Keeping in Mind the **Learning Capability** of Children

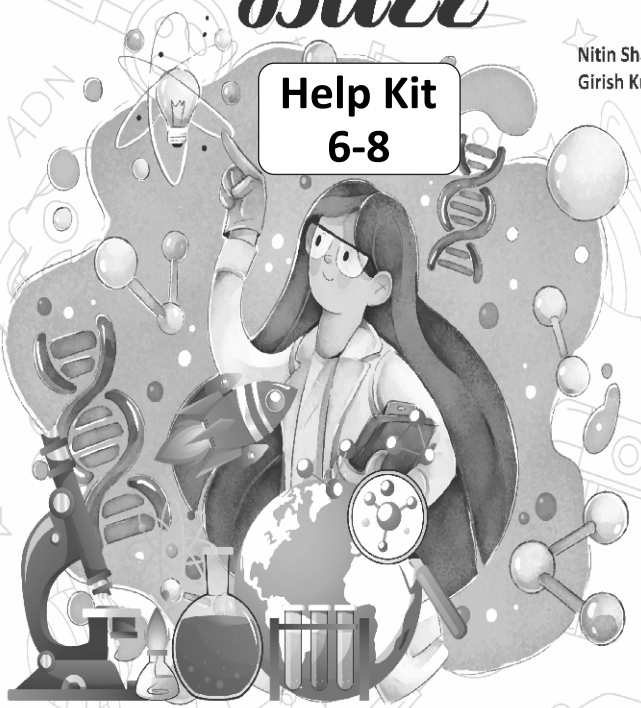
GOLD MIND

NEP 2020

Science Buzz

Help Kit 6-8

Nitin Sharma
Girish Kumar



Teacher's Manual
Science Bullet (Class-6)

CHAPTER 1 : SOURCES OF FOOD

A. 1. (b) 2. (a) 3. (c) 4. (b) 5. (a) **B.** 1. root 2. root 3. stem 4. stem 5. seeds 6. seeds 7. leaf 8. fruit 9. fruit 10. stem 11. seeds 12. seeds **C.** 1. (a) Hens, goat (b) Cheese and curd. **D.** 1. True 2. True 3. False 4. False 5. False 6. True **E.** 1. milk, rice and sugar 2. four 3. omnivore, plants, animals 4. herbivore, plants. 5. flesh of animals 6. leaf 7. Radish, Carrot 8. nectar, flowers 9. hens 10. sugarcane **F.** 1. Herbivores 2. Omnivores 3. Carnivores 4. Radish 5. Onion 6. Cabbage 7. Green Gram **G.** 1. The material or substance which we eat is known as food. 2. The animals which eat only plants are known as herbivorous animals. 3. Cockroach and squirrel. 4. The animals which provide meat and eggs both are known as poultry. 5. Honey is a sweet liquid produced by honeybees from the nectar. **H.** 1. A variety of food products are obtained from animals. These include milk and milk products, eggs, meat and honey. 2. (a) Vegetable, rice, salt, oil, spices and water. (b) Atta (flour) and water (c) Vegetable, salt, oil, spices and water. (d) Egg, salt, oil, spices. **I.** 1. We need food for the following purposes : (a) to provide energy for various activities of the body. (ii) for growth and development of the body. (iii) to protect the body from diseases and keep it healthy. (iv) for repair of the injured body parts. (v) for reproduction 2. All living things need different kinds of foods according to their eating habits. 3. Animals are grouped into three groups on the basis of food eaten by them– (a) **Herbivorous Animals :** They eat only plants or plant products. For eg : Cow, buffalo, horse etc. (b) **Carnivorous Animals :** They eat flesh of other animals, For eg : Lion, Tiger and dog etc. (c) **Omnivorous Animals :** They eat both plants and animals. For eg : Human being, crow, cockroach, etc. 4. The food items obtained from plants are : (a) Cereals (wheat, rice, maize). (b) Pulses (pea, bean, soyabean, gram) (c) Vegetables (carrot, radish, potato, onion) (d) Fruits (banana, apple, mango, grape) (e) Spices (turmeric, chilli, saunf, cardamom) 5. **Herbivores :** They eat only plants or plant products. For eg : cow, buffalo **Carnivores :** They eat flesh of other animals. For eg : Lion, sugar **Omnivores :** They eat both plants & animals. For eg : Cockroach, crow. **J.** 1. Chicken, oil/ghee, spices, vegetables and water. 2. Indian lotus, water chestnut, water spinach. **K.** Do it yourself **L.** Do it yourself

CHAPTER 2 : COMPONENTS OF FOOD

A. 1. (a) 2. (c) 3. (a) 4. (c) 5. (d) **B.** 1. Iodine solution 2. Carbohydrates, fats 3. Starch, Glucose 4. Fats, Carbohydrates 5. bulk **C.** 1. Pulses 2. Vitamin 3. Proteins 4. Peanuts **D.** 1. Children need to have more proteins in their diet because proteins are required for growth and repair of worn out tissues. 2. A labourer needs to have more carbohydrates daily because it gives energy immediately. 3. Carrots are good for our eyesight as it contains vitamin A. **E.** Do it yourself. **F.** 1. Glucose is the simplest carbohydrate found in refined sugar. 2. Fats provide us energy. 3. Proteins are the body-building nutrient. 4. A diet which contains the right amounts of all kinds of nutrients is known as balanced diet. 5. Malnutrition is the condition that occurs when a person's body does not get enough nutrients. **G.** 1. The food we take should contain all the components to serve different purposes in our body. These components are called nutrients. 2. Kwashiorkor is caused by the deficiency of sufficient amount of proteins and carbohydrates in the diet. The legs become very lean and thin. The hair becomes dull and reddish in colour. The stomach region bulges out. The mental and physical growth is slow. 3. Take some glucose powder in a test tube. Add water and make a solution. Add Benedict's solution and heat the test tube. A brick red colour's shows the presence of sugar. 4. It is Important to drink water because– (a) It is a good solvent and it helps in transportation of various substances and carrying the digested food to all parts of the body. (b) Water is essential for the proper functioning of the kidneys and bowels. (c) It keeps our body cool. 5. The diseases that are caused by the lack of an element in the diet, usually a particular vitamin or mineral is called deficiency disease. **H.** 1. The amount of a nutrient needed by a person differs with age, sex and the kind of physical work the person does. A child in his growing years needs more of proteins and carbohydrates to grow well and to build his or her body and get energy for various life processes. A sportsman, who does a lot of physical work, needs more carbohydrates to get energy. 2. Obesity is caused by eating too much of fast foods like pizzas and burgers regularly because these food items contain a lot of carbohydrates and fats. 3. Roughage is an essential part of any healthy diet. The main function of roughage. is to add bulk to the daily diet. We cannot digest roughage, so it adds bulk to the faeces. This aids in the digestion process and healthy function of the bowel system. 4. (a) Protein and Mineral (b) Protein (c) Protein and Mineral (d) Mineral's and Proteins **I.** 1. The people living in the coastal regions do not suffer from goitre usually because they eat sea food and it contain sufficient amount of salt which contain iodine. **J.** Do it yourself

CHAPTER 3 : SEPARATION OF SUBSTANCES

A. 1. (b) 2. (c) 3. (a) 4. (b) **B.** 1. components 2. handpicking 3. sediment

4. sedimentation 5. decantation **C.** 1. False 2. True 3. False 4. False 5. True **D.** 1. A substance that settles down at the bottom of a liquid is called sediment. 2. The process of settling down of a solid at the bottom of a liquid is called sedimentation. 3. A mixture made of two liquids, that do not mix with each other, can be separated by using the method of decantation. 4. The method of separating insoluble solid components from a liquid is called filtration. 5. A method of separating husk from grains using wind is called winnowing. **E.** 1. A mixture of sugar and water cannot be separated by filtration because it is a method of separating insoluble solid components from a liquid 2. Yes, because decantation is the method of separating two liquids that do not mix with each other. 3. After harvesting the crop, the grain seeds have to be separated from the stalks, this can be done by the process of threshing. 4. Water is called a universal solvent because it is capable of dissolving a variety of different substances. **F.** 1. Soil, rocks and air 2. The substances which make up a mixture are called its components. 3. Threshing 4. Winnowing is the method of separating husk from grains with the help of wind. **G.** 1. Filtration is a method of separating insoluble solid components from a liquid by passing them through a filter. 2. Evaporation is the process of converting water into water vapour. 3. A solution in which no more solute can be dissolved at a given temperature is called a saturated solution. 4. Condensation is the process of changing of water vapour back into liquid water. **H.** 1. The method of separating a mixture into its components by hand is called handpicking. The method of handpicking can be used to separate only those mixtures in which the components : (a) are mixed in small quantities. (b) can be easily picked by hand. (c) have different size, shape or colour. 2. Stones from pulses, husk from wheat. 3. The process used to separate grain seeds from stalk is called threshing. In order to separate grain seeds from stalks, the stalks are threshed on a wooden board. Machines and bullocks are also used to separate the grains. 4. To separate common salt from sea water, the sea water is trapped in shallow pits and is left in the sun for long. The sun's heat evaporates all the water leaving the salts behind. This mixture of salts is then purified to obtain common salts. 5. Bran and impurities present in the flour are being separated using a sieve. 6. We need to separate the components of a mixture for the following reasons : (a) To obtain two different but useful components of a mixture. (b) To remove harmful components or impurities of a mixture. (c) To remove non- useful components of a mixture. **I.** Do it yourself **J.** Do it yourself

CHAPTER 4 : CLOTH MATERIAL

A. 1. (d) 2. (a) 3. (c) 4. (d) 5. (b) **B.** 1. ginning 2. warping 3. lint 4. black 5. tissues 6. cocoon 7. sericulture 8. Lint 9. Cotton **C.** 1. The fibres obtained

from natural sources are called natural fibres while man-made fibres are called synthetic fibres. 2. Ginning is process that involves separating the cotton fibres from the cotton while spinning is the process of making fibrous material into yarn or thread. 3. The yarn placed lengthwise in the loom is called warp while the back and forth movement of the thread in the shuttle with the help of the machine is called weft. **D.** 1. The raw cotton of the bales or lint are beaten into shreds to form a fluffy mass. This process of beating lint is called carding. 2. The cotton fibres from which cotton seeds are removed. This is called lint. 3. The process used for obtaining fibres from the stem of the jute plant is called retting. 4. A thread made by spinning fibres is called yarn. 5. A long loose strand of cotton made from the combed cotton. **E.** 1. We wear clothes because they protect us from heat, cold, rain and insects. 2. Man – made fibres – Rayon, Nylon. Natural fibres – cotton, silk. 3. Pre – historic man use to cover his body with leaves, bark of trees and animal furs. 4. Silk is obtained from the cocoon of the silk worm. 5. The cotton plant grows best in the black soil of the Deccan plateau and the Malwa plateau of Gujarat. A cool, dry climate with plenty of sunshine is suitable for the growth of the cotton plant. **F.** 1. (a) Cleaned and carded raw cotton is used as bandage for covering wounds. (b) It is filled in pillows, quilts and mattresses. (c) High quality printing paper is manufactured from inferior grade cotton. (d) It is used as mops to clean the floor. 2. The trade route between Europe and Asia was called silk route. 3. The conditions necessary for the growth of jute are– (a) Soil (b) Climate (c) Sowing & Harvesting (d) Retting 4. Cotton clothes are more suitable in hot climate because they are soft and absorb a lot of sweat. **G.** 1. The dried stalks of jute are tied into bundles and soaked in water for a few days. This process is called retting. Retting separates the fibres by softening the tissues between them. Jute fibres are extracted from the retted jute by jerks and pulls of the hand. These fibres are then dried and sent to mills in bundles. 2. Ropes and bags are made from jute as it is durable and strong. 3. The process of making cotton fabric from raw cotton are– (a) Carding – The raw cotton of the bales or lint are beaten into shreds to form a fluffy mass. The carded lint is cleaned to remove straw, dried leaves, etc. (b) Combing – The carded and cleaned cotton is fed into a machine which combs and straightens the fibres. (c) Formation of silver – Another machine converts the combed and straightened fibres into a rope–like strand of cotton fibres called silver. (d) Silver is spun into yarn – silver is liquid and spun in another machine and thus converted into a strong yarn (e) The yarn is wound on big reels called bobbins. Yarn is used for making cloth. 4. Light the candle and hold the cotton, nylon and silk strips lengthwise over the candle flame with the help of tongs. As soon as they catch fire, hold it over the

saucer of water. Record your observation regarding the smell and residue. **H.** 1. They are called so because they are obtained from natural sources. 2. We prefer to wear cotton clothes in summer because they are soft and absorb a lot of sweat. **I.** Do it yourself

CHAPTER 5 : GROUPING MATERIALS OF DIFFERENT KINDS

A. 1. (c) 2. (a) 3. (c) **B.** 1. False 2. True 3. False 4. False 5. True **C.** 1. Transparent 2. Metallic chain, aluminium foil 3. Plastic 4. more 5. Oxygen, Hydrogen **D.** 1. (iii) 2. (iv) 3. (i) 4. (v) 5. (ii) **E.** 1. We need to group or classify things for our convenience. 2. Soluble materials– A substance which dissolves completely in water. Insoluble materials– A substance which does not dissolve in water at all. 3. Salt and sugar are soluble in water while sand and chalk powder are insoluble in water. 4. Chalk powder and sand settle down in water because their densities are more than water. 5. Salt and lime juice will dissolve in water. **F.** 1. Kerosene oil and cooking oil float in water because their densities are less than water. 2. The condition of being transparent is called transparency. 3. (a) shirts, saree (b) Shoes, bags (c) Books, Note books (d) Bucket, mug (e) Keys, lock (f) Furniture 4. (a) Transparent (b) translucent (c) opaque (d) Transparent (e) Opaque (f) opaque **G.** 1. The materials that cannot be pressed with hands or scratched or cut easily are called hard materials. The materials that can be compressed with hands or scratched or cut easily are called soft materials. 2. When two materials, such as a solid and a liquid or two different liquids are put together, the less dense material floats above the more dense material. The more dense substance sinks and settles down. 3. **Transparent Materials :** Materials through which you can see clearly. for eg : glass, water. **Translucent materials :** Materials through which you can see only partially. For eg : butter paper, thin muslin cloth. **Opaque materials :** Materials through which you cannot see at all. For eg : Metal sheet, paper. 4. (a) Dissolve in water (b) dissolve in water (c) does not dissolve in water (d) does not dissolve in water (e) Float on water (f) dissolve in water (g) Dissolve in water (h) Float on water. **H.** (a) Both are living beings. (ii) Plants cannot move from one place to another whereas animals can move from one place to another 2. Piece of wood float on water because wood is less dense than the water. **I.** Do it yourself

CHAPTER 6 : THINGS AROUND US

A. 1. (b) 2. (a) 3. (a) 4. (c) 5. (c) **B.** 1. Cell 2. heterotrophs 3. produce 4. Stimulus **C.** 1. ✗ 2. ✓ 3. ✗ 4. ✓ 5. ✓ **D.** 1. **Plants :** (a) Plants cannot move from one place to another. (b) Plants can make their own food **Animals :** (i) Animals can move from one place to another (ii) Animals cannot make their own food 2. **Living things :** (i) They need food to grow and develop (ii) They use oxygen to produce energy (iii) They respond to stimuli

Non-living things : (i) They do not need food (ii) They do not respire (iii) They do not respond to stimuli 3. **Growth of plants :** (i) Plants often can grow continuously. (ii) Its growth happens mainly by cell enlargement. **Growth of Animals :** (i) Animals tend to grow to a maximum size. (ii) Animal's growth happens by increasing the number of cells. **E.** 1. Plants 2. Amoeba 3. Carbon Dioxide 4. Sponges 5. Multicellular organisms 6. Excretion 7. Phototropism 8. Reproduction **F.** 1. The organisms which can prepare their own food are called autotrophs. 2. Production of energy by oxidation of food in living cells in called respiration. 3. The process of taking in oxygen from the air and giving out carbon dioxide is called breathing. 4. Gum or a thick fluid is called latex. **G.** 1. **Living things :** (i) They grow (ii) They reproduce **Non-living things :** (i) They do not grow (ii) They do not reproduce 2. All living things take in oxygen from air. oxygen is used by the cells to produce energy by the oxidation of food in the body. This energy is utilised by living things for various activities like heart beat, thinking, reading and playing. 3. The period during which an organism completes its life cycles is called life span. 4. Grass, fish, earthworm, mosquito. **H.** 1. All living things need food to grow and obtain energy for various activities. 2. Reproduction is the capacity of an organism to produce young ones ar new individuals of its own kind. 3. Removal of waste products from the body is called excretion. Waste products of various reactions in the body, if accumulated, may prove harmful. Thus, they are excreted in the form of urine, sweat and carbon dioxide 4. Plants can exhibit only slight movements, for example, the touch-me-not plant curls up its leaves when it is touched. Flowers like daisy and lily close at night and open in the morning. The sunflower also faces the sun. 5. The stem grows towards sunlight and away from the gravitational pull. The bending of stem in the direction of sunlight is called phototropism. Roots tend to grow towards gravitational pull, while the stem grows in the opposite direction of the gravitational pull. The response of roots towards gravity is called geotropism. **I.** 1. Non-living 2. We cannot call a car a living thing because it does not need food to grow and develop. **J.** Do it yourself. **K.** Do it yourself.

CHAPTER 7 : THE HABITAT

A. 1. (a) 2. (d) 3. (d) 4. (c) 5. (a) **B.** 1. aquatic animals 2. deserts 3. fat 4. narrow 5. action of wind, water & sun 6. habitat 7. biotic, abiotic 8. oxygen **C.** 1. ✗ 2. ✓ 3. ✓ 4. ✗ 5. ✓ 6. ✗ 7. ✓ 8. ✓ 9. ✓ 10. ✓ **D.** 1. Living things such as plants, animals and microbes present in a particular habitat constitute biotic factors whereas a biotic factors include a number of factors like sunlight, temperature, water, air, and soil. 2. The special characteristics which help them to survive in a particular habitat is called adaptation whereas In winter, when food is not available, they simply go off to sleep. This is known as hibernation. 3. The organisms which depend on food prepared by

plants are called heterotrophs whereas decomposers decompose the dead remains of plants and animals into nutrients. 4. Hydrophytes are plants which grow in watery places or places which remain very wet throughout the year whereas xerophytes are the plants which survive in desert habitats or dry places where there is scarcity of water. 5. The animals which obtain their food directly from plants are called primary consumers whereas the animals which feed on the flesh of other animals are called secondary consumers. 6. Animals living in water are called aquatic animals whereas animals which can survive in the extreme hot and dry climate of desert are known as xeric animals. **E.** 1. hibernation 2. vegetative production 3. Bacteria 4. Clayey soil 5. Hydrilla 6. Cactus 7. Sweet pea 8. In very humid climate 9. Cold regions. **F.** 1. Xerophytes are the plants which survive in desert habitats or dry places where there is scarcity of water, for example, cactus, asparagus etc. 2. Shark, whale, sea turtles, water bugs and lily. 3. The animals which are adapted for surviving both on land and in water are called amphibians. 4. Camel is known as the ship of the desert. 5. Animals living in cold regions that have a thick layer of fat are called blubber. **G.** 1. Soil is formed by the breaking down of rocks over hundreds of years by the action of wind, water and sun. 2. **Herbivores :** Those who eat only plants or plant products are called herbivores. **Carnivores :** Those who eat flesh of animals are called carnivores. **Omnivores :** Those who eat both plants and animals are called omnivores. 3. The percentage of oxygen in air is 21% 4. The natural home of an animal or plant is called habitat. 5. Animals like squirrel, bear and dormouse store food as fat in their body during summer. In winter, when food is not available, they simply go off to sleep. This is known as hibernation. **H.** 1. (a) (i) The fishes have gills for breathing in water. (ii) They have fins and tails for swimming. (iii) Scales and mucus over the body keep their skin waterproof. (b) (i) Camel can drink a large amount of water at one time. (ii) It excretes little urine when water is not available. (iii) It excretes nearly dry dung. (c) (i) They have long & extensive root systems which penetrate deep into the soil to absorb water. (ii) The stem is fleshy and green to store water and make food by the process of photosynthesis as in cactus. (iii) Leaves get modified into spines to reduce loss of water through transpiration (d) (i) Roots and root hairs are poorly developed. (ii) Stems are long and narrow to withstand water currents without getting damaged. (iii) leaves are large and flat so that they can float on the surface of water. 2. Loamy soil is considered to be the best soil for growing plants as it can hold proper amount of air and water needed for the growth of plants. 3. Ozone layer checks the entry of harmful ultraviolet rays of the sun into the atmosphere. 4. Penguins have a thick layer of fat called blubber under their skin, which acts as an insulator and does not allow the body heat to escape. 5. Biotic and a biotic components are present in every ecosystem and community. They work together to provide a working environment that

is suitable for all living things. **I.** 1. If there are no micro-organisms, the dead remains of plants and animals will not decompose. 2. Some insects are green and leaf-like so that they cannot be seen and eaten by other predators. **J.** Do it yourself. **K.** Do it yourself.

CHAPTER 8 : PLANTS – PARTS AND FUNCTIONS

A. 1. (b) 2. (b) 3. (d) 4. (d) 5. (c) **B.** 1. Pollination is the transfer of pollen grains from the anther to the stigma of a flower. 2. Stomata help in getting rid of extra water in the form of water vapour. This is called transpiration. 3. The fusion of male and female reproductive cells is called fertilization. 4. The arrangement of veins in a leaf is called venation. 5. The position of the stem between the nodes is called internode. **C.** 1. (b) 2. (d) 3. (f) 4. (a) 5. (c) 6. (e) **D.** 1. Chlorophyll 2. Stomata help the plant to exchange gases. 3. The places on the stem of a plant where leaves grow are called nodes. 4. The bud responsible for the growth of a plant is called apical bud. **E.** 1. Leaves grow on stem, making an angle with the stem. This is called axil. 2. Herbs are usually short and have green and tender stems, which may or may not have branches. Shrubs have hard but not very thick stem, which branches out near the base. Trees are tall and have hard and thick brown stem, which branches much above the ground. 3. Sepals, Petals, Stamens and Carpel. 4. Do it yourself. 5. (i) A flowers is the reproductive part in a plant. (ii) It has brightly coloured petals which attract insects that help in pollination. (iii) After being pollinated, the flower produces seeds. **F.** 1. When a seed germinates, a root emerges from the seed. This is called the main root. From this root branches emerge. The main root grows deep into the soil. In fibrous root system, the cluster of roots is thin and fibrous. There is no main root. Fibrous root spread out in the soil giving support to the plant. 2. (i) The leaf takes in carbon dioxide and water and prepares food in the presence of sunlight by the process of photosynthesis. The green pigment, chlorophyll present in the leaves, help in this process. (ii) Stomata also help in getting rid of extra water in the form of water vapour. 3. The outer covering of a seed is called seed coat. Inside the seed coat, we have cotyledons that contains embryo and embryo root. Embryo shoot is the part from which the seed germinates. 4. Pollination is the transfer of pollen grains from the anther to the stigma of a flower. This can be done by wind, water, birds and insects. **G.** 1. Food come from plants. 2. Flowers produce nectar as it is used for pollinating and the nectar attracts insects for this process. **H.** Do it yourself. **I.** Do it yourself.

CHAPTER 9 : ANIMALS – FORM AND FUNCTION

A. 1. (b) 2. (a) 3. (b) 4. (a) **B.** 1. Backbone 2. Foot 3. Exoskeleton 4. Boat 5. Heart 6. Joints 7. Ligaments 8. Immovable joints 9. Hinge joint 10. Muscles

C. 1. Bones, cartilages 2. Earthworms 3. Snail 4. Three, two 5. Muscles 6. Gliding **D.** 1. Digestive system, Respiratory system, Nervous system, Circulatory system, Excretory system, skeletal system. 2. Backbone is made up of 33 small bones called vertebrae. The backbone protects the spinal cord. Backbone runs along our back starting from the neck. 3. The places where two or more bones are joined together are called joints whereas the bones are held together at the joints by stong structures called ligaments. 4. Ribs are thin, flat curved bones that form a protective cage around the organs in our chest region. This is called the ribcage. **E.** 1. (i) Ball and socket joint (ii) Pivot joint (iii) Hinge joint 4. Gliding joint 2. The elbow joint is a type of hinge joint, so the hinge joint does not provide movements backwards, only forward movement is allowed. 3. Muscles have the property of contraction and relaxation. It is this property of muscles which is responsible for the movement of bones. 4. Contraction and relaxation property. 5. (i) Birds have streamlined bodies. (ii) Bones are hollow and light which makes their body light. (iii) They have wings with feathers. (iv) Strong breast muscles help in flapping of wings during flight. **F.** 1. (a) The outer skeleton of cockroach is made of different units joined together and it helps in movement. (b) The body of an earthworm secretes a slimy substance which helps in movement. (c) The movement in snails takes place by a muscular organ called the foot which produces a slimy fluid called mucus. (d) A streamlined body offers least resistance to the flow of water and allows the fish to move in water easily. (e) Birds have streamlined bodies, hollow & light bones, wings with feathers, strong breast muscles which help them to move. (f) Snakes have long backbone, many thin muscles connected to each other which help them to move. 2. (i). It Provides shape to the body. (ii). It Provides a framework which supports the body and keep it upright. (iii). It Protects the soft internal organs like the heart, stomach and liver. (iv). blood cells are made in the soft substance (bone marrow) present in the bones which from the skeleton. The Skeletal system consists of bones and cartilages. While bones are hard structures, the cartilages are soft and elastic, and can be easily bent. A cartilage can easily be located in the ear lobe and nose. The framework of the body formed by the bones and cartilages is called the skeleton. **G.** 1. Movement can be related to plant body where there is no change of place, only like growth of plants or bending towards light whereas locomotion is the movement occuring in whole of body like in animals. 2. The underwater divers wear fin-like flippers on their feet because the flippers help divers move at greater speed and force and put less pressure on the diver. **H.** Do it yourself. **I.** Do it yourself. **J.** Do it yourself.

CHAPTER 10 : MEASUREMENT AND MOTION

A. 1. (b) 2. (a) 3. (d) 4. (d) 5. (b) 6. (a) 7. (c) 8. (c) **B.** 1. Projectile 2. Kelvin

3. non-uniform 4. oscillatory 5. vibratory 6. circular 7. unit 8. parallax error **C.** 1. Motion along a straight line is called rectilinear motion. 2. The motion which repeats itself after a fixed interval of time is known as periodic motion. 3. The fast or rapid oscillatory motion is called vibratory motion. 4. The to and fro motion of an object about a mean position along the same path is known as oscillatory motion. 5. When the position of an object changes with time with respect to the other surrounding objects, it is said to be in motion. **D.** 1. The to and fro motion of an object about a mean position along the same path is known as oscillatory motion whereas the motion which repeats itself after a fixed interval of time is known as periodic motion. 2. The length the tip of the thumb and that of the little finger is called handspan whereas the length between the tip of the middle finger and that of the elbow is called cubit. 3. The motion in which all the particles, of a body move the same distance is the same interval of time is known as translatory motion whereas the motion in which a body moves about a fixed axis without changing its position is known as rotatory motion. 4. The motion along a straight line is called rectilinear motion whereas when an object moves along a curved line, it is said to be in curvilinear motion. **E.** 1. ✗ 2. ✗ 3. ✗ 4. ✓ 5. ✗ 6. ✓ 7. ✓ **F.** 1. Rectilinear motion 2. Oscillatory motion 3. Circular motion 4. Vibratory motion 5. Periodic motion 6. Non-uniform motion 7. Oscillatory motion 8. Rotatory motion **G.** 1. Scale 2. The length between the tip of the middle finger and that of the elbow is called cubit. 3. Second is the standard unit of time. 4. When an object moves along a curved line, it is said to be in curvilinear motion. **H.** 1. The comparison of an unknown quantity with some known quantity is known as measurement. 2. Standard units are used to communicate facts, measurements, duration clearly and precisely. 3. Metre is the standard unit of length. A standard metre rod is kept at NPL. 4. Measuring the length using different positions of the eye over the scale, you will get different measurements each time. This type of error in reading measurements is called parallax error. To avoid this type of error, keep your eye vertically above the point where the measurement is to be taken. 5. The precautions that need to be taken are - (i) If the scale is not placed exactly parallel to the length which is to be measured, the measured length will not be accurate. (ii) Keep your eye vertically above the point where the measurement is to be taken. **I.** 1. Ruler, metre rod and a measuring tape are some devices used to measure length. 2. An object is said to be in motion if its position changes with time with respect to its surroundings. 3. When a body covers equal distances in equal intervals of time along a straight line, it exhibits uniform motion, for example, an aeroplane flying in a particular direction at a constant speed and a train moving in a particular direction at a constant speed show uniform motion. 4. The to and fro motion of an object about

a mean position along the same path is known as oscillatory motion, for example, a child on a swing exhibit oscillatory motion. 5. The motion which repeated itself after a fixed interval of time is known as periodic motion. For example, heartbeat. **J.** Do it yourself. **K.** Do it yourself.

CHAPTER 11 : ELECTRICITY AND CIRCUITS

A. 1. (a) 2. (c) 3. (b) 4. (a) 5. (b) **B.** 1. two 2. filament 3. closed path 4. copper 5. fused **C.** 1. Electric circuit 2. Insulator 3. Electric switch 4. Cell 5. Solar **D.** 1. False 2. True 3. False 4. True **E.** 1. Energy of water 2. The combination of two or more cells is called a battery. 3. Gold, silver, copper, aluminium. 4. The materials which do not allow the flow of electric current through them are called insulators. **F.** 1. Electric wires are covered with plastic so that naked wires may not give an electric shock to the user. 2. Electric circuit is a closed path for current to flow through an electric device. 3. A circuit with an open switch is called an open circuit. 4. No **G.** 1. All electrical appliances and tools have their handles coated with insulating materials like rubber or plastic to prevent accidents. 2. (i) Never play with sockets or electric wires. (ii) Never touch an electric switch, ply or device with wet hands. (iii) Never switch on a off geyser while barefoot, especially, if the floor of the bathroom is wet. (iv) In case of a short circuit or a spark in a switch, put it off immediately with the help of a plastic or wooden stick. 3. Television, Refrigerator, Microwave, Washing machine, etc. 4. (i) Insulators like rubber and plastics are used to cover electric wires, so that naked wires may not give an electric shock to the user. (ii) Electricians use rubber (insulators) gloves while working as safeguard to save themselves from electric shocks. (iii) All electrical appliances & tools have their handles coated with insulating materials like rubber or plastic to prevent accidents. 5. If the connecting wire of a circuit breaks down, then the flow of current through it will stop, thus the device will stop working. **H.** 1. An electrician always holds the earth wire while working with electric equipments. Hence, no harm is caused to him. 2. When the switch is open, the current does not flow because the circuit breaks. **I.** Do it yourself. **J.** Do it yourself.

CHAPTER 12 : RAIN, THUNDER AND LIGHTENING

A. 1. (c) 2. (d) 3. (b) 4. (b) 5. (a) **B.** 1. False 2. True 3. True 4. True 5. True **C.** 1. Lightning 2. Condensation 3. Evaporation 4. Water cycle 5. Fog **D.** 1. (iv) 2. (i) 3. (vi) 4. (ii) 5. (iii) 6. (v) **E.** 1. Solid, liquid and gas. 2. The process of conversion of a soild into its liquid state is called melting : The process of conversion of a liquid into its soild state is called freezing. The process of conversion of a liquid into its gaseous state is called vapourization. 3. The process of conversion of a liquid into its solid state is called freezing. 4. The process of conversion of a solid into its liquid state is called melting. 5. The

process of conversion of a liquid into its gaseous state is called vaporization. 6. The slow conversion of water into its vapour state is called evaporation. **F.** 1. The fast conversion of water into its vapour state is called boiling. Boiling occurs at a particular temperature called boiling point. 2. The process of conversion of a gas or vapour into its liquid state is called condensation. Condensation takes place at a particular temperature called condensation point. 3. The freezing point and melting point of water is 0°C. 4. The boiling point and the condensation point are 100°C. 5. Thunder and lightning occur when there is a heavy flow of electric charges either between two clouds or between a cloud and a tall tree or building. **G.** 1. The slow conversion of water into its vapour state is called evaporation whereas fast conversion of water into its vapour state is called boiling. 2. Water present on the earth evaporates due to the heat of the sun and moves to the atmosphere. Also, water in the form of vapour goes to the atmosphere through transpiration. It gets cooler when you go higher up from the surface of the earth. The air moving up gets cooler and cooler. While moving up at sufficient heights, air becomes so cool that the water vapour present in it gets condensed into tiny water droplets on dust particles. These water droplets remain floating in the air and appear as clouds. 3. The continuous circulation of water among land, water bodies and atmosphere is called water cycle. Water cycle maintains the water balance on land, water bodies and atmosphere. It also controls weather patterns and sustains plant and animal life on the earth. **H.** 1. Vapours / smoke comes out from the mouth. 2. Evaporation is a process that converts water into vapours, then those vapours get condensed and form clouds by the process of condensation and finally water comes back to the earth in the form of rain by the process of precipitation. **I.** Do it yourself.

CHAPTER 13 : MAGNETISM

A. 1. (b) 2. (c) 3. (c) 4. (c) **B.** 1. Compass 2. Steel 3. Electromagnets 4. Columbus 5. Electromagnet **C.** 1. Iron, nickel 2. By using an iron nail, a dry cell and a copper wire. 3. A substance called fertile is sometimes used to make artificial magnets. 4. Demagnetization is the process of removing magnetization. 5. Like poles will repel each other. **D.** 1. A freely suspended magnet always rests in the north-south direction. 2. Fixed dial compass was used by columbus. 3. If a magnet is dropped frequently then it will lose its strength. 4. (i) By hammering it (ii) By heating it. (iii) By not storing it properly. 5. Unlike poles will attract and like poles will repel. **E.** 1. Temporary magnets are the magnets which lose their magnetism as soon as the cause producing is removed. An iron nail attracted by a magnet also becomes a temporary magnet. 2. Magnet always point towards north because the earth is like a magnet and therefore it will attract the compass needle to

the magnetic north pole. 3. The properties of a magnet are– (i) A magnet attracts magnetic substances. (ii) A freely suspended magnet always rests in the north-south direction. (iii) The magnetic pull or magnetic influence is stronger near the ends of a magnet. (iv) Poles exist in pairs. (v) Unlike poles attract and like poles repel. 4. The uses of magnet are– (i) Magnets are used in making magnetic stickers. (ii) Magnet in a magnetic compass can help to find the direction. (iii) Magnets are used by doctors to pull out small iron particles from the wounds of the victims of accidents. **F.** 1. No 2. Yes, we can make a magnet with the help of electricity. **G.** Do it yourself.

CHAPTER 14 : LIGHT

A. 1. (d) 2. (b) 3. (a) 4. (a) **B.** 1. True 2. False 3. False 4. False 5. False **C.** 1. Sun and stars 2. opaque 3. opposite 4. pinhole camer 5. Mirrors **D.** 1. (iv) 2. (i) 3. (v) 4. (ii) 5. (iii) **E.** 1. The objects which emit light of their own are called luminous objects. 2. The object that do not have light of their own but are visible when light falls on them. 3. Firefly. 4. The necessary conditions to form a shadow are— (i) a source of light (ii) an apaque object that obstructs, as comes in the way of the source of light, and (iii) a screen **F.** 1. A transparent object does not form a shadow. A translucent object forms a light shadow. An opaque object forms a dark shadow. 2. No, a transparent object cannot cast a shadow because it does not blocks the light. 3. Objects that do not allow light to pass through them are called opaque objects, for example, wood, book, etc. Objects that allow light to pass through them partially and called translucent objects, for example, butter paper, muddy water, etc. Objects that allow light to pass through them fully are called transparent objects, for example, glass, air, etc. 4. Making of a pinhole camera– (i) Take two tins such that one can slide into another leaving no gap in between. (ii) Remove their lids (or any one side) (iii) On the opposite side of the larger box, make a small pinhole in the centre. (iv) On the opposite side of the small box, cut out a square in the centre with a side of about 5 to 6 cm. (v) Cover the open square with a tracing paper and secure it in position by using some suitable tape. (vi) Slide the smaller box inside the larger box such that the side with tracing paper is inside. Working of a pinhole camera— (i) Try to look at a well- illuminated object say a lamp, through the pinhole camera from the open face of the smaller box. (ii) Cover the pinhole camera and your head with a piece of black cloth. (iii) Adjust the position of the pinhole camera forward or backward to get an image of the object on the tracing paper. 5. (i) Put a lighted candle on a table. (ii) Take a piece of pipe. (iii) Close one eye and look at the lighted candle through the pipe. You will be able to see the lighted candle clearly. (iv) Now bend the pipe in the middle while looking at the lighted candle. You, will not be

able to see the lighted candle. (v) Straighten the pipe and now turn the pipe to your right or left. You will not be able to see the lighted candle if you turn the pipe to your right or left. From all these observations you can conclude that light travels in a straight line. **G.** 1. (i) A shadow can be seen only on a screen. (ii) The colour of the shadow does not change with the change in the colour of opaque objects. (iii) The shadow formed is always black in colour. 2. As the angle between the source of light and the object base decreases, the lenght of shadow increases and vice-versa. 3. (i) The length of a shadow changes with the change in the position of the object with respect to the source of light. (ii) The length of the image in a mirror always remains the same as equal to the size of the object at all positions. (ii) The shadow is always black in colour irrespective of the colour of the object and the colour of the light. (iv) The image in the mirror is laterally inverted while the shadow has no such lateral inversion. (v) The shadow is always black in colour while the image in a mirror is of the same colour as the object. 4. (i) Take a large thermocol sheet and paste a sheet of paper on it. (ii) Take a comb and a mirror. (iii) Fix the comb on the side of the thermocol sheet and the mirror on the other side. (iv) Direct a beam of torch light through the comb. This shows that light travels in a straight line and gets reflected from a mirror. **H.** Do it yourself. **I.** Do it yourself.

CHAPTER 15 : WATER

A. 1. (c) 2. (b) 3. (a) **B.** 1. Evaporation 2. transpiration 3. Transpiration, evaporation and respiration 4. flood **C.** 1. water cycle 2. Respiration 3. Condensation 4. Drought 5. Rainwater harvesting. **D.** 1. If it does not rain in a particular region for a long time, it may lead to a condition called drought while if it rains heavily, it may cause the water level of lakes, ponds and rivers to rise, leading to a condition called floods. 2. The slow conversion of water into its vapour state is called evaporation while the process of conversion of a gas or vapour into its liquid state is called condensation. **E.** (i) Water is used for drinking, cooking, washing, taking bath, flushing the lavatory etc. (ii) Water also helps our body to work. (iii) Plants need water to make their food. 2. The collection and storage of rainwater from roof tops or from land surface for future use is called rainwater harvesting. 3. Water spilled on the floor disappears after sometime because of evaporation. 4. Evaporation. **F.** 1. The continuous circulation of water from the earth's surface to the air and from the air back to the earth's surface is called water cycle. 2. The role that plants play in the water cycle is that they absorb water into the roots, then they transport the water to the leaves. The water is then evaporated. 3. (i) Groundwater— In this method, the rainwater is allowed to go into the ground directly. This can be stored underground for later use. (ii) Storing rainwater in tanks— In this method, the rainwater collected on the rooftops is collected in a tank with help of pipes.

4. Drought occur if it does not rain in a particular region for a long time. **G.** 1. Floods occur if its rains heavily and cause the water level of lakes, ponds and rivers to rise. 2. (i) Floods causes great damage to crops, animals and human life. (ii) Flood water can damage structures such as buildings. (iii) Flood can lead to landslides. (iv) People and animals may drown in flood water and die. (v) Flood can cause shortage of food crops as the entire harvest can get destroyed. 3. (i) For taking bath, use a bucket instead of a shower. (ii) Make sure that your house has no leaky taps. (iii) Avoid flushing the toilets unnecessarily. (iv) Turn off the taps immediately after use. (v) Adopt rainwater harvesting. 4. Place some ice cubes in a completely dry glass. Cover the glass with a thick cardboard or a plate. Let it stand for a few minutes. The tiny drops of water appear on the outside of the glass. In this activity, the air around the glass gets cooled because of the presence of ice. The cool air cannot hold much water. Some of the water vapour, therefore, changes into water drops. **H.** 1. Rainwater is not saline and it is also chlorine free. 2. Puddles on roads and playgrounds soon dry up when the sun comes out because of the process of evaporation. 3. Water cycle is the constant movement of water through the earth and its atmosphere. Water on the ground evaporates, becoming water vapour. The vapour rises, becomes clouds, and then fall back to the earth as rain. **I.** Do it yourself. **J.** Do it yourself.

CHAPTER 16 : WASTE MANAGEMENT

A. 1. (c) 2. (b) 3. (d) 4. (d) 5. (d) **B.** 1. Waste that decomposes by microorganisms and get mixed up in the soil is called biodegradable waste while waste that does not decompose in the environment is called non-biodegradable waste. 2. The waste that can be recycled is called recyclable waste while the waste that cannot be recycled is called non-recyclable waste. 3. The method of converting biodegradable waste into a useful product is called composting while the process of making compost by using worms is called vermicomposting. **C.** 1. red 2. manage waste 3. biomass 4. manure **D.** (i) Waste that decomposes by micro organisms and get mixed up in the soil is called biodegradable wastes. 2. Earthworms. 3. The method of using waste and converting it into useful items is called recyling. 4. The process of making compost by using worms is called vermicomposting. 5. A valuable soil formed by decomposition of organic plant matter is called compost of organic plant matter is called compost. **E.** 1. Leftover, useless and unwanted by-products from an industrial, commercial, domestic or any other activity is called waste. 2. Peel of fruits and vegetables, cloth, paper, human waste. 3. During cooking food, during agricultural practices, during work in factories, during operations in hospitals, etc. 4. The method of converting biodegradable waste into a useful product is called composting. This is done by the micro organisms living in the soil. Compost is a valuable

soil formed by decomposition of organic plant matter. 5. Vermicomposting produce no pollution or unusable residue making it a very effective form of recycling. The organic matter that passes through the digestive tract of the worm is excreted as castings. **F.** 1. (i) Earthworms are used as a means of decomposing of waste and improving soil structure. (ii) They serve versatile natural bio-reactors to harness the beneficial soil, microflora and destroy Pathogens, thus converting organic waste into valuable products such as bio-fertilizers and bio-pesticides. 2. There is a need to manage waste and its dispersal because of the following reasons— (i) Food hazards—Chemicals used to manufacture polybags can get into food products stored in them and thereby reach our systems and cause harm. (ii) Animal deaths — Cows foraging dustbins eat polybags and die. Ingested polybags block their intestines. Polybags also harm marine animals when they swallow them. 3. Piling up of waste attracts flies and mosquitoes which spreads various diseases. A major step in dealing with this problem related to accumulation of waste is to develop methods to either reuse or recycle the waste. This can be done by the method of composting. Composting is the method of converting biodegradable waste into a useful product. This is done by the microorganisms living in the soil. 4. The wastes that we produce at home are vegetable peel, fruits peel, paper, polythene, etc. Ways to deal with waste are— (i) Vegetable peels, rotten food can be turned into compost. This compost can be added to soil to enrich its quality for crop production. Biogas may also be produced. (ii) Old newspapers can be converted into new forms of handmade paper or paper mache. (iii) Reduce the use of plastic bags and poly bags and use more of paper bags and cloth bags.

G. Do it yourself. **H.** Do it yourself.

MODEL TEST PAPER – I

1. (a) flesh (b) fibre (c) evaporation (d) transparent (e) reproduce **2.** (a) True (b) false (c) true (d) false (e) true **3.** (a) Honey is a sweet liquid produced by honeybees from the nectar. (b) Proteins are complex substances found in many foods and are made up of thousands of small units called amino acids. (c) The substances, which make up a mixture are called its components. (d) We wear clothes because they protect us from heat, cold, rain and insects. (e) The materials through which we can see clearly is called transparent materials. **4.** (a) The food we take should contain all the components to serve different purposes in our body. These components are called nutrients. Carbohydrates, Proteins, Vitamins, fats and Minerals. (b) The Method of separating sand and water using a filter paper is called filtration. (c) (i) Cleaned and carded raw cotton is used as bandage for covering wounds. (ii) It is filled in pillows, quilts and mattresses. (iii) High quality printing paper is manufactured from inferior grade cotton. (iv) It is

used as mops to clean the floor. (d) The period during which an organism completes its life cycle is called life span. (e) In winters, when food is not available, animals simply go off to sleep. This is known as hibernation. **5.** (a) The amount of a nutrient needed by a person differs, with age, sex and the kind of physical work the person does. A child in his growing years needs more of proteins and carbohydrates to grow well and to build his or her body and get energy for various life processes. A sportsman, who does a lot of physical work needs more carbohydrates to get energy. (b) Light the candle and hold the cotton, nylon and silk strips length wise over the candle flame with the help of tongs. As soon as they catch fire, hold it over the saucer of water. Record your observation regarding the smell and residue. (c) The bending of stem in the direction of sunlight is called phototropism. The response of roots towards gravity is called geotropism. (d) The outer covering of seed is called seed coat. Inside the seed coat, we have cotyledons that contains embryo shoot and embryo root. Embryo shoot is the part from which the seed germinates. (e) The material through which light passes fully are called transparent materials. The material through which light passes partially are called translucent materials. The material through which light does not pass at all are called opaque materials.

MODEL TEST PAPER – II

1. (a) earthworms (b) two (c) electromagnets (d) opaque (e) floods **2.** (a) True (b) False (c) False (d) False (e) True **3.** (a) The place where two or more bones are joined together are called joints while the strong structures which hold the bones together at the joints are called ligaments. (b) When an object moves along a curved line, it is said to be in curvilinear motion. (c) The materials which do not allow the flow of current are called insulators. (d) The process of conversion of a liquid into its gaseous state is called vaporization. (e) Firefly. **4.** (a) The comparison of an unknown quantity with some known quantity is called measurement. (b) A circuit with an open switch is called an open circuit. (c) Magnet will lose its magnetism. (d) The collection and storage of rainwater from roof tops or from land surface for future use is called rainwater harvesting. (e) The leftover, useless and unwanted by-products from an industrial, commerial, domestic or any other activity is called waste. **5.** (a) The to and fro motion of an object about a mean position along the same path is known as oscillatory motion. The pendulum of a clock exhibit this type of motion. (b) (i) Insulators like rubber and plastics are used to cover electric wires, so that naked wires may not give an electric shock to the user. (ii) Electricians use rubber gloves while working as safeguard to save themselves from electric shocks. (iii) All electrical appliances and tools have their handles coated with insulating materials like rubber or plastic to prevent accidents. (c) Water present

on the earth evaporates due to the heat of the sun and moves to the atmosphere. Also, water in the form of vapour goes to the atmosphere through transpiration. It gets cooler when you go higher-up from the surface of the earth. The air moving up gets cooler and cooler. While moving up at sufficient heights, air becomes so cool that the water vapour present in it gets condensed into tiny water droplets on dust particles. These water droplets remain floating in the air and appear as clouds. (d) The properties of magnet are— (i) A magnet attracts magnetic substances. (ii) A freely suspended magnet always rests in the north-south direction. (iii) The magnetic pull or magnetic influence is stronger near the ends of a magnet. (iv) Poles exist in pairs. (v) Unlike poles attract and like poles repel.

Teacher's Manual
Science Bullet (Class-7)

CHAPTER 1 : NUTRITION IN PLANTS

A. 1. (c) 2. (c) 3. (d) **B.** 1. Heterotrophic nutrition 2. Cuscuta or dodder plant 3. Stomata 4. Insectivorous plants **C.** 1. starch 2. iodine solution 3. plants & animals 4. amarbel 5. chlorophyll **D.** 1. (iv) 2. (iii) 3. (v) 4. (ii) 5. (i) **E.** 1. The basic functions which allow living organisms to live on earth are known as life processes. 2. The process of taking in food and its utilization by the body is called nutrition. 3. Chlorophyll is a green pigment present in the leaves of the plants. **F.** 1. We need food because food provides us with a number of nutrients which are necessary for the proper functioning of our body. 2. (a) Chlorophyll helps leaves to capture sun's energy to prepare the food for the plant. (b) leaves 3. We should test the presence of starch in leaves by performing the iodine test which is after we add a drop of iodine solution to the leaf and the leaf show a blue black colour which shows the presence of starch in the leaf. **G.** 1. The process by which green plants prepare their own food is called photosynthesis, During this process, plants absorb the sun's energy through their leaves and convert it into food energy, using raw materials from the atmosphere and soil. Chlorophyll, sunlight, carbon dioxide and water are required for the process of photosynthesis. Photosynthesis can be represented by the following equation :

$$6CO_2 + 6H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + 6O_2$$

Carbon dioxide (from atmosphere) + Water (from soil) → (in the leaves) Carbohydrate (food) + Oxygen

2. The non-green plants produce yellow tubular structures which attach themselves to a plant and wrap them around the stem and branches. Chlorophyll is not present in these plants. These absorb ready made food from the host plant through special structures. 3. In a pitcher plant, the pitcher– like structure is the modified part of the leaf. The leaf tip is modified to form a lid which can open or close the mouth of the pitcher. Inside the pitcher, downward– pointing hair are present. Once an insect enters the pitcher, the lid closes and the insect gets trapped in the hair. Digestive juices secreted in the pitcher now digest the insect. **H.** If the number of plants on our planet is reduced then the number of animals will also reduce. **I.** Do it yourself.

CHAPTER 2 : NUTRITION IN ANIMALS

A. 1. (b) 2. (d) 3. (d) 4. (a) 5. (a) **B.** 1. Ingestion, Digestion, Absorption and Ingestion. 2. liver 3. digestive 4. villi 5. food vacuole **C.** 1. False 2. True

3. True 4. True 5. False **D.** 1. Liver secretes bile juice. It helps in the digestion of fats by emulsifying them. 2. Cellulose. It can be digested by ruminants but not by humans because there is no natural enzyme present in the body of humans. 3. Glucose is the simplest form of carbohydrate that can be easily broken down to give energy. Hence, we get instant energy from glucose. 4. The wave like movement in the food pipe, which pushes the food forward is called as peristalsis. This wave like movement takes place throughout the alimentary canal and pushes the food downwards. **E.** 1 The inner walls of the small intestine have thousands of finger-like outgrowths. These are called villi. The villi increases the surface area for absorption of the digested food. The surface of the villi absorbs the digested food materials. 2. Alimentary canal is the passage along which food passes through the body from mouth to anus during digestion. 3. Similarity– Both amoeba and human use digestive juices to digest food. Difference– Human beings are multicellular while amoeba is unicellular. **F.** 1. (a) Glucose (b) Fatty acids and glycerol (c) Amino acids. 2. (a) Duodenum receives secretions from the liver and the pancreas. (b) Liver secretes bile juice that is stored in a sac like structure. (c) Gall bladder store and concentrate bile, a yellow-broke digestive liquid produced by the liver. (d) Bile help the body absorb the necessary fats. It is also good for eliminating waste products for your system through bowl movements. 3. Lymph is a light yellow fluid present in the tissue. It is also called the tissue fluid or extracellular fluid as it bathes the cells and lies outside cells. Lymph flows in lymphatic ducts and helps in the transportation of digested fat. **G.** 1. When vomiting accurs, it is because the diaphragm relaxed suddenly during the retching cycle, enabling the stomach contents to be expelled through the mouth. 2. Doctors keep a patient on glucose drip after operation because glucose is essentially sugar water. After an operation, glucose gives your body energy to replace lost blood, keep you hydrated & give your body energy it needs to heal. **H.** Do it yourself

CHAPTER 3 : CLOTH MATERIALS-FIBRE TO FABRIC

A. 1. (a) 2. (c) 3. (a) 4. (b) 5. (b) **B.** 1. wool and silk 2. natural, man-made 3. shearing 4. goats 5. cocoons **C.** 1. shearing 2. scouring 3. caterpillars 4. egg 5. Merino **D.** 1. (c) 2. (e) 3. (a) 4. (b) 5. (d) **E.** 1. True 2. True 3. False 4. False **F.** 1. camel 2. Reeling 3. Tassar 4. cotton **G.** 1. We wear different types of clothes to stay warm or cold in different types of weather. 2. Wool yielding animals are found in hilly and cold regions. The hair of these animals trap a lot of air, Air is a poor conductor of heat and keep these animals warm during winter. 3. worsted woollen cloth is better than the ordinary woollen cloth because worsted wool hold creases and shape better than regular woollens. **H.** 1. Rayon, nylon, polyester and acrylic. 2. Cotton, jute, wool

and silk. 3. The shaving of sheep's body to obtain fleece is called shearing. **I.** 1 People working in the sorting department are at risk because they may get infected by anthrax bacteria. The anthrax disease is a fatal blood disease and is called sorter's disease. 2. The rearing of silk moths for obtaining silk is called sericulture. 3. The best quality of silk is obtained from the cocoons of silk moth, Bombyx mori. **J.** 1. Petrochemicals are used in the manufacture of synthetic fibres. 2. The quality of wool depends on the length of fibres, number of crimps or curls per centimetre and tensile strength. 3. The risk associated with one's occupation is called occupational hazard. 4. People working in the sorting department are at risk because they may get infected by anthrax bacteria. The anthrax disease is a fatal blood disease and is called sorter's disease. **K.** 1. Workers of sericulture industry develop asthma, chronic bronchitis and difficulty in breathing because of inhalation of vapours arising from cocoons when being steamed, boiled and reeled. 2. It is necessary to kill the pupa by boiling cocoons because it contains too much salt in it. 3. A shorn sheep is dipped in an antiseptic solution soon after shearing to kill lice. **L.** Do it yourself

CHAPTER 4 : HEAT FLOW AND TEMPERATURE

A. 1. (d) 2. (a) 3. (a) 4. (d) **B.** 1. Energy 2. electrical 3. Temperature 4. temperature **C.** 1. True 2. False 3. True 4. True **D.** 1. The energy transferred from one body to another body due to temperature difference is called heat. 2. The measure of the degree of hotness or coldness of a body is called temperature. 3. The mode of heat transfer in which energy is transferred from one molecule to the other molecule without the actual movement of molecules is called conduction. 4. The mode of heat transfer by the circulation or movement of the heated parts of a liquid or gas is called convection. 5. The mode of heat transfer in which a material medium is not necessary. **E.** 1. Rise in water temperature, Increase in volume and change of state. 2. A substance expand on heating because the particles that make up the substance is trying to get out and escape the heat. 3. 50°C = 122°F 4. 288 **F.** 1. People wear white clothes in summer because white clothes reflect heat and do not absorb it. 2. In winter, dark coloured clothes are good absorbent of heat energy thus they absorb maximum heat keeping us warm. 3. The speed of light in a vaccum is 186,282 miles per second. **G.** 1. Land breeze- At night, land cools down faster than the water in the sea. The air over the sea remains comparatively warmer than the air over the land So the cool air over the land rushes towards the sea, setting up land breeze. Sea breeze– During the day, land gets heated up faster than water. As a result, the air over the land becomes warm and, as hot air is lighter, it rises up. An upward current of air is set up over the land. The cool air blowing over the sea, rushes towards the land to fill the space left

by the hot air. Therefore, the breeze that blows from the sea towards the land during the day is known as sea breeze. 2. The air which we breathe out is warm and less dense than the air outside. Being light, it rises up and leaves the room through ventilators provided near the ceilings. The fresh air from outside enters the room through the doors and windows of the house to fill this gap. Smoke and vapours from the kitchen rise and escape through exhaust. That is why, ventilators and exhausts are important. 3. The vacuum that lies between the walls prevents loss of heat by convection. Its outer shiny surface is a poor radiator of heat, hence, it prevents loss of heat by radiation. **H.** 1. The outer body of the inner bottle of a thermos flask is made silver in colour because silver colour absorbs maximum heat radiation. **I.** do it yourself

CHAPTER 5 : ACIDS, BASES AND SALTS

A. 1. (b) 2. (c) 3. (c) 4. **(a) B.** 1. sour, bitter 2. blue, red; red, blue 3. salt 4. natural 5. lichens **C.** 1. Indicator 2. salt and water 3. neutralization **D.** 1. False 2. True 3. False 4. True 5. False **E.** (d) 2. (b) 3. (a) 4. (c) **F.** 1. Lactic acid, citric acid, tartaric acid, Acetic acid 2. sodium hydroxide, Potassium hydroxide, Ammonium hydroxide, Calcium hydroxide. 3. Red cabbage. 4. Antacid neutralizes stomach acidity. **G.** 1. A substance that is sour in taste and turns blue litmus red is called an acid. 2. A substance that is bitter in taste, is soapy to touch and turns red litmus is called a base. Bases are chemicals that are apposite to acids. 3. (a) Sour milk, Tea, Citrus fruits. (b) Bleach, baking soda and coke. 4. (a) It turns colourless in acidic solutions and pink in basic. (b) It turns red in acidic solutions and yellow in basic. (c) It turns colourless in acidic solutions and reddish brown in basic. **H.** 1. (i) Vinegar contains acetic acid which is used as a food preservative. (ii) An acid, called sulphuric acid, is used in car batteries 2. It depends on the Ph level of the acids. Ph is the measure of acid or alkali. 3. A reaction in which an acid combines with a base to form salt and water is called neutralisation. The salt produced in a neutralisation reaction may be acidic, basic or neutral, depending upon the acids and bases used during a reaction. 4. (i) Decaying food particles in our teeth produces acid and cause tooth decay. (ii) Using toothpaste during brushing help to neutralise the acid and preventing tooth decay since toothpaste is an alkaline. **I.** 1. Do it yourself 2. Turmeric stain turns red when washed with soap because turmeric contains an acid while the soap contains a base. When an acid reacts with a base, neutralization reaction takes place. **J.** 1. sodium bicarbonate solution 2. Milk of magnesia **K.** Do it yourself

CHAPTER 6 : PHYSICAL AND CHEMICAL CHANGES

A. 1. (c) 2. (c) 3. (b) **B.** 1. irreversible, reversible 2. physical, chemical 3. chemical 4. Magnesium hydroxide 5. chemical, physical **C.** 1. False 2. True 3. False 4. True 5. True **D.** 1. Iron articles are often coated with paint

because it prevents them from coming in contact with air and moisture. 2. Carbon dioxide gas is used in fire extinguishers because of the fact that it is non-reactive. **E.** 1. Magnesium 2. Calcium oxide 3. Alloy 4. Chemical change.

F. 1. The change in which a substance undergoes a change in shape, size or state is called a physical change. 2. A change in which a new substance is formed is called a chemical change. 3. When mixed with certain corrosion resistant metals or some non-metals, iron forms alloys which are resistant to rusting. 4. Crystallization is the process of formation of solid crystals precipitating from a solution, melt or more rarely deposited directly from a gas. 5. We apply coat of grease on iron articles because it prevents the iron article from getting rusted. **G.** 1. We paint iron articles because it prevents them from coming in contact with air and moisture. 2. Rusting takes place only when the water and the oxygen come in contact at the sametime. 3. The process of depositing a layer of zinc on an iron article is called galvanization. 4. A metal made by combining two or more metallic elements, especially to give greater strength or resistance to corrosion. **H.** 1. **Physical change :** (i) A change in which no new substance is formed. (ii) It is usually accompanied by a change in shape, size or state.; **Chemical Change :** (i) A change in which a new substance is formed. (ii) It is usually accompanied by a change in colour, release of heat & light, etc. 2. Alloying is done to prevent rusting. 3. A reddish or yellowish-brown flaking coating of iron oxide that is formed on iron or steel by oxidation, especially in the presence of moisture is called rust. 4. Rusting of iron can be prevented by the following methods : (i) Coating an iron article with paint – Applying a coat of paint on iron articles prevents them from coming in contact with air & moisture. (ii) coating an iron article with grease- applying a coat of grease on an iron article cuts off its contact with air and moisture. This prevents the iron article from getting rusted. (iii) Galvanization - This is the process of depositing a layer of metal, called zinc, on iron. The coating of zinc does not allow the iron article to come in contact with air and moisture and this prevents it from getting rusted. 5. Rusting takes place only when the water and the oxygen come in contact at the same time. The chemical change that occurs during rusting is represented as :

Iron	+	Water	⟶	Oxygen	+	Rust iron oxide
Fe	+	H_2O		O_2	+	Fe_2O_3

I. 1. Chemical change 2. (a) Carbon dioxide (b) Hydrogen gas 3. Do it yourself.

CHAPTER 7 : WATHER, CLIMATE AND ADAPTATION OF ANIMALS TO CLIMATE

A. 1. (a) 2. (c) 3. (b) 4. (b) 5. (c) **B.** 1. climate 2. adaptation 3. penguins

4. Hibernation 5. hot and humid **C.** 1. False 2. False 3. True 4. True 5. False **D.** 1. (d) 2. (a) 3. (b) 4. (c) **E.** 1. Elephant 2. Thick coat of fur 3. Walrus **F.** 1. Weather is the condition of the atmosphere at a particular time and place. 2. The average weather condition of a place over a long period of time is called climate. 3. No 4. The maximum temperature of the day is usually in the afternoon and the minimum temperature is usually in the morning. 5. Migratory bird is a bird that travels from one place to another at regular times often over long distances. **G.** 1. Temperature, humidity, wind and other factors are called elements of the weather. 2. (i) Distance from the equator. (ii) Height above the sea level (iii) Distance from the sea. (iv) Direction of the winds. 3. Weather 4. The average weather condition of a place over a long period of time is called climate. Climate includes the region's general pattern of weather conditions, seasons and weather extremes like hurricanes, droughts or rainy periods. 5. Animals living in the polar region have flat broad paws which help them to walk on ice, they have a thick coat of white fur and furry paws which keep them warm in the freezing environment. **H.** 1. The polar bears have a thick coat of white fur and furry paws which keep them warm in their freeing environment. They have flat and broad paws which help them to walk on ice. In addition, except for the balls of the feet, the soles are covered with hair, making a non-skid tread. Their paws act like snowshoes. 2. The penguin has thick skin and a thick layer of fat under the skin. These features protect it from cold. The body of penguins is streamlined and the feet have webs. Both these fractures help them in swimming. They have very small ears which help them to retain as much heat as possible. They usually huddle together. They do this to keep warm. 3. Animals in this region live on the trees, have developed strong long tails, long and large beaks, bright colours, loud voices, sharp patterns, sensitive hearing, sharp eyesight, thick skin, ability to camouflage in order to protect themselves from predators. 4. The tropical rainforest has a large population of animals because of continuous warmth and rain. 5. The animals adapt to survive in the conditions in which they live. Animals living in very cold and hot climate must possess special features to protect themselves against the extreme cold or heat. This adaptation is due to evolution spread over a long period of time. Polar bear and penguin are adapted to live in the polar regions. Lion-tailed macaque and Indian elephant are adapted to live in tropical rain forest. **I.** 1. Deforestation can influence global warming as forests contain large amounts of CO_2. Therefore, deforestation lead to changes in weather. 2. As-the coastal areas are nearer to the sea, the moisture content in air is more and hence have high humidity. **J.** Do it yourself **K.** Do it yourself **L.** Do it yourself

CHAPTER 8 : REPIRATION

A. 1. (a) 2. (a) 3. (c) 4. (d) **B.** 1. Respiration 2. alveoli alveolus 3. Ethyl alcohol and carbon dioxide 4. gills 5. skin **C.** 1. ✗ 2. ✓ 3. ✓ 4. ✗ **D.** 1. The breakdown of glucose to carbon dioxide and water in the presence of oxygen is known as aerobic respiration while the process of respiration that takes place in the absence of oxygen, is known as anaerobic respiration, 2. The exchange of gases in the cell which utilise oxygen to produce energy by breaking down the food molecules into carbon dioxide and water is called cellular respiration while the process of inhalation and exhalation of air is called breathing.

E. 1. The breathing aperture of insects are called spiracles. 2. All organisms respire because they need oxygen for living. 3. The process of inhalation of oxygen and exhalation of carbon dioxide in living organisms is called breathing. 4. Loricifera **F.** 1. The process that includes breathing in of oxygen, using it for the release of energy by the oxidation of food in the living cells and breathing out of waste products like carbon dioxide and water is called respiration. 2. Oxygen is utilised to produce energy by breaking down the food molecules during respiration. 3. The tiny openings present in the leaves that help the plant in respiration are called stomata. 4. A large membranous tube reinforced by rings of cartilage, extending from the larynx to the bronchial tubes and conveying air to and from the lungs; the windpipe is called tracheal. **G.** 1. Aerobic respiration – The breakdown of glucose to carbon dioxide and water in the presence of oxygen is known as aerobic respiration. 2. Do it yourself 3. (a) The water, that enters the body of a fish, flows over the gills. The blood vessels absorb the oxygen dissolved in water and transport it to the rest of the tissues in the body of the fish. The blood vessels also bring back carbon dioxide from the cells of the gills. This carbon dioxide is released into the surrounding water. (b) In a cockroach, there is a network of tubes called tracheae that help in the gaseous exchange. Air, that is rich in oxygen, enters the insect's body through the spiracles and is carried to all parts of the body through the tracheal tubes. From here it reaches the cells of the body tissue. Now the reverse process starts. The carbon dioxide rich air enters the tracheal tubes and escapes through the spiracles. (c) Earthworms have a moist and slimy skin. Gaseous exchange takes place through the skin. **H.** 1. We should breathe through nose because the mucus present in the nose makes it moist. The dust particles stick to the nasal hair and the mucus. 2. An athelete breathes faster & deeper because in running, a lot of energy is consumed, that is why, he require more oxygen. **I.** Do it yourself **j.** Do it yourself

CHAPTER 9 : TRANSPORTATION IN ANIMALS AND PLANTS

A. 1. (c) 2. (c) 3. (a) 4. (a) 5. (b) **B.** 1. haemoglobin 2. WBC's 3. Pulmonary 4. Arteries 5. Urea **C.** 1. Septum 2. cardiac muscles 3. Left auricle 5. Urinary bladder. **D.** 1. (c) 2. (e) 3. (f) 4. (a) 5. (d) **E.** 1. True 2. False 3. True 4. False 5. ?? **F.** 1. ?? 2. Skin 3. glucose 4. ureters 5. stomata **G.** 1. Blood is a red-coloured viscous fluid that flows in the blood vessels while plasma is the non-living, yellowish fluid that makes. up more than half of blood volume. 2. Circulatory system is the system consisting of heart, blood and blood vessels that transports various things within the body while vascular system consists of pipe-like vessels arranged end to end. 3. The blood vessel that carries oxygenated (pure) blood from heart to different parts of the body while vines carry blood from body organs to the heart. 4. The vascular tissue of plants that transports water & minerals absorbed by roots to various parts of the plant is called xylem while the vascular tissue that transports food manufactured by leaves to various parts of the plant is called phloem. 5. The process of removing toxic waste from the body is called excretion while transpiration is the loss of water from leaves and other aerial parts of a plant into the air. **H.** 1. Ventricles have thicker walls than auricles because the walls of ventricles contain more cardiac muscle than the walls of the atria. This enables the ventricles to pump blood out to the lungs and the rest of the body. 2. The opening of auricles into ventricles are guarded by valves because valves are needed to prevent blood flowing backwards into the heart. 3. Arteries have thick, muscular and elastic walls so withstand the immense pressure of the blood which is forced out of the heart. 4. They are called soldiers of the body because they help in fighting infection or diseases caused by pathogens, by producing immunological resistance against them. **I.** 1. Plasma and blood corpuscles. 2. Arteries, veins and capillaries. 3. Aorta 4. Harvey **J.** 1. Red blood corpuscles are cells without nucleus. Their cytoplasm has oxygen carrying pigment called haemoglobin. It gives red colour to these corpuscles. It combines with oxygen to form oxy-haemoglobin, which transports oxygen to all the body cells. 2. The process of removing toxic waste from the body is called excretion. 3. The presence of sugar in urine indicates that the person is suffering from diabetes. In this disease, sugar level increases in blood instead of moving into the cells to provide energy. 4. (i) Transport of nutrients like glucose, vitamins, minerals, etc. (ii) Transport of oxygen from the organs of respiration to the body cells. **K.** 1. Transpiration is the loss of water from leaves and other aerial parts of a plant into the air. It occurs through stomata. 2. Septum separates the right & left sides of the heart and prevents blood from flowing from the right to the left ventricle or vice-versa. 3. The heart beat sound is caused by the contraction of muscles and shutting down of valves. • In the lub phase, the ventricles contract and cuspid valve close. • In the dub phase,

the pulmonary and aortic values close. We can hear it by placing our ear on the left side of the chest. 4. It is necessary to remove waste products from the body because the toxic substances are poisonous in nature and it can harm our body. **L.** 1. The left half of the heart has oxygenated blood and the right half of the heart has deoxygenated blood. 2. The process of transpiration makes water and minerals rise in tall trees. 3. Fan creates a wind chill effect. Due to this, more evaporation takes place which makes you feel cool. **M.** Do it yourself **N.** Do it yourself

CHAPTER 10 : REPRODUCTION IN LANTS

A. 1. (a) 2. (b) 3. (c) 4. (a) 5. (b) **B.** 1. vegetative propagation 2. unisexual flower 3. cross pollination 4. fertilization 5. Wind, water and animals **C.** 1. ✓ 2. ✗ 3. ✗ 4. ✓ 5. ✓ **D.** 1. germination 2. pollination 3. Spore formation **E.** 1. (b) 2. (c) 3. (a) 4. (e) 5. (d) **F.** 1. The flowers are the reproductive parts of a plant. The stamens are the male reproductive part and the pistil is the female reproductive part of the flower. 2. The vegetative buds give rise to new plants. 3. A pond or a lake usually shows a greenish tinge on the upper surface because of blue-green algae. 4. Spores are usually covered by a hard protective coat because it help the spores to survive adverse conditions in the environment. 5. An eye consists of a short stem around which immature overlapping leaves are folded. **G.** 1. Sexual reproduction is a process that creates a new organism by combining the genetic material of two organisms. 2. In asexual reproduction, plants give rise to new plants without forming seeds while sexual reproduction is a process that creates a new organism by combining the genetic material of two organisms. 3. The flowers which contain either only the pistil or only the stamens are called unisexual flowers. 4. The fusion of male and female gametes is called syngamy. 5. A zygote is the initial cell formed when two gamete cells are joined by means of sexual reproduction. **H.** 1. Do it yourself 2. The pollination of a flower by pollen from the same flower or from another flower on the same plant is called self-pollination while the fertilization by transfer of pollen from the anthers of one flower to the stigma of another is called cross pollination. 3. After the pollen grains are transferred from anther to the stigma of the flower, then pollen tube is formed through which the male gametes enter into the overy and fuse with the eggs in ovules. This process is referred to as fertilization. 4. The ways by which seeds are dispersed are– (i) Dispersal by wind : Seeds float over long distances and is likely to be carried a long way from the parent plant by slight air currents. (ii) Dispersal by water : The fruits or seeds usually develop floating ability in the form of spongy or fibrous coat with hard covering which can easily be carried to long distances by water currents. (iii) Dispersal by animals : Some seeds are dispersed by animals, especially

spring seeds with hooks which get attached to the body of animals and are carried to distant places. 5. The methods of asexual reproduction are– (i) Vegetative propagation : A method of reproduction in some plants in which a new plant develops from the vegetative parts of plants such as root, stem or leaf. (ii) Budding : In budding, a new organism develops from an outgrowth or bud on another one due to cell division at one particular site. (iii) Fragmentation : In this, the filaments break up into two or more fragments. Each fragment or piece grows into a new individual. (iv) Spore Formation : Spores are very small in size. They have thick walls. The thick walls help the spores to survive adverse conditions in the environment. The spores give rise to new organisms under favourable conditions. **I.** 1. The seeds dispersed by animals have spines and hooks because they get attached to the body of animals and are carried to distant places. 2. The pond scum, a green slime found in stagnant water is a green alga. Most species are buoyant and will float to the surface, where they form scum layers or floating mats. **J.** Do it yourself **K.** Do it yourself

CHAPTER II : MOTION AND SPEED

A. 1. (d) 2. (b) 3. (a) 4. (a) 5. (c) **B.** 1. Sundials 2. Romans 3. oscillatory 4. Clock 5. millennium 6. uniform **C.** 1. ✓ 2. ✓ 3. ✗ 4. ✗ 5. ✗ 6. ✓ **D.** 1. Non-uniform 2. Uniform 3. Uniform **E.** 1. Sundials, water clocks and hour clocks. 2. A sand clock consists of two round glass bulbs. The upper bulb is filled with a fixed amount of sand that passes through the tube into the lower bulb in a fixed interval of time. 3. Do it yourself 4. A motion in which a body covers equal distances in equal intervals of time is called uniform motion. 5. The S.I. unit of speed is metres per second. **F.** 1. In ancient times, people used to keep track of time by observing the position of the sun in the sky. 2. Oscillatory motion is described as a motion that tends to be repetitive or it usually repeat the motion all over and over again. 3. The distance travelled by a body in unit time is called speed. Time is the indefinite continued progress of existence and events in the post, present and future regarded as a whole. 4. The kinds of motion are– (i) Uniform motion : A motion in which a body covers equal distances in equal intervals of time. (ii) Non-uniform motion : A motion in which a body covers unequal distances in equal intervals of time. **G.** 1. A simple pendulum consists of a small mass like a piece of stone or a metallic ball known as bob. The bob is suspended by a string. At rest, the bob is at its mean position (i.e. at the centre). When the bob of the pendulum is displaced slightly and released, it begins to move to and from. 2. A body seems to be at rest with respect to one neighbouring fixed object but the same body may appear to be in motion with respect to some other fixed neighbouring object. So, rest and motion are relative terms. 3. Speed (in m/s) = 400m /10s = 40 m/s speed (in km/hr) = 144

km/hr 4. Do it yourself 5. Basically, you can divide any unit of length by any unit of time. The S.I. unit is metres/ second, but kilometres/ hour are also commonly used worldwide. In the United states, miles/hour are used instead. **H.** Do it yourself **I.** Do it yourself **J.** Do it yourself

CHAPTER 12 : ELECTRIC CURRENT AND ITS EFFECTS

A. 1. (a) 2. (b) 3. (c) 4. (b) 5. (d) **B.** 1. Tungsten 2. Soft Iron 3. Positive, negative 4. Iron 5. Two **C.** 1. (iii) 2. (iv) 3. (i) 4. (v) 5. (ii) **D.** 1. True 2. False 3. True 4. False 5. True **E.** 1. Electric current is a measure of the amount of electrical charge transferred per unit time. 2. The path along which electric current can flow is called electric circuit. 3. A container consisting of one or more cells, in which chemical energy is converted into electricity and used as a source of power. 4. The materials which show high resistance or conduct almost no electric current through them are called insulators. 5. A safety device in an electric circuit which prevents short circuits is called fuse. **F.** 1. An open circuit is an electric trail whose normal path of current has been interrupted. This is done by either disconnection of one part of its conducting pathway. 2. A nichrome wire get heated in an electric circuit because nichrome offers a large resistance and thus the mechanical energy of the drifting electrons changes to heat energy rapidly. 3. Lead and tin are used to make the fuse wire. 4. Overloading the circuit or a device like a power strip will cause the wiring to heat up at its weakest point and can result in fire, it can also cause insulation to melt resulting in an electrical short. **G.** 1. The following are the steps to make an electromagnet– (i) Take an iron nail of about 6-10 cm in length and wind an insulated copper wire on it. (ii) Now connect the ends of the copper wire to the two terminals of a dry cell via a switch. (iii) Switch on the current through the circuit and bring a few pins near the wounded nail. (iv) Now switch off the current. The iron nail behaves like a magnet as long as current flows through the circuit. The pins cling to the nail when the switch is 'on', while they drop as soon as the switch disconnects the electric circuit. 2. An electric bell is the most common application of electromagnets. It consists of an electromagnet, a spring iron strip, a hammer, a gong, two switches and connecting wires. When you press the switch of the call bell at your door, the current passes through the circuit and the electromagnet pulls the springy iron strip, which forms one terminal of the other switch. As the strip moves towards the electromagnet, its contact with terminal is lost. This breaks the circuit. As a result, the electromagnet stops attracting the iron strip. The strip goes back to its original position and its contact with terminal is re-established. This backward and forward movement of the iron strip takes place many a times in a second and produces sound. The loudness of the sound may be enhanced with the help of a hammer attached to strip which in turn strikes

the gong. 3. The measure of material's hindrance to the flow of electric current is known as electrical resistance. The heat that is generated from the light that we get from light bulls is due to resistance. In a light bulb, the electricity flowing through the filament inside the bulb, cause them to glow white hot. If all the oxygen were not removed from inside the bulb, the wires would burn up. 4. The substances that conduct electricity are called conductors. They offer very less resistance to the flow of electric current. This property of different resistance offered by different materials towards flow of electric current is used in various applications of electricity.

H. Do it yourself **I.** Do it yourself **J.** Do it yourself

CHAPTER 13 : LIGHT

A. 1. (a) 2. (a) 3. (c) **B.** 1. Straight 2. beam 3. Convergent 4. same distance, object 5. distant **C.** 1. pole 2. Centre of curvature 3. Radius of curvature 4. Dispersion 5. Spectrum **D.** 1. False 2. False 3. True 4. False 5. True **E.** 1. The geometric centre of the spherical mirror is called its pole. 2. A beam of light which comes from a small source and diverge out is called a divergent beam of light. 3. The reflected rays appear to come from a point on the principal axis and this point is called principal focus of convex mirror. 4. A convergent lens is a lens that converges rays of light that are travelling parallel to its principal axis. 5. An image obtained due to actual meeting of reflected rays is called real image. 6. The distance between the pole and the centre of curvature is called the focal length. **F.** 1. A beam of light broad source of light and converge at a point is called a convergent beam of light while a beam of light which comes from a small source and diverge out is called a divergent beam of light. 2. A curved mirror with its outer side polished silver is called concave mirror while a curved mirror with silver polish on its inner surface is called convex mirror. 3. A spherical lens with thick edges and thin centre is called concave lens while a spherical lens with a bulge at the centre and thin edges is called convex lens. **G.** 1. A convex lens can be used to burn a piece of paper using the sunlight because convex lens converges rays of light to a point. It converges sunlight to a point which in turn ignites the paper. 2. Lemons kept in a glass of water appear to be enlarged because when light travels from denser medium to lighter medium, it bends towards the normal. Due to this, different light rays meet above the actual position of the lemon. 3. The word 'AMBULANCE' is written inverted in the concerned vehicles so that you can read it correctly when you look in your rare view mirror. 4. In plane mirror, the image in formed behind the mirror.

H. 1. All luminous objects, both natural and artificial, are called the sources or light. 2. A plane mirror is a mirror with a plan or reflective surface. 3. The centre of a circle which passes through a curve at a given point and has the same tangent and curvature at that point. 4. Concave mirrors are used in telescopes and microscopes 5. A spherical lens with a bulge at the centre and thin edges in called convex lens. **I.** 1. A curved mirror with its outer side polished silver is called concave mirror. 2. The midpoint of the pole and centre of curvature of the spherical mirror is called its focus. It lies on the principal axis and is denoted by capital 'F'. 3. The lens, which is thin at the centre and becomes thick as you move towards the edges, is called a concave lens. 4. Some elderly people, who have both the defects in their eyes, use both the types of lenses in their spectacles. Such spectacles are known as bifocal spectacles. 5. The splitting of while light into its seven constituent colours on passing through a prism. **J.** 1. The uses of convex lens are– (i) Convex lens are used in cameras of all types except a pin hole camera. (ii) Convex lens are used in telescopes and microscopes. (iii) Convex lens are used in spectacles to help people see nearby things clearly. 2. Convex mirror is used as a rear view because it gives a clear diminished and an erect image of the traffic that is behind you. It covers a wide range of the traffic behind you and gives a very clear image. 3. The left and the right sides of the image get interchanged, as compared to those of the object. This behaviour is known as lateral inversion. 4. (i) The size of the image is equal to the size of the object. (ii) The image is upright or erect. (iii) The image formed in a plane mirror is at the same distance from the mirror, as the object is kept in front of it. **K.** Do it yourself **L.** Do it yourself **M.** Do it yourself

CHAPTER 14 : WIND, STORM AND CYCLONE

A. 1. (c) 2. (d) 3. (c) 4. (a) **B.** 1. pressure 2. hurricane 3. Storm 4. Waterspouts **C.** 1. False 2. True 3. True 4. True **D.** 1. The force of the earth's gravity pulls the molecules of the air towards the ground. 2. Air expands on heating and occupies more space. Hence, warm air is lighter than cold air. 3. All the places on the earth are not heated to the same extent. In other words, there is uneven heating of the earth. This results in the generation of wind currents. 4. Too much rain can cause flood. **E.** 1. Fill the plastic bottle with some hot water. Next, empty the bottle and tighten its cap. Then place the bottle under running tap water for some time. By doing this, the shape of the bottle gets distorted. This is because when cold water is poured over the bottle, some water vapour in the bottle condenses into water. This leads to a decrease in the amount of air inside the bottle. The pressure exerted by the outside air is more than the pressure of the air inside the bottle.

This difference in pressure compresses the bottle and it gets distorted. This shows that air exerts pressure. 2. Thunderstorms are caused by violent air currents inside moist clods. The warm and moist air rapidly rises inside the clouds. In this process, the water vapour present in it condenses to form tiny droplets of water which freeze to form ice. 3. Storms are severe atmospheric disturbances followed by very fast moving winds. They are generally accompanied by rain or snow and sometimes by thunder and lightning. 4. A column of rapidly spinning air around a low pressure area over the sea is called cyclone. Effects of cyclone– (i) Cyclone can damage houses, uproot trees, telephone and other communication systems leading to the loss of life and property. (ii) Heavy rains may bring flood. **F.** 1. A cyclone exhibits the following characteristics– (i) The centre of a cyclone is known as its eye. (ii) Violent winds circulate round the eye like a spiral (iii) A cyclone is more than 100m thick and 80-500km wide. (iv) A cyclone generally move west wards in the tropical zone (v) In a cyclone, winds blow on a curved path with a speed of over 100km per hour. 2. All the places on the earth are not heated to the same extent. In other words, there is uneven heating of the earth. This results in the generation of wind currents. 3. The Indian Meteorological Department studies the development of cyclones with the help of INSAT satellites and cyclone detection radars. This government organisation is responsible for meteorological observations, weather forecasts, and detection of earthquakes. The IMD is also responsible for forecasting tropical cyclones in the Arabian Sea and the Boy of Bengal. It is located in New Delhi. **G.** Do it yourself **H.** Do it yourself

CHAPTER 15 : WATER

A. 1. (d) 2. (c) 3. (c) 4. (b) 5. (a) 6. (d) 7. (c) 8. (c) **B.** 1. ice 2. Water table 3. well, spring 4. ice, water & vapours 5. Infiltration **C.** 1. True 2. False 3. True 4. False 5. True **D.** 1. (d) 2. (c) 3. (a) 4. (e) 5. (b) **E.** 1. Groundwater 2. Water 3. Drip irrigation 4. aquifer **F.** 1. About 71% of the earth's surface is covered with water. 2. Water evaporates from the oceans and other large water bodies and returns to the earth as rain, snow and other kinds of precipitation. This is called water cycle. 3. The three states of water are ice, water and vapours. 4. The process of seeping of water into the ground is called Infiltration. 5. Water-bearing rocks readily transmitting water to wells and springs are called aquifer. **G.** 1. The earth look blue from space because 71% of the earth's surface is covered with water. This water lies in the vast oceans, seas rivers, lakes, ice-caps, underground water and in the atmosphere. 2. (i) Increase in population. (ii) Increase in industrial and agricultural activities. (iii) Scanty rainfall (iv) Deforestation and decrease in the effective

area for seepage of water. 3. Water table will lower down. 4. Water is used by all the industries. In almost all processes of industry we use water. The number of industries is increasing continuously. Water used by most of the industries is drawn from the ground. This lowers the water table further. 5. Rainwater harvesting is the accumulation and deposition of rainwater for reuse before it reaches the aquifer. 6. Bawris are deep step wells built into the ground. It is a rational way of collecting water. It is a method of collection of spring water in small reservoirs scattered at intervals on the high uplands and then drawing water from these ponds when required. Water from these bawris is used for irrigating crops and also for drinking purposes. **H.** 1. Water evaporates from the oceans and other large water bodies and returns to the earth as rain, snow and other kinds of precipitation. This is called water cycle. The water cycle is necessary for all life on earth because it is constantly maintaining the earth's supply of fresh water. This means that no life would have been possible on land without water cycle. 2. Groundwater is present in between the various layers of soil and impervious rock. It is actually rain water which mainly comes from seepage of water accumulated under the ground. The process of seeping of water into the ground is called infiltration. The groundwater thus gets recharged by this process. 3. Water table goes down when large quantity of ground water is taken out for various purposes. Some of the causes of depletion of water table are increase in population, industrial and agricultural activities. Scanty rainfall is another factor that may deplete the water table. Yet another factor affecting water table could be deforestation and decrease in the effective area for seepage of water. 4. Water management is the activity of planning, developing, distributing and optimum use of water resources under defined water policies and regulations. A technique to conserve water is Rainwater harvesting. It is the accumulation and deposition of rain water for reuse before it reaches the aquifer. 5. Drip irrigation is a technique of watering plants by making use of narrow tubing's which deliver water directly at the base of the plant. This saves a lot of water. Drip irrigation is commonly used in dry regions with scarce water resources. **I.** Do it yourself **J.** Do it yourself **K.** Do it yourself

CHAPTER 16 : FORESTS

A. 1. (d) 2. (b) 3. (d) 4. (b) **B.** 1. 30% 2. soil erosion, floods 3. Global warming 4. deforestation 5. afforestation **C.** 1. False 2. True 3. True 4. False **D.** 1. Forests are called green lungs. 2. The increase in the temperature of the earth with the increase in CO_2 concentration is called global warming 3. The interlinked food chains form a food web 4. The destruction of forests or felling of trees on a large scale is called deforestation. 5. Large scale planting of trees is called afforesation. **E.** 1. The plant layers found at different heights below the canopy are known as understoreys. 2. The

branches of tall trees tend to form a roof over other plants in the forest. Such a roof or cover formed by the tree branches in the upper regions is called a canopy. The part of a tree, above the stem, which has branches, is known as the crown of the tree. Crowns differ in shape and size in different trees. 3. Paper, Furniture, Spices, Firewood, coir food mat. 4. Food chain is a system where a small animal is the food for a larger animal which in turn is the food for an even larger animal. The food chain can be represented as follows– Grass–Grasshopper–Frog–Snake–Eagle 5. Plants are dependent on animals for– (i) Carbon dioxide required for photosynthesis. (ii) Pollination required for seed formation. (iii) Dispersal of seeds and fruits. **F.** 1. The forests are useful to us in many ways : (i) source of food– All living organisms depend on plants directly or indirectly for food. (ii) Prevent soil erosion– Tree prevent soil erosion by holding the soil particles together through their root system. (iii) Provide shutter and protection– Many animals and plants live in forests. (iv) Regulate climate and water cycle– Trees absorb water from the soil through their roots and release water vapour into the air through evaporation (transpiration). 2. Trees allow water to seep into the soil through their root system. Forest acts as a natural absorber of rainwater and helps to maintain the water table. Further, the flow of water is also reduced by the presence of trees. In this manner, the impact of floods is greatly reduced. If trees are not present, rain hits the ground directly and floods the area around it. 3. Plants purify airs as they release oxygen in the atmosphere through the process of photosynthesis. The oxygen is used by animals and plants for their respiration. However, plants have the unique ability of using carbon dioxide during the process of photosynthesis. Plants thus maintain the balance of oxygen and carbon dioxide in the atmosphere. 4. Some living organisms get food from the dead bodies of other plants and animals. Not only do the living bodies of living organisms provide food for others but their dead bodies also serve as food. The dead bodies of plants and animals are food for fungi and bacteria that live in the soil. These organisms are called decomposers. Due to the activity of decomposers, the bodies of plants and animals get reduced to the substances from which they were made. 5. The causes of deforestation are– (i) To increase food production, forest land has been converted into agricultural land. (ii) To create more houses for the increasing population, forests have been cut. (ii) To create more houses for the increasing population, forests have been cut. (iii) To create transport facilities, construction of road has increased manifold. (iv) Increased industrial development has led to deforestation. (v) Increased wood requirement for paper and various other industries has led to felling of more trees. **H.** Do it yourself **I.** Do it yourself

MODEL TEST PAPER – I

A. 1. Corpse flower 2. cytoplasm 3. mulberry 4. bad 5. natural **B.** 1. True 2. True 3. False 4. True 5. True **C.** 1. The process of taking in food and its utilization by the body is called nutrition. 2. The process of shaving a sheep's body to obtain fleece is called shearing. 3. A substance expand on heating

because the particles that make up the substance is trying to get out and escape the heat. 4. Migratory birds are the birds that travels from one place to another at regular times often over long distances. 5. The breathing aperture of insects are called spiracles. **D.** 1. We need food to stay alive. Food provides us with a number of nutrients which are necessary for the proper functioning of our body. 2. The speed of light in a vacuum is 186, 282 miles per second. 3. A substance that is sour in taste and turns blue litmus red is called an acid. 4. The process of depositing a layer of zinc on an iron article is called galvanization. 5. The process that includes breathing in of oxygen, using it for the release of energy by the oxidation of food in the living cells and breathing out of waste products like carbon dioxide and water. **E.** 1. In a pitcher plant, the pitcher like structure is the modified part of the leaf. The leaf tip is modified to form a lid which can open or close the mouth of the pitcher. Inside a pitcher, downward pointing hair, are present. Once an insect enters the pitcher, the lid closes and the insect gets trapped in the hair. 2. The food becomes trapped in a food vacuole. Inside it, food gets digested by digestive enzymes which are secreted into the food vacuole. These enzymes act on the food and break it into simpler substances. Gradually the digested food is absorbed and utilised by the cell. 3. The stages in the life cycle of silk moth are the adult, the egg, the larva and the pupa. 4. A reaction in which an acid combines with a base to form salt and water is called neutralisation reaction. Toothpastes are basic in nature and neutralise the acid and thus help in preventing tooth decay. 5. Rust is a reddish-brown substance that appears on the surface of iron articles when they are left exposed to moist air.

MODEL TEST PAPER – II

A. 1. WBC's 2. Wind, water, animals 3. oscillatory 4. iron core, insulated wire 5. hurricane **B.** 1. True 2. False 3. False 4. True 5. False **C.** 1. Aorta is the largest artery. 2. The vegetative buds give rise to new plants. 3. The movement of charges through a body and the flow of electric charge is called electric current. 4. A spherical lens with a bulge at the centre and thin edges is called convex lens. 5. The interlinked food chains form a food web. **D.** 1. The xylem vessels transport water and dissolved minerals upwards from roots through stem to the tips of leaves against the force of gravity. This upward movement of water and minerals is called ascent of sap. 2. Zygote is an initial cell formed when two gamete cells are joined by means of sexual reproduction. 3. Oscillatory motion is a motion that repeats itself in a regular cycle. e.g., pendulum. 4. Overloading the circuit or a device like a power strip will cause the wiring to heat up at its weakest point and can result in fire. 5. The elderly people, who have both the defects in their eyes, use both the types of lenses in their spectacles. Such spectacles are known as bifocal spectacles. **E.** 1. Red blood corpuscles (RBCs) are cells without nucleus. Their cytoplasm has oxygen carrying pigment called haemoglobin. It gives red colour to these corpuscles. It combines with

oxygen to form ox haemoglobin, which transports oxygen to all the body cells. RBC's live for 90 to 120 days only. 2. A simple pendulum consists of a small mass like a piece of stone or a metallic ball known as bob. The bob is suspended by a string. At rest, the bob is at its mean position (i.e., at the centre). When the bob of the pendulum is displaced slightly and released, it begins to move to and fro. 3. All the places on the earth are not heated to the same extent. In other words, there is uneven heating of the earth. This results in the generation of wind currents. 4. Groundwater is present in between the various layers of soil and impervious rock. It is actually rain water which mainly comes from seepage of water accumulated under the ground. The process of seeping of water into the ground is called infiltration. The groundwater thus gets recharged by this process. 5. The conservation of forests can be done in the following ways– (i) preventing overgrazing. (ii) Protection from forest fires. (iii) Planned cultivation and wise use of agricultural land.

Teacher's Manual
Science Bullet (Class-8)

CHAPTER 1 : CROP PRODUCTION

A. 1. (a) 2. (b) 3. (c) 4. (d) **B.** 1. Rice, wheat 2. broadcasting 3. loosening soil 4. preparation 5. following **C.** 1. False 2. False 3. True 4. False 5. False **D.** 1. (d) 2. (a) 3. (e) 4. (b) 5. (c) **E.** 1. Cereal or grain crops– Rice, Wheat. Pulse or legume crops– Gram, pea. Oilseed crops– Mustard, Groundnut. Fibre crops– Cotton, jute. 2. The field is levelled with the help of a leveller before souring of seeds. 3. Transplanting seedling promotes better penetration of roots in the soil and also enables us to select only healthy seedlings for the plants. 4. Following allows the soil to naturally regain the nutrients. **F.** 1. The various sources of irrigation are– (i) Traditional methods– Moat, chain pump, dhekli and Rahat. (ii) Modern methods– Sprinkler system, drip system. 2. Most farmers remove weeds from the crop fields because weeds reduce crop yield as they composite with the crops for water, minerals and sunlight. So, it is necessary to remove them from the fields from time to time. 3. Legume plants are grown in crop rotation because these are able to fix atmospheric nitrogen and convert it into usable nitrogen. 4. In traditional methods of irrigation, cattle or human labour is used. Hence, these methods are cheaper, but less efficient. The different traditional methods are moat, chain, pump, rahat, dhekli, etc. **G.** 1. The advantages of ploughing the soil are– (i) Loose soil contains a lot of air spaces in it. This allows roots to breathe easily. (ii) Ploughing uproots the undesirable plants are kills them. (iii) Loose soil mixes uniformly with manure or fertilizers. (iv) Ploughing brings the nutrient–rich soil from the lower layers to the top and makes it easily available for plant to use. 2. Point to be kept in mind while souring seeds– (i) Seeds should be of good quality and healthy. (ii) They should be sown at the proper depth in the soil. The proper depth varies from crop to crop. If sown deep in the soil, roots will not be able to respire. If sown on the surface, birds many damage the seeds. (iii) Seeds should be sown at proper distance from each other to prevent overcrowding of plants. This allows plants to get enough water, nutrients and sunlight. 3. The methods of irrigation which conserve water are– (i) Sprinkler system– In this system, perpendicular pipes with rotating nozzles on the top joined to the main pipeline at regular intervals. A pump is used to allow water to flow under pressure in the main pipeline. From the main pipeline, water enters the perpendicular pipes and escapes from the rotating nozzles, which sprinkles water on the crop. (ii) Drip system– In this method, water falls drop by drop at the position of the roots. It is an economical method because water is not wasted at all. 4. (i) Manual

removal– The weeds are removed or pulled out (uprooted) by hand or by cutting them close to the ground at intervals. This is done with the help of a trowel or a harrow. (ii) Removal with chemicals– Certain chemicals are also used to control weed. **H.** 1. Some seeds becomes hollow as they are eaten by worms or little insects from inside which makes them lighter and this is why they float on the surface of water. 2. We should not use chemical fertilizers indiscriminately because it makes the soil less fertile and are a source of water pollution. **I.** Do it yourself. **J.** Do it yourself. **K.** Do it yourself. **L.** Do it yourself.

CHAPTER 2 : MICRO ORGANISMS

A. 1. (c) 2. (d) 3. (a) 4. (a) **B.** 1. Pathogenic 2. algae 3. decomposers 4. multicellular 5. pathogens 6. aerobic 7. entamoeba histolytica **C.** 1. False 2. True 3. True 4. False 5. True 6. False 7. True **D.** 1. Microbiology 2. Lactobacillus 3. Fermentation 4. Blue green algae 5. Toxins **E.** 1. Mosquitoes 2. Laminaria 3. Rabies **F.** 1. Pasteurisation is the process of heat and cold treatment to which milk is subjected to make bacteria free. 2. Fermentation is a metabolic process that converts sugar to acids, gases or alcohol. **G.** 1. Virus are smallest and the most primitive cellular microorganism while bacteria constitute a large domain of prokaryotic micro organisms. 2. Algae are simple unicellular or multicellular green plants while fungi are plant like, non-green multicellular organisms. 3. Yeasts are eukaryotic microorganisms while a mushroom is the fleshy, spore, bearing fruiting body of a fungus. 4. Bacteria constitute a large domain of prokaryotic micro organisms while blue green algae are any of a number of species of microscopic bacteria that are photosynthetic. **H.** 1. The study of micro organisms is called microbiology. 2. The bacteria which do not require oxygen are called anaerobic bacteria. 3. Algae are called grass of water. 4. An obligate parasite is a parasitic organism that cannot complete its life cycle without exploiting a suitable host. 5. A vaccine is a biological preparation that improves immunity to a particular disease. **I.** 1. Food should always be kept covered to avoid flies and insects from sitting on it. Because food poisoning is more common in areas with poor sanitation or living conditions. 2. Antibiotics are powerful drugs used to treat certain illness. They can even be harmful. 3. Lactic acid bacterium is used to make curd from milk. These bacteria multiply in milk and convert in into curd. 4. Vaccines are given to healthy persons to induce formation of antibodies infection. These have dead or weekend micro organisms. 5. Mangoes get spoiled but not the jam prepared from them because sodium benzoate and sodium metabisulphite

are used as preservatives to preserve jams made from mangoes. **J.** 1. On the basis of shapes, bacteria are classified into the following types : (i) Cocci– spherical bacteria. (ii) Bacilli– Rod shaped bacteria. (iii) Spirilla– Spiral– shaped bacteria. (iv) Vibrio– Comma–shaped bacteria. 2. The fungi include the fact that they break down organic matter. The broken down organic matter nourishes. Animals and plants. Fungus is the form of yeast is advantageous for making breed. 3. The conversion of free atmospheric nitrogen into useful nitrogen compound is called nitrogen fixation. There are three methods of nitrogen fixation– Atmospheric nitrogen fixation, biological nitrogen fixation and Industrial nitrogen fixation. 4. A medicine which is used to kill or stop the growth of disease causing bacteria are called antibiotics. The precautions to be taken while taking antibiotics are– (i) antibiotic should be taken under the supervision of a well qualified doctor. (ii) Course of antibiotics should be complete as per the prescription given by the doctor. 5. Fungi have heterotrophic mode of nutrition and they acquire their nutrients by absorption. They are non-green plants. They are either saprophytic or parasitic. (i) The saprophytic fungi obtain food from dead & decaying organic matter over which they grow. (ii) The parasitic fungi live in or on the body of living organisms and derive food from them. 6. Decomposers are organisms that break down dead or decaying organisms, and in doing so, carry out the natural process of decomposition. Decomposers break down cells of other organisms using biochemical reactions that convert the prey tissue into metabolically useful chemical products. **K.** 1. Drain water foul smell because of the decaying matter in it. 2. Do it yourself. **L.** Do it yourself.

CHAPTER 3 : SYNTHETIC FIBRES AND PLASTICS

A. 1. (d) 2. (c) 3. (b) 4. (b) **B.** 1. polymer 2. rayon 3. wool 4. plastic **C.** 1. D 2. A 3. C 4. B **D.** 1. plastic 2. nylon **E.** 1. Monomers. 2. Terylene with cotton. 3. The substances which do not decompose to harmless substances by the action of air, water and bacteria are called non-biodegradable substances. Example– Nylon and polyester. 4. Thermosetting plastics. **F.** 1. The uses of polyester fibres are– (i) For manufacturing sarees, dress materials, curtain cloth, etc. (ii) For making sails for sail boats. (iii) For making water hoses for fire fighting. (iv) For making convey or belts. 2. Linear polymer is a chain of molecules organized in a strict linear structure and a cross-link is a bond that links one polymer chain to another. 3. Biodegradable substances are the ones that will decay after a period when buried under the soil. 4. (i) It is light weight and can be transported easily.

G. 1.	Thermoplastic	Thermosetting plastic
(i)	Thermoplastic are polymers with no cross-linking. Heating also does not produce any cross-linking between the chains.	Thermosetting plastics are the polymers in which chains get highly cross-linked on heating.
(ii)	It can be processed repeatedly.	Once moulded, it cannot be reprocessed.
(iii)	Example– Polythene, PVC, etc.	Example– Bakelite, Melamine, etc.

2. Advantages of Synthetic fibres– (i) They do not shrink. (ii) They are quick drying and need very little or no ironing. Disadvantages of Synthetic fibres– (i) They do not absorb water or sweat in hot and humid weather. (ii) They melt and burn easily. 3. (i) Soil pollution. (ii) Blockage of drains and sewer lines. (ii) Death of animals who happen to chew these bags along with the food wrapped therein. (iv) Reduces the percolation of water into the soil. **H.** 1. Melamine. 2. Kitchen waste, cotton cloth. 3. Do it yourself.

CHAPTER 4 : METALS AND NON-METALS

A. 1. (b) 2. (b) 3. (c) 4. (a) **B.** 1. Malleability 2. Silver 3. Graphite 4. Acids **C.** (i) 1. Graphite 2. Diamond 3. Sodium 4. Graphite (ii) 1. The property by virtue malleability. 2. The property by virtue of which metals can be drawn into thin wires is called ductility. 3. The property by virtue of which metals object produces a ringing sound when struck with a hard object is called sonority. 4. The property of slow eating away of a metal due to the attack of atmospheric gases and moisture on its surface is called corrosion. **D.** 1. Lustre, malleability and ductility. 2. Metals are good conductors of electricity and are therefore, used for making electrical cables. 3. Rusting of iron is an undesirable reaction because the layer of rust formed falls off, exposing the metals to further rusting. 4. Copper vessels turn green with the passage of time due to the reaction of copper with carbon dioxide and moisture present in the atmosphere. **E.** 1. (i) Ductility • Most metals can easily be drawn into thin wires, which have a wide range of applications. • Non metals are brittle and cannot be drawn into wires. (ii) Thermal conductivity • Metals are good conudctor of heat and are therefore used for making cooking utensils. • Non-metals are generally poor conductors of heat. (iii) Electrical conductivity. • Metals are good conductors of electricity. • Non-metals are generally poor conductors of electricity. 2. (a) Zinc reacts with sulphuric acid to from zinc sulphate and hydrogen gas.

$$Zn + H_2SO_4 \longrightarrow Zn\,SO_4 + H_2$$

(b) Magnesium reacts with sulphuric acid to from magnesium sulphate and hydrogen gas.

$$Mg + H_2SO_4 \longrightarrow Mg\ SO_4 + H_2$$

(c) Aluminium reacts with hydrochloric acid to from aluminium chloride and hydrogen gas.

$$2Al + 6HCl \longrightarrow 2AlCl_3 + 3H_2$$

3. Displacement reaction is a chemical reaction in which a more reactive element displaces a less reactive element from its compound. Iron reacts with copper sulphate solution because it is placed higher in the activity series than copper while copper does not react with iron sulphate as it is less reactive than iron. **F.** 1. Metal pans in the kitchen have either wooden or plastic handles because they are bad conductors of heat. 2. Metallic bells exist but not the wooden bells because of the property of sonority. **G.** Do it yourself**.**

CHAPTER 5 : COMBUSTION AND FLAME

A. 1. (c) 2. (a) 3. (d) **B.** 1. Pollution 2. LPG 3. Ignition temperature 4. Water **C.** 1. True 2. True 3. True 4. False **D.** 1. Iron nails 2. Coke 3. Heat 4. Gasoline **E.** (b) 2. (d) 3. (a) 4. (c) **F.** 1. Water is not used to control the fire involving electrical equipment because water is a good conductor of electricity. 2. Wet paper does not burn while a dry paper catches fire easily because in the presence of water, the ignition temperature of paper is not reached. 3. Charcoal is burnt in a hearth because it provides us warmth for a longer period of time. 4. Petrol does not catch fire at room temperature because its ignition temperature is higher than room temperature. **G.** 1. It is difficult to burn a heap of green leaves but dry leaves catch fire easily because green leaves have moisture in them but in dry leaves, the cells are dead and it is combustible to fire. 2. Goldsmith blows the outermost zone of a flame with a metallic blow-pipe for melting gold and silver because here the supply of oxygen is adequate and this is the hottest part of the flame 3. Do it yourself. 4. Yes, the process of rusting could be called combustion because combustion involves elements combining with oxygen. With rust, the iron atoms combines with the oxygen atoms in the air forming iron oxide. **H.** 1. We should try to conserve energy because it helps to reduce demand for nuclear power as well as for fossil fuels. 2. Carbon dioxide gas is used to extinguish fire because it is non-reactive and it displaces the oxygen near the fire. **I.** Do it yourself. **J.** Do it yourself.

A. 1. (a) 2. (a) 3. (a) 4. (c) **B.** 1. heavy 2. deforestation 3. endemic species 4. natural **C.** 1. True 2. False 3. False 4. True 5. False **D.** 1. Conservation 2. Biosphere reserves 3. Core zone 4. Endangered. **E.** 1. (d) 2. (a) 3. (e) 4. (b) 5. (c) **F.** 1. The species that are facing threat of extinction are called endangered species while the species that existed on land once but have disappeared now are called extinct species. 2. All plant species found in a particular area are called flora while are called fauna. 3. The clearing of forests by indiscriminate cutting of forests is called deforestation while replanting in forests is called a forestation. 4. A sanctuary is a protected land area reserved for the conservation of wild animals, birds and plants while a biosphere reserve is a specified land area in which multiple use of land is permitted for preserving biodiversity. 5. The species that are found exclusively in a particular area are called endemic species while exotic species is one that is not native to a given area. **G.** 1. Conservation of biodiversity is essential because : (i) Biodiversity maintains balance in nature or balance in the ecosystem. (ii) Wildlife animals and plants provide a variety of commodities. (iii) Wildlife is needed for breeding programmes in agriculture, horticulture, sericulture, apiculture, etc. 3. India has a rich and varied biodiversity because of a variety of habitats such as desert, grassland, tropical and temperate forests, coastal wetlands and alpine vegetation. More than 50% of total species of plants and animals found on the earth are present in India. Therefore, India is one of the mega biodiversity nation. 4. Deforestation leads to loss of natural habitats of wild animals and depletion of food resources. 5. Birds migrate to escape the inhospitable winter conditions, find plenty of food and lay eggs at a worm place where they can incubate early. **H.** 1. Red Data Book contains a record of all those species of plants and animals which are under the threat of extinction or are rare and vulnerable for extinction. 2. The IUCN stands for International Union for Conservation of Nature and Natural Resources. 3. Replanting trees in forests is called afforestation. 4. The species that are found exclusively in a particular area are called endemic species. **I.** 1. The effects of deforestation on environment are– (i) Global dioxide– Deforestation increases level of carbon dioxide in the atmosphere causing global warming and greenhouse effect. (ii) Change in climate– It increases temperature, reduces rainfall and increases wind velocity. These changes lead to climate changes. 3. The major threats to wildlife are– (i) Habitual loss– The destruction of natural habitats of animals by deforestation disturbs the life, growth and reproducing timing of wild animals. (ii) Indiscriminate hunting– Indiscriminate killing and poaching of wild animals for food, skin, fur, horn, tusk, etc. (iii) Pollution– Air, water and soil pollution is also responsible for death and elimination of sensitive wild species. 4. Project Tiger was launched in 1973 CE to save tiger

from poaching. Under this project, 23 tiger reserves have been established in India. **J.** 1. Deforestation leads to loss of natural habitats of wild animals and depletion of food sources. 2. A biosphere reserve is a specified land area in which multiple use of land is permitted for preserving biodiversity. It is divided into three zones for different activities. • Core zone– Where no human activity is permitted. • Buffer zones– Where limited human activity is allowed. • Manipulation zone– Where several human activities are permitted. A biosphere reserve helps in maintaining the biodiversity as well as the culture of that area. 3. Great increase in human population in the last 70 years is responsible for the rapid decline of biodiversity because more and more land is needed for agriculture, housing, for making roads, and for constructing dams, bridges, powerhouses and industries. 4. In our country several legal provision or acts related to conservation of wildlife and forests have been enacted by the government. These are– **(a) Forest Conservation Act :** This act empowers government and forest deparment (i) to create and manage reserved forests, protected forests and village forests. (ii) to conserve forests as a natural heritage. (iii) to control movement of forest produce. (iv) to control and regulate cattle grazing in forests. **(b) Wildlife Protection Act :** The objectives of this act are– Prohibition of hunting of listed threatened species. (ii) Setting up and management of national parks, sanctuaries and biosphere reserves. (iii) Control and management of captive breeding. (iv) Protection of specific plants and natural habitats of animals. **K.** Do it yourself**. L.** Do it yourself**.**

CHAPTER 7 : THE CELL

A. 1. (c) 2. (c) 3. (a) 4. (b) 5. (c) **B.** 1. tissue 2. nucleus 3. ostrich's egg 4. unicellular 5. irregular **C.** 1. (i) 2. (ii) 3. (iii) 4. (iv) 5. (v) **D.** 1. cell membrane 2. slice of cork 3. organelles 4. cell organelles 5. chromosomes **E.** 1. Robert Hooke, on English man, discovered the cell. 2. Cells in different organisms show variations in their number, shape and size. 3. The three basic parts of cell are– (i) Cell membrane (ii) Cytoplasm (iii) Nucleus 4. The living substance of the cell is called the protoplasm. 5. Organelles are present in the cytoplasm. **F.** 1. Do it yourself. 2. Nerve cells are long in order to transmit information by electrical and chemical signalling from the body to the brain. 3. A cell is the basic unit of structure and function of an organism. In other words, it is the smallest sub-division is an organism which has a definite structure and performs functions of life. All living organisms are made up of one or more cells. 4. Do it yourself. **G.** 1. (a) Cytoplasm is a jelly like liquid which occupies the space between the cell membrane and the nucleus while the living substance of a cell is called protoplasm. (b) Plant cells have chloroplast while animals cells do not have chloroplast. Plant cells have large central vacuole while animals cell have a

very small or no vacuole at all. (c) Cell membrane is a thin outer covering of a cell and allows movement of substance both inward and outward whole nuclear membrane is a thin porous membranes that separated the nucleus from the cytoplasm. (e) The organisms with prokaryotic cells are called prokaryotes while the organisms with eukaryotic cells are called eukaryotes. (f) A jelly like fluid which occupies the space between the cell membrane and the nucleus are called cytoplasm while a jelly like substance called the nucleoplam fills up the nucleus. 2. (a) The living substance of the cell is called the protoplasm. It includes the cytoplasm and the nucleus. (b) The cytoplasm is a jelly like fluid which occupies the space between the cell membrane and the nucleus. A number of tiny components or structure called the cell organelles are present in the cytoplasm. (c) Nucleus is a spherical structure present in the centre of the cell and is surrounded by the cytoplasm. It is also known as the control centre of the cell. (d) Cytoplasm contains a number of small structures called organelles. These include mitochondria, Lysosomes, ribosome's, plastids, etc. 3. (a) Cell membrane separates cells from one another and also from the surrounding medium. It serves as a boundary that separates the contents of the cell from the outer environment. It is composed of proteins and lipids. (b) A number of tiny components or structure called the cell organelles are present in the cytoplasm. Some of these organelles are mitochondria, Golgi bodies, ribosome's and endoplasmic reticulum. All the chemical reactions and functions of life take place in the cytoplasm. (c) The function of the nucleus is to maintain the integrity of the genes and to control the activities of the cell by regulating gene expression. (d) The additional covering layer around the cell membrane is called the cell wall. A cell wall is made of a rigid, non-living substance called cellulose and provides protection and shape & support to the cell. (e) Chromosomes carry a number of genes. The chromosomes and the genes help in the inheritance of characters from the parents to their children. (f) The function of the chloroplast is to transfer the carbohydrate to all parts of the plants aiding in a plants survival. It also captures light energy which is stored in the energy storage molecules ATP for use in the process of photosynthesis. **H.** Do it yourself.

CHAPTER 8 : FORCE AND PRESSURE

A. 1. (c) 2. (d) 3. (b) 4. (a) **B.** 1. force 2. gravitational 3. shape, size 4. energy, wind 5. magnetic, distance **C.** 1. true 2. true 3. false 4. false 5. true **D.** 1. muscular force 2. aneroid barometer 3. picking alpine with a magnet 4. Pascal 5. drawing pin **E.** 1. Frictional force 2. Electrostatic force 3. Pascal 4. Atmospheric pressure 5. Pascal's law **F.** 1. The SI unit of force is Newton. Some other units used for describing force are kilogram force and gram force. 2. (i) Contact forces – The forces in which the two interacting

objects are in physical contact with each other are called contact forces. For example : When you push a car, you are in actual physical contact with the car. (ii) Non-Contact forces – The forces which do not make a physical contact with the body and act through space are called non-contact forces. For example : A magnet can pull iron alpines from a distance. 3. The force acting on a body may cause the following effects on it : (i) A force acting on a body can change its sate of motion or rest. (ii) A force can change the direction of motion of a moving object. (iii) A force can change the shape and size of an object. (iv) A force can stop a moving object. (v) A force can change the speed of a moving object. 4. Balanced force — When the resultant of all the forces acting on a body is zero, the forces are said to be balanced forces. The balanced forces : (i) Cannot set any stationary body into motion. (ii) Cannot change the speed / velocity of a moving body. (iii) Many change the shape and size of a soft object. Unbalanced force — When the resultant of all the forces acting on a body is not zero, the forces are unbalanced forces. The unbalanced forces can – (i) Set a stationery object in motion. (ii) Set a moving object at rest. (iii) Change the direction of motion. Unbalanced forces can bring changes in state of motion. 2. The pressure exerted by the weight of the air on an object is called atmospheric pressure. 3. Torricelli made a device to measure atmospheric pressure called simple barometer. 4. The SI unit of pressure is Newton per square metre (or N/M^2). This unit is also called Pascal (Pa).

G. 1. The various types of forces are– (i) Muscular force– Contact force (ii) Frictional force– Contact force (iii) Magnetic force– Non contact force (iv) Electrostatic force– Non contact force (v) Gravitational force– Non contact force. 2. Fill a tick polythene bag with water. Make several holes in the bag with a fine pin. Squeeze the bag gently. What do you see ? Water streams out in all directions with equal force. This shows that the pressure applied at any point on an enclosed liquid gets transmitted equally in all directions. The statement is known as Pascal's law. 3. All of these have larger surface area as this decreases the pressure exerted on the ground, thus, preventing it from sinking into the soil. 4. When the force applied on an object is doubled, the pressure also gets doubled as :

Pressure = Force / Area

So, if force = 2F

Thus, $F = 2 \times \frac{F}{A}$

H. 1. (a) The pressure due to a liquid increases with depth from the surface of the liquid. It is maximum at the bottom and minimum at the top. 2. A

pull or push acting on a body which tends to change its state of rest or of motion is called force.

CHAPTER 9 : REPRODUCTION IN ANIMALS

A. 1. (a) 2. (b) 3. (a) 4. (a) **B.** 1. Sexual 2. ova 3. zygote 4. foetus **C.** 1. (iii) 2. (v) 3. (ii) 4. (i) 5. (iv) **D.** 1. false 2. false 3. true **E.** 1. larva 2. sperm duct 3. yeast 4. viviparous animals **F.** 1. During reproduction, an organism produces an organism similar to itself which normally goes through a period of growth and development. 2. One nucler is present in a zygote. 3. A zygote is the initial cell formed when two gamete cells are joined by means of sexual reproduction while foetus is an unborn human being in its later stages of development. 4. (a) Cloning is the production of an identical cell or any other living part or a complete organism. (b) The close attachment of the embryo with the uterus is called implantation. **G.** 1. The embryo gets embedded in the wall of the uterus for further development. 2. The drastic change which takes place during the development of an animal is called metamorphosis. During this change there is complete transformation from larval stage to an adult form, e.g., from tadpole (larva of frog) to an adult frog. 3. The fertilization which takes place inside the female body is called internal fertilization while the type of fertilization in which the fusion of a male and a female gamete takes place outside the body of the female is called external fertilization. 4. The animals which lay eggs are called oviparous animals while the animals which give birth to young ones are called viviparous animals. **H.** 1. During fertilization, the nuclei of the sperm and the egg fuse to form a single nuclues. This results in the formation of a fertilized egg or zygote. The zygote undergoes division and specific changes to grow into a new individual. The process of fertilization is the meeting of an egg cell from the mother and a sperm cell from the father. 2. The type of reproduction in which only a single parent is involved is called asexual reproduction. The methods of asexual reproduction are– (i) Budding– It is a type of asexual reproduction which can be seen in hydra. In this reproduction, the new individual develops from the buds. (ii) Binary fission– It is a type of asexual reproduction which can be seen in amoeba. In this reproduction animals reproduces by dividing into two individuals. 3. (a) Ovary produces female gametes called ova (eggs). In human beings, a single matured egg is released into the oviduct by one of the ovaries every month. (b) The testes produce the male gametes called sperms. Millions of sperms are produced by the testes. The two sperm ducts open into the top of the urethra, just after it leaves the urinary bladder. (c) The urethra, at different times, carries both urine and sperms. (d) The uterus communicates with the outside through a muscular passage, the vagina. (e) The oviducts open into a wide walled muscular chamber called uterus. 4. A test tube baby is

who is born but who grew from an egg cell taken from the mother's body and artificially united with a sperm cell in a laboratory. The fertilized egg cell grows in the laboratory unit it has divided into eight cells. Then it is introduced into the mother's womb (uterus) so that it can develop normally. **I.** Do it yourself. **J.** Do it yourself.

CHAPTER 10 : REACHING THE AGE OF ADOLESCENCE

A. 1. (a) 2. (b) 3. (c) 4. (a) **B.** 1. males 2. X,Y 3. high pitched, deep 4. blood 5. false **E.** 1. economic growth 2. ovulation 3. insulin 4. goitre

F. 1. The period of life when the body undergoes changes, leading to reproductive maturity is called adolescence while the age at which the reproductive system becomes functional is called puberty. 2. The most conspicuous change during puberty is that boys and girls become capable of reproduction. 3. At puberty, the voice box or the laymen begins to grow. Boys develop larger voice boxes. 4. Endocrine glands are ductless glands which pour their secretion directly into the blood. They are called so because their secretions are poured directly into the blood and not through any special duct. **G.** 1. Hormones 2. (i) The age at which the reproductive system becomes functional is called puberty. (ii) The period of life when the body undergoes changes, leading to reproductive maturity is called adolescence. 3. In female, if fertilization does not occur, the released egg, and the thickened lining of the uterus along with its blood vessels are shed off. This causes bleeding in women called menstruation. Menstruation occurs once in about 287 to 30 days. 4. (i) Increase in height. (ii) Increased activity of sweat and sebaceous glands. (iii) Development of sex organs. (iv) Reaching mental, intellectual and emotional maturity. 5. Hormones are chemical substances which are secreted from endocrine glands. Mormones regulate most of the metabolic activities inside our body. Most of these hormones are secreted by special glands called endocrine glands. Hormones are carried to all parts of the body by the blood but their effect is produced in one or more specific parts only.

H. 1.	**Name of the gland**	**Location**	**Function**
(a)	Pineal gland	Within the brain	The function of this gland are not fully known, but it seems to have a part in a person's sexual development.

(b)	Pituitary gland	At the base of the brain	This gland has many regulatory functions and therefore, also referred to as the "master gland".
(c)	Parathyroid glands	Four small glands embedded in the thyroid	The more secretion of tyrosine causes underweight, protruding eyes, restlessness and mental instability.
(d)	Thymus gland	Behind the breastbone (near the heart)	This gland seems to have an important part to play in the body's immune system.
(e)	Pancreas	Situated below the stomach	It contains cluster of cells called islets of langerhans which produce two secretions affecting the metabolism of glucose.

2. The testes and ovaries secretes sex hormones. These hormones are responsible for the male and female secondary sexual characters. The sex hormones are under the control of hormones from pituitary gland. 3. (a) The glands which have ducts that carry their secretions to specific places in the body are called exocrine glands. (b) Endocrine glands releases hormone is termed menopause. 4. The two chromosomes present in males which determine the sex of the body are called sex hormones. Inside the fertilized egg or zygote is the instruction for determine the sex of the unborn. This instruction is present in the thread like structures in the fertilized egg, called chromosomes.

I. Do it yourself. **J.** Do it yourself.

CHAPTER II : SOUND

A. 1. (d) 2. (b) 3. (d) 4. (a) 5. (d) **B.** 1. vibrations 2. compressions, rarefactions 3. medium 4. pinna 5. different **C.** 1. A vibration is a rapid back and forth movement of a body about a central position. 2. The maximum displacement from the mean position during an oscillation is called the amplitude of the oscillation. 3. The sound waves of frequencies above 20,000 Hz are called ultrasonic waves. 4. The sustained presence of harmful, unwanted or annoying noise in the environment is called noise pollution. **D.** 1. Sound waves are3 produced due to the to and fro oscillation of particles in a medium. Frequency is considered an important characteristic of a sound

wave because different frequencies sound different to us. 2. The speed of sound depends on various factors like temperature, nature, etc. 3. The time taken to complete one oscillation is called the time period of the oscillation. It is measured in seconds. 4. 20 Hz to 20000 Hz. 5. The three types of musical instruments are– (i) Stringed instruments (ii) Wind instruments (iii) Percussion instruments. **E.** 1. The organ in human beings, that is involved in the production of sound is called larynx. The voice box is situated in the neck at the upper end of the wind pipe. 2. Vibration causes waves in the air. We hear the sound when these waves reach our ears. For example : When a loudspeaker is switched on, a membranes in the loudspeaker moves backward and forward, i.e., it vibrates. This causes the air molecules surrounding the loudspeaker to vibrate. 3. Sound waves require a material like a solid, liquid or gas to travel through. The working of ears is explained below– (i) Outer ear– The part of the outer ear, that is visible to us, is called pinna. The pinna collects sound waves and directs them to the ear tube. At the end of the ear tube is the ear drum. The ear drum vibrates when sound waves strike it and transmits the sound to the middle ear. (ii) Middle ear– The middle ear is a cavity with three important ear bones. These three bones are placed in such a way that they move when the ear drum vibrates, and, therefore, transmit the vibration to the inner ear. (iii) Inner ear– The inner ear is connected to the middle ear through a small opening. It is filled with a fluid. When this fluid vibrates, it excites tiny hair in the inner ear. These hair transform the vibrations into electrical impulses, which are then transferred to the brain via the auditory nerve. This is how we 'hear' a sound. 4. The three categories of musical instruments are– (i) Stringed instruments– In stringed instruments like violin, guitar and sitar, sound is produced by a vibrating string. The shrillness or pitch of the sound is altered by changing the length of the vibrating portion of the string. (ii) Wind instruments– In wind instruments like trumpet, flute, etc, sound is produced by the vibrating air column inside the instrument. The pitch of the sound is altered by changing the length of the vibrating air column. (iii) Percussion Instruments– In percussion instruments like table, drums and dholak, sound is produced by a vibrating skin or membrane. The pitch of the sound is altered by increasing or decreasing the tension in the membrane. 5. The unpleasant, discomfort– causing sound from any source is called noise pollution. The measures to reduce noise pollution are– (i) The use of loudspeakers should be avoided. (ii) People living in flats should not talk too loudly or play the television / music too loudly so as not to disturb their neighbours. (iii) While driving, people should avoid playing loud music and using the horn unnecessarily.

A. 1. (a) 2. (b) 3. (a) **B.** 1. good 2. bad 3. electrolysis 4. conductor, electric 5. negative charged **C.** 1. anode 2. electroplating 3. voltmeter 4. impure water **D.** 1. True 2. True 3. false 4. False 5. True 6. True **E.** 1. The process of causing a chemical change in a solution by passing the electric current through it, is called electrolysis. 2. Depositing a thin layer of a metal on another metallic object with the help of an electric current is called electroplating. 4. The electrode connected to the negative terminal of the battery is called the cathode. 5. The electrode connected to the positive terminal of the battery is called the anode. **F.** 1. The full form of LED is light emitting diode. 2. No, distilled water is a bad conductor of electricity. 3. We are insructed to never touch an electric switch with wet hands because we may get an electric shock. 4. The container carrying the electrolyte along with the electrodes is known as voltmeter. 5. There are two main reasons for electroplating the objects. (i) To protect the metal underneath. (ii) To produce an attractive finish. **G.** 1. Tap water conduct electricity because tap water is normally found mixed with a number of gases and minerals in it and therefore, is impure and a good conductor of electricity. 2. In nature, it is practically impossible to find a 100% pure sample of water or distilled water because water is a great solvent and a number of gases and other substances get dissolve in it easily. 3. The electrode connected to the positive terminal of the battery is called the anode. 4. Nowadays, electrolysis is widely used in chemical and commercial industries for the following purposes : (i) Refining impure metals into pure ones. (ii) Extraction of metals from their ores. (iii) Electroplating. **H.** 1. (i) Gas bubble get deposited at the electrodes. (ii) Colour of the electrolyte solution change. (iii) A metal gets deposited at the negative electrode or cathode. 2. The process of causing a chemical change in a solution by passing the electric current through it, is called electrolysis. During electrolysis, the liquid electrolyte also gets heated just like solids, due to the passage of electric current. 3. The main applications of electrolysis are – (i) Refining impure metals into pure ones. (ii) Extraction of metals from their ores. (iii) Electroplating. 4. Depositing a thin layer of a metal on another metallic object with the help of an electric current is called electroplating. When the electric current from the battery passes through the electrolyte solution, the free copper present in it is attracted towards the negatively charged electrode, i.e., the iron nail in this case. At the cathode, the free copper loses its positive charge and gets deposited on it. Whereas, some copper from the anode dissolves into the electoral, to replace the amount of copper which has got desposited on the iron nail. 5. There are two main reasons for electroplating the objects. (i) To protect the metal underneath. (ii) To produce an attractive finish. 6. (i) electroplating is done on a large variety of artificial jewellery to give

to give it a real look. (ii) Electroplating is done on fittings and parts of fancy lights, bathroom accessories, kitchen appliances, etc. 7. The factors on which the amount of metal deposited during electroplating on the cathode depends upon the following : (i) The time for which the current is passed through the electrolyte, and (ii) The amount of current which passes through the electrolyte. 8. Do i yourself. **I.** Do it yourself. **J.** Do it yourself.

CHAPTER 13 : SOME NATURAL PHENOMENA

A. 1. (b) 2. (c) 3. (d) **B.** 1. lightening 2. electric discharge 3. earthquake 4. Richter scale **C.** 1. (d) 2. (a) 3. (b) 4. (c) **D.** 1. insulator 2. tsunami 3. cotton cloth 4. volcanic eruption. **E.** 1. Comb, balloon, etc. 2. Electric discharge or lightening. 3. Fault 4. Seismograph **F.** 1. (i) do not use the wired phone. (ii) do not take bath during thunderstorms and avoid contact with running water. (iii) Do not stand near windows or in balcony having metallic railings. 2. When a charged cloud passes over a tall buildings tree, in induces an opposite charge on them. If the charge built up is large, it leads to an electrical discharge in the form of a lightning strike. 3. (a) Richter scale, (b) Modified mercalli scale 4. The factors on which the damaging effect of an earthquake depends are– (i) Magnitude of the earthquake. (ii) Local geological conditions. (iii) Focal depth (iv) Distance from the epicentre. (v) Distance buildings and other structures. (vi) Density of constructions and population in the affected area. **G.** 1. High rise buildings can be protected from lightning by providing a lightning conductor at its highest point. When a highly charged cloud passes over a tall building, it induces an opposite charge on the spikes. This charge quickly flows to the earth through the copper rod/strip. Thus, the lightning discharge is prevented and the building is saved from damage. 2. The measures to protect ourselves from lightning are– (i) On hearing a thunder, rush to a safer place such as a low-rise house building. (ii) If travelling by car / bus, you are safer inside. (iii) Keep the windows / doors of the vehicle shut. 3. Do it yourself. 4. Seismic focus– The point from where the shock-waves of an earthquake originate due to sudden movement / slip of rocks is termed seismic focus. Epicentre– The point on the surface of the earth vertically above he seismic origin is called epicentre. Focal depth– the focal depth of an earthquake is the depth of the seismic focus below the earth's surface. Seismic waves– The waves generated in the lithosphere due to sudden movement in part of earth's crust are called seismic waves. **H.** Do it yourself.

CHAPTER 14 : LIGHT

A. 1. (c) 2. (b) 3. (a) 4. (d) **B.** 1. normal 2. plane 3. 4. prism **C.** 1. (b) 2. (c) 3. (d) 4. (a) **D.** 1. True 2. False 3. True 4. True 5. True **E.** 1. The ray of light coming from an object that falls on the surface of the mirror is

called incident ray. 2. Cornea is the front bulging part of the eye. It is made of thin transparent tissues. 4. The people whose vision is extremely poor or they are blind are known as visually challenged people. **F.** 1. The two laws of reflection are– (i) Regular reflection • It is also called specular reflection. • Reflection from polished surfaces. • Reflection rays are parallel to each other. • The image is seen in the reflecting surface. • It can be seen in a plane mirror, unused stainless. steel plate, water, etc. (ii) Diffused reflection : • It is also called irregular reflection. • Reflection from rough or irregular surfaces. • Reflected rays move in various directions. • The image is diffused or irregular. • It can be seen in scratched mirrors, rippling water, etc. 2. The phenomenon of splitting of white light into its component colours is known as dispersion of light. 3. The phenomenon in which we get multiple images of an object is called multiple reflection. 4. The ability of the eye to alter the focal length of its lens, so that it can clearly see all objects within a certain range, is called accommodation. **G.** 1. The characteristics of image formed by a plane mirror are– (i) The image is formed behind the mirror. (ii) It is a virtual image which cannot betaken on the screen. (iii) The size of the image and the object is the same. (iv) The image formed by the place mirror is erect and not inverted. (v) The image will be formed as for behind the mirror as the object is in front of it. (vi) The image formed by a plane mirror is laterally inverted.

2.	Regular Reflection	Diffused Reflection
(i)	It is also called specular reflection.	It is also called irregular reflection.
(ii)	Reflection from polished surfaces.	Reflection from rough or irregular surfaces.
(iii)	Reflected rays are parallel to each other.	Reflected rays move in various directions.
(iv)	The image is seen in the reflecting surface.	The image is diffused or irregular.

3. Do it yourself. 4. Braille system is a tactual aid which is based on the sense of touch. The Braille system was developed by Louis Braille of France in 1821. Braille is an approach that enables the blind to read and write. In this, the text is printed on a thick sheet of paper in the form of a pattern of raised dots. The dotted symbols represent letters, numbers, punctuation marks, etc. There are 63 symbols or characters in Braille. Math symbols is represented by a cell which consists of two vertical rows of three dots. One or more dots in a cell may be raised to form the symbols. **H.** Do it yourself. **I.** Do it yourself.

CHAPTER 15 : COAL AND PETROLEUM

A. 1. (b) 2. (a) 3. (a) **B.** 1. petroleum 2. air 3. coal, petroleum & natural gas 4. carbonisation 5. petroleum refining **C.** 1. natural gas 2. coke 3. coal tar **E.** 1. the resources that are likely to be exhausted by various human activities are called exhaustible resources while the resources that are not likely to be exhausted by various human activities are called inexhaustible natural resources. **F.** 1. Petroleum, coal and natural gas are exhaustible natural resources. 2. The resources that come form the remains of plants called fossil fuels. 3. The slow conversion of dead trees and other plants into coal is called carbonisation. 4. The full form of CNG is compressed natural gas. 5. Coke, coal gas and coal tar are formed. **G.** 1. Coal is used– (i) as a fuel to cook food. (ii) Primarily for generating elecricity in thermal power plants. (iii) as a source of energy in various industries like cement, paper, steel, iron, etc. 2. About three hundred million years ago, our earth was covered with dense forests and swamps having huge trees, ferns and other leafy plants. As these trees and other plants died, they fell down on the wet and swampy floor of the forest and began to sink into the soil. More and more dead vegetables, gravel and soil deposited over them. The heat and pressure from the top layers gradually turned the remains of plants into coal. 3. The three types of cola are– (i) Anthracite– 90% (ii) Bituminous– 60% (iii) Lignite– 40% 4. Coke is greyish black in colour but is not as shiny as coal. It has a rough texture. When coal is heated in the absence of air, the volatile impurities and moisture get removed. The solid left behind is coke. Coke contains approximately 98% carbon. 5. Coat tar is obtained when coal is heated in the absence of air. It is a dark, black, oily liquid with very unpleasant smell. Coal tar contains many useful chemicals. These can be used to make inks, dyes, detergents, insecticides and artificial fibres. **H.** 1. Petroleum was formed from the remains of very tiny animals and plants that lived in the sea and died millions of years ago. After they died, their bodies sank and got buried at the bottom of the sea. Over time, they were covered by layers of sand, silt and clay. Over millions of years, the layers of sand, silt and clay become very thick and the remains buried deeper and deeper. In the absence of air, enormous heat and pressure from these layers, the dead organisms slowly changed into petroleum and natural gas. 2. (i) Petroleum gas– It can be compressed into a liquid and transported in metal cylinders, giving a portable fuel supply in homes and industries. (ii) Diesel oil– It can be used as a full for buses, cars, ships, trucks, etc. (iii) Paraffin wax– It is used for making shoe polish, grease, candles, ointments. 3. Petroleum production can affect the environment as follows : (i) Drilling of petroleum may cause disturbance in the aquatic ecosystem. (ii) Transporting petroleum may cause oil spills. (iii) Sometimes tanks in which petroleum is stored may develop leakage and pollute the groundwater. (iv) Refining of petroleum to

produce various products may lead to water and air pollution. 4. Natural gas is a fossil fuel formed when layers of buried plants and animals are exposed to intense heat and pressure over thousands of years. Natural gas is called a clean fuel because it emits less air pollutant and is eco-friendly. 5. The ways that can help us in saving of fossil fuels are– (i) Walk down to the nearby market instead of going by a car or a scooter. (ii) Switching off the engine at traffic light. (iii) Car pool is a good way to reduce consumption of fossil fuel.

MODEL TEST PAPER – I

1. (a) preparation of soil (b) pathogenic (c) nickel (d) LGP (e) deforestation **2.** (a) True (b) True (c) True (d) True (e) False **3.** (a) Leveller is used for levelling the field before sowing the seeds. (b) A vaccine is a biological preparation that improves immunity to a particular disease. (c) Yes, the process of rusting can be called slow combustion. The rusting of iron is an oxidation process. In this, iron using oxygen & water, gets oxidized and is rusted out. (d) The living substance of a cell is called protoplasm. (e) Friction **4.** (a) The sources of irrigation are pulley system, chain pump, dhikli, rahat, sprinkler system and drip system. (b) The uses of polyester fibre are– (i) It is used for manufacturing sarees, dress materials, curtain cloth, etc. (c) Project Tiger was launched in 1973 CE to save tiger from peaching. Under this project, 23 tiger reserves have been established in India. (d) The cytoplasm is a jelly like fluid which occupies the space between the cell membrane and the nucleus. A number of tiny components or structure called the cell organelles are present in the cytoplasm. All the chemical reactions and functions of life take place in the cytoplasm. (e) The combined effect of force and area on which it acts can be described by a quantity called pressure. **5.** (a) The advantages of ploughing the soil are– (i) Ploughing uproots the undesirable plants and kills them. (ii) It brings the nutrient rich soil from the lower layers to the top and makes it easily available for plant to use. (iii) Loose soil contains a lot of air spaces in it. This allows roots to breathe easily. (iv) Loose roots to uniformly with manure or fertilizers. (b) (i) Culturing fungi is used to produce antibiotics and other frugs. (ii) Fungi is added to dough to make bread. (iii) Fungi also helps to greater soil ecological movement. (c) The chipko movement is a socio-ecological movement that practised the Gandhi an methods of non-violent resistance, through the act of hugging trees to protect them from being cut. (d) All basic functions for the organisms survival take place inside cells. A group of cells form a tissue which performs a specific function. A group of tissue forms an organ. And in the same way a group of organs form an organism. That is why cells are considered as the basic structural units of living organisms.

MODEL TEST PAPER – II

1. (a) zygote (b) blood (c) medium (d) bad (e) compressed natural gas. **2.** (a) true (b) false **3.** (a) The container carrying the electrolyte along with the electrodes is known as voltmeter. (b) An inflated rubber balloon stick to a wall because of static electricity. (c) The phenomenon in which we get multiple images of an object is called multiple reflection. (d) The ray of light coming from an object that falls on the surface of the mirror is called incident ray. (e) The resources that come form the remains of plants and animals that died millions of years ago are called fossil fuels. **4.** (a) The gametes fuse to form zygote which develops into a new individual while the stage of the embryo in which all the body parts can be distinguished easily is called a foetus. (b) Hormones are chemical substances which are secreted from endocrine glands. (c) The harmful effects of noise pollution are– (i) Irritation and loss of concentration. (ii) Sleep disturbance and stress. (iii) Ear damage and loss of hearing. (d) The electrode connected to the positive terminal of the battery is called the anode. (e) Coal tar is obtained when coal is heated in the absence of air. It is a dark, black, oily liquid with very unpleasant smell. It make inks, dyes, detergents, insecticides and artificial fibres. 5. (a) A test tube baby is who is born normally, but who grew from an e.g. cell taken from the mother's body and artificially united with a sperm cell in a laboratory. The fertilized egg cell grows in the laboratory until it has divided into eight cells. Then it is introduced into the mother's womb so that it can develop normally. (b) Vibration causes waves in the air. We hear the sound when these waves reach our ears. For Example– When a loudspeaker is switched on, a membrane in the louds peaker moves backward and forward, i.e., it vibrates. This causes the air molecules surrounding the loudspeaker to vibrate. (c) (i) Electroplating is done on a large variety of artificial jewellery to give it a real look. (ii) electroplating is done on fittings and parts of fancy lights, bathroom accessories, kitchen appliances, etc. (d) The measures to protect ourselves from lightning are– (i) On hearing a thunder, rush to a safer place such as a low-rise house / building. (ii) If travelling by car / but, you are safer inside. (iii) Keep the windows / doors of the vehicle shut. (e) Braille system is a tactual aid which is based on the sense of touch. It was developed by Louis Braille of France in 1821. He himself was a visually challenged person. Braille is an approach that enables the blind to read and write. In this the text is printed on a thick sheet of paper in the form of a pattern of raised dots. The dotted symbols represent letters, numbers, punctuation marks, etc. There are 63 symbols or characters in Braille. Each symbol is represented by a cell which consists of two vertical rows of three dots each. One or more dots in a cell may be raised to form the symbols.