

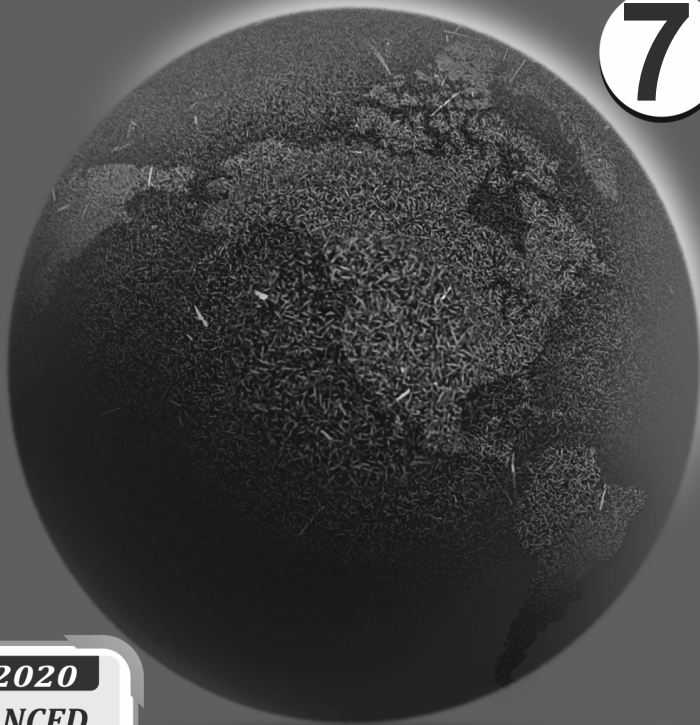


DISCOVERY

Science

Teacher Manual

7



NEP 2020
ENHANCED
EDITION

CLASS - VII

CHAPTER 1 (Nutrition in Plants)

Just Do More (Pg 9)

1. Yes, nutrition is important for all living beings.
2. $6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
3. Because they lack chlorophyll.

Just Do More (Pg 12)

1. Mushroom, Yeast
2. Because it climbs on the branches of other plants with the help of its yellow coloured thread like stem.
3. Pitcher Plant, Sundew, Venus Flytrap.

EXERCISE

- A**
1. (b) respiration
 2. (c) Leaves
 3. (c) Nitrogen
 4. (b) Round Worm
 5. (c) Insectivore
- B**
1. (e) Green pigment
 2. (d) Simple sugar
 3. (f) Light
 4. (a) Parasite
 5. (b) Saprophyte
 6. (c) Symbiotic organisms
- C**
1. True
 2. True
 3. True
 4. True
 5. True
 6. True
- D**
1. parasitic, parasite, host
 2. symbiotic relationship
 3. Nutrients
 4. chemical
 5. photosynthesis
 6. parasite
- E**
1. Vitamins, Minerals
 2. Money plant, Mango tree
 3. Blue green algae, Red algae
 4. Bread moulds, Fungi on pickles
 5. Pitcher plant, Venus flytrap
 6. Lichen, Rhizobium
- F**
1. Process by which food is taken in and used by an organism.
 2. The mode of nutrition in which organism make their own food from simple non living substances.
 3. The mode of nutrition in which organism obtain their food from plants or other animals.
 4. The mode of nutrition in which organism thrive on or inside the body of another animal or plant and obtain food from its body.
 5. The mode of nutrition in which organism obtain food from dead

and decaying bodies of plants or animals.

6. Insectivorous plants are those that feed on insects.

G 1. Autotrophic nutrition is that mode of nutrition in which organism make their own food from simple non living substances whereas heterotrophic nutrition is that mode of nutrition in which organism obtain food from plants or other animals.

2. The process of making food by green plants in presence of air, sunlight and water.

3. The process of photosynthesis is important because:

F It results in synthesis of food from inorganic raw material.

F Green plants provide organic food to all living organism on earth.

F It helps in maintaining ecological balance of environment.

F It helps in addition of oxygen in atmosphere.

F It decreases the concentration of CO_2 which increase due to respiration of organism.

4. Saprophytes secrete some enzyme from their body which break the complex organic matter into simpler substances. This converts the solid matter into a liquid form. They then easily absorb the nutrients from the dead and decaying matter and digest them easily.

5. Symbiotic nutrition is a mode of nutrition in which two different organism depend on each other for shelter and nourishment and both are benefited. These organisms are called symbiotic organisms.

6. We will conduct an iodine test for checking presence of starch in a leaf. The green portion of the leaf will become bluish black while the non green portion of the leaf does not show any change. Thus, we will conclude that starch is only present in green portion of leaves.

H 1. The living world consists of organism that show two kinds of nutrition i.e.,

1. Autotrophic Nutrition

2. Heterotrophic Nutrition

Autotrophic Nutrition – Auto means self and trophs means nutrition. Green plants make their own food with help of CO_2 , water and minerals in presence of sunlight. This mode of nutrition is called autotrophic nutrition.

Heterotrophic Nutrition – Animals and non green plants such as fungi and bacteria cannot prepare their own food. They depend directly on green plants for their nutrition.

This mode of nutrition is called heterotrophic nutrition.

- The plants contain green pigment in their leaves called chlorophyll. These green pigments trap sunlight during the day and convert light energy to mechanical energy. Water absorbed by the roots is sent to different parts of plant. The leaves synthesise food in the form of glucose and oxygen is released. In most of the plants glucose is converted into starch and stored in the leaves, stems, roots and fruits. The overall process of photosynthesis can be represented through following equation:



- The heterotrophic nutrition are commonly of four types:
 - Saprophytic Nutrition** – The mode of nutrition in which organism depend on dead and decaying plants and animals for their nutrition. Eg. mushroom, yeast etc.
 - Parasitic Nutrition** – The mode of nutrition in which organism derive their food from the body of another living organism. Eg. cuscuta.
 - Symbiotic Nutrition** – It is the mode of nutrition in which two different organism depend on each other for shelter and nourishment and both are benefitted.
 - Insectivorous Nutrition** – In this mode of nutrition organism feeds on insects. For eg. pitcher plant.
- A special category of plants are insectivorous plants. These plants are also called carnivorous plants as they capture animals of different kinds, particularly insects. This type of nutrition is called insectivorous nutrition. Some common example of insectivorous plants are pitcher plant, sundew, venus fly trap etc.
- Rhizobium bacteria present in the root nodules of legumes also exhibit symbiotic relationship. It derives its nutrition from the roots and in turn converts atmospheric nitrogen into nitrogenous compounds. These compounds are used by the plants for synthesising proteins. In this way the soil is replenished with nitrogen naturally.
- The plant absorb mineral nutrients from the soil for their growth and development. The farmer continue cultivating crops, year after year in their fields so, the amount of these nutrients goes on declining. As a result, the yields of crops also go on decreasing. The addition of manures and fertilizers thus help in replenishment of nutrients of the soil.

HOTS

- Because legumes help in fixing atmospheric nitrogen into

nitrogenous compounds for better growth of plants or crops.

- Plants secrete their waste through transpiration. Therefore, they do not need digestive system as they have leaves to convert sugar into simpler form.

Let's Enjoy

- A** Do yourself.
- B** Do yourself.
- C** Do yourself.
- D** Do yourself.

CHAPTER 2
(Nutrition in Animals)

Just Do More (Pg 20)

- C shaped
- Liver
- It secretes pancreatic juices for digestion of food.

Just Do More (Pg 22)

- 2 phases
- Unicellular organism
- Rumen, reticulum, omasum and abomasum.

EXERCISE

- A** 1. (b) canines 2. (c) Assimilation 3. (a) Incisors
4. (a) Hydrochloric acid 5. (a) liver
- B** 1. True 2. False 3. False 4. False
5. True
- C** 1. (f) Elimination of food 2. (a) Gastric juice
3. (e) Intestinal juice 4. (b) Bile juice
5. (d) Pancreatic juice 6. (c) Bacteria
- D** 1. starch 2. Ingestion 3. juices 4. chyme
5. pancreatic juice 6. ruminants
- E** 1. On either sides of canines there are premolar. They have broader grinding surfaces. They help in chewing and grinding food. Whereas molars are the last three teeth on both sides in both the jaws. They have flat surfaces with small projections for effective grinding of the food.
2. At childhood a baby grows 20 temporary teeth, 10 in upper jaw and 10 in lower jaw. These are called milk teeth. The milk teeth fall off at age of ten and are replaced by larger permanent teeth. These are 32 in number. These teeth do not fall naturally.
3. Carnivores are the organism that eat flesh or other animals. Whereas omnivores are those organism that eat both flesh and plants as food.

4. Human beings are organism that depend on animal products and plant products for their food.
Ruminants are the organism that feed on grass/plants or which can digest cellulose.
- F**
1. Oesophagus, stomach, small intestine, rectum, large intestine, gall bladder and liver.
 2. **Premolars-** On either side of the canines there are premolars. They have broader grinding surfaces. They help in chewing and grinding food.
Molars- These are the last three teeth on both sides in both the jaws. They have flat surfaces with small projections for effective grinding of food.
 3. The function of taste bud is to distinguish whether a type of food is sweet, sour, bitter or hot.
 4. The wall of the ileum produce intestinal juice and the digestive process of the duodenum continue for some time in ileum. Nearly all the absorption of digested food takes place through the help of villi present in wall of small intestine. Simple sugar and proteins are absorbed through the intestinal wall into blood capillaries.
 5. In large intestine water and minerals are absorbed, so that it is not lost from the body. The semi solid remains are called faeces which are passed through anus at intervals.
 6. **Diarrhoea** – It is a condition of passing watery substances more frequently than normal. It is caused by the infection by water borne bacteria. Food poisoning and indigestion may also result in diarrhoea.
Constipation – It is a condition in which an individual has fewer than normal bowel movement. The stool is hard, dry, small in size and difficult to pass. It is often caused by intake to pass. It is often caused by intake of rich food and over refined food that does not contains enough roughage.
 7. The bile secreted by the liver helps in breaking down fat into simpler substances.
 8. Food stays in stomach for 6 to 8 hours.
- G**
1. In animal the nutrition takes place in different phases:
 - F** Ingestion – It is the taking in of food. It involves taking in of food through the mouth and eating it.
 - F** Digestion – It is the process by which food is dissolved and is chemically converted so that it can be absorbed by the cells of an organism and further use to maintain vital body function.

- F Absorption – It is a process by which organism absorbs the nutrients which are broken down into simpler substances during digestion.
 - F Assimilation – It is the process of utilisation of absorbed nutrients by body cells. In this process, absorbed nutrients are distributed to different parts of the body, where these nutrients are used upto maintain growth and function.
 - F Egestion – This is the final phase of nutrition. In this process undigested food and unabsorbed solid waste are removed from the body.
2. There are four types of teeth:
- F Incisors – The four front teeth present in both the jaws are called incisors. These are flat in shape. They are also called biting teeth as they help in biting and cutting the food.
 - F Canines – They are also called tearing teeth. These are pointed and are used for piercing and tearing pieces of food such as meat. These are four in number.
 - F Pre-Molars – On either sides of the canines there are pre-molars. They have broader grinding surfaces. They help in chewing and grinding of food.
 - F Molars – These are the last three teeth on both sides in both the jaws. They have flat surfaces with small projections for effective grinding of food.
3. The stomach is the C shaped muscular bag in which food is temporarily stored. Its contents are passed on gradually to small intestine. Peristaltic movement help to mix the food with gastric juices and turns into a watery substance called chyme. The inner wall of the stomach secretes digestive juices called gastric juices and hydrochloric acids. Proteins are broken down into simpler forms by digestive juices. Micro organisms are killed by the hydrochloric acid.
- The mucus helps to protect the stomach wall from its own secretion of hydrochloric acid and pepsin. Some absorption of small molecules such as glucose, salt, alcohol takes place in the stomach.
4. Digestion in the ruminants take place in two phases:
- 1st Phase :** The ruminants chew grass hurriedly. This half chewed grass reaches the first chamber of the stomach called rumen. It helps in storing the food consumed by the animals in large quantities. This food is called cud. In the rumen bacteria and other organism act upon the food. Thereafter, this food is sent to the next chamber called reticulum.

Ind Phase : From the reticulum the food that is cud is again sent back to the mouth. The ruminants chew it again but this time very slowly. This process is called rumination. This time the half digested and proper chewed food directly enters the third chamber called the omasum. Here this food is further broken down and excess water is absorbed. From here the food finally reaches the fourth column called abomasum. It secretes digestive juices from its walls and helps in the digestion of food. In this chamber the food mixes up with various enzymes and gets digested.

5. Do yourself.

HOTS

1. Because glucose in simpler form of sugar and gives energy to the body instantly.
2. Humans are not ruminants i.e., they do not only eat grass/plants or have cellulose to digest completely.

Let's Enjoy

- A** Do yourself.
B Do yourself.
C Do yourself.
D Do yourself.

CHAPTER 3
(Natural Fibres)
EXERCISE

- A** 1. (b) nylon 2. (c) shearing 3. (b) goat 4. (a) sheep
- B** 1. (c) Sericulture 2. (d) Shearing
 3. (e) Scouring 4. (b) Tassar
 5. (a) Merino
- C** 1. True 2. True 3. True 4. True
 5. True 6. False
- D** 1. Fibres 2. wild 3. fleece
 4. Angora rabbit 5. boiled
- E** 1. The early man covered their body parts using skin of animals, bark of trees etc.
 2. Wool is the common name applied to soft curly fibres obtained mainly from the fleece of animals.
 Wool bearing animals are camel, sheep, goat and rabbit.
 3. Removing animal hair from it's body for commercial purpose is called shearing.

4. The art of breeding silk worms for commercial use is called sericulture.
 5. Sericulture is not very popular with people working for animal protection because sericulture involves boiling of cocoons of silk worms which is against the rights of animals.
 6. Australia is the world's largest producer of raw wool.
The woollen industry in India is small and located in state of Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Arunachal Pradesh, Sikkim, Haryana, Punjab, Rajasthan and Gujarat.
- F**
1. Silk is obtained from silk worm, which are reared to obtain silk thread from them.
 2. A silky case spun by the caterpillar of silk worm around its body is called cocoon. Cocoons are boiled to kill the insect inside them. Cocoons are then dried and brushed to remove outer coarse filaments. Then the filaments of different cocoons are twisted to make a thread, which is then wound on a reel. This is a reel of raw silk.
 3. The production of wool fibre mainly comprises of :
 1. Cleaning – This is the first and the most important process. In this process the sheared wool is washed properly using detergent and chemicals to make it clean, soft and germ free. Thereafter, it is smothered by oiling.
 2. Carding – In this process washed wool is sent into a carding machine. The carding machine combs the loose wool fibres into a sheet. Then the sheet is twisted into robs called silver. The silver, is then stretched and twisted into yarn.
 4. The uses of wool are:
 1. Wool is used to make all woollen garments like sweaters, shawls etc.
 2. It is used to make blankets, felts, upholstery etc.
 3. Compressed wool is used to absorb noise in machines and stereos.
 4. Used wool is cut into small pieces, carded and spun again. This is used to make inferior type of garments and blankets.
 5. Sericulture gives us a beautiful and shining fabric to wear and look good but it effects adversely on the workers, working in this industry. They suffer from various diseases like:

F Respiratory problems like chronic bronchitis, asthma and other breathing problems. This is due to the vapour of cocoon while steaming and inhalation of the foul smell, emitted by silk worms.

3. 37°C
 4. Transferring of heat by the molecules of liquid and gases from the sources of heat to other molecules is called convection.
 5. The hotness and coldness of a body is called its temperature.
- E**
1. Transferring heat from one body to another body by variation of temperature is called flow of heat. Heat is transmitted from one body to another body by three means:
 - F Conduction
 - F Convection
 - F Radiation
 2. Movement of heat in solids is only by conduction so, the process of transmission of heat energy in solids without actual movement of particles from their position is called conduction.
Eg. tubes of copper are used in automobiles radiators, as they easily conducts the heat coming from the engine.
 3. Mercury is preferred to other liquids because of following reason:
 1. Mercury is the only metal which is found in liquid state. It is also a good conductor of heat.
 2. It is a shiny, silvery white liquid which can be seen very easily.
 3. The position of the boundary edge can be read distinctly on a scale.
 4. It does not stick to the wall of thermometer.
 5. It has a uniform contraction and expansion
 6. It has a sufficiently low freezing point (-39°C) and considerably high boiling point (357°C).
 7. It can be easily obtained in pure form.
 8. Its specific heat is low.
 4. Convection of heat is the process by which heat is transmitted when the molecules of a body move. To absorb heat and then move away to transfer the heat. The phenomenon due to which particles of a medium actually moves to a sources of heat energy, and then move away from it after absorbing heat energy is called convection. Transmission of heat in liquids and gases takes place through convection.
 5. The transfer of heat energy from a hot body to a cold body directly without heating the space in between the two bodies is called radiation. It is a faster medium than conduction or connection. Radiation need no medium to transfer heat from one body to another body unlike conduction or connection.

HOTS

1. 1° rise in the celcius scale is greater than 1° rise in fahrenheit scale.
2. Because they are big in size and readings are more than required for measuring human temperature.

Let's Enjoy

- A** Do yourself.
B Do yourself.

CHAPTER 5 (Classification of Substances) EXERCISE

- A**
- | | |
|-----------------------|------------------------------|
| 1. (c) sour | 2. (a) red litmus paper blue |
| 3. (b) indicator | 4. (a) oxalic acid |
| 5. (c) neutralisation | 6. (a) salt |
- B**
- | | |
|--------------------|---------------|
| 1. (d) Diluted | 2. (e) Acid |
| 3. (b) Lactic acid | 4. (c) Alkali |
| 5. (a) Bases | |
- C**
- | | | | |
|-------------------|-----------|----------------|-----------|
| 1. citric | 2. alkali | 3. indicators | 4. formic |
| 5. neutralisation | | 6. baking soda | |
- D**
1. **Citric acid** is an example of organic acid.
 2. **Water and salt** are produced when oxides of metals react with acids.
 3. Bases turn **red litmus blue**.
 4. The reaction of an acid with a base to form a salt and oxide is called **neutralisation**.
 5. Any substance that liberate hydrogen ions, sour in taste, which can turn red litmus blue is called **base**.
 6. Acid can be strong or weak depending upon their capacity to react with water.
- E**
1. Common Salt – In baking cakes, cookies, breads and in bicarbonate fire extinguishers.
 2. Baking Powder – In cooking as preservative in pickles, in washing soda, baking soda, caustic soda.
 3. Slaked Lime – White washing, neutralise acidity, construction of building.
 4. Washing Soda – ink remover, manufacturing nitric acid, synthetic fibres.
- F**
1. Substances can be classified into three categories acid, bases and salts.
 2. Common salt and sugar are neutral because:

- F They are good conductors of electricity.
 - F They have high melting and boiling point.
 - F They are soluble in water.
3. All bases which are soluble in water are called alkalis.
4. (a) Acids
- F Turns blue litmus red.
 - F Sour in taste.
- (b) Bases
- F Turns red litmus blue.
 - F Bitter in taste.
- (c) Salts
- F Neutral in nature.
 - F Soluble in water.
- (d) Diluted acids
- F Good conductor of electricity.
 - F Soluble in water.
- (e) Sodium Hydroxide
- F Soapy and slippery touch.
 - F Bitter in taste.
5. Sodium Chloride + Water
- G** 1. Hydrochloric acid is an acid because:
- F It is soluble in water.
 - F It is corrosive in nature.
 - F It turns blue litmus red.
 - F It is sour in taste.
 - F It is good conductor of electricity.
2. Sodium hydroxide is a base because:
- F It is bitter in taste.
 - F It turns red litmus blue.
 - F It has soapy and slippery touch.
 - F It neutralizes chemical property of acid.
 - F It is corrosive in nature.
3. (a) **Acids**
- F Turns blue litmus red.
 - F All acids are corrosive in nature.
 - F Sour in taste.
 - F Good conductor of electricity.
 - F They form diluted acids after getting mixed with water.

Bases

F Turns red litmus blue.

F Only strong bases are corrosive in nature.

F Bitter in taste.

F Bad conductor of electricity.

F Water soluble bases are called alkalis.

(b) Acids which are prepared from minerals are called mineral acid. Eg. sulphuric acid, nitric acid etc.

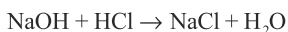
Whereas all naturally occurring acids in humans and plants are called organic acids. For eg. citric acid, oxalic acid etc.

(c) Acids which have very small amount of water or no water are called concentrated acids. Eg. HCl.

Dilute acids are prepared by adding water to the concentrated acid. They contain more amount of water in them.

(d) Those bases which are quite soluble in water are called strong bases. Eg. oxide and hydroxide of sodium and potassium. Whereas those bases which are not easily soluble or not at all soluble in water are called weak bases. Eg. ammonium hydroxide, copper hydroxide etc.

4. The complex naturally occurring substances which change their colour on coming in contact with acidic or basic substances are called indicators. Red litmus paper and blue litmus paper are most commonly used indicators in laboratories to test for acid or bases. Except these litmus paper. Methyl orange and phenolphthalene are also the indicators which are used to test acid or bases.
5. Salts have constituents contributed by both acids and bases. Eg. in sodium chloride, sodium is contributed by sodium hydroxide which is a base and chloride as radical which are contributed by an acid, hydrochloric acid thus forming sodium chloride that is common salt.



HOTS

1. Soap solution is basic in nature because it is slippery to touch and bitter in taste. It also turns red litmus blue.
2. To reduce the effect of formic acid, the area around the sting is rubbed with soap or baking soda solution or calamine which contains zinc carbonate. These substances neutralise the effect of formic acid to some extent and thus, help in relieving pain.

Let's Enjoy

- A** 1. Bases 2. Alum 3. Dilute 4. Acid
5. Alkaline 6. Salt
- B** Do yourself.
- C** Do yourself.

CHAPTER 6 (Structure of Matter)

Just Do More (Pg 54)

1. 91 metals
2. 9 elements are developed by man.
3. Metalloids are semi-metals which have both the properties of metal and non metal.

Just Do More (Pg 57)

1. 1 : 4
2. 2 : 1

Just Do More (Pg 60)

1. It divides into its two constituents i.e., hydrogen and oxygen.
2. 2 hydrogen and 1 oxygen atom.
3. Monoatomic refers to the atomicity one whereas diatomic element refers to having two atoms in an element.
4. The number of atoms present in one molecule of element is called atomicity.
5. Representation of elements or compounds according to the presence of the atom in them.

EXERCISE

- A** 1. (c) breaking of a glass tumbler
2. (c) Low boiling point
3. (a) Carbon 4. (c) Silicon 5. (a) 12:22:11
- B** 1. reversible 2. mercury 3. join
4. properties 5. homogeneous mixture 6. reactants
- C** 1. False 2. True 3. True 4. False
5. False
- D** 1. An element is the simplest form of a pure substance. From these elements all the other substances on the earth are made. This is the reason elements are called the building blocks of universe.
2. Metalloids are the elements that possess the characteristics of both metals and non metals. Boron (B), Silicon (Si) and Arsenic (As) are examples of metalloids. Metalloids are often known as semi metal.

3. Mixture of sand and water is heterogeneous mixture because they show visible boundaries between them even when examined by naked eyes.
 4. The chemical formula of a reactant (elements or compounds) are written on the left hand side with (+) sign to distinguish each participating reactants.
- E**
1. Chemical change is a permanent change in which new substance is formed with different properties with the evolution or absorption of some kind of energy. Eg. digestion of food, rusting of iron.
 2. Elements which are malleable, ductile and good conductors of electricity are called metals. Eg. copper, silver etc.
Whereas elements which are brittle and which cannot be beaten into sheets are called non metals. Eg. carbon, plastic etc.
 3. Pure substance made up of two or more substances is called compound. Eg. water. Whereas smallest particles of a compound is known as molecule. For eg. hydrogen and oxygen in water.
 4. Representation of elements or compounds according to the presence of the atoms in them are called chemical formula.
 5. Crystallisation is the process of obtaining crystals of a soluble substance from its hot saturated solution.
- F**
1. F $A \rightarrow B$ In it, a single substance undergoes a chemical reaction to become a new substance; as a piece of paper burns into ash.
 - F $A \rightarrow B + C$. In it, a single substance breaks up into two new substance; as water breaks up into oxygen and hydrogen.
 - F $A + B \rightarrow C$. In it, two substances react to form a new substance, as oxygen and hydrogen react to form water.
 - F $A + B \rightarrow C + D$ In it, two substances react to form two new substances; as iron and sulphuric acid react to form iron sulphate and hydrogen.
 2. A mixture that shows visible boundaries of its constituents when examined closely under the microscope or even by the naked eyes is called heterogeneous mixture. Eg. mixture of air and carbon particles, mud and water etc. whereas homogeneous mixture have the same composition throughout the sample. It does not show any visible boundaries of its constituents even when examined under microscope. For eg. salt solution, sugar solution etc.
 3. A mixture has following properties:
 - F A mixture can be solid, liquid or gas.

- F A mixture is generally made up of atoms of more than one element, particles of compound or both.
 - F It has its constituents present in any ratio.
 - F Constituents have their particle lying side by side.
 - F Constituents can be separated by simple mechanical methods.
 - F Constituents show their respective properties. Eg. lemonade has sour taste of lemon and sweet taste of sugar.
 - F Formation of a mixture is a physical temporary change, in which no new substance is formed so this change is reversible.
4. Properties of compound:
- F A compound always contain some elements which are combined chemically in a fixed ratio.
 - F The properties of a compound are different from those of its constituents elements.
 - F The constituents elements of a compound can be obtained by chemical methods. In other words, a compound can be broken chemically into its constituents element.
5. 1. The chemical formula of reactant (elements or compounds) are written on left hand side with (+) to distinguish each participating reactants.
Eg. $Mg + O_2$
2. An arrow (\rightarrow) is placed just after ending position of reactants. The arrow means yield too.
Eg. \longrightarrow
3. To the right side of the arrow we write the chemical formula of the product.
Eg. MgO
4. Finally, we balance the equation.
Eg. $Mg + O_2 \rightarrow 2MgO$

HOTS

1. Curdling of milk is a chemical change because it is irreversible and new products are formed with different properties with the evolution or absorption of some kind of energy.
2. Burning of small piece of paper is irreversible change as it changes into ash.

Let's Enjoy

- A** Do yourself.
- B** Do yourself. **C** Do yourself.

CHAPTER 7
(Respiration in Organisms)

Just Do More (Pg 67)

1. Aerobic respiration takes place in the presence of oxygen.
2. Larynx is the voice box through which voice is produced from our mouth.
3. Trachea is around 44 inches long.

Just Do More (Pg 69)

1. No, all organisms breathe differently.
2. Amphibians live both on land and water.
3. Outer covering of the body of amoeba contains plasma membrane.

EXERCISE

- A**
1. (c) Ammonia
 2. (a) stomata
 3. (c) Pancreas
 4. (b) alveoli
 5. (a) oxygen
- B**
1. energy
 2. life
 3. trachea
 4. Diaphragm
 5. inhalation and exhalation
 6. Carbon dioxide
- C**
1. The mechanism of taking in and giving out air is called breathing.
Whereas the process by which energy is released from the eaten food is called cellular respiration.
 2. The process of respiration which requires air i.e., oxygen is called aerobic respiration. Whereas the process of respiration which does not require air is called anaerobic respiration.
 3. Breathing is a mechanical process of taking in atmospheric air called inhalation and giving out air which is called exhalation.
- D**
1. During respiration, cells modify the organic food, in the process of oxygen. This process is called oxidation of food. In the process carbon dioxide, water and energy are released as waste products. Thus, respiration helps in releasing energy for carrying out vital functions necessary to maintain life.
 2. Aerobic respiration takes place in the presence of oxygen and is carried out in the bodies of almost all living things and plants. The energy released is more.
Whereas anaerobic is such respiration in which oxygen is not utilised by the organism to release energy from the food. Very little amount of energy is produced in such respiration.
 3. The process of anaerobic respiration in which yeast is used to break down food item into other form. It is used in bread making industry, yeast is used to make breads and cake.

4. A cellular respiration is a chemical process in which food molecules are broken down into simpler molecules within cells and energy is produced. A number of chemical reactions catalysed by enzymes occur during this process.
- E**
1. It is such respiration in which oxygen is not utilised by the organisms to release energy from the food. Yes, anaerobic respiration takes place in humans also. When our legs or hands require extra amount of energy, but they do not get sufficient amount of oxygen. In this situation, the cells of legs respire anaerobically to produce lactic acid.
 2. There are a pair of respiratory organs that are spongy bag like structures lying in the chest cavity on either side of the heart. The lower part of the trachea is divided into two smaller tubes called bronchi. Each bronchus enters the main respiratory organ, lungs, where they are branched into smaller bronchioles. These bronchioles terminate into million of tiny sac like structure called alveoli. The walls of alveoli are lined with a network of blood capillaries. Alveoli have a far large surface area than the total skin surface and consequently provide far greater respiratory exchange. Lungs are located in thorax cavity.
 3. Breathing is a mechanical process of taking in atmospheric air called inhalation and giving out air which is called exhalation. When air inside the chest cavity and the air from the surroundings enters the lungs, the lungs get filled with air and hence, the first phase of breathing which is inhalation is completed. During exhalation, the ribs move downward and inwards, and at the same time the diaphragm moves upward. In this way, high pressure area is created and air is forced to move out of the chest cavity. At this time the size of the lungs is reduced as it contracts.
 4. In the process of internal respiration, food is broken down into simpler substances and energy is produced. During the process of inhalation air reaches the lungs. Here oxygen from the air reaches the lungs and combines with haemoglobin to form oxyhaemoglobin. On reaching the tissue capillaries, oxyhaemoglobin dissociates to release oxygen. This oxygen released in the tissue is then utilised to breakdown the food, releasing energy and waste products carbon dioxide and water. The carbon dioxide formed enters the blood from the tissues. It is carried mainly as bicarbonate and partly as carbamide haemoglobin. On reaching the lungs, oxygenation of blood causes release of carbon dioxide from both bicarbonate and carbamide haemoglobin. Carbon dioxide is released from the lungs into the atmosphere during exhalation.

as well as animal species are found in moderate climate region.

4. Most parts of grassland are covered with grass. Therefore, these regions are called grasslands. As long grasses are available here, a wide variety of herbivore are found cattle, sheep, horse and many other herbivore are found.
5. Polar bear found in the polar regions has black skin of covered with white long fur. The black skin of the polar bear absorbs solar heat and keeps it warm and white fur helps to hide and protect from their predators.

E 1. The climate of a region depend on:

- F the presence or absence of rainfall.
- F amount of sunshine it gets.
- F the ability to transfer water to the atmosphere.
- F the place whether it is hilly or a plain region.

Thus, the climate in a desert is hot while it is cold climate in the hilly area.

2. In today's world man has brought industrial reduction to satisfy his ever increasing demand. As a result man started over exploitation of resources which has further led to pollution and depletion of resources. These factors include–
 - F Over consumption of fossil fuel, leading to increase in amount of CO₂ level in atmosphere.
 - F Use of chlorofluorocarbons (CFC) gas has depleted the ozone layer of the atmosphere.
 - F Due to depletion of ozone layer, the temperature has increased in many parts of world.
 - F Rise in temperature leads to melting of icebergs.
 - F Acid rain has also caused a change in climatic conditions.Human activities are responsible for an overall climatic change which is matter of great concern.
3. Amphibians like frog can live both on land and water. They generally live on land. But they give eggs in water of the ponds and ditches. The young ones of the frogs look like fishes, and are called tadpoles. Frogs breathe through their lungs on land. But when they are in water they breathe through their moist skin. They also have webbed feet that help in swimming in water.
4. Following are feature of camel which help them to survive in hot climate–
 - F Paddy feet of camel help them to walk easily on the sandy surface of the desert.

- F Camel does not perspire so there is no water loss through sweating.
 - F Camels have hump on their back which store fat. This fat can be converted into metabolic water when needed.
5. Elephants have a long trunk which is used for picking food. The tusk are used for tearing the bark of trees for eating. They have large ears which help them to keep cool in the hot and humid climate of the rainforest. These ears works like a fan.
 6. Following are the features of camel which help them to survive in hot climate–
 - F Paddy feet of camel help them to walk easily on the sandy surface of the desert.
 - F Camel does not perspire so there is no water loss through sweating.
 - F It excretes very little urine so as to conserve water inside its body water.
 - F Camels have hump on their back which store fat. This fat can be converted into metabolic water when needed.
 - F A camel can drink about 40-50l of water at a time. And it can remain without water for several days. The water gets distributed to all parts of the body and is not stored in any specific body parts.
 - F The thick skin of camel protects camel from scorching and water loss.

HOTS

1. The climate of a place is affected by distance of the sea. The areas near the sea are always humid than inland areas because the wind blowing from the sea towards the land carries a lot of moisture.
2. During the night, because the sun is not shining on us the way that it does during daytime. And, of course, the sun is what keeps us warm.

Let's Enjoy

- A** Do yourself. **B** Do yourself. **C** Do yourself.

CHAPTER 9 (Soil)

Just Do More (Pg 83)

1. Ants, worms, leeches and microbes.
2. It contains dead and decay of plants and animals. It is rich in humus.
3. Sandy is not good for cultivation as it cannot hold water and has less water retention capacity due to which crops do not grow on it.

EXERCISE

- A**
- (b) weathering
 - (b) O-horizon
 - (b) Black soil
 - (a) Desert soil
 - (c) Laterite
- B**
- Humus
 - B-Horizon
 - fragments
 - dark
 - alluvial soil
- C**
- (d) Loamy texture
 - (e) Beccan trap
 - (a) Iron oxide
 - (b) Good mineral content
 - (c) Large amount of humus
- D**
- False
 - True
 - True
 - False
 - True
- E**
- Soil consist of inorganic and organic materials, air, water and microorganisms.
 - Sample taken from the surface down through the soil.
 - Sandy soil has a lot of sand in it and very little silt and clay. It is found, mostly in deserts.
Whereas loamy soil is best suited for the plant growth because it contains sand, clay and humus in a good proportion.
 - The alluvial soil is by far the largest and most important soil group of India contributing the largest share to its agricultural wealth. It is made of silt brought by the rivers from the mountains. This type of soil is found in Uttarakhand, Uttar Pradesh, Haryana, Bihar, West Bengal etc.
 - Soil support plant growth in two ways:
 - by holding the roots firmly, and
 - by supplying water and nutrients.
 - A-Horizon is rich in humus.
- F**
- Collect some soil from the garden put equal amount of soil in each of the glasses. Press the soil in one of the glass. Fill the glasses with water.
You will observe that air bubbles start coming out from both the glasses. The compressed soil has less air space as compared to the loose so, air bubbles are more in loose soil in comparison to soil.
 - Soil can be categorised on the basis of its colour, texture and contents.
We can prevent soil erosion by keeping the following steps in mind-

- F Red Soil- It contains high amount of iron oxide which gives it red colour. This soil is not good for growing crops, as it lacks many other minerals and organic matter. It is found in Tamil Nadu and other South Indian states. It is also called red latosol.
- F Desert Soil – A large part of arid region of Rajasthan and some parts of Gujarat has desert soil. This soil has very poor soil development. The soil has very poor water retention. However, it contains good amount of salt.
- F Alluvial Soil – It is by far the largest and most important soil group of India contributing largest share to its agriculture weather. It is made of silt brought by rivers from the mountains. It is good for growing wheat, rice, pulses, vegetable, sugarcane etc. The type of soil is found in Uttarakhand, Uttar Pradesh, Haryana, Bihar, West Bengal etc.
- F Laterite Soil – It is found in regions where heavy rainfall occur. It is rich in mineral contents. It is good for growing tea and coffee. Laterite soil is found on the hills of Karnataka, Kerala, Madhya Pradesh, the Eastern Ghats, regions of Odisha, Maharashtra, West Bengal, Tamil Nadu and Assam.
- F Black Soil – The typical soil derived from the Deccan trap is the black cotton soil. It is also known as regar. Black soil is highly argillaceous. It is good for cultivation of cotton and sugarcane. Black soil is found in Maharashtra, Western Parts of Madhya Pradesh, Parts of Andhra Pradesh, parts of Gujarat and some parts of Tamil Nadu.
- F Mountain Soil – It is found in Himalayan regions Heavy rainfall and abundant amount of humus present in the soil makes it very fertile. The composition of mountain soil varies from place to place.

3. There are several factors which allow water and wind to cause soil erosion:

Deforestation – Roots of the tree bind soil particles together and do not allow them to be carried away. But, due to deforestation a large part of earth has turned into barren land due to soil erosion.

Overgrazing – When cattle pull out grass on other plants from the soil, the soil of the top of the land becomes loose overgrazing also destroys vegetation which ultimately causes soil erosion.

Poor Farming Methods – Due to poor farming methods the top soil is also washed away while irrigating field, farmers generally do not adopt any method to check soil erosion. Farmers inability to rotate crops on their land also causes soil erosion.

CHAPTER 10
(Transportation of Materials)

Just Do More (Pg 92)

1. Blood
2. Red bone marrow
3. The upper chamber of heart is called auricle.

Just Do More (Pg 93)

1. The circulation fluid of insects is called haemolymph.
2. Cat and Cow

EXERCISE

- A**
1. (b) WBC
 2. (a) 3,00,000 per cubic ml
 3. (c) 255 gm
 4. (c) C
 5. (b) 90-100 times/minute
- B**
1. False
 2. True
 3. True
 4. False
 5. True
 6. True
 7. False
- C**
1. (e) Haemoglobin
 2. (a) Red bone marrow
 3. (c) Pericardium
 4. (f) Loss of blood
 5. (d) Transportation of food
 6. (b) Diffusion
- D**
1. oxygenated, deoxygenated
 2. pericardium
 3. Arteries
 4. hepatic vein
 5. diffusion
 6. haemoglobin
- E**
1. Circulation of blood throughout the body through the arteries, capillaries and veins which carry oxygenated blood from the left ventricle to various tissues and return waste blood back to heart is called systematic circulation of blood.
 2. Pulse rate indicates the number of heart beat.
 3. Earthworms have a well developed circulatory system. It consists of a network of blood vessel, which is in contact with almost all cells of the body. Blood is also present inside the tubes in earthworms which consists of mainly water with dissolved substances and a pigment called haemoglobin which help in transportation of oxygen and nutrients.
 4. Red Blood Cells or RBC consists of haemoglobin a pigment which transport oxygen.
Whereas White Blood Cells or WBC consist of substances that provide immunity to the blood.
 5. Blood is composed of a fluid portion plasma and three types of cells namely RBC, WBC and blood platelets.
 6. The liver receives its blood supply through the hepatic artery, a

small branch of the aorta. Blood from the intestine is also brought to the liver where excess of certain nutrients is converted into suitable form of storage.

- F
1. The heart is enclosed in a double sac called the pericardium. A wall, called septum divides the heart into a left half and a right half which thus prevents the mixing of deoxygenated and oxygenated blood of the heart. Each half is divided into an upper chamber, the auricle or atrium and a lower chamber, the ventricle. The auricles receive blood from the veins. The ventricles pump blood into the arteries. The left and right ventricles pump blood respectively into the aorta and the pulmonary artery, both openings being guarded by semi lunar vessels to prevent back flow of blood from the arteries to the ventricles. Aorta or the big arteries, carries the oxygenated blood to every part of the body. The pulmonary artery carries deoxygenated blood to the lungs.
 2. A process through which blood is transferred from one person to another. There is a need for the blood transfusion because if there is loss of blood a person can help other person by donating blood.
 3. Blood circulates across the body through network of tubes called arteries, veins, capillaries.

Arteries – The arteries carry away oxygenated blood from the heart to rest of the body. These are settled deep in the skin and cannot be seen easily. Pulmonary artery carries deoxygenated blood from the heart to lungs for oxygenation.

Veins – Veins carry deoxygenated blood from different parts of the body to the heart. But the pulmonary veins carry oxygenated blood from the lungs to the heart. Veins are located closer to the surface of the skin.

Capillaries – Capillaries are the thinnest blood vessels, about as thick as a strand of your hair. They have very thin walls, through which oxygen, digested food, CO₂ and other waste products are exchanged between the blood and the surrounding cells.

4. Plants are living organism like animals. They need water, minerals, food for their survival. The transport of materials in plants is carried out by the vascular tissues. These tissues extend from the tip of the root to the tip of the leaves. There are two kinds of vascular tissues found in plants. These are xylem and phloem.

Xylem – The xylem transports water and nutrients upwards from the roots to the leaves.

Phloem – Phloem carries the food prepared by the leaves downwards to all parts of the plants including roots.

5. The water moves from the root hair to the xylem in the root. The absorbed water then moves up the stem through the xylem by the force developed in the leaves by the process of transpiration. This is called transpiration pull. The food prepared in the leaves from the leaves to other parts of the plants. This process is called translocation and it mainly takes place through phloem.
6. Blood vessels which carry away deoxygenated blood from different parts of the body to the heart are called veins.
Whereas blood vessels which carry away oxygenated blood from the heart to rest of the body.
Capillaries are thin tubes which act as a medium between arteries and veins.

HOTS

1. Doctors check pulse rate because it indicates the number of heart beats of a person.
2. WBC help in giving our body immunity to fight against the harmful bacteria and other foreign bodies.

Let's Enjoy

- A** Do yourself.
- B** Do yourself.
- C** Do yourself.

CHAPTER 11
(Excretion in Animals)
EXERCISE

- A** 1. (c) Amoeba 2. (a) Gills 3. (a) 10 cm 4. (a) Tubules
5. (a) diabetes
- B** 1. diffusion 2. nephrons 3. osmosis 4. blood
5. urinary bladder 6. Malpighian
- C** 1. False 2. True 3. True 4. True
5. False
- D** 1. Ammonia, urea and uric acid come out from the body in the form of urine and sweat.
2. A process of releasing waste out of the body is called excretion.
3. During life activities such as cellular respiration, several chemical reactions take place in the body. These are known as metabolic reactions. These chemical reactions produce waste products such as carbon dioxide, water, salts, urea and uric acid.
4. Do yourself.
5. Freshwater fishes must overcome the problem imposed by the water which is entering the body through osmosis. For this, they

produce large volume of dilute urine and take in salts from the water through specialised cells in their gills. Nitrogenous waste for the most part are diffused as ammonia through the skin. Marine fish, on the other hand lose water through skin and take in salt by osmosis.

6. Human excretory system consist of 2 kidneys, ureters, urinary bladder and urethra.
- E 1. F The blood of the circulatory system also passes through the kidneys for removal of waste product that it contains.
- F When this blood passes through the kidneys the nephrons present in the kidneys filter this blood and separate waste product which gets collected in tubules of the nephrons.
- F The filtrate free of blood cells and proteins move into the tubules.
- F Some of the useful products like glucose and amino acid are also filtered. The useful products are absorbed into the blood through the walls of he tubules.
- F The waste products are sent to urinary bladder through ureter for storage.
- F During storage, the sphincter muscles at the base of the urethra remains contracted.
- F Accumulation of urine, distends the bladder. A certain degree of muscular tension stimulates the sense organs in the wall of the bladder and the resultant contraction of its muscles expel the urine.

2. Dialysis is an artificial filtration of the blood through semi permeable membrane to remove urea and other waste.

Procedure of Dialysis:

During dialysis, blood from the arm is allowed to flow into the dialysis machine. This is made up of long cellophane tube, coiled in a chamber with a dialysing solution. When the blood passes through this machine, the impure substances are separated and the pure blood is sent to the patient's body.

3. F Amoeba is a unicellular organism found in freshwater. In amoeba, carbon dioxide and ammonia are the main waste material. These waste material are excreted out of the process of diffusion through general body surface.
- F In earthworms, nephridia constitute the excretory organs. These are coiled tubes which throw waste into the intestine of the earthworm or directly outside form of urea and ammonia.
- F In cockroaches, the excretory system constitute a bunch of long tubules called malpighian tubules. The waste inside

cockroaches body contain mainly uric acid, which is discharged along with faeces.

4. During life activities such as cellular respiration, several chemical reactions take place in the body. These are known as metabolism. This chemical reaction produce waste products, such as carbon dioxide, water, salt, urea and uric acid. Accumulation of these waste beyond a level inside the body is harmful to the body. The excretory organs remove these waste.
5. The malfunctioning of excretory system can be detected by examination of urine constituents. For eg.–
 - F If urine test shows that it contains glucose it is considered that the person may be suffering from diabetes mellitus.
 - F Frequent discharge of urine also indicates that the man may be suffering from diabetes.
 - F If urine contains blood it is considered that man may be suffering from any infection in excretory system or a kidney failure.

HOTS

1. Kidneys.

Each kidney consist of about one million functional unit called nephrons. Each nephron has bowman's capsule at one end and rest part of the nephron is differentiated into a coiled proximal convoluted tubule, a U shaped thin tubule and a distal tubule. Nephrons filter blood which passes through the kidneys and the waste products are collected here in form of urine.

2. Insulin is given to a diabetic patient to control the sugar level in the body.

Let's Enjoy

- A Do yourself.
- B Do yourself.
- C Do yourself.

CHAPTER 12 **(Reproduction in Plants)**

Just Do More (Pg 107)

1. Asexual reproduction does not involve mating of male and female of the same kind.
2. Sporulation
3. In grafting, a cutting (scion) of one plant is placed over the stump (stalk) of the other plant and both of them are tied together. After sometime the stalk accepts the cell property of scion and starts feeding its cells.

Just Do More (Pg 110)

1. The fusion of the male and female cells fertilizes the flower and an embryo (zygote) is developed.
2. Stamen and anther
3. The male cells of the flower are called pollen grains.

EXERCISE

- A**
1. (b) flower
 2. (a) Molds
 3. (a) Ginger
 4. (a) Ovary
 5. (a) They store food
- B**
1. (d) Amoeba
 2. (a) Yeast
 3. (b) Mosses
 4. (f) Onion
 5. (c) Jasmine
 6. (e) Orchids
- C**
1. True
 2. True
 3. False
 4. True
 5. True
- D**
1. sporulation
 2. vegetative propagation
 3. Zygote
 4. leaves
 5. embryo
- E**
1. The pollen grains are carried from the anther to the stigma. This is called pollination.
 2. It is a type of reproduction in which a small outgrowth appear on the body of the organism. The outgrowth is called the bud. The buds grow and finally detach from parent body and begin to live as independent organism. For eg. yeast, hydra etc.
 3. In asexual mode of reproduction there is no involvement of mating of male and female of same kind.
Whereas in sexual reproduction males and female gamete fuse together to form a zygote.
 4. In this method plants grow artificially from their own body parts. Types of artificial propagation are grafting, culms and layering, tissue culture.
- F**
1. F Vegetative Propagation by Roots: Sweet potato, dahila etc. reproduce through their roots. The swollen roots of these plants are burried in the soil which develops into new plants.
F Vegetative Propagation by Stems : Some plants reproduce through their stems. Such plants are potato, ginger, sugarcane. Actually the swollen part of these plants are their stems.
F Vegetative Propagation by Leaves: Some plants reproduce by their leaves. Such plants are bryophyllum, begonia etc. New plantlets develop from the edge of these plants. When they come in contact of soil, they get detached from the leaves and grow into new plant.

2. After fertilisation the formation of zygote takes place. The ovule develops into a seed. It contains stored food. The zygote forms the embryo, which is enclosed in a seed coat. The ovary matures into the fruit. The size, shape and colour of fruits and seeds vary enormously and there are various strategies adopted by plants to disseminate them.
3. After the development of zygote, the flower slowly withers and only the ovary is left back. The zygote in each ovule slowly develops into a seed. But in fruit plants the ovary changes into a fruit. It ripens to become sweet, juicy and edible.
4. Some of the important agents that help in seed dispersal are:
 - F **Wind:** There are certain seed of plants that have wings on tufts of hair, which make their movement in air easy.
 - F **Water :** Some seeds and fruits are carried to long distances by water, before they develop into new plants.
 - F **Animals:** Animals are also an important medium for the dispersal of seeds.
 - F **Explosion of Fruits:** Fruits of some plants burst when they get ripen. This results in scattering of seeds in adjoining areas.
5. Different types of asexual reproduction–
 - F **Binary Fission** – This way of reproduction is used by unicellular organism like amoeba etc. The parent divides its body into two cells and each of them grow to size of parent cell. This process goes on and the species continue to exist.
 - F **Budding** – In this type of reproduction, a small outgrowth appears on the body of organism. The outgrowth is called a bud. The buds grow and finally detach from parent body and begin to live as independent organism.
 - F **Sporulation** – In this method, parents release single cell structure called spores, from its body. Each spore grows into a full fledged organism.
 - F **Fragmentation and Regeneration** – This process is somewhat similar to the binary fission. In it parent breaks into several pieces and each piece grows into a full adult. The missing parts grow through a process called regeneration.
 - F **Vegetative Propagation** – This method is used by plants that can grow from their own body parts i.e., root, stem and leaves.
 - F **Artificial Propagation** – Men felt encourage to see plants grow through vegetative propagation and invented some

methods of artificial propagation that are grafting, culms, layering, tissue culture.

HOTS

1. There would have been no variation and variety of flowers in the world.
2. Vegetative propagation

Let's Enjoy

- A** Do yourself.
- B** Do yourself.
- C** Do yourself.
- D** Do yourself.

CHAPTER 13
(Electric Current and its Effects)

EXERCISE

- A**
 1. (c) a room heater
 2. (a) switch
 3. (a) fuse
 4. (a) open electric circuit
 5. (b) the soft iron strip
- B**
 1. (h) Conductors
 2. (j) Overloading
 3. (g) Resistors
 4. (i) Heating effect of current
 5. (f) Tungsten
 6. (c) Electric circuit
 7. (d) Elements of electric circuit
 8. (b) Heat energy
 9. (e) Fuse
 10. (a) Electromagnet
- C**
 1. Ammeter
 2. Variable Resistance
 3. Battery
 4. Galvanometer
 5. Electric fuse
- D**
 1. Bulb
 2. Ammeter
 3. Resistor
 4. Galvanometer
 5. Open switch
 6. Inductor
 7. Milliammeter
 8. Battery
- E**
 1. Various elements like wires cells, batteries etc. which constitute an electric circuit are called elements of electric circuit.
 2. Ammeter, resistor, variable resistance, inductor, cell.
 3. The principle of heating effect of the electric current is also used in another very useful device called fuse. Fuse is a safety device which works when a sudden flow of high electric current passes through the circuit.
 4. An iron bar, which behaves like a magnet when current is passed through the coiled wire around this bar.
 5. If we disconnect any wire, the flow of current will be stopped. So, when the flow of current is broken at any point of the circuit it is called an open electric circuit.

- F**
1. Take a loop of a nichrome wire. Connect two copper wires to the ends of this loop and connect them to two dry cells. You will observe that the nichrome loop gets hot and become red. This proves that electric current produces heat energy.
 2. Fuse is a safety device which works when a sudden flow of high electric current passes through the circuit. Fuses are made up of metal alloys which have low melting point. So, when heavy current passes through a fuse, it heats up and melts down. When fuse melts the electric current breaks and saves the appliance from heavy current, which is more than the capacity of the appliance. This is also called the over loaded electric circuit, so fuse saves an appliance from over loaded circuit.
 3. Every electric circuit should have a fuse. It should be placed near the point where the current starts flowing in the circuit.
Diagram of fuse (Do yourself)
 4. Take a cardboard and make a hole in its centre. Now pass a wire through the hole vertically. Sprinkle some iron filings on the board, and complete the circuit of the wire by connecting the wire to the battery. The iron filings have arranged themselves in concentric circles around the wire showing the magnetic lines in the magnetic field formed by the flow electric current through the wire.
 5. An electric bell consist of an electromagnet, an armature, a gong and a contact adjusting screw. An iron rod is mounted on a spring and one end of this rod presses against the contact adjusting screw. This forms an armature. When we switch on the current. It starts flowing through the electromagnet. The electromagnet attracts the soft iron rod towards it, and the hammers strikes on the gong to make the sound of the bell. In the meantime the armature loses its contact with the screw causing break in circuit and hammer comes back to its position. Once again the current passes through the electromagnet and the magnetic field causes hammer to strike the gong. This process keeps on repeating until we press the switch.

HOTS

1. Fuse wires or MCBs are not required in the small battery operated electrical circuits where the amount of current flows is low and if the circuit breaks there is no risk of fire.
2. No, copper wire cannot be used to make filament of an electric bulb as copper wire has very low resistance. Therefore, the bulb will not glow if current is passed, it would also melt the filament.

Let's Enjoy

- A** Do yourself.
B Do yourself.

CHAPTER 14 (Our Forests)

Just Do More (Pg 123)

- 33%
- About 1.5 billion people depend on fuel wood as their primary energy source.
- Bamboo are used in rafters, roofing, walling, flooring and basketry.

EXERCISE

- A**
- (c) Kerosene
 - (c) Both (a) and (b)
 - (c) Polythene
 - (c) Resins
 - (b) Protection of animals
 - (c) Both (a) and (b)
- B**
- True
 - True
 - True
 - False
 - False
- C**
- porosity, humus
 - Bamboos
 - cycling
 - interdependent
 - deforestation
- D**
- Today, society is developing very fast. Many new buildings, roads, shop, business centres are being constructed. New railway tracks are being laid down. For this development, trees are being cut on a large scale.
 - Forest are necessary for the maintenance of environment balance in nature. They help in cycling nutrients, producing oxygen and also reducing atmospheric pollution. They also help in reducing flood, storing water, moderating soil erosion. Forest also provide shade which prevents the soil from becoming to dry and friable. During the summer, forest improve the quality of soil by increasing its porosity and fertility by contributing humus to it. In this way forest are very important for healthy and balanced environment.
 - Forest maintain temperature and help in rainfall. Large part of the earth is facing the problem of low rainfall due to deforestation. The temperature of earth's atmosphere is also increasing which is not a good sign. The amount of CO₂ is decreasing due to deforestation and industrialisation. All these things have resulted in an overall climate change.
 - Some animals eats plants which are called herbivores. Carnivores eat the flesh of herbivores that depend on plants or food. Herbivores depend on plants and carnivore eat flesh. If there is no food for herbivores, carnivores also would not get

food. Thus, if there is a food chain formed by eating and being eaten. Food chain is important for a balance in nature.

5. Cutting trees on a large scale for the construction of buildings, roads, railways tracks, for wood and timber and for obtaining agricultural land is called deforestation. The consequence of deforestation are-

F The amount of CO_2 is increasing due to deforestation and industrialisation. All these things have resulted in overall climatic change.

F The roots of the plants bind soil. Thus, cutting of trees causes soil erosion reducing the fertility of soil.

F In many parts of the world, flood occur frequently because there are no forest.

F Forest provide habitat to wide variety of animals. Due to deforestation animals lose their habitat.

- E 1. Forests are of immense value to the life and prosperity of human beings and of nation. Their importance includes:

F Forest are habitat for millions of plants and animals which are important for maintaining biological diversity on the earth.

F Forest are necessary for the maintenance of environmental balance in nature.

F Forest help in cycling nutrients, producing oxygen and also reducing atmospheric pollution.

F Forest help in reducing flood, storing water, moderating soil erosion etc.

F Forest are main source for timber and wood.

F Forest also provide products like resin, thatch, fruits, nuts, herbs, medicines, oil, forage, commercial flower, spices and syrups.

F Forest plant such as sandal wood, rosha grass and khas are used in the manufacture of cosmetic soaps, incense sticks etc.

2. The survival of plants depends on animals and survival of animals depend on plants. Animals depends on plant for –

F For food – Plants are the source of food grains, fruits, vegetables, spices, tea, coffee etc. Herbivores, carnivores omnivores all are dependent on plant for food.

F For oxygen – Animals need oxygen for respiration. During photosynthesis, plants take in CO_2 and give out O_2 . In this way plants maintain the amount of oxygen in nature.

F For shelter – Plants give shelter to a large number of animal species and help in maintaining biodiversity.

Like animals plants are also dependent on animals in various ways–

- F For carbon dioxide – Plants need CO₂ for photosynthesis. This CO₂ comes from animals during respiration.
 - F For pollen – Animals like bees, butterflies, moths etc. help in pollination in plants which is necessary for the fertilisation. Some birds and bats also help in pollination.
 - F For seed dispersal – Dispersal of seeds depend on animals. Birds and other animals are the important agents of seed dispersal. Dispersal of seeds help in plant growth with less competition and of better quality.
 - F For supplying nutrients – Animals excreta and their dead bodies add nutrients to the soil. They act as manure and provide mineral for plant growth.
3. Growing new plants on barren sand on a large scale is called afforestation. The people all around the world have realised the importance of forests and they have come forward for conservation of forests by launching various afforestation programmes. In our country too the government has launched Social Forestry Programme in which people grow plants on barren land or along the road side. Van Mahotsav is another programme in which new saplings are planted everywhere. It is celebrated twice a year.
 4. The popular movement launched by the village people of the Terai forests in the Himalayan foothills to hug trees to prevent them from cutting was named as Chipko Movement. It was perhaps the first well known development program initiated by the common people to protect forest. It started in March 1973, in the remote hill town of Gopeswar, in Chamoli, district of Uttarakhand. The movement was led by a reputed environmentalist Sunderlal Bahuguna. Women of the villages were in the forefront and took active participation in this movement.

HOTS

1. There would be disturbance caused in the food chain of forest. The number of herbivores will increase as compared to number of carnivores.
2. Forest are of immense value to the life and property of human being and of nations.
 - F They maintain ecological balance.
 - F They provide us wood and timber.
 - F They provide us products like resin, fruits, nuts, sandal wood etc.

underground water is called ground water. Groundwater is usually pure as it passes through the soil which acts as a natural filter.

3. The main source of fresh water on the earth is rain water. When it rains the water evaporated from the earth due to heat of the sun, returns back on the earth in form of rain drops adds to the volume of water present in rivers and other reservoirs. A part of life, water gets drained to the sea and some of it gets seeped inside the earth and add to the underground water.
4. Conservation of water means using water properly and avoiding wastage of water so that water is available for future generations.

Methods of water conservation–

- F Using less water and not wasting it at home.
 - F Using better methods of irrigation, like drip irrigation. In this method, water is supplied to the roots of plants drop by drop, instead of filling the entire field with water.
 - F Recycling of water in factories.
 - F Effective flood control by building dams and reservoirs.
 - F Planting trees, also increase the supply of ground water.
 - F Water harvesting is nowadays being encouraged by the government.
 - F Make people aware about the importance of water in their life.
 - F World Water Day is celebrated every year on 22nd March to highlight the importance of water.
5. Collecting rainwater to be recycled is called rainwater harvesting. It helps in water falls on the roof top of the building. Then it flows deep in a trench in the ground. The water is then filtered and stored in the tanks under ground for future use.

HOTS

1. Because the population has increased at a very great rate as compared to our ancestors.
2. It is very important to conserve our water resources at this point of time. As the water level under the earth is falling, it can cause huge crisis for the whole world. We should stop wastage of water and should use it judiciously. People should be aware of the problems which they have to face in future, if they do not start saving water for future use.

Let's Enjoy

- A Do yourself. B Do yourself. C Do yourself.

CHAPTER 16
(Time and Motion)

Just Do More (Pg 138)

1. Maharaja Jai Singh II of Jaipur.
2. Stopwatch, clock, digital watch.
3. 86400 seconds

Just Do More (Pg 141)

1. Distance = 660 km
Time = 6 hours
Speed = Distance / Time
= 660/6 km/hr = 110 km/hr

The speed of the bus is 660 km/hr.

2. When an object moves in a constant speed and covers equal distances in equal intervals of time, we say that it is uniform motion.
3. Yes, because it is covering equal distance at constant speed in equal interval of time.
4. If the body changes its position with respect to its surroundings then the body is said to be in motion.

EXERCISE

- A**
1. (c) Handspan
 2. (b) Lucknow
 3. (c) Digital Clock
 4. (c) 1000 years
 5. (a) 60 km/hour
- B**
1. Digital clock
 2. 365 days
 3. century
 4. sun, moon and stars
 5. Huggins
 6. Speed
- C**
1. (e) 1656
 2. (a) 1926
 3. (f) Maharaja Jai Singh
 4. (c) Metre per second
 5. (d) Speed in km
 6. (b) Unequal distance in equal interval of time
- D**
1. False
 2. False
 3. False
 4. True
 5. False
- E**
1. Sand clock is based on the principle that a certain quantity of sand falls from the upper chamber into the lower chamber in one hour.
 2. The length and weight of the pendulum is taken in such a way that it takes one second for one to and fro movement. The needle of the minute is set in such a way that it moves one step further in 60 seconds and the needle of the hour moves one step further. When the needle of minute completes, one full rotation is completed.
 3. The watches which work on the basis of the vibration of certain

crystals of a substance. These crystals are called quartz and the watch which work on quartz are called quartz watches.

4. When an object moves with a constant speed and cover equal distances in equal intervals of time, we say that the motion is uniform motion.
 5. A device which displays the distance covered by the vehicles in kilometers is called odometer. A device which displays the speed of a running vehicle is called speedometer.
- F**
1. **F** Pendulum was perhaps the first modern time measurement device. It was invented by a Dutch scientist, Huggins in 1656. It was based on the Galileos suggestion that the period of swing of a pendulum is constant.
 - F** The quartz watches are widely in use. They can give time in fraction of second because the quartz used in such watches vibrate vary fast and with very precise rate.
 - F** Digital clock are the most advanced. They display time in digits. They do not have hour, minute or seconds hand. Now a days, most of the scientific equipment consist of digital watches.
 - F** A stop watch is used to know the time taken in completing a certain piece of work. It also displays time in digits. It has a start and stop button.
 2. In ancient times, people followed the movement of sun, moon and stars. They noticed that after the sun rose in the morning, it would set after a certain time. They did their work during this period according to sunrise and sunset. With the passage of time people developed sundials to know time more accurately. The sundials were based on the change in the length of the shadow with change in position of the sun. Another important device used to measure time in ancient time was an hour glass. It was based on the principle that a certain quantity of sand falls from the upper chamber into the lower chamber in one hour.
 3. A lot of vehicles move on the road. Some of them are fast whereas some are slow. A car moves faster than an autorikshaw. But, there is a method to represent our observation on paper or to compare which is faster or by how much. According to this method we find the distance covered by a body in a unit time called speed.
 4. When an object moves with a constant speed and covers equal distance in equal intervals of time, we say that the motion is uniform motion.

Whereas when an object moves unequal distances in equal intervals of time, the object is said to be in non-uniform motion.

- D**
1. F Peelings of vegetables and fruits
F Dry leaves
F Paper
F Cloth
F Excreta
 2. F Plastic
F Glass
F Thermacole
F Cans
F Industrial waste
- E**
1. Liquid or semi liquid wastes produced from households is called sewage.
 2. Cholera, jaundice, diarrhoea, dysentery
 3. Solid waste are generated from household and industrial activities. Plastic bottles, cans, tins, glass bottles etc. Metal scraps, old papers, packing material etc. are solid waste generated from industries.
Gaseous waste are generated by household and industries both. Chimneys, factories, vehicles, thermal powerplant, carbon dioxide, carbon monoxide etc. are all source of gaseous waste.
Domestic waste are discharged from the kitchen, bathroom and toilets, the effluents discharged from factories come under liquid waste.
 4. The harmful effects of sewage are—
F It causes harmful diseases and environmental problems.
F It pollutes the ground water.
F It chokes the drainage system and cause problem in rainy season.
F It cause eutrophication.
F It causes threat to environment.
 5. It is necessary to treat sewage before disposing off in a water body because it leads to several environmental problem as well as health hazards to human beings.
- F**
1. Sewage treatment method is solution to this problem. It is done in different phases called primary treatment, secondary treatment and tertiary treatment.
F Primary Treatment – In this stage, solid contents of the sewages are removed by the method of filtration by setting the sludge, by sinking it in large holding tanks. In this stage bacterial reduction is 90% and virus reduction is even more. Besides faecal solids, oils and grease floating on the top are skimmed off.

- F Secondary Treatment – At the stage of secondary treatment, sludge and other solid or semi-solid are removed. After their removal, the process of aeration to reduce pathogens is followed. The process of aeration is done in daylight in large storage tanks or it may be trickled or sprayed over banks of stones open to the air and day light. The pathogens reduction is 99% of total reduction.
 - F Tertiary Treatment – It is final stage of water treatment. In this method, water obtained after primary and secondary treatment is passed through clear quartz tubes exposed to intense ultraviolet light. In this way, pathogens are totally removed. Some chemical methods are also used to remove the remaining pathogens. It includes chlorination.
2. Pollution of river by sewage or fertilizers make it unhygienic. It means disposal of sewage into rivers causes high concentration of nutrients in them. Euthropication leads to excessive growth of algae. These algae consume a large part of dissolved oxygen which results in depletion of O_2 in water. Due to acute shortage of O_2 many aquatic plants and animal die. This water cannot be used for household purposes. Run off from fertilizers, animal waste and sludge contains nitrates and other nitrates which causes euthropication.
 3. We find open sewage in small towns and villages. In this system the side of the drain are plastered to avoid soil erosion. In rainy season, these drains gets overloaded and filthy water spreads on roads and streets which causes diseases. Besides, people throw waste into the open drains and the drains get choked. It also causes overflow of drains.

Open drains or sewage are the breeding ground for flies, mosquitoes and other microorganism. They are the sources of many disease like cholera, jaundice, diarrhoea etc. Sometimes dirty water enters the pipe of water supply and contaminates this water. This contaminated water create serious health hazard on consumption.

Waste water also percolates through the surface and reaches the ground water. In this way many harmful organic and inorganic matter mix up with ground water which leads to pollution of groundwater. This water cannot be used for drinking purpose.
 4. Step to maintain proper sanitation are–
 - F Wastes should be disposed off properly and not thrown anywhere.
 - F Proper toilet facilities should be provided to rural people.
 - F Chemical wastes from the factories should be properly

2. The object which do not allow the light to pass through them are called opaque objects.
 3. A plane mirror is a smooth surface that reflects most of the light striking it.
 4. Image that can be formed on screen are called real image.
Whereas image that cannot be formed on a screen is called virtual image.
 5. At the front side of the ambulance the word 'AMBULANCE' is written laterally inserted so that it may appear correct in the rear view mirror of the vehicle moving ahead.
- F**
1. Take a rubber tube about 5 cm long and spread it along the edge of table in a straight line. Switch on the flash light and place it on the side of the rubber tube. Keep your eye on the other end of the tube. You will observe that light passing through a straight tube is visible. Now bend the rubber tube. You will observe that light passing through the tube is not visible. Thus, the activity proves that light travels in straight line. It cannot bend along the corners.
 2. Kaleidoscope works on the principle of multiple images created by mirrors inclined to each other. Two mirrors run through the entire cylindrical tube. Also, there are two plates—one of smooth glass while the other of ground glass. The smooth plate is close to the eye hole. Several pieces of coloured beads of glass are placed between the two plates. The image of these beads are formed in the mirrors. When we turn the device, the patterns of these head images change.
 3. If the object lies between the focus (F) and the centre of curvature (C), the image is—
 - F real i.e., can be obtained on the screen.
 - F inverted i.e., upside down.
 - F enlarged i.e., larger than the object.
 - F image is formed beyond the centre of curvature but not at infinity in front of the mirror.
 4. The uses of concave mirror are—
 - F They are used as shaving mirrors. If you place your face between the pole and the principle focus of the concave mirror an erect, enlarged and virtual image of your face can be seen behind the mirror.
 - F Head lights of automobiles are made by concave mirror which act as reflector. In head lights the bulb is placed at the principal focus of the concave reflection so as to get a powerful parallel beam of light.
 - F Dentist use concave mirrors to see back tooth by placing it

behind the tooth. In this way, he gets virtual, erect and enlarged image of the tooth.

5. The images formed in a plane mirror are always laterally inverted. If you sit before a plane mirror and eat with your right hand. It will appear in the mirror that you are eating with your left hand.
6. F The rear view mirrors of the automobiles are convex mirrors. A convex mirror forms a small erect and diminished image close to the eyes of the driver.
F As a convex mirror diverges the rays of light over a wide area, it is used as a street light reflector.

HOTS

1. Head lights of automobiles are made by concave mirror which acts as a reflector. In head lights the bulb is placed at the principal focus of the concave reflector so as to get a powerful parallel beam of light.
2. Distance = 750,000 km
Speed of light = 312500 km/sec
Time = $750000/312500 = 2.4$ sec

Let's Enjoy

- A Do yourself.
B Do yourself.
C Do yourself.

CHAPTER 19 (Pressure of Air) EXERCISE

- A 1. (b) Volcanic eruptions 2. (a) all directions
3. (b) Do not sit near a window
- B 1. (e) cumulus 2. (a) land 3. (c) anemometer
4. (b) low pressure 5. (d) wind
- C 1. False 2. False 3. False 4. False
5. True 6. False
- D 1. high pressure, low pressure
2. rising, cumulus 3. spiral, eye
4. eye 5. expands 6. heavy rains and fast winds
7. INSAT satellite
- E Do yourself.
- F 1. The pressure exerted by the atmosphere on the surface of the earth is called the atmospheric pressure.
2. The heating of the earth by the sun varies the air temperature and world's wind patterns.

3. The flow of air from high pressure area to the low pressure is called wind.

Whereas winds blowing at a very fast speed along with thunder, lightning and rain are called thunderstorm.

4. The wind vane indicates the direction from which the wind is blowing.
5. The centre of the cyclone is called an eye of the cyclone. It is calm and sunny.

- G**
1. Thunderstorms are caused inside the clouds called cumulus. The air which is warm and full of water vapour rise up fast and water vapours inside it condense to form ice. During this process, a big amount of heat energy is produced. It further warms up the air and it moves with much more speed. In the mean while, the water particles and ice particles rub against each other and build up negative electric charge in the cloud. Then clouds show great lightening to release this negative charge. The heat of the negative charge, heats up the air and it starts moving very fast, so fast that the bombardment of the air molecules with each other produces great sound i.e., a thunder.
 2. Thunderstorms cause a lot of damage due to heavy rains and fast winds. These winds uproot the trees, break away weak buildings, blow away the roofs of the houses.
 3. The main reasons behind the hurricanes are the hot water vapour (27°C) strong and high altitude winds, warm moist air and large air pressure differences. Over the surface of warm tropical sea, the winds coming from opposite direction meet to form the spirals of air. Due to this, the warm water vapour rise at an high altitude. They condense to form clouds. Condensation of water vapours cause the heat release, which further warms up the air and it rises up more fastly causing the spiraling of the air. It increases the speed of the air, more warm water vapour rise up and more energy is released. The spiral movement of air increases and the cyclone moves with a great speed causing rains and destruction back on its path. It ends up when it reaches the land, because it cannot get more warm water vapours to sustain it.
 4. The hurricane ends up when it reaches the land, because it cannot get more warm water vapour to sustain it.
 5. A dark funnel shaped cloud formed on land such that it reaches from the sky to the ground. The neck of the funnel sucks up anything which come in its path. The tornadoes are sometimes formed within the cyclones. Tornadoes cause a lot of damage due to heavy rains and fast winds. These winds uproot the trees break

away weak buildings, blow away the roofs of the houses.

6. The steps taken by government for cyclone warning are—
- F The weather is continuously broadcasted on hourly or half hourly basis on news channels, newspaper, T.V., radio etc. So that everybody knows about the impending disaster and moves out.
 - F District administration actively helps the people to move to the safer places or specially constructed cyclone shelters.
 - F Government of India has set up weather observation radars which detects the formation of cyclones and their movement.
 - F If the cyclone is moving towards the coast, the news in the immediately broadcasted from a chain of radio stations at least 48 hours before the expected arrival of the cyclone.

HOTS

The equator of the earth receives direct sun rays. So, the earth at equator gets heated the most. The air in the region of equator gets heated and expands. The expanded air rises up and cooler air flows from the poles to take the place of rising air. In this way, warm winds flow away from equator and cooler air moves towards equator to take the place of rising air.

Let's Enjoy

- A Do yourself.
- B Do yourself.
- C Do yourself.
- D 1. Hurricane 2. Wind 3. Thunder 4. Cumulus
5. Low 6. Eye

MODEL TEST PAPER I

- A 1. (c) Nitrogen 2. (a) liver 3. (a) convection
4. (c) Silicon 5. (b) weathering
- B 1. Humus 2. hepatic vein 3. pancreatic juice
4. neutralisation 5. Properties
6. Diaphragm
- C 1. Blue green algae, Red algae 2. Lichen, Rhizouim
3. Wool, Silk 4. Digestion of food, Curding of milk
5. Dissolution of rubber and petrol, Dissolution of sugar in water
- D 1. (c) Green pigment 2. (a) Red bone marrow
3. (e) Sericulture 4. (f) Loss of blood
5. (d) Bile juice 6. (b) Diffusion
- E Do yourself.

- F**
1. The process of photosynthesis is important because –
 - F It results in synthesis of food from inorganic raw material.
 - F Green plants provide organic food to all living organism on earth.
 - F It helps in maintaining ecological balance of environment.
 - F It helps in addition of oxygen in atmosphere.
 - F It decreases the concentration of CO₂ which increase due to respiration of organism.
 2. In large intestine water and minerals are absorbed. So that it is not lost from the body. The semi solid remains are called faeces which are passed through anus at intervals.
 3. Crystallisation is the process of obtaining crystals of a soluble substance from its hot saturated solution.
 4. Fermentation is the process of anaerobic respiration in which yeast is used to break down food item into other form. It is used in bread making industry, yeast is used to make breads and cake.
 5. Soil support plant growth in two ways:
 - (a) by holding the roots firmly and
 - (b) by supplying water and nutrients
 6. Earthworms have a well develop circulatory system. It consists of a network of blood vessel which is in contact with almost all cells of the body. Blood is also present inside the tubes in earthworms which consists of mainly water with dissolved substances and a pigment called haemoglobin which helps in transportation of oxygen and nutrients.
- G**
1. The production of wool fibre mainly comprises of:
 - (a) **Cleaning**: This is the first and the most important process. In this process the sheared wool is washed properly using detergent and chemicals to make it clean, soft and germs free. Thereafter, it is smothered by oiling.
 - (b) **Carding**: In this process washed wool is sent into a carding machine. The carding machine combs the loose wool fibres into a sheet. Then the sheet is twisted into robs called silver. The silver, is then stretched and twisted into yarn.
 2. Transferring heat from one body to another body by variation of temperature is called flow of heat. Heat is transmitted from one body to another body by three means–
 - F Conduction
 - F Convection
 - F Radiation
 3. Sodium hydroxide is a base because–

$$1 \text{ sec} = 1/3600 \text{ hour}$$

$$S = 0.08/1/3600 = 0.08 \times 3600 = 288 \text{ km/hr}$$

2. Speed = 25 km/hr
Time = 15 min
= 15/60 hr
Speed = Distance/Time
 $25 = x/15/60$
 $25 = 60x/15$
 $25 \times 15 = 60x$
 $375 = 60x$
 $x = 375/60 = 6.25 \text{ km}$

- E**
1. During dialysis, blood from the arm is allowed to flow into the dialysis machine. This is made up of long cellophane tube, coiled in chamber with a dialysing solution. When the blood passes through this machine, the impure substances are separated and the pure blood is sent to the patient's body.
 2. Vegetative Propagation by Roots– Sweet potato, dahila etc. reproduce through their roots. The swollen roots of these plants are burried in the soil which develops into new plants.
Vegetative Propagation by Stems– Some plants reproduce through their stems. Such plants are potato, ginger, sugarcane. Actually, the swollen part of these plants are their stems.
Vegetative Propagation by Leaves– Some plants reproduce by their leaves. Such plants are bryophyllum, begonia etc. New plantlets develop from the edge of these plants. When they come in contact of soil. They get detached from the leaves and grow into new plants.
 3. Causes of water scarcity are–
 - F Overpopulation
 - F Over irrigating for agriculture
 - F Climatic change and variability
 - F Indiscriminate cutting of forest
 - F Destruction of natural water reservoirs
 - F Misuse of water
 4. The harmful effects of sewage are -
 - F It causes harmful diseases and environmental problems.
 - F It pollutes the ground water.
 - F It chokes the drainage system and causes problem is rainy season.

- F It causes eutrophication.
 - F It causes threat to environment.
5. There are two sources of light. Sun, stars, fireflies and animals that give out light from their bodies are the natural sources of light. Electric light candles, oil lamps, camp fires, torches, laser etc. are the artificial sources of light.
 6. The center of the cyclone is called the eye of the cyclone.
- F**
1. An electric bell consists of an electromagnet, an armature, a gong and a contact adjusting screw. An iron rod is mounted on a spring and one end of this rod presses against the contact adjusting screw. This forms an armature.

When we switch on the current, it starts flowing through the electromagnet. The electromagnet attracts the soft iron rod, towards it and the hammer strikes the gong to make the sound of the bell. In the mean time, the armature loses its contact with the screw causing break in circuit and hammer comes back to its position. Once again the current passes through the electromagnet and the magnetic field causes the hammer to strike the gong. This process keeps on repeating till we press the switch.

2. Forests are of immense value to the life and prosperity of human beings and of nations.
 - F They are habitat for plants and animals.
 - F They maintain ecological balance.
 - F They provide us wood and timber.
 - F They provide us products like resin, fruits, nuts, sandalwood etc.
3. Collecting rainwater to be recycled is called rainwater harvesting. It helps in water falls. On the roof top of the building. Then it flows deep in a trench in the ground. The water is then filtered and stored in the tanks under ground for future use.
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5. The uses of concave mirror are—
- F Concave mirror are used in shaving mirror.
 - F Head lights of automobiles are made by concave mirror which acts as a reflector.
 - F Dentist use concave mirrors to see back tooth by placing it behind the tooth.
6. Thunderstorms are formed inside the clouds cumulus. The air which is warm and full of water vapour rise up fast and water vapours inside it condense to form ice. During this process a big amount of heat energy is produced. It further warms up the air and it moves with much more speed. In the mean while, the water particles and ice particles rub against each other and build up negative electric charge in the cloud. then clouds show great lightning to release this negative charge. The heat of the negative electric charge, heats up the air and it starts moving very very fast, so fast that the bombardment of the air molecules with each other produces a great sound i.e., a thunder.

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