy. They can not retain the moisture for a long time
3.	It is found in Madhya Pradesh, Gujarat, Maharashtra, Andhra Pradesh and Karnataka.	This soil is found in Andhra Pradesh, Tamil Nadu, Meghalaya, Assam, Manipur, Bihar etc. in the parts of India

Chapter 6 : Respiration in Living Things

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. gills **2.** mouth **3.** Earthworms **4.** carbon dioxide **5.** respiration

(C) State the following statements are True or False :

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

(D) Match the following :

1. Gills **2.** Air tube within their body **3.** Amphibian **4.** Lungs

5. Two pairs

(E) Answer the following question in very short :

1. There are two types of respiration : (a) Aerobic respiration (b) Anaerobic respiration.

2. The various organs are involved in the process of respiration like as nostrils, nasal cavity, larynx (voice box), trachea, bronchi (Bronchial Tube), alveoli etc.

3. The equation of respiration is

$$\underset{\text{Glucose}}{C_6H_{12}O_6} + \underset{\text{Oxygen}}{6O_2} \rightarrow \underset{\text{carbon dioxide}}{6CO_2} + 6H_2O + \text{Energy}$$

4. Inhalation is the process of taking in air which is rich in oxygen

5. Exhalation is the action of giving out air rich in carbon dioxide to the environment.

6. Frog and humans breathes through the lungs.

(F) Answer the following question in short :

1. The process by which energy is released from food in human body is called respiration. In the process of respiration, several organs participate in human beings. Lungs are the breathing organs in human beings. It is a system that helps an organism to take in oxygen, break down the absorbed food in the body and release energy, carbon dioxide and water vapour.

2. The word 'anaerobic' means in the absence of oxygen. In this process anaerobic respiration is the break down of food in the absence of oxygen. Food is converted into alcohol and carbon dioxide with release of little amount of energy and this type of respiration is known as anaerobic respiration.

3. The word 'Aerobic' means 'with air'. In this process the breaking up of food into carbon dioxide (CO_2) and water (H_2O) in the presence of oxygen with release of energy is called aerobic respiration. Aerobic respiration produces a considerable amount of energy which is stared as ATP molecules.

4.

S.No	Aerobic respiration	Anaerobic respiration
1.	It is common in all higher plants and animals.	It is common i certain microorganisms but very rare in all higher plant and animals.
2.	It is a permanent process that continuous througout the life of plant and animals.	It is a permanent process in anaerobic microorganisms but a temperary in higher plants and animals only anaerobic condition.
3.	The process occurs in the presence of oxygen.	The process occurs in the absence of oxygen.

5. The process of respiration in animals like plants and humans, during respiration animals cells produce carbon dioxide as a waste product. All cells, therefore, must be supplied with oxygen and must be able to get rid of carbon dioxide. Different organisms have different methods of breathing.

6. **Inhalation** is the action of taking in air rich in oxygen. During inhalation, the rib cage moves outwards and the diaphragm contracts to move downwards. As the rib cage expands, the space in the chest cavity increases allowing air rich in oxygen enter the lungs.

Exhalation is the action of giving out air rich in carbon dioxide to the environment.During exhalation, the ribs move inwards and the diaphragm relaxes to return to its normal position. The contraction of rib cage reduces the size of the chest cavity. Now air rich in carbon dioxide is driven out of the lungs.

(G) Answer the following question in long :

1. Plants also need energy like humans. Plants get energy by the process of respiration. During respiration plants take in oxygen and release carbon dioxide. The plants get oxygen by diffusion. The oxygen diffuses into the root hairs and passes into the root. All the parts of plants respire individually. Stomata pores in a leaf, mostly on the undersurface. Each pore is surrounded by a pair of guard cells. Guard cells can change shape to open or close the stoma. Stomata are the openings on the surface of the leaf through which an exchange of gases between the air and cells of the leaves takes place. The stomata also regulate water loss through the leaves of a plant. This regulating process is called transpiration. The stems of woody plants have special openings, called lenticels, for gaseous exchange. The surface of leaves are provided with tiny apparatus termed as stomata. During respiration, oxygen diffuses in through the stomata and passes into the cells of the leaves. When the amount of carbon dioxide increases in these cells, the stomata open to release it into the atmosphere. The carbon dioxide produced during respiration diffuses out from the leaf into the air through the stomata.

2. When the human takes in air our nostrils breathing in is called inhalation and takes out the air through the nostrils is called exhalation. There are two pairs of lungs present in the chest cavity. Each lung is soft, spongy and conical shaped. The bronchi, bronchioles and alveoli are lodged in the lungs. Lungs are protected by the flexible rib cage. At the bottom is a dome-shaped sheet of muscles called the diaphragm. During inhaling, the rib muscle contract and front ends of the ribs move up and outwards.

The diaphragm, which forms the floor of the chest cavity moves down and becomes somewhat straight. These increase the volume of the air tight chest cavity and creates pressure inside the lungs. Air rushes from outside through the trache to the air sacs and alveoli.

When the human is exhaling, the ribs move up and the diaphragm relaxes, become convex and the abdominal organs take their original positions. The capacity of chest decrease,the lungs become compressed and the pressure in them rises. The air from the lungs rushes out through the air passage as a result, air rushes out of the lungs as it would be out of a squeeze.

3. **(i) The brathing process in animals :** In lower animals like amoeba a single celled organism which lives in fresh water, the respiration is carried out by the general body surface. It takes in oxygen present in the water and gives out carbon dioxide through its plasma membrane by diffusion. Excess water in the amoeba is pumped out through the cell membrane by a contractile vacuole.

(ii) Respiration in Fish : Fishes and many other aquatic animals have special respiratory organs called gills. Gills are covered by operculum and made up of numerous fine capillaries containing blood vessels. When the oxygen passes from the water into the blood in the gills. Fish obtain oxygen dissolved in water. During respiration, water enters the body through mouth, passes through gills and comes out of the operculum. Exchange of gases takes place in the gills of fish supplied by numerous blood vessels. They accept oxygen into the body and expel out carbon dioxide. Carbon dioxide wastes also pass out of the fish through the gills and finally it is released to the surrounding water.

I. Science Puzzle:

(1) RESPIRATION (2) AEROBIC (3) ANAEROBIC
(4) AMOEBA (3) GRASSHOPPER

Chapter 7 : Acis, Base and Salt

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. Sour **2.** electricity **3.** bitter **4.** purification **5.** ionic

(C) State the following statements are True or False :

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

(D) Match the following :

1. Acid **2.** Lactic Acid **3.** Hydroxide **4.** Easily Soluble

(E) Answer the following question in very short :

1. Sodium hydroxide, caustic soda are the example of strong base.

2. Sulphuric acid and nitric acid are the example of strong acid.

3. Litmus paper, turmeric, Phenolphtalein, PH paper are some indicaters.

4. Neutralization reaction : $\mathbf{NaOH + HCl \rightarrow NaCl +} H_2O$

5. Salt solutions in water are good conductors of electricity.

(F) Answer the following question in short :

1. The Uses of salt are : (i).The salts are used in our food daily by us.

(ii) Potassium nitrate (KNO3), as a fertilizer and manufacture of gun powder and matchsticks.

(iii) Alum is very useful for purifying drinking water in dying industry and also in leather industry.

(iv) Copper sulphate (CuSO4) is used as a fungicide and in electroplating, dying and calico printing.

2. Neutral substances do not bring about any change in the colour of common indicators. Only acids and basic substances change in the colour. Alcohol, ether, petrol, sugar, common salt, lime stone and methane, oxygen, nitrogen, hydrogen gases are some examples of neutral substances.

3. Neutralization is a reaction between acid and base. The acidic nature of the acid and basic nature of the base are destroyed. This process is known as neutralization. After neutralization reaction resulting in the form of salt and water.

$$\underset{\text{Sulphuric acid}}{H_2SO_4} + \underset{\text{Sodium hydroxide}}{2NaOH} \rightarrow \underset{\text{Sodium Sulphate}}{Na_2SO_4} + \underset{\text{Water}}{2H_2O}$$

4. pH scale is a series of number from 0 to 14 and 7 is the middle point of scale, it is the neutral point of the scale. pH scales used to measure the strength of acids and bases.

5. Strong Acid : Most mineral acids like sulphuric acid, nitric acid and hydrochloric acid are strong acids because they have a high concentration of hydrogen ions.

Strong Bases : Strong bases produce more number of hydroxide ions on dissolving in water. Sodium hydroxide, caustic soda are the examples of strong bases.

(G) Answer the following question in long :

1. The word acid is derived from the Latin word acerc or acides meaning sour. All acids have one property in common i.e., they are sour to taste and produce positive hydrogen ions (H+) when dissolved in water. Substances that taste sour contain acids. The chemical nature of such substances is acidic for example – Lemons, oranges, grapes and vinegar contain citric acid which is used to preserve food. Sulphuric acid, which is found in batteries, all these are examples of acid. They all contain hydrogen. Most of the acids are soluble in water. All the acidic solutions prepared by dissolving acids in water are good conductors of electricity.

2. Properties of Bases : 1. Bases are soapy to touch.

2. The taste of bases are bitter and unpleasant.

3. Bases turn red litmus blue and phenolphthalein to bring pink.

4. When bases dissolve in water, they provide the negative hydroxide ions (OH^-).

5. Bases react with acids to neutralize them and are hence called antacids.

6. Bases are good conductors of electricity in aqueous solution. In aqueous solution, they release ions, which conduct electricity.

3. The Uses of Acids and Bases are :

Acids :

(i) Hydrochloric acid, nitric acid and sulphuric acid are important reagents used in the laboratory.

(ii) Nitric acid is used in the purification of metals such as gold and silver.

(iii) Sulphuric acid is the king of chemicals. It is used in batteries and petroleum.

(iv) Carbonic acid is commonly called plain soda. When it is mixed with citric acid and sugar it is used for making soft drinks.

(v) Tartaric acid is sowing agent and it used in baking powder.

Bases :

(i) Ammonia is used for manufacturing nitrogenous fertilizers like urea, ammonium sulphate and ammonium nitrate.

(ii) Magnesium hydroxide and aluminium hydroxide are used as antacids for relieving acidity in the stomach.

(iii) Ammonium hydroxide is used to remove grease from glass, pans and ink spots from clothes.

(iv) Alkalis are used in the manufacture of soap from vegetable oils.

(v) Calcium hydroxide is used in the preparation of plaster, white wash and bleaching powder.

4. Turmeric is used as a spice in Indian recipes as it imparts colour to curries. When soap is applied to a turmeric stain, the turmeric stain works as an indicator. As a reaction, the sodium hydroxide changes the colour of turmeric stain from yellow to red because the soap necessarily contains sodium hydroxide which is a base.when another substance like nitric acid, is applied to it. It changed into red colour of the rurmeric stain regains its original yellow colour.

5. Uses of salts in our daily life :

(i) The salts are used in our food daily by us.

(ii) Potassium nitrate (KNO3), as a fertilizer and manufacture of gun powder and matchsticks.

(iii) Alum is very useful for purifying drinking water in dying industry and also in leather industry.

(iv) Copper sulphate (CuSO4) is used as a fungicide and in electroplating, dying and calico printing.

(v) It is also used to preserve raw fish and meat.

6. Washing soda is used in the manufacture of detergents to wash clothes. It is also used in fire extinguishers.

(H) Complete the equation and balance :

$CaCO_3 + H_2SO_4 \rightarrow CaSO4 + H_2O + CO_2$

Calcium Carbonate — Sulphuric acid — Calcium sulphate — Water — Carbon dioxide

$Fe + SO_4 \rightarrow FeSO_4$

Chapter 8 :Transportation in Plants and Animals

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. Sphygmomanometer **2.** Stethoscope **3.** bean shaped

4. diseases **5.** Xylem, Phloem

(C) State the following statements are True or False :

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

(C) Match the Following:

1. Fight diseases **2.** Haemoglobin **3.** Universal donar **4.** Clotting

(D) Answer the following question in very short :

1. There are two types of conducting tissues are there in plants.

2. Sphygmomanometer is an instrument used to measure the blood pressure.

3. The heart of human beat 72 times per minute.

4. Xylem and Phleom

5. Red blood cells, white blood cell and Platelets are three kinds of blood cells.

(F) Answer the following question in short :

1. The red colour of the blood is due to the pigment called Haemoglobin. It helps in transport food, water and oxygen to all parts of the body.

2. The fluid part of blood is known as plasma. It is yellowish in colour and makes about 55 percent of the total blood. Plasma contains about 92% of water, while the remaining 8 percent consists of various dissolved materials. Plasma also carries certain proteins that help in the clothing of blood during injury. It has food, wastes, enzymes, minerals and harmones dissolved in it.

3. Stethoscope is an instrument used to hear heartbeat of a person. The doctors uses the stethoscope for measuring the heartbeat. The heart beat and the other sounds in the chest and back can be clearly heard by placing the stethoscope.

4. The white blood cells fight diseases. The main function of white blood cells (WBCs) is to defend the body against infections. White blood cells are somewhat larger than red blood cells. Each white blood cell has a nucleus and moves around with the help of pseudopodia like an ameoba.

5. Pulse is the rhythmic throbbing of the heart pulse is generated due to blood flowing in the arteries. The number of beats per minute is called the pulse rate. Doctors count the pulse rate which helps them in diagnosing the intensity of illness.

(G) Answer the following question in long :

1. Plants have no special organ for removal of waste substances but there are different methods for their disposal or Excreation. These are -

(i) The waste gaseous (oxygen, CO2 and water) of respiration and photosynthesis are released to air through stomata in leaves and lenticels of stems.

(ii) Some of waste materials of photosynthesis are collected in the leaves and barks of the trees. The plants get clear of them by shedding of leaves and peeling of bark.

(iii) Some plants can transform soluble toxic substances into harmless insoluble forms and keep them as crystals stored up in the body cells.

(iv) Some wastes are stored as solid bodies. Rubber and raphides are examples of such bodies.

(v) Some plants give secretions such as gums, resin, eucalyptus oil etc.

(vi) Some waste materials of plants i.e. rubber, resin, gum etc. are useful while raphides are harmful.

2. The heart pumps blood through our body. It is located in the chest cavity with its lower parts towards the left. Its size is that of the person's fist. It has four chambers. The two upper chambers are the atria and the two lower chambers are the ventricles.

The partition between the two chambers is called the septum. The walls of the heart are made up of the most powerful muscles. The muscles of the heart contract and relax, which constitute a heartbeat. .

3. The pressure of blood in the arteries. Each time the heart contracts to pump blood through blood vessels blood pressure rises. This phase is called systole. Blood pressure falls each time the heart relaxes between beats. This phase is called diastole. High blood pressure makes the heart work harder and if the blood pressure is low the person feels weakness.

4. Kidneys are the bean shaped organs. Kidneys are situated in the abdomen on either side of the backbone, behind the stomach. Each kidney weighs about 150 g. Each kidney has about a million tiny filters called nephrons. Nephrons are funnels like structures and act as filters that separate waste products from the blood. About 60 percent of human body weight is water. This water is mixed with salts. The amount of various salts in the body's water, particularly in the water blood tissue, is very important. Too much or too little salt can lead to problems. So it is necessary that the salts in the body's water be kept at exactly the right concentration. The liquid that is left over after reabsorption is called urine.

(H) Do yourself

(I) Do yourself

(J) Do yourself

Chapter 9 : Time Measurement and Motion

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. Hour **2.** Motion **3.** Delhi, Jaipur **4.** 1656

5. Uniform, Non- Uniform

(C) State the following statements are True or False :

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

(D) Match the following :

1. Shadow **2.** Fall sand **3.** Distance/ Speed **4.** Sundial **5.** Pendulum

(E) Answer the following question in very short :

1. In India, the Jantar Mantar as sundial situated at Delhi and Jaipur.

2. All over the world Second is the SI unit of time.

3. Meter per second is the SI unit of speed.

4. 30 Or 31 days are in one month.

5. Average speed is the mesured value of speed over a measurable interval of time.

(F) Answer the following question in short :

1. The objects which change their positions with time is callled motion. Motion can be slow or fast. In our daily life we observe different types of motion for example, vehicles move on the road, birds fly in the sky, the movement of the blades of a fan, etc.

2. An object moving along a straight line with constant speed is said to be in uniform motion. The body in uniform motion travels equal distances in equal intervals of time**.** For example: A ball rolled on a very smooth straight track.

3. In olden days, the people did not have watches or clocks. They used length and direction of the shadow of an object and the sun and also used the time from sunrise to sunset or the next sunrise. Time measures the gap between the occurrences of two events. All our activities are based on a point of time and duration of time.

4. The SI unit of time is second (s) all over the world. The longer units of time are minute hour and day. These are use used depending on the duration.

5. An object is in non-uniform motion if its speed keeps varying, i.e. it travels unequal distances in equal intervals of time. For example: A ball rolled on a rough straight surface. It keeps on showing down because of friction.

(G) Answer the following question in long :

1. Speed is the distance covered by an object in unit time. The objects are said to be in fast or slow motion depending upon the speed of their motion. Speed is calculated using the expression–

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{\text{Metre}}{\text{Second}}$$

The SI unit of time is second (s) and that of distance is metre (m). So the SI unit of speed is metre per second (m/s). Speed is also measured in kilometre per hour (km/h). The average speed of a moving object is defined as the total distance covered by it divided by the total time taken.

2. Simple pendulaum clock is a small metallic bob suspended by a light, inextensible string from a rigid support, such that it is free to oscillate without friction about a point. The bob of the pendulum moves to and fro along the same path and passes through the mean position. This type of motion is called oscillatory motion. The maximum displacement of the pendulum, i.e., the displacement between the mean position and the extreme position, is called its amplitude. The time taken by an oscillating pendulum to make one complete oscillation is called its time period. The number of oscillations made by the pendulum in one second is called its frequency of oscillation.

3. Sundial is a historical clock. It was used to record time in the days of Alexander the great (300 B.C.) but a sundial works only when the sun shines. The measurement of time is recorded by the position and length of the shadow of the pointer. Some historical sundials also exist in India at Jantar Mantar in Delhi and Jaipur. The time shown by them is quite accurate. Both of these structures were built by Maharaja Jai Singh II of Jaipur. They were of having a number of uses after sunset and on cloudy day.

4. Speed = 600 km/hour

$$\text{Time Taken} = 15 \text{ min} = \frac{15}{60} = \frac{1}{4} \text{ hour}$$

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$= \frac{600 \times 1}{4} = 150 \text{ km}$$

5. Speed = 140km/hour = 38.88889 Meter/Second

Time = 1 min = 60 second

$$\text{Speed} = \frac{\text{Metre}}{\text{Second}}$$

Distance = Speed × Second

= 38.88889× 60

= 2333.33 metre

(H). Science puzzle ;

1. MOTION 2. SPEED 3. DISTANCE
4. LENGTH 5. PENDULUM

Chapter 10 : Weather, Climate and Adaption

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks :

1. Hump **2.** Migration **3.** Siberian cranes **4.** Prehensile **5.**Toucans

(C) State the following statements are True or False :

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

(D) Match the following :

1. Camel **2.** Arctic tern **3.** Bird **4.** Ice region

(E) Answer the following question in very short :

1. Hygrometer is the instrument used to measured the humidity in percentage**.**

2. The instrument is used for measuring the amount of rain fall in certain period of time is called rain gauge.

3. Climate is the conditions of temperature and precipitation for an area.

4. Temperature, pressure , wind, humidity and rainfall are some factors responsible for the climate.

5. The weather included the humidity, rainfall, windspeed, and the temperature.

(F) Answer the following question in short :

1. The day-to-day condition of the atmosphere at a place with respect to elements like temperature, humidity, rainfall, wind speed, etc. is known as weather of that place. Changes in the weather are observed in the atmosphere.

2. Humidity is the amount of water vapour present in the atmosphere. It is high after it rains and in places near the sea.

3. Latitude is one of the most important factors determining climate. It is a measure of distance north or south of the equator where high temperature is the norm, and the sun can beat down from directly so these areas near the equator have a warm climate. Further form the equator, the sun rays are not direct. Less radiant energy is are received by areas farther from the equator. So climate cooler.

4. Animals living in cold places have thick fur and below it a thick layer of fat. For example the bodies of penguins are white and merge into the back ground. They have a thick layer of skin and move around in groups to keep warm. Their streamlined bodies and webbed feet make penguins swift swimmers. The skin of penguins insulates the bird from cold.

5. Difference between climate and weather

S. No	Climate	Weather
1.	Climate refers to sum of the total weather condition and variation over an areafor a long period of time.	Weather refers to the state atmosphere at any point of time and place.
2.	Climate does not change so frequently	Weather conditions may vary at intervals of a few or a few days.
3.	Climate refers to the average value of several elemets of weather, relating to a period more than 30 years.	Weather data are the observation recorded at a specific time.

(G) Answer the following question in long :

1. Migration is the mass movement of animals. Mostly birds migrate from colder places to warmer regions to escape the cold, to breed or due to shortage of food. Some birds travel about 5,000 km to escape the extreme cold. They fly high where the wind flow is helpful and the cold conditions allow them to disperse the heat generated by their flight muscles. During migration, birds are guided by the sun during day and the start at night. The Siberian crane comes to India (Sultanpur in Haryana and Bharatpur in Rajasthan) from Siberia every year. The arctic tern makes the longest migration. Animals like eels, fish, whales, insects are also known to migrate in search of better climates.

2. The tropical rain forest have awide variety of animals. The animals are adapted to hot summers and plenty of rainfall. The conditions of climate are very supporting to animals living in these forests. The animals in rain forest -

(i) Elephants : The elephants have adapted themselves to the conditions of rainforest, elephants keep moving their big ears to keep their body cool and help to hear very small sounds. It uses its trunk for picking up food. Its tusks are modified teeth and can tear the bark of trees.

(ii) Monkeys : They have long prehensile tails with the help of which they grasp branches and move from one tree to another. Their hands and feet are also adapted for swift movement on trees.

(iii) Birds : Toucans are big birds with long beaks. The long beak helps them to get food from weak branches. Birds have a light weight body and forclimbs are modified into wings for flying. The bones of bird are hollow with air cavities to make the body light. Birds have strong flight muscles which provide additional strength to the wings during flying. d limbs or legs that are joined to the spine by the tip girdle or pelvic girdle. The bones of upper leg or thigh is called tibia and fibula.

3. Desert is an example of extreme climate conditions. It receives very less rainfall and large amount of sunlight therefore plants and animals have to adapt to such conditions. Camel has broad feet almost as large as a plate, helping it to walk easily on the soft sand without sinking. It can store food in its hump. In can store water in its blood. This helps it stay without food or water for many days at a stretch. It has long legs that keep the sand's heat away from its body and the long hair that keeps it warm during the cold desert nights. It has thick lips to enable it to eat prickly desert plants

without pain and long eyelashes that keep the sand out. It can shut its nostrils to keep out sand. Camel has long hair that keeps it warm during the cold desert nights.

4. Polar bears live an arctic ice-flowes. Polar bears protect themselves with the thick fur on their bodies.They have two layers of fur for protection from the extreme climate. They also have a layer of fat under the skin, and are very well insulated. often take rest to avoid getting overheated. The polar bear often goes a swim to cool off on warm days. Its wide and large paws are useful for swimming as well as for walking on the snow. It has very good and strong sense of smell that helps to locate and catch the prey. Polar bears have an extra transparent eyelid that the polar bear keeps closed to protect its eyes from snow blindness and while swimming under water.

Chapter 11 : Physical and Chemical change

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. physical **2.** monoatomic **3.** salt **4.** Stainless **5.** rusting

(C) State the following statements are True or False :

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

(D) Match the following :

1. Permanent **2.** Temporary **3.** Element **4.** Compound **5.** Mixture many gases

(E) Answer the following question in very short :

1. Those molecules are represented by three atoms called triatomic. For exaple ozone – O_3.

2. Crystallization is the slow precipitation of crystals from a solution of a substance.

3. A chemical change occurs when one or more substances are converted into one or more new substances.

4. A change in the physical properties such as shape, size, colour and state of a substance is a physical change.

5. $\underset{\text{Water}}{2H_2O} \rightarrow \underset{\text{Hydrogen}}{2H_2} + \underset{\text{Oxygen}}{O_2}$

(F) Answer the following question in short :

1. When iron are left in open air for some time, they get coated with a brown powdery substance called rust. This process of changing iron into rust is called rusting.

2. When one or more substances undergo chemical changes, entirely new substance with new properties are produced. Such a change takes place due to what is known as chemical reaction.

3. A crystal is solid structure with flat sides. Many substances form crystal. It is based on the principle of obtaining pure sample of a soluble solid from its solution.

4. The preventing of rusting are ;

(a) Painting an Iron Surface

(b) Oil and Grease

(c) Converting iron into an stainless steel (alloying).

5. The difference between Analysis and Synthesis reaction

Analysis : In this chemical reaction, a substance splits into different substances i.e. two or more products are obtained from a single reactant. For exaple : When passing electric current through water it breaks up giving hydrogen and oxygen.

Synthesis : When two or more substances combine to form a new substance, a synthesis reaction occurs. For example ; Mercury and oxygen combine to form mercury oxide.

(G) Answer the following question in long :

1. Chemical symbols are one or two letters from the Latin alphabet, but can be three when the element has a temporal name, and are written with the first letter capitalized. Chemical elements listed by symbol. A chemical formula is the symbolic representation of a molecule of a substance. Atomicity is defined as the number of atoms present in one molecule of an element.

2. The statement that uses symbols and formulae to describe a chemical reaction is called a chemical equation. It is a shorthand representation of a chemical reaction with the help of chemical symbols and formulae.The substances that take part in a chemical reaction are called the reactants. It is on the left side of the arrow of reaction. The new substances formed in a reaction are called the products. It is on the right side of the arrow.

Hydrogen + Oxygen $\rightarrow$ Water

An equation in which the number of atoms of each element is the same on both sides is called a balanced chemical equation.

3. The types of chemical reaction are :

(i) Decomposition Reactions or Analysis : In this chemical reaction, a substance splitsinto different substances i.e. two or more products are obtained from a single reactant. When passing electric current through water it breaks up giving hydrogen and oxygen.

$$\underset{\text{Water}}{2H_2O} \rightarrow \underset{\text{Hydrogen}}{2H_2} + \underset{\text{Oxygen}}{O_2}$$

(ii) Combination Reactions or Synthesis : When two or more substances combine to form a new substance, a synthesis reaction occurs. Example : (a) Mercury and oxygen combine to form mercury oxide.

$$\underset{\text{Mercury}}{2Hg} + \underset{\text{Oxygen}}{O_2} \rightarrow \underset{\text{Mercury oxide}}{2HgO}$$

(iii) Neutralization Reactions : The reaction that produces a salt is called a neutralization reaction. It always produces water and salt. When combined the hydrogen chloride and sodium hydroxide that produce water and sodium chloride.

$$\underset{\text{Hydrogen Chloride}}{HCl} + \underset{\text{Sodium hydroxide}}{NaOH} \rightarrow \underset{\text{Water}}{H_2O} + \underset{\text{Sodium chloride}}{NaCl}$$

(iv) When an element and compound react and if the element displace an element from a compound, such a reaction is called a displacement reaction.

When zinc is added to hydrochloric acid, the hydrogen of hydrochloric acid is displaced by zinc.

$$\underset{\text{Zinc}}{Zn} + \underset{\text{Hydrochloric acid}}{2HCl} \rightarrow \underset{\text{Zinc chloride}}{ZnCl_2} + \underset{\text{Hydrogen}}{H_2}$$

4. The crystallization is a process of separation and purification method which involves the participating of solid crystal from its saturated solution on cooling. A crystal is solid structure with flat sides. Many substances form crystal. It is a method of producing the crystals of a substance by cooling its hot saturated solution. A saturated solution is one that contains the maximum possible amount of a solute dissolved in it. The liquid left after crystallization is a dilute solution of the substance. It is used to obtain a substance in the pure form. We can prepare crystals of common salt, sugar, alum, copper sulphate and Neela thotha by this method. Crystallization produces beautiful crystals.

Chapter 12 : Reproducton in Plants

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. seeds **2.** Bryophyllum **3.** asexual reproduction **4.** water **5.** Stamen.

(C) State the following statements are True or False :

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

(D) Match the following :

1. water **2.** animals **3.** fruits **4.** spores **5.** Bryophyllum

(E) Answer the following question in very short :

1. The two types of reproduction are Asexual Reproduction and Sexual Reproduction

2. Wind , water, animals and bursting are the agents of the dispersals.

3. Self- Pollination And Cross pollination are the two types of pollination.

4. Many plants grow into new plants from a single parent plant. In vegetative propagation of asexual reproduction, new plants are produced from the vegetative parts such as leaves, roots or stems, etc.

5. Budding is another type of asexual method of reproduction commonly observed in yeast.

(F) Answer the following question in short :

1. Cutting is a very simple method. It is a method of asexual reproduction in plants. In the process of cutting a small cutting of the parent plant having some buds taken, burried in the moist soil. After some days the cutting develops, roots, shoots and grow into a new plant. Plants like grapes, sugar cane, banana etc. can be grown by this method. The new plants are the true replicas of the parent plant.

2. Budding is another type of asexual method of reproduction commonly observed in yeast. In this method some unicellular organisms. A small bulb like projection is formed on the parent body. The projection is called a bud, which grows in size and forms an adult individual. From this another bud may arise forming a chain of buds. When these are well grown, they detach from the parent body and form new individuals, this whole process is termed as budding.

3. In the fragmentation method, certain algae like spirogyra that have a long ribbon like, filamentous body, the body breaks up into two or more parts called fragments. The breaking of body into two or more parts is called fragmentation. Each fragment

grows into a new individual. Each part of the body of an organism is capable of developing into a complete organism.

4. Regeneration is the process defined as the ability of an organism to regenerate i.e. replace its lose part. A small tissue from the body column of hydra grows into a small hydra.
5. **The process of dispesal by animals are :** The seeds like those of Xanthium, stick to bodies of animals passing by through tiny hooks in their coat and travels to far off places. Animals also help in seed dispersal by eating the succulent fruits. The seeds of such fruits may pass through guts of animals undigested and may get deposited in the soil along with excreta.

(G) Answer the following question in long :

1. Pollination is the process of transfer of pollen grains from the anther of a flower to the stigma of a flower. When pollen from a plant's stamen is transferred to the same plant's stigma, it is called self-prollination and when pollen from a plant's stamen is transferred to a different plant's stigma, it is called cross pollination. Self pollination can occur only in bisexual flowers, besides for self-pollination to occur the anthers and the ovules must mature at the same time. Cross-pollination is much more common than self-pollination. All unisexual flowers are cross-pollinated, so are bisexual flowers in which the anthers and ovules nature at different times.
2. **Seeds and fruits formation :** There occur some changes in the flower which underwent the process of fertilization.
   (i) Sepals, petals, stigma fall of leaving the fertlized ovary.
   (ii) Zygote utilizes the reserved food in the ovule to divide and transform into an embryo enclosed in a seed coat.
   (iii) The walls of the ovule convert hard layers of the seed.
   (iv) A seed contains a young plant and stored food in the form of cotyledons.

   Thus a seed contains a young plant in the form of an embryo and stores food for its development, protected by covering and the fruits so formed may be fleshy and juicy like oranges and mangoes or hard and woody like almonds and walnuts.
3. **The process of dispersal by seeds ;** A seed contains the embryo which grows into a plant. A plant produces a large number of seeds. Each seed requires special space, minerals, sunlight and water for its development. If all the seeds produced from a plant grow around it, they will compete with each other for these resources and may not get enough of them. Many of these seeds may die also.In nature same kinds of plants grow at different places. After seeds ripen, they usually are scattering far from where they were made. The scattering of seeds is called dispersal of seeds. They disperse in many ways. Seed dispersal prevents competition between the plants and its own seeding for sunlight, water and minerals.
4. **Vegetative propagation :** Many plants grow into new plants from a single parent plant. In this process of asexual reproduction, new plants are produced from the vegetative parts such as leaves, roots or stems, etc.
   (i) **Vegetative Propagation by Roots :** Some plants like carrot, radish etc. are develop numerous large swollen fleshy roots. These swollen roots are cut and planted in the soil. These roots contain large quantity of food inside them. Each such single root is capable of giving rise to a new plant. These are then detached from the parents plant and grow separately.

(ii) Vegetative Propagation by Stem : Propagation by stem takes place in number of plants like ginger, turmeric etc. The under grand stem ginger is called rhizome. It also has scale leaves and buds, which can grow into new plants and the bulb of onion is vertical in direction under favourable conditions. It gives rise the onion plant.

(iii) Vegetative Propagation by Leaves : In bryophyllum the leaf has buds at the edges or margins. The leaves when fall on the ground develop many bods on its margin. Each of buds gives rise to a small plant bearing leaves and roots. These new plants remain attached to the leaf for a while but eventually detach them selves and grow as independent plants under favourable conditions.

Chapter 13 : Light

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. Real **2.** Virtual **3.** angle of reflection **4.** 3×10^8 **5.** straight

(C) State the following statements are True or False :

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

(D) Match the following :

1. Concave mirror **2.** Converging lens **3.** Diverging lens **4.** 3×10^8

5. Angle of reflection

(E) Answer the following question in very short :

1. Light is a form of energy. It is very important for us. We need light to see the objects around us. Our eyes can see an object only if light reflected from it enters our eye.

2. When the collection of light rays starting from a point travel in various directions, they are called the divergent beam.

3. Focal length is the distance between the pole and the focus of the mirror. It is half the radius of curvature.

$$F=\frac{R}{2}$$

4. There are seven colours in rainbow.

5. Seven colours are presented by VIBGYOR. It means

Violet	Indigo	Blue	Green	Yellow	Orange	Red
V	I	B	G	Y	O	R

(F) Answer the following question in short :

1. A lense is a transparent medium. It is bounded by two curved surfaces of which at least one is spherical (curved). Mostly lenses are made of plastic and glass. As the rays of light pass through the lens, they are refracted so that they either come together or spread out.

2. The difference between real image and virtual image:

(i) Real Image : A real image, that can be formed by light rays and a screen is called a real image.

(ii) **Virtual Image :** Images that cannot be captured on a screen are called virtual images.

3. Light travels very fast but it takes some time to travel. The speed of light in a vacuum is 2,99,792 km/second. But for practical purpose it is taken as 3×108 m/s or 3×105 m/s or 3,00,000 km/s in air. The speed of light is diffrent in water and glass . In water = 2.25 ×108 M/S and glass = 1.8 ×108 m/s. The light travels at the fastest speed in air, but in water and glass, its speed decreases, so air is called the rarer medium and glass and water are called the denser medium.
4. **The laws of Reflection are :** (i). The incident ray, the reflected ray and the normal to the mirror at the point of incidence all lie in the same plane.
   (ii) The angle of incidence is always equal to the angle of reflection.
5. Due to the reflection of light, the impression of an object formed in a mirror is called the image of the object. As the distance of the object from the mirror increases, the distance of the image from the mirror also increases.
6. The spherical mirrors are of two types : (i) Concave mirror (ii) Convex mirror
   (i) Concave Mirror : The concave mirror, reflecting surface is curved inward the mirror.
   (ii) Convex mirror : The convex mirror, reflecting surface is curved outwardly.

(G) Answer the following question in long :

1. The path of light is always straight and never curved. Examples to show that light travels in a straight line are light emitted by a torch light and light emitted from the headlights of a vehicle. The direction of light can be changed only by reflection. The bouncing of light by any surface, like a mirror, is called reflection of light.
2. A spherical mirror is not flat like a plane mirror but curved. It is a portion of a sphere capable of reflecting light. Spherical mirror is also known as the curved mirror. The spherical mirrors are of two types : (i) Concave mirror (ii) Convex mirror
   (i) **Concave Mirror :** The concave mirror, reflecting surface is curved inward the mirror.
   (ii) **Convex mirror :** The convex mirror, reflecting surface is curved outwardly.
   In case of concave mirror, the bulging surface is painted with mercury and then with red lead oxide. So the inner shining surface becomes the reflecting surface.
   In case of convex mirror, the inner hollow surface is painted with mercury and then with red lead oxide. So, the bulging surface becomes the reflecting surface.
3. **There are various terms Related to spherical Mirror are :**
   (i) **Pole of the Mirror :** It is a centre point of spherical mirror. It is represented by 'P' or 'O'.
   (ii) **Centre of Curvature :** Centre of curvature is the centre of the sphere of which mirror is a small part. It is represented by symbol 'C'.
   (iii) **Radius of Curvature :** It is the distance between the centre of curvature and the pole of a curved mirror. It is represented by symbol 'R'.
   (iv) **Principal Axis ;** It is the straight line joining the centre of curvature and pole of the spherical mirror.
   (v) **Focus :** When, eays of light parallel to the principal axis of a spherical mirror meet a point on the principal axis as in a concave mirror or appear to meet at apoint on the principal axis as in a convex mirror after reflection, this point is called the focusof spherical mirror. It is a represented by symbol 'F'.

(vi) **Focal Length :** Focal length is the distance between the pole and the dfocus of the mirror. It is half the radius of curvature.

$$F = \frac{R}{2}$$

4. The dispersion of white light occurs because colours of white light travel at different speeds of coloured light in glass. The different colours travel at different speeds, they are refracted at different angles on passing through the glass prism. When white light consisting of seven colours falls on a glass prism, each colour in it is refracted by different angles, with the result that seven colours spread out to form a spectrum.

5. **Focus of Concave Lens :** In concave lens, when the parallel rays of light pass through a concave lens they bend outwards. The rays will appear to diverge from a single point if we look through the lens. This point is called the focal point or focus. It is represented by 'F'.

Focus of convex lens : In convex lens, the point where a bunch of parallel rays meet on the other side of the lens is called the focal point or focus. It is represented by 'F'.

(H) Group Discussion

Do yourself

Chapter 14 : Electric Current and Circuits

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. two **2.** Copper, aluminium **3.** dynamo **4.** Nichrome **5.** repel

(C) State the following statements are True or False :

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

(D) Match the following :

1. Negative **2.** Positive **3.** Electric charges **4.** Electric current

5. In one direction

(E) Answer the following question in very short :

1. Electric fuse is a safety device which is used in household wirings and in many appliances.

2. Silver is the best material for floeing the current.

3. Ampeare is an SI unit of electric current.

4. An ammeter is a measuring device used to measure the flow current in the circuit.

5. Nichrome wire is used in fuse.

(F) Answer the following question in short :

1. A circuit is said to be a closed or a complete circuit when current flows through it. Its switch is in 'on' position.

2. A voltmeter is a device used for measuring electrical potential difference between two points in an electric circuit. A voltmeter in a circuit is presented by the letter (V) in a circle.

3. When electric current flows through a conducting wire, the temperature of wire increases. This is called heating effect of electric current.

4.

S. No	Alternating Current	Direct Current
1.	In our houses the current which we use is alternating current.	The direct current flows in only one direction.
2.	Alternating current starts from zero, flows in one direction, gradually rising to maximum value.	The current in dry cells and batteries is direct current.
3.	The current reverses its direction of flow and increases to its maximum value.	In DC supply the loss of energy in the conductor is much more.

5. A circuit breakers is an automatically operated electrical switch designed to protect an electric circuit from damage caused by overload of electricty or short circuit.

(G) Answer the following question in long :

1. **The use of Electromagnet are** : There are many uses of electromagnet :

(i) The electromagnets are used to separate magnetic material from the junk.

(ii) Electromagnets are also used in electric bells, audio and video tape, telephones, telegraphs, loudspeakers or many other things.

(iii) Electromagnets are used in cranes, in steel works and scarp yards.

(iv) Doctors use tiny electromagnets to take out small pieces of magnetic material that have accidentally fallen in the eye.

2. Magnetism is closely related to electricity because both involve the motions of electrons. A length of wire wound closely together is called a coil. An electric current flowing through a wire gives rise to magnetic field surrounding the wire. Thus magnetism could be produced from electricity. Coiled wire acts like a magnet when a current passes through it. The more coils the wire has, the greater will be strength of the magnet. A conductor around a piece of soft iron would produce an even more powerful magnet. When powerful magnets are temporary they are known as electro-magnet. Its magnetism lasts only while a current passes through its coil. Once the current stops, the iron core loses its magnetism.

3. When the circuit is completed (by pressing on the switch), a current starts flowing through the electromagnet and magnetizes it. It attracts the armature towards it. This results in the hammer striking against the gong and making a sound. However, the attraction of armature causes the flexible strip to lose contact with the screw. This result in a break in the circuit so that the current through the electromagnet stops. The electromagnet, thus, loses its magnetism and the armature springs to its original position. The circuit gets completed again and the whole process repeats itself. This continues as long as the bell switch kept pressed and we, therefore, keep on getting an intermittently ringing sound. It is the action of the electromagnet in the bell that makes it ring.

4. A closed path formed by the interconnection of electrical components through which electric current flows is called an electrical circuit. A simple electrical circuit consists of a battery, a light bulb and a switch connected using connecting wires. If current does not flow through a circuit, then it is said to be an open or an incomplete circuit. Its switch is in 'off' position. A circuit is said to be a closed or a complete circuit when current flows through it. Its switch is in 'on' position. A combination of two or more

cells connected together is called a battery. Batteries are used in many devices, such as torch lights, mobile phones, calculators and even automobiles.

5. The precaution of electric current are :

An electric current flowing through our body gives us an electric shock because a human body is good conductor of electricity. A shock can damage the blood cells and muscles in our body and cause death.

(i) We should always use good quality insulating tape while joining copper wires.

(ii) Never handle appliances when your hands are wet or when you are standing in water.

(iii) Never overload a circuit by connecting too many appliances to it.

(iv) No metallic objects or fingers should be inserted in the electrical objects.

(v) We should always check and disconnect the power source before repairing the electrical equipment.

6. An electric bell is the direct application of electromagnet. We use the electric bells in our houses and offices. Its components are an electromagnet, an armature (a soft iron bar mounted on a spring), a hammer, a gong and a contact screw. When the circuit is completed (by pressing on the switch), a current starts flowing through the electromagnet and magnetizes it. It attracts the armature towards it. This results in the hammer striking against the gong and making a sound.

(H) Science Puzzle :

(i) ELECTROMAGNET (ii) AMPEARE (iii) COULOMB

(iv) FUSE (v) WIRE

Do yourself

Chapter 15 : Water

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. Vapour **2.** Oxygen **3.** water cycle **4.** living organisms

5. waste **6.** Water pollution

(C) State the following statements are True or False :

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

(D) Match the following :

1. Ice **2.** Water **3.** Water level **4.** Oxide of hydrogen **5.** Rivers

(E) Answer the following question in very short :

1. Rainfall, rivers, seas, wells, lakes, are the various sources of water on the earth.

2. Solid state(Ice), Liquid state (water), Gaseous state(water vapour) are the various forms of water.

3. Hydrogen and Oxygen are the elements of the water.

4. Yes water is a natural resource.

5. Rivers,ponds, lakes, seas, oceans are the sources of surface water.

(F) Answer the following question in short :

1. When rain falls, some of the water evaporates. Some runs off the surface forming streams and rivers and some water percolates to the deeper layers of soil and reaches the non-porous rocks underneath. This is called underground water.

2. According to the scientists, water is a chemical compound. It is a mixture of hydrogen and oxygen. Water is a colourless, tasteless liquid formed when hydrogen burns in the air or oxygen. Chemically, we present the water in the form of H_2O. Water is an oxide of hydrogen.

3. Water pollution affects drinking water, rivers, lakes and oceans all over the world. In many developing countries, it is usually a leading cause of death, by people drinking water from polluted water sources.

4. Water plays a vital role for the survival plants. If plants do not get water for few days they dry up and die. Water is also an important component in the food manufacturing known as photo-synthesis. Plants need water to get mineral, nutrients from the soil.

5. Water management is very important because water is very essential for all living and non living things. Due to water only we can satisfy our daily as well as our basic need like food. Water is very much needed in every factory, every agriculture field, every human being, in fact water is needed for all living things very eagerly.

(G) Answer the following question in long :

1. Water is an important natural resource. About three–fourths of the earth's surface is covered with water. However, inspite of this huge availability of water, it is not enough for human consumption.Out of all the water on earth, 97.4 percent is in the oceans. Sea water is salty and cannot be used for drinking. Out of the remaining 2.59% of fresh water, about 1.98% is frozen and locked in glaciers and ice caps. Thus it is not available to us for our use.

2. There are mainly three sources of water :

(a) **Surface Water :** Surface water is water on the surface of earth. For example : Rivers, ponds, lakes, sea and ocean. The waters of rivers, ponds and lakes are fresh water while sea and ocean water has salts dissolved in it. Sea water is unfit for household use and human consumption.

(b) Underground water : When rain falls, some of the water evaporates. Some runs off the surface forming streams and rivers and some water percolates to the deeper layers of soil and reaches the non-porous rocks underneath. This is called underground water. At some places, ground water comes out of the surface in the form of natural springs. As the ground water passes through various layers of the soil, it gets filtered by several layers of sand and rock. It is, therefore, free of suspended impurities. Ground water can be obtained by digging wells or sinking tube wells.

(c) Rainwater : Rain is the main source of water on the earth. Rain occurs when the water vapour in the air condenses. Rainwater is the purest form of water. It is free from germs and soluble solid impurities. It contains dust particles and some dissolved gases like carbon dioxide present in air. In place with a lot of air pollution, rain water may also contain harmful substances like acids.

3. We need water because water is very essential for all living and non living things.Water is very much needed in every factory, every agriculture field, every human being, in fact water is needed for all living things very eagerly.We all need

water for our daily routine like for drinking, watering, cooking, washing, bathing and washing clothes and many much more daily purposes.

4. Clean, safe drinking water is scarce. we take it for granted, we waste it, and we even pay too much to drink it from little plastic bottles. Scarcity of water is defined as a state of is less or insufficient water for daily use. On the whole about 18% of our country is drought–prone. Lack of rainfall is not the only reason for the scarcity of water.

5. Water pollution is the contamination of water bodies (e.g. lakes, rivers, oceans, aquifers and groundwater), very often by human activities. Water pollution occurs when pollutants (particles, chemicals or substances that make water contaminated) are discharged directly or indirectly into water bodies without enough treatment to get rid of harmful compounds. Pollutants get into water mainly by human causes or human factors. Water pollution can be a Point-source, Non Point-source, or Transboundary in nature. Water pollution is the second most imperative environmental concern along with air pollution. Any change or modification in the physical, chemical and biological properties of water that will have a detrimental consequence on living things, is water pollution.

6. **The ten ways to conserve the water are :**(i). Rainwater harvesting is a good idea for the purpose like uses washing clothes, watering garden etc. so that clean water can be saved for drinking and cooking purposes.

(ii) Planning for water use by industries and farms which will cut down wastages of water.

(iii) Maintaining watershed, or areas with trees and other plants which will help store ground water and keep the soil from washing away.

(iv) Fix a dripping tap.

(v) Turn the water off while you brush the teeth.

(vi) Don't run the dish water or washing machine until thry are full.

(vii) Stop using your toilet as an ashteay or wastebucket.

(viii)Install watyer saving shower heads or restrictors.

(ix) If you wash dishes by hand, don't leave the water running for rinsing.

(x) Use rainwater to water the palnts in the house.

(H) Project :

Do yourself

Chapter 16 : Wind, Storm and Cyclones

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. Typhoon **2.** everywhere **3.** 600°C **4.** natural **5.** Calm and clear

(C) State the following statements are True or False :

1.True **2.** True **3.** True **4.** True **5.** True

(D) Match the following :

1. During the day **2.** At night **3.** The direction of wind

4. Measuring wind speed

(E) Answer the following question in very short :

1. Thunderstorm, tornadoes, cyclones(tsunami) are the types of storms.

2. Local Wind and Global wind are two types of wind.

3. Wind vane is the metal object and it is used for knowing the directionof the wind.

4. Cock is sitting on the wind vane.

5. An anemometer is a device used to measured the speed of wind.

6. American people called the hurricane to the cyclone.

(F) Answer the following question in short :

1. The Cyclone causes a lot of damages are -

(i) Trees, poles of electricity may fall down on the road and cause danger for the humans.

(ii) The boats, may come loose from mooring.

(iii) Building materials are blown away from construction sites, and other places.

2. A rotating column of high speed winds that appears as a dark funnel shaped cloud reaching from the ground to sky is called tornado.

3. The local winds occur on a small spatial scale, their horizontal dimensions are typically from several tens to a few hundred of kilometres. During the day time, the air over a land area is often warmer than the air over a nearby lake or sea.

4. As above answer 1.

5. The direction of wind means the direction from which the wind comes. In fact, the direction of the wind is the direction from which it blows.

(G) Answer the following question in long :

1. Thunderstorms are violent winds which are also called tropical storms. It brings heavy rains with high speed wind and lots of lightning and thunder. The thunderstorm's development is that the ground heats up and hot air rises up. The air warmer than the surrounding air rises up. As the air cools and the water condenses, there is release of heat energy inside the storm, and a low pressure area. Water droplets in the upper part of the cloud freeze into snow and ice crystals start falling through the cloud. They chill the water droplets in the cloud and cause them to form large drops and fall. The usual result is a downpour of rain by thunder and lightning.

2. A cyclone is a natural calamity caused by difference in air pressure in the atmosphere. It is a violently rotating wind storm. It develops over the sea and may move over the land causing great damage. Cyclones begin as thunderstorms and later develop into cyclones. They are associated with strong winds, heavy rains and tidal waves. In tropical regions like India, thunderstorms are common, but very few thunderstorms become cyclones. In India, the eastern coast is more vulnerable to cyclones than the western coast.

3. Precaution during tornado :

1. Prepare for tornadoes by gathering emergency supplies including food, water, batteries, flashlight important doument, road, maps, and full tank of gasoline.

2. When a tornado approaches, anyone, in its path should take shelther indoors-preferably in a basement or an interior first floor eoom oe hall way.

3. The nitrogen present in air is essential for the growth of plants. Plants take in nitrogen directly from the air or from the soil.

4. Difference between tornado and cyclone :

S.No	Tornado	Cyclone
1.	It is a small but very powerful twisting mass of air that causes a lot of damage.	A cyclone is a natural calamity caused by difference in air pressure in the atmosphere.
2.	A tornado forms due to the effect of low pressure in the eye of a cyclone.	It is a violently rotating wind storm.
3.	Dust, soil, trees, animals, people cars and even building may be drawn up into it and whirled around.	It develops over the sea and may move over the land causing great damage. Cyclones

(H) Science Puzzle :

(i) TYPHOON (ii) CYCLONE (iii) STORM (iv) TORNADO (v) THUNDER

(I) Creative Time

Do yourself

Chapter 17 : Forest and Waste Management

(A) Multiple Choice Question (MCQ) :

Tick (✓) the correct answer :

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

(B) Fill in the blanks with suitable words :

1. resources **2.** natural **3.** environment **4.** maintain **5.** garbage

6. seawage treatment plants

(C) State the following statements are True or False :

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

(D) Match the following:

1. carbon dioxide **2.** Oxygen **3.** Petrol **4.** Non-Organic waste

5. Plastic bags

E. Answer the following question in very short :

1. Wood, rubber, honey, fruits, gum and bamboo are six forest products.

2. There are three types of wastes in oue environment .

3. There are many different kinds of forests around the world are Boreal forest, mangrove forest, tropical rain forest, temperature rain forest and Carolinian forest etc.

4. Solid domestic waste is called garbage. These waste are dumped at public places, causing inconvenience to the general public. It includes packing materials, vegetable-peels, plastic containers, junk steel, food residue etc. .

5. Animals also play an important role in the dispersal of seeds and fruits. The scattering of seeds is called seed dispersal.

(F) Answer the following question in short :

1. Forests are the natural ecosystem having a variety of flora and fauna. Forests provide us with many things we need in our day to day life. Besides, they play a very important role in maintaining the environment balance. Forest plants are dominated

by trees, their species varying in different parts of the world. The large areas where trees, shrubs and herbs grow very close to one another are called forests.

2. Forests provide wood, bamboo, rubber, gum, resin, katha, honey, lac, medicinal plants, fruits, berries and also provide raw materials for food. Wood pulp is used for making paper. Many chemicals are derived from wood, including acetic acid, glycerine and methyl alcohol-wood contains cellulose and this can be extracted and used to make plastic and artificial fabrics. Varnish, turpentine, soaps and explosives are the other forestry products.

3. Forests play a vital role in balance the environment and controlling the pollution. Forests are also important in the following ways :

(i) Forests recycle water into the atmosphere which falls as rain to replenish the ground water.

(ii) Forests regulate the climate by maintaining the level of rainfall.

(iii) Forests decrease the run off rate of rain water and thus prevent soil erosion.

(iv) Forests maintain the fertility of the soil.

(v) Forests purify the air and water.

4. The Dependence of Plants on Animals are :

(i) Carbon dioxide : Plants need the carbon dioxide to make their own food by the processing of photosynthesis. Animals give out carbon dioxide during respiration.

(ii) Dispersal of seeds : Animals also play an important role in the dispersal of seeds and fruits. The scattering of seeds is called seed dispersal.

(iii) Pollination : In some plant pollination is brought about by insects, birds and bats. Without animals, help fruits of many plants would not be formed.

(iv) Nutrients : The excreta of animals and the decomposed dead bodies of animals add nutrients to the soil. These nutrients help in better growth of the plant.

5. The dependence of Animals on Plants are :

(i) Food : Animals depend directly or indirectly on the green plants for their food. Mostly animals eat the leaves of the plants.

(ii) Oxygen : Plants release the oxygen during the process of photosynthesis while the animals used the oxygen. Animals depend upon plants for oxygen for their respiration.

(iii) Habitat : Some animals make their homes in holes in the trees. Birds live in nests on the branches of the trees. Monkeys and apes also live in trees. Many insects live in trees. Plants provide shade and protection from heat, rain and strong wind.

(G) Answer the following question in detail :

1. Deforestration means cutting of tree he earth has lost a large area of forest cover. Every biological community of plants and animals live on products which are constantly renewed through nature cycle. Cleaning of land by destroying forest affects the ecosystem greatly. Some important consequences of this action are as follows.

(i) Overgrazing by animals.

(ii) Excessive felling of trees.

(iii) Construction of huge dams.

(iv) Fertility of the soil is lost.

(v) Habitats of animals are destroyed which leads to their extinction.
(vi) Oxygen-carbon dioxide balance in air is disturbed.
(vii) Water cycle is disturbed and the ground water is depleted.
(viii) Air pollution by industries located near the forests.

2. The conservation of forest is very important to maintain a balance in nature. Some following ways can make it possible are -
(i) Forest fire should be controlled by the use of anti-fire solutions, fire blenkless etc.
(ii) Forest nurseries should be established, these will help in forestation.
(iii) Overgrazing should not be allowed.
(iv) Continuous afforestation programmes should be undertaken.
(v) People should be made aware about the usefulness of forests.
(vi) Cutting of trees should only be allowed with the condition that twice the number of trees to be cut, will be planted.

3. The wastes are generated by us and mixed in environment. According to physical nature, wastes are of three types :
(i) Solid Waste : Solid domestic waste is called garbage. These waste are dumped at public places, causing inconvenience to the general public. It includes packing materials, vegetable-peels, plastic containers, junk steel, food residue etc.
(ii) Liquid Waste : The waste which is in liquid form or is released along with water or any other liquid is known as liquid waste. Liquid domestic waste is called sewage. It is the mixture of waste from the human body faeces and urine and waste water that is carried away from houses by pipes under the ground. Most of the waste is harmful to living organisms and pollutes our environment. The liquid wastes pass through the pipes or under the ground. That carry away waste material and used water from house, factories etc. are called sewers.
(iii) Gaseous Waste : This type of wastes is discharged into the atmosphere in the form of gases. Burning the coal, petrols, kerosene, wood, cooking gas etc. produce smoke which contains carbon dioxide and other irritation fumes.

4. The waste should be managed in avery good manner. So that the watse do not pollute our environment. The various measures of management of waste are -
(i) All drains should be covered properly and water should not be allowed to stand in drains for a long time. Because mosquitoes and flies breed in the stagnant water and cause diseases, such as malaria.
(ii) Different chemical products like paints, medicines, motor oils, insecticides kill water purifying microorganisms when they are thrown in drains.
(iii) Do not throw cotton, sanitary to wells, food remains in drains. They choke the drains and do not allow free flow of oxygen thus hampering the degradation process.
(iv) Proper sanitation facilities should be provided to rural people. Defecation in open fields and near railway tracks should be discouraged.

(H) Group Discussion :
Do yourself

❑