IMPORTANT CHAPTERS FROM NCERT SCIENCE

CONTENTS

CLASS	PHYSICS CHAPTER	CHEMISTRY CHAPTER	BIOLOGY CHAPTER
7^{TH}	4, 13, 14 & 15	5 & 6	1, 2, 10, 11 & 12
8^{TH}	11, 12, 13, 14, 15 & 16	3, 4, 5 & 6	2, 8, 9 & 10

CHAPTER-1

NUTRITION IN PLANTS

- Carbohydrates, proteins, fats, vitamins and minerals are components of food.
- These components of food are necessary for our body and are called nutrients.
- Nutrition is the mode of taking food by an organism and its utilisation by the body.
- The mode of nutrition in which organisms make food themselves from simple substances is called autotrophic (auto = self; trophos = nourishment) nutrition. plants are called autotrophs.
- Animals and most other organisms take in readymade food prepared by the plants. They are called heterotrophs (heteros =other).
- the bodies of living organisms are made of tiny units called cells.
- Cells can be seen only under the microscope.
- Some organisms are made of only one cell.
- The cell is enclosed by a thin outer boundary, called the cell membrane cell membrane.
- Most cells have a distinct, centrally located spherical structure called the nucleus.
- The nucleus is surrounded by a jelly-like substance called cytoplasm.
- Carbon dioxide from air is taken in through the tiny pores present on the surface of the leaves.
- These pores are surrounded by 'guard cells'. Such pores are called stomata.
- The leaves have a green pigment called chlorophyll. It helps leaves to capture the energy of the sunlight. This energy is used to synthesise (prepare) food from carbon dioxide and water.
- Since the synthesis of food occurs in the presence of sunlight, it is called photosynthesis (Photo: light; synthesis : to combine).
- So we find that chlorophyll, sunlight, carbon dioxide and water are necessary to carry out the process of photosynthesis.
- During photosynthesis, chlorophyll containing cells of leaves in the presence of sunlight, use carbon dioxide and water to synthesize carbohydrates.
- During the process oxygen is released.
- The carbohydrates ultimately get converted into starch.
- The presence of starch in leaves indicates the occurrence of photosynthesis.
- The starch is also a carbohydrate. You often see slimy, green patches in ponds or in other stagnant water bodies.
- These are generally formed by the growth of organisms called algae.
- They contain chlorophyll which gives them the green colour.
- Algae can also prepare their own food by photosynthesis.
- The carbohydrates are made of carbon, hydrogen and oxygen.
- These are used to synthesise other components of food.
- proteins are nitrogenous substances which contain nitrogen.
- Soil has certain bacteria that convert gaseous nitrogen into a usable form and release it into the soil.
- These soluble forms are absorbed by the plants along with water.
- Farmers adding fertilisers rich in nitrogen to the soil.
- In this way the plants fulfill their requirements of nitrogen along with the other constituents.
- Plants can then synthesise components of food other than carbohydrates such as proteins and fats.
- humans and animals such plants depend on the food produced by other plants.

- They use the heterotrophic mode of nutrition.
- Yellow tubular structures twining around the stem and branches of a tree? This is a plant called Cuscuta (Amarbel).
- It does not have chlorophyll.
- It takes readymade food from the plant
- The plant on which it climbs is called a host.
- Pitcher plant showing lid and pitcher
- The apex of the leaf forms a lid which can open and close the mouth of the pitcher.
- Inside the pitcher there are hairs which are directed downwards.
- When an insect lands in the pitcher, the lid closes and the trapped insect gets entangled into the hair.
- The insect is digested by the digestive juices secreted in the pitcher. Such insect-eating plants are called insectivorous plants

SAPROTROPHS

- cotton-like threads spread on the piece of bread
- These organisms are called fungi.
- They have a different mode of nutrition.
- They secrete digestive juices on the dead and decaying matter and convert it into a solution.
- Then they absorb the nutrients from it.
- This mode of nutrition in which organisms take in nutrients in solution form from dead and decaying matter is called saprotrophic nutrition saprotrophic nutrition.
- Plants which use saprotrophic mode of nutrition are called saprotrophs
- Fungi also grow on pickles, leather, clothes and other articles that are left in hot and humid weather for long time
- Some organisms live together and share shelter and nutrients. This is called symbiotic relationship.
- For example, certain fungi live in the roots of trees.
- The tree provides nutrients to the fungus and, in return, receives help from it to take up water and nutrients from the soil.
- This association is very important for the tree.
- In organisms called lichens, a chlorophyll-containing partner, which is an alga, and a fungus live together.
- The bacterium called Rhizobium can take atmospheric nitrogen and convert it into a soluble form.
- But Rhizobium cannot make its own food.
- So it lives in the roots of gram, peas, moong beans and other legumes and provides them with nitrogen.
- Most of the pulses (dals) are obtained from leguminous plants.

CHAPTER-2-NUTRITION IN ANIMALS

- Animal nutrition includes nutrient requirement, mode of intake of food and its utilisation in the body.
- The components of food such as carbohydrates are complex substances.
- These complex substances cannot be utilised as such.
- So they are broken down into simpler substances.
- The breakdown of complex components of food into simpler substances is called digestion.
- Starfish feeds on animals covered by hard shells of calcium carbonate.

DIGESTION IN HUMANS

- The food passes through a continuous canal which begins at the buccal cavity and ends at the anus.
- The canal can be divided into various compartments:(1) the buccal cavity, (2) food pipe oesophagus, (3) stomach, (4) small intestine , (5) large intestine ending in the rectum rectum and (6) the anus.
- These parts together form the alimentary canal alimentary canal (digestive tract) .
- The digestive tract and the associated glands together constitute the digestive system.
- The saliva breaks down the starch into sugars.
- The swallowed food passes into the food pipe or oesophagus.
- The stomach-widest part of the alimentary canal
- The inner lining of the stomach secretes mucous, hydrochloric acid and digestive juices.
- The mucous protects the lining of the stomach.
- The acid kills many bacteria that enter along with the food and makes the medium in the stomach acidic.
- The digestive juices break down the proteins into simpler substances
- The small intestine-The small intestine is highly coiled and is about 7.5 metres long.
- It receives secretions from the liver and the pancreas. Besides, its wall also secretes juices.
- The liver is a reddish brown gland situated in the upper part of the abdomen on the right side.
- It is the largest gland in the body.
- It secretes bile juice that is stored in a sac called the gall bladder gall bladder.
- The bile plays an important role in the digestion of fats.
- The pancreas is a large cream coloured gland located just below the stomach.
- The pancreatic juice acts on carbohydrates and proteins and changes them into simpler forms.
- The digested food can now pass into the blood vessels in the wall of the intestine. This process is called absorption.
- The inner walls of the small intestine have thousands of finger-like outgrowths. These are called villi (singular villus).
- Large intestine is wider and shorter than small intestine.
- about 1.5 metre in length. Its function is to absorb water and some salts from the undigested food material.
- The remaining waste passes into the rectum and remains there as semi-solid faeces.
- The faecal matter is removed through the anus from time-to-time. This is called egestion.

DIGESTION INGRASS-EATING ANIMALS

- Actually, they quickly swallow the grass and store it in a separate part of the stomach called rumen.

Diarrhoea

- Sometime you may have experienced the need to pass watery stool frequently. This condition is known as diarrhoea.
- caused by an infection, food poisoning or indigestion.
- very common in India, particularly among children.
- Under severe conditions it can be fatal because of the excessive loss of water and salts from the body.
- Diarrhoea should not be neglected.
- Even before a doctor is consulted the patient should be given plenty of boiled and cooled water with a

pinch of salt and sugar dissolved in it. This is called Oral Rehydration Solution (ORS).

CHAPTER-4-HEAT

- Our sense of touch is not always a reliable guide to the degree of hotness of an object.
- Temperature is a measure of the degree of hotness of an object.
- Thermometer is a device used for measuring temperatures.
- Clinical thermometer is used to measure our body temperature. The range of this thermometer is from 35°C to 42°C. For other purposes, we use the laboratory thermometers. The range of these thermometers is usually from –10°C to 110°C.
- The normal temperature of the human body is 37°C.
- The heat flows from a body at a higher temperature to a body at a lower temperature.
- There are three ways in which heat can flow from one object to another. These are conduction, convection and radiation.
- In solids, generally, the heat is transferred by conduction. In liquids and gases the heat is transferred by convection. No medium is required for transfer of heat by radiation.
- The materials which allow heat to pass through them easily are conductors of heat.
- The materials which do not allow heat to pass through them easily are called insulators.
- Dark-coloured objects absorb radiation better than the light-coloured objects. That is the reason we feel more comfortable in light-coloured clothes in the summer.
- Food partially digested and is called cud.
- But later the cud returns to the mouth in small lumps and the animal chews it.This process is called rumination and these animals are called ruminants.
- The grass is rich in cellulose, a type of carbohydrate.
- Many animals, including humans, cannot digest cellulose.
- Ruminants have a large sac-like structure between the small intestine and large intestine.

FEEDING AND DIGESTION IN AMOEBA

- Amoeba is a microscopic single-celled organism found in pond water.
- Amoeba has a cell membrane, a rounded, dense nucleus and many small bubble-like vacuoles in its cytoplasm.
- Amoeba constantly changes its shape and position.
- It pushes out one, or more finger-like projections, called pseudopodia or false feet for movement and capture of food.
- Amoeba feeds on some microscopic organisms.
- When it senses food, it pushes out pseudopodia around the food particle and engulfs it.
- The food becomes trapped in a food vacuole.
- Digestive juices are secreted into the food vacuole.
- They act on the food and break it down into simpler substances.
- Gradually the digested food is absorbed.
- The absorbed substances are used for growth, maintenance and multiplication.
- The undigested residue of the food is expelled outside by the vacuole.

- The basic process of digestion of food and release of energy is the same in all animals.
- In a later chapter you will learn about the transport of food absorbed by the intestine to the various parts of the body.
- The solutions which do not change the colour of either red or blue litmus are known as neutral solutions.
- These substances are neither acidic nor basic.
- Turmeric is another natural indicator.
- China Rose as Indicator turns acidic solutions to dark pink (magenta) and basic solutions to green.
- the rain containing excess of acids is called an acid rain.
- The rain becomes acidic because carbon dioxide, sulphur dioxide and nitrogen dioxide (which are released into the air as pollutants) dissolve in rain drops to form carbonic acid, sulphuric acid and nitric acid respectively.
- Woollen clothes keep us warm during winter. It is so because wool is a poor conductor of heat and it has air trapped in between the fibres.

CHAPTER-5- ACIDS, BASES AND SALTS

- Curd, lemon juice, orange juice and vinegar taste sour. These substances taste sour because they contain acids.
- The chemical nature of such substances is acidic. The word acid comes from the Latin word acere which means sour.
- The acids in these substances are natural acids.
- Baking Soda- it does not taste sour it means, that it has no acids in it. It is bitter in taste.
- If you rub its solution between fingers, it feels soapy.
- Substances like these which are bitter in taste and feel soapy on touching are known as bases. The nature of such substances is said to be basic.
- Special types of substances are used to test whether a substance is acidic or basic. These substances are known as indicators.
- The indicators change their colour when added to a solution containing an acidic or a basic substance.
- Turmeric, litmus, China rose petals (Gudhal), etc., are some of the naturally occurring indicators.
- Name of acid Found in Acetic acid Vinegar Formic acid Ant's sting Citric acid Citrus fruits such as oranges, lemons, etc.
- Lactic acid Curd Oxalic acid Spinach Ascorbic acid Amla, Citrus fruits (Vitamin C) Tartaric acid Tamarind, grapes, unripe mangoes, etc.
- All the acids mentioned above occur in nature Name of base Found in Calcium hydroxide
- Lime water Ammonium hydroxide Window cleaner Sodium hydroxide/ Soap Potassium hydroxide Magnesium hydroxide Milk of magnesia.
- The most commonly used natural indicator is litmus. It is extracted from lichens. It has a mauve (purple) colour in distilled water. When added to an acidic solution, it turns red and when added to a basic solution, it turns blue. It is available in the form of a solution, or in the form of strips of paper, known as litmus paper. Generally, it is available as red and blue litmus paper.

- Acid rain can cause damage to buildings, historical monuments, plants and animals.
- It is evident that when the solution is basic, phenolphthalein gives a pink colour. On the other hand, when the solution is acidic, it remains colourless.
- When an acidic solution is mixed with a basic solution, both the solutions neutralise the effect of each other.
- When an acid solution and a base solution are mixed in suitable amounts, both the acidic nature of the acid and the basic nature of the base are destroyed.
- The resulting solution is neither acidic nor basic.
- In neutralisation reaction, heat is always produced, or evolved.
- A change in which one or more new substances are formed is called a chemical change.
- A chemical change is also called a chemical reaction.
- vinegar and baking soda together produced carbon dioxide, which turned lime water milky.
- For rusting, the presence of both oxygen and water (or water vapour) is essential.
- Prevent iron articles from coming in contact with oxygen, or water, or both. One simple way is to apply a coat of paint or grease.
- In fact, these coats should be applied regularly to prevent rusting. Another way is to deposit a layer of a metal like chromium or zinc on iron. This process of depositing a layer of zinc on iron is called galvanisation.
- Stainless steel is made by mixing iron with carbon and metals like chromium, nickel and manganese. It does not rust.
- Large crystals of pure substances can be formed from their solutions. The process is called crystallisation. It is an example of a physical change.
- The evolved heat raises the temperature of the reaction mixture.
- In neutralisation reaction a new substance is formed. This is called salt.
- Salt may be acidic, basic or neutral in nature.
- The reaction between an acid and a base is known as neutralisation.
- Salt and water are produced in this process with the evolution of heat.
- Stomach contains hydrochloric acid. It helps us to digest food.
- When an ant bites, it injects the acidic liquid (formic acid) into the skin.
- The effect of the acid can be neutralized by rubbing moist baking soda (sodium hydrogen carbonate) or calamine solution, which contains zinc carbonate.

CHAPTER-6- PHYSICAL AND CHEMICAL CHANGES

- Properties such as shape, size, colour and state of a substance are called its physical properties.
- A change in which a substance undergoes a change in its physical properties is called a physical change.
- A physical change is generally reversible. In such a change no new substance is formed.
- A change with which you are quite familiar is the rusting of iron.
- When we leave a piece of iron in the open for some time, it acquires a film of brownish substance. This substance is called rust and the process is called rusting where magnesium hydroxide is a base.
- Magnesium oxide is a new substance formed on burning of magnesium.
- Magnesium hydroxide is another new substance formed by mixing magnesium oxide with water.
- Change in colour of the copper sulphate solution due to reaction with iron.

CHAPTER-10- RESPIRATION IN ORGANISMS

- The process of breakdown of food in the cell with the release of energy is called cellular respiration.
- Cellular respiration takes place in the cells of all organisms.
- In the cell, the food (glucose) is broken down into carbon dioxide and water using oxygen.
- When breakdown of glucose occurs with the use of oxygen it is called aerobic respiration.
- Food can also be broken down, without using oxygen. This is called anaerobic respiration.
- Breakdown of food releases energy.
- There are some organisms such as yeast that can survive in the absence of air. They are called anaerobes.
- They get energy through anaerobic respiration.

- In the absence of oxygen, glucose breaks down into alcohol and carbon dioxide.
- Yeasts are single-celled organisms.
- They respire anaerobically and during this process yield alcohol. They are, therefore, used to make wine and beer.
- Our muscle cells can also respire anaerobically, but only for a short time, when there is a temporary deficiency of oxygen.
- The taking in of air rich in oxygen into the body is called inhalation and giving out of air rich in carbon dioxide is known as exhalation.
- When we inhale air, it passes through our nostrils into the nasal cavity.
- From the nasal cavity, the air reaches our lungs through the windpipe.
- Lungs are present in the chest cavity
- This cavity is surrounded by ribs on the sides.
- A large, muscular sheet called diaphragm forms the floor of the chest cavity.
- Breathing involves the movement of the diaphragm and the rib cage. A cockroach has small openings on the sides of its body. Other insects also have similar openings. These openings are called spiracles.
- Insects have a network of air tubes called tracheae for gas exchange.
- Oxygen rich air rushes through spiracles into the tracheal tubes, diffuses into the body tissue, and reaches every cell of the body.
- Earthworms breathe through their skins.
- The skin of an earthworm feels moist and slimy on touching. Gases can easily pass through them.
- Though frogs have a pair of lungs like human beings, they can also breathe through their skin, which is moist and slippery.
- Gills in fish help them to use oxygen dissolved in water.
- Gills are projections of the skin.
- Gills are well supplied with blood vessels for exchange of gases.

CHAPTER-11- TRANSPORTATION IN ANIMALS AND PLANTS

CIRCULATORY SYSTEM

- Blood- the fluid which flows in blood vessels.
- It transports substances like digested food from the small intestine to the other parts of the body.
- It carries oxygen from the lungs to the cells of the body.
- It also transports waste for removal from the body.
- The fluid part of the blood is called plasma. One type of cells are the red blood cells(RBC) which contain a red pigment called haemoglobin.
- Haemoglobin binds with oxygen and transports it to all the parts of the body and ultimately to all the cells.
- It will be difficult to provide oxygen efficiently to all the cells of the body without haemoglobin. The presence of haemoglobin makes blood appear red.
- The blood also has white blood cells (WBC) which fight against germs that may enter our body.
- The clot is formed because of the presence of another type of cells in the blood, called platelets. two types of blood vessels, arteries and veins are present in the body.
- Arteries carry oxygen-rich blood from the heart to all parts of the body. Since the blood flow is rapid and at a high pressure, the arteries have thick elastic walls.
- The number of beats per minute is called the pulse rate.
- A resting person, usually has a pulse rate between 72 and 80 beats per minute.
- Veins are the vessels which carry carbon dioxide-rich blood from all parts of the body back to the heart.
- The veins have thin walls. There are valves present in veins which allow blood to flow only towards the heart.
- arteries divide into smaller vessels. On reaching the tissues, they divide further into extremely thin tubes called capillaries.
- The capillaries join up to form veins which empty into the heart.
- The heart has four chambers. The two upper chambers are called the atria (singular: atrium) and the two lower chambers are called the ventricles.
- The partition between the chambers helps to avoid mixing up of blood rich in oxygen with the blood rich in carbon dioxide.
- A doctor uses the stethoscope as a device to amplify the sound of the heart.
- It consists of a chest piece that carries a sensitive diaphragm, two ear pieces and a tube joining the parts.
- When our cells perform their functions, certain waste products are released. These are toxic and hence need to be removed from the body.
- The process of removal of wastes produced in the cells of the living organisms is called excretion. The parts involved in excretion forms the excretory system.
- The waste which is present in the blood has to be removed from the body.
- This is done by the blood capillaries in the kidneys. When the blood reaches the two kidneys, it contains both useful and harmful substances.
- The useful substances are absorbed back into the blood.
- The wastes dissolved in water are removed as urine.
- From the kidneys, the urine goes into the urinary bladder through tube-like ureters.
- It is stored in the bladder and is passed out through the urinary opening at the end of a muscular tube called urethra.
- The kindeys, ureters, bladder and urethra form the excretory system. Sometimes a person’s kidneys may stop working due to infection or injury.

- As a result of kidney failure, waste products start accumulating in the blood.
- Such persons cannot survive unless their blood is filtered periodically through an artificial kidney. This process is called dialysis.
- Plants have pipe-like vessels to transport water and nutrients from the soil.
- The vessels are made of special cells, forming the vascular tissue.
- A tissue is a group of cells that perform specialised function in an organism.
- The vascular tissue for the transport of water and nutrients in the plant is called the xylem.
- The xylem forms a continuous network of channels that connects roots to the leaves through the stem and branches and thus transports water to the entire plant.
- leaves synthesise food. The food has to be transported to all parts of the plant. This is done by the vascular tissue called the phloem.
- Thus, xylem and phloem transport substances in plants. Plants absorb mineral nutrients and water from the soil.
- Not all the water absorbed is utilised by the plant.
- The water evaporates through the stomata present on the surface of the leaves by the process of transpiration.

CHAPTER-12-REPRODUCTION IN PLANTS

- The production of new individuals from their parents is known as reproduction.
- Most plants have roots, stems and leaves. These are called the vegetative parts of a plant.
- The flowers perform the function of reproduction in plants.
- Flowers are the reproductive parts of a plant. There are several ways by which plants produce their offspring. These are categorised into two types: (i) asexual, and (ii) sexual reproduction. In asexual reproduction plants can give rise to new plants without seeds, whereas in sexual reproduction, new plants are obtained from seeds.
- In asexual reproduction new plants are obtained without production of seeds or spores.

Vegetative propagation

- It is a type of asexual reproduction in which new plants are produced from roots, stems, leaves and buds. Since reproduction is through the vegetative parts of the plant, it is known as vegetative propagation.
- Apart from flower buds, there are buds in the axil (point of attachment of the leaf at the node) of leaves which develop into shoots.
- These buds are called vegetative buds.
- A bud consists of a short stem around which immature overlapping leaves are folded.
- The vegetative buds can also give rise to new plants.
- Bryophyllum (sprout leaf plant) has buds in the margins of leaves.
- If a leaf of this plant falls on a moist soil, each bud can give rise to a new plant.
- Plants produced by vegetative propagation take less time to grow and bear flowers and fruits earlier than those produced from seeds.

- The small bulb-like projection coming out from the yeast cell is called a bud.
- The bud gradually grows and gets detached from the parent cell and forms a new yeast cell.
- The new yeast cell grows, matures and produces more yeast cells.
- Sometimes, another bud arises from the bud forming a chain of buds.
- If this process continues, a large number of yeast cells are produced in a short time.
- Slimy green patches in ponds, or in other stagnant water bodies. These are the algae.
- When water and nutrients are available algae grow and multiply rapidly by fragmentation. An alga breaks up into two or more fragments.
- The fungi on a bread piece grow from spores which are present in the air. When spores are released they keep floating in the air.
- As they are very light they can cover long distances.
- The spores are asexual reproductive bodies.
- Each spore is covered by a hard protective coat to withstand unfavourable conditions such as high temperature and low humidity and can survive for a long time.
- Under favorable conditions, a spore germinates and develops into a new individual. Plants such as moss and ferns also reproduce by means of spores.
- The flowers which contain either only the pistil or only the stamens are called unisexual flowers.
- The flowers which contain both stamens and pistil are called bisexual flowers.
- Corn, papaya and cucumber produce unisexual flowers, whereas mustard, rose and petunia have bisexual flowers. Another contains pollen grains which produce male gametes.
- A pistil consists of stigma, style and ovary.
- The ovary contains one or more ovules. The female gamete or theeggis formed in an ovule.
- In sexual reproduction a male and a female gamete fuse to form a zygote. The transfer of pollen from the anther to the stigma of a flower is called pollination.
- If the pollen lands on the stigma of the same flower it is called self-pollination. When the pollen of a flower lands on the stigma of another flower of the same plant, or that of a different plant of the same kind, it is called cross-pollination. The cell which results after fusion of the gametes is called a zygote.
- The process of fusion of male and female gametes (to form a zygote) is called fertilisation.
- The zygote develops into an embryo.
- All organisms multiply or reproduce their own kind. In plants there are two modes of reproduction, asexual and sexual.
- There are several methods of asexual reproduction such as fragmentation, budding, spore formation and vegetative propagation.
- Sexual reproduction involves the fusion of male and female gametes.
- In vegetative propagation new plants are produced from different vegetative parts such as leaves, stems and roots.
- Flower is the reproductive part of a plant.
- A flower may be unisexual with either the male or the female reproductive parts.
- A bisexual flower has both the male and the female reproductive parts.
- The male gametes are found inside the pollen grains and female gametes are found in the ovule.
- Pollination is the process of transfer of pollen grains from the anther of one flower to the stigma of the same or another flower.
- Pollination is of two types, self-pollination and cross-pollination.
- In self-pollination, pollen grains are transferred from the anther to the stigma of the same flower.

- In cross-pollination, pollen grains are transferred from the anther of one flower to the stigma of another flower of the same kind.
- Pollination takes place in plants with the help of wind, water and insects.
- The fusion of male and female gametes is called fertilisation.
- Fertilised egg is called zygote.
- Zygote develops into an embryo. Fruit is the mature ovary whereas ovule develops into a seed, which contains the developing embryo. Seed dispersal is aided by wind, water and animals.
- Seed dispersal helps the plants to (i) prevent overcrowding, (ii) avoid competition for sunlight, water and minerals and (iii) invade new habitats.

CHAPTER-13-MOTION AND TIME

- The distance moved by an object in a unit time is called its speed.
- Speed of objects help us to decide which one is moving faster than the other.
- The speed of an object is the distance travelled divided by the time taken to cover that distance. Its basic unit is metre per second (m/s).
- Periodic events are used for the measurement of time. Periodic motion of a pendulum has been used to make clocks and watches.
- Motion of objects can be presented in pictorial form by their distance-time graphs.
- The distance-time graph for the motion of an object moving with a constant speed is a straight line.

CHAPTER-14- ELECTRIC CURRENT AND ITS EFFECTS

In the bulb there is a thin wire, called the filament, which glows when an electric current passes through it.

 When the bulb gets fused, its filament is broken.

 An electric bulb is used for light but it also gives heat. This is not desirable.

 This results in the wastage of electricity. This wastage can be reduced by using fluorescent tube lights in place of the bulbs.

 Compact fluorescent lamps (CFLs) also reduce wastage and can be fixed in the ordinary bulb holders.

 These days Miniature circuit breakers (MCBs) are increasingly being used in place of fuses.

 These are switches which automatically turn off when current in a circuit exceeds the safe limit.

 The coil in the above activity behaves like a magnet when electric current flows through it. When the electric current is switched off, the coil generally loses its magnetism.

 Such coils are called electromagnets. The electromagnets can be made very strong and can lift very heavy loads. The coil is no longer an electromagnet.

 It no longer attracts the iron strip.

 The iron strip comes back to its original position and touches the contact screw again.

CHAPTER-15-LIGHT

- Light travels along straight lines.
- Any polished or a shining surface acts as a mirror.
- An image which can be obtained on a screen is called a real image.
- An image which cannot be obtained on a screen is called a virtual image.
- The image formed by a plane mirror is erect. It is virtual and is of the same size as the object. The image is at the same distance behind the mirror as the object is in front of it.
- In an image formed by a mirror, the left side of the object is seen on the right side in the image, and right side of the object appears to be on the left side in the image.
- A concave mirror can form a real and inverted image. When the object is placed very close to the mirror, the image formed is virtual, erect and magnified.
- Image formed by a convex mirror is erect, virtual and smaller in size than the object.
- A convex lens can form real and inverted image. When the object is placed very close to the lens, the image formed is virtual, erect and magnified. When used to see objects magnified, the convex lens is called a magnifying glass.
- A concave lens always forms erect, virtual and smaller image than the object.
- White light is composed of seven colours.

Class 8th

CHAPTER-2-MICROORGANISMS: FRIEND AND FOE

- Living organisms which cant been seen with eyes alone are called microorganisms or microbes.
- Microorganisms are classified into four major groups.
- These groups are bacteria, fungi, protozoa and some algae.
- Viruses are also microscopic.
- They, however, reproduce only inside the cells of the host organism, which may be a bacterium, plant or animal.
- Common ailments like cold, influenza (flu) and most coughs are caused by viruses.
- Serious diseases like polio and chicken pox are also caused by viruses.
- Diseases like dysentery and malaria are caused by protozoans whereas typhoid and tuberculosis (TB) are bacterial diseases.
- Microorganisms like amoeba can live alone, while fungi and bacteria may live in colonies.
- They are used in the preparation of curd, bread and cake.
- Microorganisms have been used for the production of alcohol since ages.
- Bacteria are also used in the preparation of medicines.
- In agriculture they are used to increase soil fertility by fixing nitrogen.
- Curd contains several microorganisms.
- Of these, the bacterium Lactobacillus promotes the formation of curd.
- It multiplies in milk and converts it into curd. Bacteria are also involved in the making of cheese, pickles and many other food items.

- An important ingredient of rava (sooji) idlis and bhaturas is curd.
- Yeast reproduces rapidly and produces carbon dioxide during respiration.
- Microorganisms are used for the large scale production of alcohol, wine and acetic acid (vinegar).
- Yeast is used for commercial production of alcohol and wine.
- For this purpose yeast is grown on natural sugars present in grains like barley, wheat, rice and crushed fruit juices, etc. process of conversion of sugar into alcohol is known as fermentation.
- Streptomycin, tetracycline and erythromycin are some of the commonly known antibiotics which are made from fungi and bacteria.
- Several diseases, including cholera, tuberculosis, smallpox and hepatitis can be prevented by vaccination.
- Polio drops given to children are actually a vaccine.
- Some bacteria and blue green algae are able to fix nitrogen from the atmosphere to enrich soil with nitrogen and increase its fertility.
- These microbes are commonly called biological nitrogen fixers.
- The microorganisms decompose dead organic waste of plants and animals converting them into simple substances.
- These substances are again used by other plants and animals.
- Thus, microorganisms can be used to degrade the harmful and smelly substances and thereby clean up the environment.
- Some of the microorganisms cause diseases in human beings, plants and animals.
- Such disease-causing microorganisms are called pathogens.

- Microbial diseases that can spread from an infected person to a healthy person through air, water, food or physical contact are called communicable diseases.
- Examples of such diseases include cholera, common cold, chicken pox and tuberculosis.
- There are some insects and animals which act as carriers of disease causing microbes.
- Housefly is one such carrier.
- Anopheles mosquito , which carries the parasite of malaria.
- Female Aedes mosquito acts as carrier of dengue virus.
- Anthrax is a dangerous human and cattle disease caused by a bacterium.
- Foot and mouth disease of cattle is caused by a virus.
- Salts and edible oils are the common chemicals generally used to check the growth of microorganisms.
- Therefore they are called preservatives.
- Sodium benzoate and sodium meta bisulphite are common preservatives.
- These are also used in the jams and squashes to check their spoilage.
- Sugar reduces the moisture content which inhibits the growth of bacteria which spoil food.
- Pasteurized milk can be consumed without boiling as it is free from harmful microbes.
- The milk is heated to about 70 degree C for 15 to 30 seconds and then suddenly chilled and stored.
- By doing so, it prevents the growth of microbes. This process was discovered by Louis Pasteur. It is called pasteurization.
- Rhizobium lives in the root nodules of leguminous plants, such as beans and peas, with which it has a symbiotic relationship.
- Some microorganisms reside in the root nodules of leguminous plants.
- They can fix nitrogen from air into soil and increase the soil fertility.
- Some bacteria and blue green algae present in the soil fix nitrogen from the atmosphere and convert into nitrogenous compounds.
- Certain bacteria convert compounds of nitrogen present in the soil into nitrogen gas which is released to the atmosphere.

CHAPTER-3-SYNTHETIC FIBRES AND PLASTICS

- Natural fibres like cotton, wool, silk, etc., are obtained from plants or animals.
- The synthetic fibres, on the other hand, are made by human beings.
- That is why these are called synthetic or man-made fibres.
- A synthetic fibre is also a chain of small units joined together.
- Each small unit is actually a chemical substance.
- Many such small units combine to form a large single unit called a polymer.
- The word ‘polymer’ comes from two Greek words; poly meaning many and mer meaning part/unit.
- So,a polymer is made of many repeating units.
- Cotton, for example, is a polymer called cellulose. Cellulose is made up of a large number of glucose units.

Types of Synthetic Fibres, Rayon, Nylon

- Fibre was obtained by chemical treatment of wood pulp. This fibre was called rayon or artificial silk.
- Although rayon is obtained from a natural source, wood pulp, yet it is a man-made fibre.

- It is cheaper than silk and can be woven like silk fibres.
- It can also be dyed in a wide variety of colours.
- Rayon is mixed with cotton to make bed sheets or mixed with wool to make carpets.
- Nylon is another man-made fibre.
- In 1931, it was made without using any natural raw material (from plant or animal).
- It was prepared from coal, water and air.
- It was the first fully synthetic fibre.
- Nylon fibre was strong, elastic and light. It was lustrous and easy to wash.
- So, it became very popular for making clothes.
- Nylon is also used for making parachutes and ropes for rock climbing.
- A nylon thread is actually stronger than a steel wire. Polyester is another synthetic fibre.
- Terylene is a popular polyester.
- PET is a very familiar form of polyester. It is used for making bottles, utensils, films, wires and many other useful products.
- We wear sweaters and use shawls or blankets in the winter. Many of these are actually not made from natural wool, though they appear to resemble wool.
- These are prepared from another type of synthetic fibre called acrylic.
- The wool obtained from natural sources is quite expensive, whereas clothes made from acrylic are relatively cheap.
- All the synthetic fibres are prepared by a number of processes using raw materials of petroleum origin, called petrochemicals.
- Plastic is also a polymer like the synthetic fibre.
- All plastics do not have the same type of arrangement of units.
- In some it is linear, whereas in others it is cross-linked.
- Polythene (Poly+ethene) is an example of a plastic. plastic which gets deformed easily on heating and can be bent easily are known as thermoplastics.
- Polythene and PVC are some of the examples of thermoplastics.
- These are used for manufacturing toys, combs and various types of containers.
- Some plastics which when moulded once cannot be softened by heating.
- These are called thermo setting plastics. Two examples are bakelite and melamine.
- Bakelite is a poor conductor of heat and electricity.
- It is used for making electrical switches, handles of various utensils, etc.
- Melamine is a versatile material.
- It resists fire and can tolerate heat better than other plastics.
- It is used for making floor tiles, kitchenware and fabrics which resist fire.
- Plastics are poor conductors of heat and electricity.
- Teflon is a special plastic on which oil and water do not stick. It is used for nonstick coating on cookwares.
- A material which gets decomposed through natural processes, such as action by bacteria, is called biodegradable.
- A material which is not easily decomposed by natural processes is termed as non-biodegradable.
- Plastic takes several years to decompose, it is not environment friendly.

CHAPTER-4-MATERIALS: METALS AND NON-METALS

- The property of metals by which they can be beaten into thin sheets is called malleability. This is a characteristic property of metals.
- The property of metal by which it can be drawn into wires is called ductility.
- Since metals produce ringing sounds, they are said to be sonorous.
- The materials other than metals are not sonorous. materials are hard, lustrous, malleable, ductile, sonorous and good conductors of heat and electricity.
- The materials which generally posses these properties are called metals.
- The examples of metals are iron, copper, aluminium, calcium, magnesium, etc.
- In contrast, materials like coal and sulphur are soft and dull in appearance.
- They break down into powdery mass on tapping with hammer.
- They are not sonorous and are poor conductors of heat and electricity. These materials are called non-metals. The examples of non-metals are sulphur, carbon, oxygen, phosphorus, etc.
- Metals like sodium and potassium are soft and can be cut with a knife.
- Mercury is the only metal which is found in liquid state at room temperature. These are exceptions.
- When a copper vessel is exposed to moist air for long, it acquires a dull green coating.
- The green material is a mixture of copper hydroxide (Cu(OH) 2) and copper carbonate
- The ash obtained on burning magnesium ribbon is dissolved in water and tested for its acidic / basic nature. When sulphur dioxide is dissolved in water sulphurous acid is formed.
- The sulphurous acid turns blue litmus paper red. Generally, oxides of non-metals are acidic in nature. Sodium metal is very reactive.
- It reacts vigorously with oxygen and water. A lot of heat is generated in the reaction.
- It is, therefore, stored in kerosene. non-metals do not react with water though they may be very reactive in air. Such non-metals are stored in water. For example, phosphorus is a very reactive non-metal. It catches fire if exposed to air.
- To prevent the contact of phosphorus with atmospheric oxygen, it is stored in water. nonmetals generally do not react with acids but metals react with acids and produce hydrogen gas that burns with a ‘pop’ sound.
- copper does not react with dilute hydrochloric acid even on heating but it reacts with sulphuric acid.
- the ‘pop’ sound indicates the presence of hydrogen gas.
- Metals react with sodium hydroxide to produce hydrogen gas. Reactions of non-metals with bases are complex.

CHAPTER-5-COAL AND PETROLEUM

- These were formed from the dead remains of living organisms (fossils) known as fossil fuels.
- **Coal**: It is as hard as stone and is black in colour. Under high pressure and high temperature, dead plants got slowly converted to coal.
- As coal contains mainly carbon, the slow process of conversion of dead vegetation into coal is called carbonisation.
- Since it was formed from the remains of vegetation, coal is also called a fossil fuel.
- **Coke**: a tough, porous and black substance.
- It is almost pure form of carbon.
- Coke is used in the manufacture of steel and in the extraction of many metals.

- **Coal tar** is a black, thick liquid with unpleasant smell. It is a mixture of Products obtained from coal tar are used as starting materials for manufacturing various substances used in everyday life and in industry, like synthetic dyes, drugs, explosives, perfumes, plastics, paints, photographic materials, roofing materials, etc.
- Interestingly, naphthalene balls used to repel moths and other insects are also obtained from coal tar.
- These days, bitumen, a petroleum product, is used in place of coal-tar for metalling the roads.
- **Coal gas** was used for street lighting for the first time in London in 1810 and in New York around 1820.
- Now a days, it is used as a source of heat rather than light.
- Petroleum was formed from organisms living in the sea.
- As these organisms died, their bodies settled at the bottom of the sea and got covered with layers of sand and clay.
- Over millions of years, absence of air, high temperature and high pressure transformed the dead organisms into petroleum and natural gas.
- the layer containing petroleum oil and gas is above that of water because the layer containing petroleum oil and gas is above that of water.
- Petroleum is a dark oily liquid.
- In India, the Petroleum Conservation Research Association (PCRA) advises people how to save petrol/diesel while driving.

CHAPTER-6-COMBUSTION AND FLAME

- Charcoal burns in air. We know that coal, too, burns in air producing carbon dioxide, heat and light.
- A chemical process in which a substance reacts with oxygen to give off heat is called combustion.
- The substance that undergoes combustion is said to be combustible also called a fuel.
- magnesium and charcoal are combustible substances.
- The lowest temperature at which a substance catches fire is called its ignition temperature.
- The substances which have very low ignition temperature and can easily catch fire with a flame are called inflammable substances.
- Examples of inflammable substances are petrol, alcohol, Liquified Petroleum Gas (LPG), etc.
- For fires involving electrical equipment and inflammable materials like petrol, carbon dioxide (CO 2) is the best extinguisher. CO 2 , being heavier than oxygen, covers the fire like a blanket.
- Since the contact between the fuel and oxygen is cut off, the fire is controlled.
- The added advantage of CO 2 is that in most cases it does not harm the electrical equipment.
- the gas burns rapidly and produces heat and light.
- Such combustion is known as rapid combustion.
- There are substances like phosphorus which burn in air at room temperature.
- The type of combustion in which a material suddenly bursts into flames, without the application of any apparent cause is called spontaneous combustion.
- Spontaneous combustion of coal dust has resulted in many disastrous fires in coal mines.
- Spontaneous forest fires are sometimes due to the heat of the sun or due to lightning strike.
- The substances which vapourise during burning, give flames.
- For example, kerosene oil and molten wax rise through the wick and are vapourised during burning and form flames.
- Charcoal, on the other hand, does not vapourise and so does not produce a flame.

    - The amount of heat energy produced on complete combustion of 1 kg of a fuel is called its calorific value.
- Tissues, in turn, form organs.
- **Amoeba** has no definite shape, unlike other organisms.
- It keeps on changing its shape.
- Observe the projections of varying lengths protruding out of its body are called pseudopodia.
- **A white blood cell** (WBC) in human blood is another example of a single cell which can change its shape.
- But while WBC is a cell, amoeba is a full fledged organism capable of independent existence.
- Generally, cells are round, spherical or elongated.
- Some cells are long and pointed at both ends.
- They exhibit spindle shape.
- Cells sometimes are quite long.
- Some are branched like the nerve cell or a neuron.
- The nerve cell receives and transfers messages, thereby helping to control and coordinate the working of different parts of the body.
- Components of the cell are enclosed in a membrane.
- The calorific valueof a fuel is expressed in a unit called kilojoule per kg(kJ/kg).
    - Carbon fuels like wood, coal, petroleum release unburnt carbon particles.
    - These fine particles are dangerous pollutants causing respiratory diseases, such as asthma.
    - Combustion of most fuels releases carbon dioxide in the environment.
    - Increased concentration of carbon dioxide in the air is believed to cause global warming.
    - Burning of coal and diesel releases sulphur dioxide gas.
    - It is an extremely suffocating and corrosive gas.
    - Moreover, petrol engines give off gaseous oxides of nitrogen.
    - Oxides of sulphur and nitrogen dissolve in rain water and form acids.
    - Such rain is called acid rain.

CHAPTER-8-CELL— STRUCTURE AND FUNCTIONS

- the basic structural unit of an organ, which is the cell.
- cells are assembled to make the body of every organism. Human body has trillions of cells which vary in shapes and sizes.
- Different groups of cells perform a variety of functions. A billion is a thousand million.
- A trillion is a thousand billion. Organisms made of more than one cell are called multicellular(multi: many; cellular : cell) organisms.
- The number of cells being less in smaller organisms does not, in any way, affect the functioning of the organisms. You will be surprised to know that an organism with billions of cells begins life as a single cell which is the fertilized egg.
- The fertilised egg cell multiplies and the number of cells increase as development proceeds.
- The single-celled organisms are called unicellular organisms.
- A single-celled organism performs all the necessary functions that multicellular organisms perform.
- A single-celled organism, like amoeba, captures and digests food, respires, excretes, grows and reproduces.
- Similar functions in multicellular organisms are carried out by groups of specialised cells forming different tissues.

- This membrane provides shape to the cells of plants and animals.
- Cell wall is an additional covering over the cell membrane in plant cells. It gives shape and rigidity to these cells.
- **Bacterial cell** also has a cell wall. The smallest cell is 0.1 to 0.5 micrometre in bacteria.
- The largest cell measuring 170 mm ×130 mm, is the egg of an ostrich.
- Each organ is further made up of smaller parts called tissues.
- A tissue is a group of similar cells performing a specific function.
- The basic components of a cell are cell membrane, cytoplasm and nucleus.
- The cytoplasm and nucleus are enclosed within the cell membrane, also called the plasma membrane.
- The membrane separates cells from one another and also the cell from the surrounding medium.
- The plasma membrane is porous and allows the movement of substances or materials both inward and outward. The jelly-like substance between the nucleus and the cell membrane is called cytoplasm.
- Cytoplasm is the jelly-like substance present between the cell membrane and the nucleus.
- Various other components, or organelles, of cells are present in the cytoplasm.
- These are mitochondria, golgi bodies, ribosomes, etc.
- Nucleus is separated from the cytoplasm by a membrane called the nuclear membrane.
- This membrane is also porous and allows the movement of materials between the cytoplasm and the inside of the nucleus.
- With a microscope of higher magnification, we can see a smaller spherical body in the nucleus. It is called the nucleolus.
- In addition, nucleus contains thread-like structures called chromosomes.
- These carry genes and help in inheritance or transfer of characters from the parents to the offspring.
- The chromosomes can be seen only when the cell divides.
- Gene is a unit of inheritance in living organisms.
- It controls the transfer of a hereditary characteristic from parents to offspring.
- The entire content of a living cell is known as protoplasm.
- It includes the cytoplasm and the nucleus.
- Protoplasm is called the living substance of the cell.
- The cells having nuclear material without nuclear membrane are termed prokaryotic cells.
- The organisms with these kinds of cells are called prokaryotes (pro : primitive; karyon: nucleus).
- Examples are bacteria and blue green algae.
- The cells, like onion cells and cheek cells having well organised nucleus with a nuclear membrane are designated as eukaryotic cells.
- All organisms other than bacteria and blue green algae are called eukaryotes. (eu: true; karyon: nucleus). blank-looking structures in the cytoplasm? It is called vacuole. It could be single and big as in an onion cell.
- Cheek cells have smaller vacuoles. Large vacuoles are common in plant cells.
- Vacuoles in animal cells are much smaller.
- several small coloured bodies in the cytoplasm of the cells of Tradescantia leaf.
- They are scattered in the cytoplasm of the leaf cells. These are called plastids.
- They are of different colours.
- Some of them contain green pigment called chlorophyll.
- Green coloured plastids are called chloroplasts. They provide green colour to the leaves. You may recall

that chlorophyll in the chloroplasts of leaves, is essential for photosynthesis.

CHAPTER-9-REPRODUCTION IN ANIMALS

- Just as in plants, there are two modes by which animals reproduce. These are: (i) Sexual reproduction, and (ii) Asexual reproduction.

Sexual Reproduction-

- Like plants, the reproductive parts in animals also produce gametes that fuse to form a zygote.
- The fusion of ovum and sperm is called fertilization.
- The fertilized egg is called a zygote.
- **Fertilization** that takes place inside the female body is called internal fertilization. This is observed in human beings and other animals such as hens, cows and dogs.
- Fertilization that takes place outside the female body is called external fertilization. This is observed in frogs, fish, starfish, etc.It is the zygote which develops into a new individual. This type of reproduction beginning from the fusion of male and female gametes is called sexual reproduction.
- The animals which give birth to young ones are called viviparous animals.
- Those animals which lay eggs are called oviparous animals.
- The transformation of the larva into an adult through drastic changes is called metamorphosis.
- Animals such as human beings, cows and dogs which give birth to young ones are called viviparous animals.
- Animals such as hen, frog, lizard and butterfly which lay eggs are called oviparous animals.
- The transformation of the larva into adult through drastic changes is called metamorphosis.
- The type of reproduction in which only a single parent is involved is called asexual reproduction. In hydra, new individuals develop from buds. This method of asexual reproduction is called budding.
    - Amoeba reproduces by dividing itself into two. This type of asexual reproduction is called binary fission.
- Asexual Reproduction- In each hydra, there may be one or more bulges. These bulges are the developing new individuals and they are called buds. Recall the presence of buds in yeast.
- In hydra too the new individuals develop as outgrowths from a single parent. This type of reproduction in which only a single parent is involved is called asexual reproduction.
- Since new individuals develop from the buds in hydra, this type of asexual reproduction is called budding.
- Another method of asexual reproduction is observed in the microscopic organism, amoeba. Let us see how this happens.
- two amoebae are produced from one parent amoeba.
- Asexual reproduction in which an animal reproduces by dividing into two individuals is called binary fission.

CHAPTER-10-REACHING THE AGE OF ADOLESCENCE

- The period of life, when the body undergoes changes, leading to reproductive maturity, is called adolescence. The human body undergoes several changes during adolescence.
- These changes mark the onset of puberty. At puberty, the voice boxor the larynx begins to grow.
- During puberty the secretion of sweat glands and sebaceous glands (oil glands) increases.
- A few glands such as sweat glands, oil glands and salivary glands release their secretions through ducts. Endocrine glands release hormones directly into the bloodstream.
- So, they are also termed ductless glands.
- The changes which occur at adolescence are controlled by hormones.

- Hormones are chemical substances.
- These are secretions from endocrine glands, or endocrine system.
- The male hormone ortestosterone begins to be released by the testes at the onset of puberty.
- This causes changes in boys about which you have just learnt, for example, the growth of facial hair.
- Once puberty is reached in girls, ovaries begin to produce the female hormone or estrogen which makes the breasts develop.
- Milk secreting glands or mammary glands develop inside the breasts.
- The production of these hormones is under the control of another hormone secreted from an endocrine gland called pituitary gland.
- Endocrine glands release hormones into the bloodstream to reach a particular body part called target site.
- The target site responds to the hormone.
- There are many endocrine glands or ductless glands in the body.
- Thyroid and adrenals secrete their hormones when they receive orders from the pituitary through its hormones. Pituitary also secretes growth hormone which is necessary for the normal growth of a person.
- Adrenal glands secrete hormones which maintain the correct salt balance in the blood.
- Adrenals also produce the hormone adrenalin.
- It helps the body to adjust to stress when one is very angry, embarrassed or worried.
- Metamorphosis in insects is controlled by insect hormones. In a frog, it is controlled by thyroxine, the hormone produced by thyroid.
- Thyroxine production requires the presence of iodine in water.
- If the water in which the tadpoles are growing does not contain sufficient iodine, the tadpoles cannot become adults.

CHAPTER-11-FORCE AND PRESSURE

- a push or a pull on an object is called a force.
- The strength of a force is usually expressed by its magnitude.
- The state of motion of an object is described by its speed and the direction of motion.
- The state of rest is considered to be the state of zero speed.
- An object may be at rest or in motion; both are its states of motion.
- The force resulting due to the action of muscles is known as the muscular force.
- the muscular force that enables us to perform all activities involving movement or bending of our body.
- Since muscular force can be applied only when it is in contact with an object, it is also called a contact force.
- The force responsible for changing the state of motion of objects in all these examples is the force of friction.

- The force exerted by a magnet is an example of a non-contact force.
- The force exerted by a charged body on another charged or uncharged body is known as electrostatic force.
- This force comes into play even when the bodies are not in contact.
- The electrostatic force, therefore, is another example of a non-contact force.
- Gravity is not a property of the earth alone.
- In fact, every object in the universe, whether small or large, exerts a force on every other object. This force is known as the gravitational force.
- The force acting on a unit area of a surface is called pressure.

CHAPTER-12-FRICTION

- Friction opposes the relative motion between two surfaces in contact. It acts on both the surfaces.
- Friction depends on the nature of surfaces in contact.
- For a given pair of surfaces friction depends upon the state of smoothness of those surfaces.
- Friction depends on how hard the two surfaces press together.
- Static friction comes into play when we try to move an object at rest.
- Sliding friction comes with play when an object is sliding over another. Sliding friction is smaller than static friction.
- Friction is important for many of our activities. Friction can be increased by making a surface rough.
- The sole of the shoes and the tyres of the vehicle are treaded to increase friction.
- The friction is sometimes undesirable. Friction can be reduced by using lubricants.
- When one body rolls over another body, rolling friction comes into play.
- Rolling friction is smaller than the sliding friction. In many machines, friction is reduced by using ball bearings.
- In many machines, friction is reduced by using ball bearings.
- Fluid friction can be minimised by giving suitable shapes to bodies moving in fluids.

CHAPTER-13-SOUND

- Sound is produced by vibrating objects.
- In human beings, the vibration of the vocal cords produces sound.
- Sound travels through a medium (gas, liquid or solid). It cannot travel in vacuum.
- The eardrum senses the vibrations of sound, It sends the signals to the brain. This process is called hearing.
- The number of oscillations or vibrations per second is called the frequency of oscillation.
- The frequency is expressed in hertz (Hz). Larger the amplitude of vibration, louder is the sound.
- Higher the frequency of vibration, the higher is the pitch, and shriller is the sound.
- Unpleasant sounds are called noise.
- Excessive or unwanted sounds lead to noise pollution. Noise pollution may pose health problems for human beings.
- Attempts should be made to minimise noise pollution.
- Plantation on the roadside and elsewhere can reduce noise pollution.

CHAPTER-14-CHEMICAL EFFECTS OF ELECTRIC CURRENT

- The process of depositing a layer of any desired metal on another material by means of electricity is

called electroplating.

- It is one of the most common applications of chemical effects of electric current.
- The passage of an electric current through a conducting liquid causes chemical reactions.
- The resulting effects are called chemical effects of currents.
- Electroplating is a very useful process. It is widely used in industry for coating metal objects with a thin layer of a different metal.
- Chromium has a shiny appearance. It does not corrode.
- It resists scratches.
- However, chromium is expensive and it may not be economical to make the whole object out of chromium.

CHAPTER-15-SOME NATURAL PHENOMENA

- The process of electric discharge between clouds and the earth or between different clouds causes lightning.
- Lightning strike could destroy life and property.
- Lightning conductors can protect buildings from the effects of lightning.
- An earthquake is a sudden shaking or trembling of the earth lasting for a very short time. It is caused by a disturbance deep inside the earth's crust.
- The outermost layer of the earth is not in one piece.
- It is fragmented. Each fragment is called a plate (Fig. 15.10).
- These plates are in continual motion. the tremors are caused by the disturbance deep down
- inside the uppermost layer of the earth called the crust.
- Tremors on the earth can also be caused when a volcano erupts, or a meteor hits the earth, or an underground nuclear explosion is carried out.
- Since earthquakes are caused by the movement of plates, the boundaries of the plates are the weak zones where earthquakes are more likely to occur.
- The weak zones are also known as seismicor fault zones.
- In India, the areas most threatened are Kashmir, Western and Central Himalayas, the whole of North-East, Rann of Kutch, Rajasthan and the Indo – Gangetic Plane.
- Some areas of South India also fall in the danger zone.
- The power of an earthquake is expressed in terms of a magnitude on a scale called Richter scale.
- Really destructive earthquakes have magnitudes higher than 7 on the Richter scale.
- The tremors produce waves on the surface of the earth. These are called seismic waves.
- The waves are recorded by an instrument called the seismograph.