

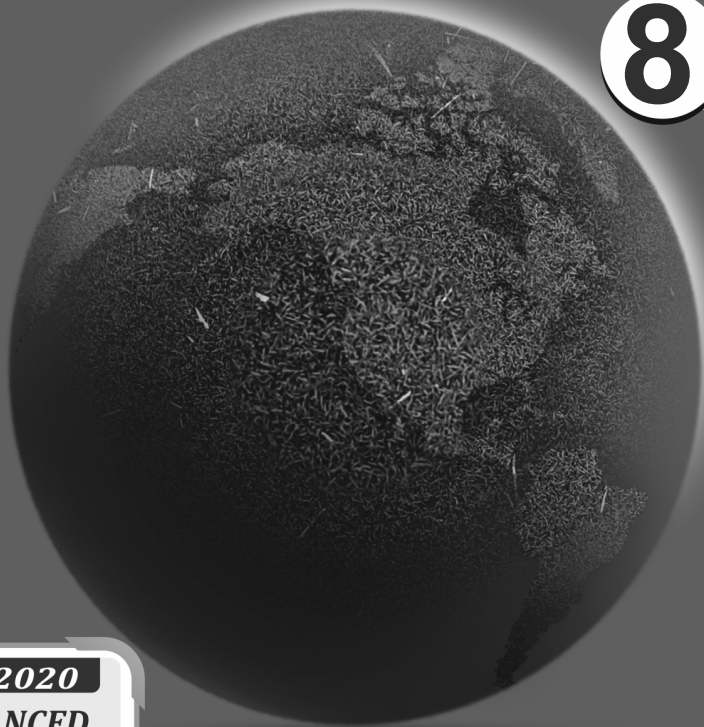


DISCOVERY

Science

Teacher Manual

8



NEP 2020
ENHANCED
EDITION

CLASS - VIII

CHAPTER 1 (Production and Management of Crops) EXERCISE

- A** 1. (c) Water harvesting 2. (b) Wilt
3. (c) Calcium 4. (c) Weeding
5. (c) Millet
- B** 1. (d) cotton 2. (a) peas
3. (e) groundnut 4. (b) tapioca
5. (c) tea
- C** 1. False 2. False 3. True 4. True 5. True
- D** 1. weeds 2. heat 3. mineral salts
4. weather, swarm of locusts 5. sickles
- E** 1. Coffee, Tea, Rubber
2. Soil is made loose by the method of tilling or ploughing. It is carried out by using a wooden or iron plough which is pulled either by an animal or by tractors. Long teeth of plough break up the lumps of soil.
3. The addition of compost to the soil to increase its fertility is called composting.
4. Removing unwanted plants from the field is called weeding.
5. A mixture of grain and chaff is obtained after threshing a wheat harvest. They are separated by the conventional method of winnowing.
6. Mustard, gram, peas
- F** 1. The advantages of preparation of soil are-
- F Air enters the gap between the loose soil particles. Air rich soil is good for plant growth because air present in the soil is used by roots to breathe easily.
 - F Loose soil allows the roots to penetrate deeper, thus securing the plant more firmly.
 - F Loose soil is good for growth of small animals. Small animals and of the microorganisms provide nutrients to the soil and also help in further loosening of soil.
 - F Turning and loosening of soil brings nutrient rich soil to the top, mixing it easier for plants to absorb these nutrients more efficiently.
 - F Manures and fertilizers can be uniformly mixed with loose soil.

2. Seeds should be sown at correct depth and distance in the soil. You should sow the seeds neither at a great depth nor at the surface. At a great depth, seeds do not get adequate amount of air. And if sown at the surface, seeds may be eaten by birds or they may be washed away by rain water.
3. Measuring means providing nutrients to the soil. The nutrients include mainly mineral salts which are required by plants for their proper growth. However, these mineral salts are replenished or recycled by natural process. But, cultivating in the same field continuously may deplete the amount of nutrients. So, to maintain the amount of nutrients in the soil we can add manures or fertilizers to the soil.
4. Excessive use of mineral salts can destroy the texture of the soil. Besides, it may also lead to pollution of ground water because it may percolate through soil.
5. Weeding is done by two ways–
 - F **Manual Weeding**– Weeding is generally done manually. In this method farmers pull the weeds out by hand and by using trowel or a harrow to uproot them.
 - F **By using weedicides**– Weeding is also done by using special chemicals called herbicides or weedicides. These chemicals are sprayed on the unwanted plants. These chemicals destroy the weeds. But these chemical do not cause any harm to main crops. Some commonly used weedicides are dalapon, metachlor and siniazine.
6. F Stray animals can be kept away by building erecting fencing.
 - F Pest can be kept away from crops by setting up scarecrows and by using insecticides and pesticides.
7. Do yourself.

HOTS

1. Seeds should be sown at the correct depth in the soil. At a great depth, seeds do not get adequate amount of air. And if sown at the surface, seeds may be washed away by rain water. Seeds should be sown at proper distances so that they could get enough space and adequate amount of nutrients to grow.
2. Yes, but also to retain the fertility of soil. Growing some type of crops again and again makes the soil infertile and yield produced is not of good quality. Therefore, farmers practice crop rotation.

Let's Enjoy

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

CHAPTER 2 (Microorganisms)

Just Do More (Pg 21)

1. Because microbes cannot be seen through naked eyes.
2. Virus
3. Bacilli, Cocci, Spirilla
4. Because they decompose the dead organisms and dispose off the unwanted materials. This not only clears the earth, but also provides back the useful nutrients to the soil.

Just Do More (Pg 25)

1. Giardia, Paramecium, Amoeba and Trypanosma, Euglena etc.
2. Plasmodium
3. Protozoa feed on algae and bacteria and thus form an important link between aquatic food chain.

Just Do More (Pg 27)

1. Sporulation
2. Yeast
3. Soft drink
4. Bacteriophage

EXERCISE

- A**
1. (c) protozoa
 2. (c) chlorophyll
 3. (b) water grass
 4. (a) rod
 5. (a) lactobacillus
- B**
1. microscope
 2. Virus
 3. Bacteria
 4. lactobacillus
 5. Amoeba, paramecium
 6. Algae
 7. Yeast
 8. Fungi
- C**
1. (d) bacteria
 2. (e) bacilli
 3. (a) algae
 4. (c) mushrooms
 5. (b) bacteriophage
- D**
1. True
 2. False
 3. True
 4. False
 5. True
- E**
1. Do yourself.
 2. Do yourself.
- F**
1. Those small organisms which are not visible to naked eyes and can be seen under microscope.
 2. A unicellular organism is an organism that consist of only one cell, unlike a multicellular organism.
 3. Virus are the microorganism that can carry all living functions only when they enter in a living cell, outside which they are totally non living. In Latin virus means poison.
 4. Protozoa are unicellular organism that have animal like characteristics. They can move from place to place. The name protozoan is derived from the Greek word which means first animals.

- G.**
1. Lactobacillus, Sarcina, Vibrio
 2. Fucus, Diatoms
 3. Giardia, Paramecium
 4. The name protozoan is derived from the Greek word which means first animals.
 5. Bacteriophage, Rabies
 6. Salt, checks the growth of bacteria by forcing microorganism to lose water by a process called osmosis. It is used for preserving meat, fish, pickles, chips etc.
- H.**
1. **F** Bacteria cause spoilage of food like souring of milk, rotting of meat etc. They act upon food at 25°C to 40°C of temperature.
 - F** Bacteria cause many fatal diseases. Diseases like tuberculosis, tetanus, pneumonia, cholera, diphtheria etc. are caused by bacteria.
 - F** Bacteria may cause diseases in plants also. Fire blight in pears, black rot in cabbage, rotting of potatoes and many other diseases of fruits and vegetables are caused by bacteria.
 2. Mostly algae are named after the colour they possess. On this basis, algae can be divided into three main kinds—
 - F** Red algae
 - F** Brown algae
 - F** Blue-green algae
 - I** Algae is also obtained from a marine algae which is used to manufacture medicines, artificial fibres and shaving creams.
 - I** The blue-green algae are used as biofertilizers as they have the capacity to fix the atmospheric nitrogen and replenish the lost nitrogen contents of the soil. It also increases the content of humus in the soil which further increase the water holding capacity of the soil.
 - I** Some algae as sea weeds are used as food in China and Japan. Chlorella and porphyra are commonly used as food in these countries.
 - I** Algae are also important for animals like fish and snail, as they use algae as their food.
 - I** Sea weeds are also used as fertilizers.
 - I** Diatoms are rich sources of silica. They are used to make toothpaste, glass, metal, polishes and porcelain.
 - F** Kelps provide iodine and potassium. Red algae also provide agar which is used to grow microorganisms in the laboratories.

3. **Uses of Protozoa**

- F Protozoa feed on algae and bacteria and thus form an important link between aquatic food chain.
- F Protozoa decompose the organic waste into simpler nutrients which gets back into the soil.
- F Some protozoa live in the digestive system of animals and help in the digestion of cellulose.

Harmful Protozoa

- F Parasitic protozoa cause a number of diseases in their host.
 - F Amoeba dysentery is caused by protozoan called *Entamoeba histolytica*.
 - F Malaria is caused by protozoa called plasmodium.
 - F A dangerous disease called sleeping sickness is caused by trypanosoma, which is a parasite living in the blood stream of human beings and animals. It spreads from one person to another person by a blood sucking fly called tsetse fly.
4. Virus is peculiar in their functions and structure. They are not living organism as they do not have any cellular organisation. They are lifeless until they enter any living organism. They are smaller than any known cell. They can carry all living functions only when they enter in a living cell, outside which they are totally non-living. In Latin virus means poison.
5. Methods of food preservation –
- F Cooling food stops microbes from growing and reproducing and hence preserves food.
 - F Heating food to a high temperature kills microbes. For e.g., milk and water are boiled to kill microbes.
 - F Chemical preservatives like sodium benzoate and sodium metabisulphite help control bacterial growth in jams, squashes and ketchups.
 - F Drying or dehydration of food consists of removing water from it. This stops microorganism from growing as they cannot grow without water.
 - F After sterilising the food, it is canned in airtight containers. Many canned food items are available in market.
6. Viruses are considered to be on the borderline of living and non living things because they carry all living functions only when they enter in a living cell, outside which they are totally non-living.

HOTS

1. Microorganisms are hardy because they form a hard outer covering called a cyst around themselves. They do this when conditions are not favourable such as under extreme conditions of temperature and dryness. They survive by remaining inactive within the cyst until conditions are favourable again.
2. (a) Because bacteria needs warm temperature for growth.
(b) Once, the curd thicknes we put it in fridge, so that extra growth of lactobacillus should not take place which makes the curd sour.

Let's Enjoy

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

CHAPTER 3 (Synthetic Materials)

Just Do More (Pg 36)

1. Thermosetting plastics, thermoplastics
2. It is used to make windows of aeroplanes and windscreens of cars.
3. It is hard and smooth.
4. They are inflammable and catch fire easily.

EXERCISE

- A 1. (b) thermosetting plastic 2. (c) polymer
3. (a) monomers
4. (c) by processing of chemicals
5. (b) synthetic materials
- B 1. Rayon 2. regenerated fibre 3. polymers
4. environment 5. thermosetting plastics 6. Teflon
- C 1. (e) Bandages 2. (d) Tooth brush
3. (a) Unbreakable kitchen ware
4. (b) Non-stick pans 5. (c) Handles of saucepan
- D 1. False 2. False 3. False 4. True
5. False 6. True
- E 1. Natural fibres are produced fibres that are produced by plants, animals and geological process. Eg. cotton, silk etc.
2. Thermoplastics are those synthetic plastics which can be moulded and reshaped again and again.
3. Thermosetting plastics are those synthetic plastics which cannot be moulded and reshaped again.

4. Process of combining various monomers to form polymers.
 5. The man made fibres are called synthetic fibres.
- F**
1. It burns completely and smell like burning of leaves or paper.
 2. It smells like burnt hair and shrinks away with very little smoke.
 3. It smells like burnt hair. It too shrinks with very less smoke produced.
 4. It burns quickly and melt, leaving a hard plastic like material in the end.
- G**
1. F Synthetic fibres are cheap.
 F They are durable.
 F They are easy to maintain.
 F They are not affected by pest and insects.
 F They are wrinkle free.
 2. There are two types of plastics–
 F Thermosetting plastics
 F Thermoplastics
 3. F Thermoplastics are used for making non stick coatings of utensils.
 F They are used to make carry bags, containers and pipes.
 F They are used as insulators on wires.
 F They are used to make thermocol.
 F They are used for making vinyl flooring.
 F They are used for making ropes, windows of airplanes etc.
 4. Polystyrene is a thermoplastic. It can be easily moulded and reshaped. It is used in refrigerators, used as packaging material for electronic items and other delicate items. It is used to make thermocol.
 5. Nylon is entirely made up of chemicals. The uses of nylon are–
 F It is used to make ropes, fishing nets, parachutes etc.
 F It is used to make household products like brushes, tooth bushes, zips, combs etc.
- H**
1. The characteristics of plastics are –
 F **Effect of flame**– Plastics are inflammable, that is why they burn easily.
 F **Reactivity**– Plastics have no reaction with water and air. They are non reactive and do not corrode easily.

- F **Thermal Conductivity**– Plastics are poor conductors of heat. Therefore they are used to make handles of cooking utensils.
 - F **Electrical Conductivity**– Plastics are poor conductors of electricity. This is the reason why electric wires, cords of electrical appliances and cables have a plastic coating.
 - F **Solubility in water**– Plastics are insoluble in water that is why buckets to store water and glasses to drink water are made from plastics.
2. Thermosetting can be softened by heating and then moulded into any shape. When cooled they get hardened. They can again be softened by heating them. This process of softening and hardening can be repeated in the thermoplastics. For eg. polythene, polyvinyl chloride etc. whereas thermosetting plastics are such synthetic plastics which can be moulded on softening by heating it. They are then cooled and hardened. But once hardened cannot be softened again by heating them. They unlike thermoplastics cannot be remoulded again and again. Eg. bakelite, melamine etc.
 3. We should not use plastic bags because we carelessly throw them which causes blockage in drainage system and pollutes our environment. When they cover the soil they do not allow the soil to absorb water. This adversely affect the quality of soil and its fertility. When animals consume these waste plastics they are killed. Plastic bags also contaminate the food stuff carried in them.
 4. Plastics are non biodegradable, so they pose a threat to our environment. They causes blockage in the drainage system and pollutes our environment. They causes soil pollution and do not allow soil to absorb water. Animals get killed after consumption of plastic. Plastic bags also contaminate the food stuff in them. Plastic bottles and broken containers or waste plastic cause great threat as they cannot be reused and their disposal is very difficult.
 5. Rayon is manufactured from natural fibres. It is made from cellulose obtained from the pulp of the wood. Cellulose is broken down and then reformed. So, rayon is also called regenerated fibre.
The uses of rayon include–
 - F It is used to manufacture carpets, bed sheets, tyres, stockings and light sweaters.
 - F It is also used to make undergarments, slacks, sportswear, tablecloth, curtain, draperies, cords etc.

6. The advantages of synthetic fibre are—
- F They are cheaper and easily available.
 - F They are easy to maintain.
 - F They do not shrink on washing.
 - F They are stronger and resistant.
 - F They have a long life.
 - F They do not get affected by pests and insects.
 - F They are comfortable to wear.

HOTS

1. Nylon is resistant to water and do not absorb water. Therefore, clothes made of nylon dry soon.
2. Synthetic fibres are not suitable for summer because they do not absorb sweat and we feel uncomfortable and warm in synthetic clothes during summer.

Let's Enjoy

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

CHAPTER 4 (Metals and Non-Metals) EXERCISE

- A**
1. (a) Graphite
 2. (c) green
 3. (a) colourless
 4. (c) Both (a) and (b)
 5. (c) lustre
- B**
1. basic oxides
 2. anticorrosive
 3. oxides
 4. concentration of the ore, reduction, refining the metals
 5. moisture
 6. local and uniform
- C**
1. (d) buried organic matter
 2. (e) gangue
 3. (a) removal of moisture
 4. (c) sounding on being struck
 5. (b) more reactive metals
- D**
1. True
 2. False
 3. False
 4. True
 5. True
 6. True
- E**
1. Ductility
 2. Corrosion
 3. Uniform corrosion
 4. Metallic minerals
 5. Gangue
 6. Metallurgy
 7. Displacement reaction
 8. Reactivity
 9. Malleability

- F**
- Malleability is the property of metal to be beaten into the sheets. Ductility is the property of metals of being drawn into wires.
 - Metals react with water in various ways:
 - Copper, silver, gold do not react with water.
 - Iron and zinc only react mildly with steam not with cold water.

$$\text{Zn} + \text{H}_2\text{O} \rightarrow \text{ZnO} + \text{H}_2$$
 - Magnesium reacts mildly with cold water but it reacts vigorously with steam to form magnesium hydroxide and hydrogen.

$$\text{Mg} + 2\text{H}_2\text{O} \rightarrow \text{Mg}(\text{OH})_2 + \text{H}_2$$
 - Sodium also react with cold water to form sodium hydroxide and hydrogen.

$$2\text{Na} + \text{H}_2 \rightarrow 2\text{NaOH} + \text{H}_2$$
 - Corrosion is used to describe the process by which materials such as metals are slowly eaten away when exposed to air and moisture.
 - Sauces, pickles, curd and juices of citrus fruits, when put into utensils of iron or aluminium, form poisonous salts that are highly injurious to health. That is why such things are put into glass or plastic vessels
 - The product formed are metal chloride and hydrogen gas.
- G**
- A freshly polished copper, when placed in the air, becomes dull in short time i.e., it loses its lustre due to action of oxygen of the air on it. The action leads to the formation of copper oxide which is dull looking. Iron and aluminum also behave like that. Iron gets rusted with a brownish layer of its oxide.
Action with water:
 - Copper, silver, gold do not react with water at all.
 - Iron and zinc react only mildly with steam, not with cold water.

$$\text{Zn} + \text{H}_2\text{O} \rightarrow \text{ZnO} + \text{H}_2$$
 - Magnesium reacts mildly with cold water but it reacts vigorously with steam to form magnesium hydroxide and hydrogen.
 - Sodium also reacts with cold water to form sodium hydroxide and hydrogen.

$$2\text{Na} + \text{H}_2 \rightarrow 2\text{NaOH} + \text{H}_2$$
 - The physical properties of metal and non metals are-

- F **Physical State**– All metals except mercury exist in solid state at room temperature. So, they are able to retain their definite shapes in normal conditions. Most metals have very high melting points. For e.g., iron melts at 1535°C while copper melts at 1083°C.

Non metals can exist in all the three states but generally, they are solid or gas at room temperature. Hydrogen, chlorine and oxygen are gases. Iodine, silicon, carbon and phosphorus are solids but bromine is found in liquid state.

- F **Lustre**– Metals shine in their pure state. This shining property of metals is called metallic lustre.

Non metals are non lustrous and dull except graphite and iodine which are lustrous.

- F **Malleability**– Metals are malleable in general. It means that they can be beaten into thin sheets.

Non metals are non malleable. They break into pieces when hammered. So, they are brittle.

- F **Ductility**– All metals are ductile as well. It means that they can be drawn into wires.

Non metals are non ductile and break on stretching.

- F **Conductivity**– Metals can conduct heat very fast and easily. Gold is best conductor of heat followed by silicon, copper and aluminum.

Non metals are generally bad or poor conductors of heat and electricity except graphite which is good conductor.

- F **Hardness**– Metals are generally hard and difficult to cut. This hardness is their strength and they can bear heavy loads. Non metals are generally soft except diamond which is very hard.

3. The wearing away of a metal layer by layer due to formation of compounds is called corrosion.

In general, corrosion result from two processes oxidation and reduction.

F Oxidation results in loss of electrons by the atoms of metal.

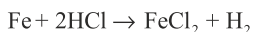
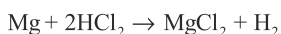
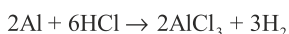
F Reduction causes these electrons to be captured by the same metal or by another.

F These moving electrons from an electric current, which cause corrosion. So, corrosion is an electro- chemical process. It is of two kinds local and uniform

Corrosion can be prevented by greasing, galvanising, coating with a paint, electroplating, alloying.

4. The uses of non metals are–
- F Silicon is used for making silicon steel alloy and a polymer called silicon.
 - F Hydrogen is used as a fuel and for making ammonia, hydrochloric acid and vegetable ghee.
 - F Chlorine is used for bleaching and sterilising water.
 - F Iodine is used for making iodised salt and tincture iodine.
 - F Oxygen is essential for respiration and combustion.
 - F Phosphorus is used in manufacturing phosphoric acid and super phosphate fertilizer matchstick etc.
 - F Sulphur is used for making sulphuric acid which in turn is used for making plastics, synthetic fibres etc.
5. Collect some pieces of various metals like iron, zinc, copper, aluminum and magnesium. Put these pieces in separate test tubes and add a little hydrochloric acid to each test tube. A gas will be given out as a result of the reaction in each test tube. Test this gas by bringing a glowing splinter near the mouth of test tube. The gas will burn with a pop sound.

But, in case of copper there is no reaction as for magnesium, it reacts strongly with dilute hydrochloric acid. Other metals will react with this acid to different degrees. In the laboratory, hydrogen is prepared by the action of dilute hydrochloric acid on zinc. Aluminum when fresh acts vigorously with hydrochloric acid.



6. These three operations have to be performed to obtain pure metals–
- F **Concentration of the ore**– It is the first and elementary operation that aims at removing impurities by concentrating i.e., by removing moisture etc. out of it.
 - F **Reduction**– It is second operation that reduces the metal compound by removing its oxygen or sulphur etc. in order to get the metal in its free state.
 - F **Refining the metals**– This is the third and last operation in which the free metal obtained after reducing the compound is refined i.e., purified. At the same time some substances are added to the refined metal in order to give it the desired properties.

HOTS

1. Metals are sonorous in nature i.e., they produce sound when struck but non metals do not. Therefore bells are made of metals and not non metals.
2. Silver is not used to make electric wires because it is very expensive and cannot be afforded by everyone.

Let's Enjoy

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

CHAPTER 5 (Combustion, Flame and Fuels) EXERCISE

- A**
1. (c) Methane
 2. (c) Natural gas
 3. (a) Diamond
 4. (a) Non luminous zone
 5. (a) Water
- B**
1. Carbon monoxide
 2. four, non luminous zone, luminous zone, central zone, inner most zone
 3. Wax candle and kerosene oil lamps
 4. container, bottle, knob
 5. combustible
- C**
1. (d) Petrol
 2. (e) Diamond
 3. (a) Kindling temperature
 4. (b) Zone of combustion
 5. (c) Fire extinguisher
- D**
1. False
 2. False
 3. False
 4. True
 5. True
- E**
1. A substance which burns in the presence of oxygen and produces heat energy.
 2. Burning of substances in the presence of oxygen.
 3. The minimum temperature to which a substance is heated to catch fire.
 4. The energy produced when one kilogram of the fuel is completely burnt in presence of oxygen.
 5. Region of the burning substance that burns in gaseous form.
- F**
1. The minimum temperature to which a substance is heated to catch fire.
 2. Combustion takes place in presence of air and oxygen.

3. There are three types of fuels–
 - F Solid Fuels
 - F Liquid Fuels
 - F Gaseous Fuels
 4. It is because charcoal do not get vapourised while burning and only those substances which vaporise on burning on being heated produces flame like wax.
 5. If oxygen and air are not present, then combustion does not get completed and this is called incomplete combustion.
- G**
1. Take a small stick of wood and burn it. It will not burn immediately. It will take time to kindle the fire. Now once it starts burning sprinkle some water on it. The stick stops burning because the water has absorbed the heat and has lowered down the temperature which is below the ignition temperature, so fire gets extinguished.
 2. Combustion is the process of burning of substances releasing heat and energy. Combustion takes place in the presence of air or oxygen. So air and oxygen are the supporters are not available in sufficient amount then combustion does not get completed and this is called incomplete combustion.
 3. The conditions necessary for combustion are–
 - F Presence of a combustible substance–
Substances that burn easily and emit light and a lot of heat is called combustible substance. Combustion is only possible if the substance is combustible.
 - F Supporter of combustion – A substance which help in the combustion of a combustible substage is called supporter of combustion.
Oxygen is the supporter of combustion. Without oxygen fire cannot be kindled.
 - F Ignition Temperature : Any fuel or object does not catch fire of its own because it is not heated to a minimum temperature at which it catches fire. Once we heat that object to the minimum temperature i.e., its ignition temperature it starts burning.
 4. Incomplete combustion of a substance takes place in the presence of insufficient amount of air or oxygen. This result in the formation of carbon monoxide, soot, water, heat and light. Carbon monoxide is produced when fuels containing carbon burn in insufficient supply of air. It is a very dangerous pollutant and can cause death if breathed in.

5. Calorific value of a fuel can be defined as the amount of heat liberated when one kilogram of the fuel is completely burnt in sufficient supply of oxygen. It is expressed in kilojoules per kilogram (KJ/Kg) Higher the calorific value, better is the fuel.
6. Flame can be divided into four parts:
 - F Non Luminous Zone- In this zone complete oxidation of carbon, and hydrogen particles take place, due to sufficient supply of oxygen. It is the hottest zone.
 - F Luminous Zone- In this portion of flame the supply of oxygen is not sufficient. So carbon particles are incompletely burnt and glow with yellow light.
 - F Central Zone- In this zone no combustion takes place because there is no supply of oxygen and thus carbon particles remain unburnt. This is called dark zone of flame. It is dark because wax vapour decompose on heating and form carbon particles.
 - F Innermost Zone- It is the small zone which is at the base of the wick of the candle and gives out blue flame.
7. The innermost zone is small zone which is at the base of the wick of the candle and gives out blue flame.

HOTS

1. When the matchstick is rubbed against the side of the match box, some of the red phosphorus is converted into white phosphorus. This immediately reacts with potassium chlorate in the matchstick head to produce enough heat to ignite antimony trisulphide and starts the combustion of matchstick.
2. A candle flame always rise upward because flame is extremely hot and thus less dense than air and thus rises up.

Let's Enjoy

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

CHAPTER 6 (Conservation of Biodiversity) EXERCISE

- | | |
|--|--|
| A 1. (b) flora
3. (b) goes down
5. (b) Asiatic lion | 2. (c) Controlling population
4. (c) Dodo
3. natural |
| B 1. afforesting 2. rare 3. natural | |

4. Wildlife sanctuaries 5. 9 6. Red Data
- C** 1. True 2. True 3. False 4. False
5. True 6. True
- D** 1. Species of plant and animals which begin to die due to various reasons are endangered whereas species of the world that have ceased to exist are called extinct species.
2. The preserved and protected areas are called wildlife sanctuary. Whereas national park protect both flora and fauna whereas wildlife sanctuaries protect only the fauna i.e., animals.
3. Flora consists of all the species of the plants whereas all the species of the animals is known as Fauna.
- E** 1. Management and protection of plants and animals is called conservation.
2. Biodiversity refers to different form of plants, animals and microorganism present on Earth.
3. Wildlife includes all types of organisms which occur in their natural habitat and are not domesticated by man.
4. All animals and plants which are on the verge of being extinct are called endangered species.
5. Bison, Indian Rhinoceros – Animals
6. IUCN prepared Red Data Book which has all information regarding specific group of animals or plants. Eg., insects, reptiles etc.
- F** 1. Forest are homes to several kinds of plants, animals and microorganism. The number and types of plants and animals found in a forest depends on the soil and climatic conditions of the region. Human being depend on the natural resources present on the earth for their survival. As the population of human beings is increasing the consumption of natural resources is also increasing. This increase is quite alarming as this stage as the balance between demand and availability is getting unproportional due to increasing demand of natural resources. We should conserve our natural resources so that balance between supply and demand is always maintained. For this we should use our resources wisely.
2. Forest play an important role in our lives directly or indirectly. Forest are the most important sources of renewable resources. Forest are very useful to us. In India, about 67.73 million hectares of land is forest. Forest protect our wildlife and help us in maintaining the balance between CO₂ and O₂ in the atmosphere. Forest regulate the temperature of the earth and keep the water cycle going on. They absorb the harmful solar

radiation and protects us from its effects. Forest check floods and soil erosion. They give us woods, raw materials. They also give us food and medicines. There are many more uses of forests in our lives.

3. We can conserve forest by –
 - F **Afforestation**– It means renewing a forest by planting seedlings or small trees of the same species as found in the forest.
 - F **Control on overgrazing**– When animals are left open in the forest for grazing, they trample the new plants with their feet or eat them. This stops the growth of new plants in the forest.
 - F **Protection from fire**– The fire in the forest spreads very fast. It destroys huge area in the forest. Many plants and animals die due to fire in the forests every years.
 - F **Protection from insects and pests**– By using insecticides and fungicides and removing infected trees.
4. Deforestation not only deprives us of our flora, but it snatches away the home of different birds and animals. To do this we should keep aside some permanent places for animals and birds to live. These preserved and protected areas are called wildlife sanctuaries. Government is responsible for the management of wildlife sanctuaries. Here, birds and animals can live and breed in their natural habitat. In India, there are a large number of wildlife sanctuaries and parks. National park protect both flora and fauna whereas wildlife sanctuaries protect only the fauna whereas wildlife sanctuaries protect only fauna i.e., the animals. We have 492 wildlife sanctuaries and 89 national parks.
5. Jim Corbett National Park, Uttaranchal
Kanha National Park, Madhya Pradesh
Kaziranga Sanctuary, Assam
Bandipur Sanctuary, Karnataka
6. There are certain species of plants and animals found in a particular region or area. Such species are called endemic species. Endemic species have great possibility of getting extinct as they are not spread over a distant area and are only restricted to a particular geographical or ecological changes in that particular area the possibility of these species getting extinct becomes very high.
7. In International Union for Conservation of Nature and Natural Resources (IUCN) has enlisted the name of species worldwide in a book called Red Data Book. Each Red Data Book has information regarding specific group of animals or plants. Eg. insects, reptiles etc. This book is revised at different times. Given

changed status of wildlife. Various such organisation like IUCN work for such purpose.

HOTS

1. No, we cannot ban cutting of trees completely rather we can lower the rate of cutting of trees. We can also practice afforestation at a bigger level.
2. Zoo is a place where animals are kept in cages for people to watch. Whereas wildlife sanctuaries are places which are protected and animals roam free in a forest like area. Animals will be happier in wildlife sanctuary as they are not kept in cages.

Let's Enjoy

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

CHAPTER 7

(Cell–Structure and Functions)

Just Do More (Pg 71)

1. One cell
2. Multicellular organisms are those which are made up of few to million of cells.
3. Largest – Nerve cell
Smallest – Red blood cells
4. Cells are capable of carrying out all functions of a living organisms such as movement, respiration, digestion and so one. Therefore, they are called living basic structural unit of living organism.

EXERCISE

- A**
1. (a) chloroplast 2. (c) Mushroom
 3. (b) plastids 4. (c) cell wall
 5. (b) two
- B**
1. False 2. True 3. True 4. True
 5. True 6. False
- C**
1. Nucleus 2. chromosomes
 3. Mitochondria 4. chloroplast
 5. Mitochondria, synthesis 6. Ostrich's egg
- D**
1. (e) Cells 2. (b) Chloroplast
 3. (d) Mitochondria 4. (c) Lysosome
 5. (a) Ribosome
- E**
1. Multicellular organism are those which are made up of a few to billions of cells.
 2. A jelly like structure which lies between the cell membrane and the nucleus.

3. In plants, there is an additional membrane called cell wall. It is not present in animal cells.
 4. Different types of small structures called organelles are scattered around the cytoplasm. They perform vital functions for functioning of body.
 5. Any of the distinct type of material of which plant and animal are made consisting of specialised cells and their products.
- F**
1. Centrosome are important for the cell division and are located near the nucleus.
 2. Unicellular organisms are those which are made up of single cell. In these organisms, all the functions like nutrition, respiration, excretion growth and reproduction are carried out by a single cell. For eg. paramecium, amoeba.
 3. All cells perform different functions but have similarities. Their basic structure is same. A general cell consist of cytoplasm, cell membrane, nucleus and different organelles both in plants and animals.
 4. Cell division is the process for formation of new cells.
 5. Cell membrane encloses the inner parts of the cell. It controls the entry and exit of some substances in and out of the cell.
- G**
1. Do yourself.
 2. Plant cells is usually surrounded by an extra cell wall in addition to the cell membrane. They have chloroplast in them which contain a green pigment called chlorophyll. Plant cell contains one or two large vacuoles in them.
Whereas animal cells only have cell membrane and lack a cell wall. Chloroplast are absent in case of animal cell. They do not have vacuoles. If vacuoles are there, they are very small in size.
 3. In plants, there is an additional membrane called cell wall. It is not present in animal cells. It supports the plant cells and protects plant cell due to lack of skeleton in plants.
 4. Thread like structures called chromosomes are present in the nucleoplasm. These chromosomes have all the information regarding reproduction of cells and to carry forward all the information to next generation of the cells. This is called inheritance of characters from parents to their children.
 5. **F** In animal cell, it is the outermost layer, whereas in plant cell, it is protected by the cell wall.
F This membrane encloses the inner part of the cell.
F It is a living structure and controls the entry and exit of some substance in and out of the cell.

- F It gives shape and size to the cell and protects it.
- F Water, minerals and some other substances can penetrate through this membrane.
- F The waste materials formed inside the cell also get expelled from the cell through this membrane.

HOTS

1. It performs the function of respiration. They are slipper shaped in structure and provide energy to the cell by the process of the oxidation of the food.
2. Yes, because giraffe are bigger as compared to rats. They need more elongated new cells for transformation of information in their body.

Let's Enjoy

A Do yourself.

B Do yourself.

CHAPTER 8
(Reproduction in Animals)

EXERCISE

- A** 1. (a) zygote 2. (a) Fish 3. (c) Oviduct
4. (b) Hen 5. (a) Dogs

- B** 1. False 2. True 3. True 4. False
5. True 6. True 7. True

- C** 1. Producing babies of one's own kind.
2. When fertilisation takes place outside the body of the parent organism, it is called external fertilisation.
3. Chemicals which are secreted by various glands in the body for controlling and coordinating various activities.
4. The fusion of sperm and egg produces zygote.
5. Age of sexual maturity.

D Do yourself.

- E** 1. For sexual reproduction two individuals are required i.e., male and female whereas for asexual reproduction only one individual is required.
2. When a male releases his gametes into the body of female then the fertilisation takes place inside the body of female. This is called internal fertilisation. Eg. humans, cats etc.
Whereas when male and female liberate their gametes in open like on land or in water, the process of fertilisation takes place out of their bodies. For eg. frogs, fishes reproduce through external fertilisation.
3. Testosterone is responsible for sexual development in males and for production of sperms.

Whereas oestrogen is responsible for sexual development in female and egg production.

4. Thyroid secretes thyroxin. It is in the neck. It affect the growth of an individual whereas parathyroid secretes parathyroid hormone. It is behind thyroid in the neck. It controls metabolism of calcium in our body.
5. Adrenalin is secreted by Adrenal gland. It is present near the stomach. It controls the alarming reaction and blood pressure.
Whereas insulin is secreted by pancreas. It is present near the stomach. It controls the sugar metabolism in our body.

- F**
1. It is because of reproduction that life continues from generation to generation.
 2. Producing babies of one's own kind is called reproduction.
 3. In unicellular organism the parent cell splits into two daughter cells.
 4. Fertilisation refers to fusion of male and female gamete to produce baby.
 5. The fertilised egg enters the uterus and get attached to its wall. Here the egg divides several times to form an embryowall. This embryo develops into the baby and this process takes time of nine months.
 6. For the reproduction it is very essential for that both parents should be of suitable age and are capable of looking after their children. This is referred to as reproductive health.
 7. **F** Thyroid – It affects growth.
F Adrenal – It controls the alarming reaction and blood pressure.
F Pancreas – It controls the sugar metabolism.
F Parathyroid – It controls the metabolism of calcium.
 8. Pituitary gland controls water balance growth and functions of other endocrine glands there it is called the master gland.
- G**
1. For sexual reproduction two individuals are required.
Whereas for a sexual reproduction only one individual is required.
 2. **External Fertilisation** – When male and female liberate their gametes in open like on land or in water, the process of fertilisation takes place. Such fertilisation is called external fertilisation. For eg. frogs and fishes, liberate their gametes in water and fertilisation takes place externally in water.
Internal Fertilisation– When a male releases his gametes into the body of the female then, the fertilisation takes place inside

the body of the female. This type of fertilisation is called internal fertilisation. For eg. in humans, dogs, cats etc.

3. Age of sexual maturity is called puberty. The changes that take place in boys and girls at the age of puberty are–
 - F Increase in height
 - F Change in shape of body
 - F Development in sex organs
 - F Change in quality of voice
 - F Development of hair in pubic region
 - F Active oil and sweat glands
 - F Attainment of mental and intellectual maturity
 - F Production of hormones takes places
4. In males, the reproductive organs are a pair of testes. They are located outside the abdominal cavity in a sac, called the scrotal sac. The testes produce the male gametes or sperms in million. Each sperm is a single cell with all the usual cell components. Each sperm has a head, a middle piece and a tail. The sperms leave each testes through a sperm duct or vas deferens. As the sperms move through sperms ducts, fluids from three glands pour their secretion into the ducts. The mixture of fluids and sperms is called semen. The sperm swim in it and reach the urethra which lies inside the penis. The penis is the organ that transfer sperms into the vagina of the female's body.
5. Some women are unable to bear babies because their oviducts are blocked. This prevents the ovum from being fertilised as the sperms cannot reach the oviduct where the ovary is present. This problem can be overcome by fertilising an ovum, with human sperms in the laboratory, with a technology called In Vitro Fertilisation (IVF). This technique is quite useful when natural fertilisation fails. This technique was first successfully introduced in humans in 1978.
6. The process of fusion of an ovum and a sperm takes place in the oviduct of the female. The fertilised egg enters the uterus and gets attached to its wall. There the egg divides several times to form an embryo. This embryo develops into baby and this process takes time of nine months.
7. In human body cells, there are 23 pairs of chromosomes in the nucleus. 22 pairs of chromosomes are same in both girls and boys. The 23rd pair of chromosomes, which are also called the sex chromosomes, are different in boys and girls. Sex chromosomes are of two types X and Y chromosomes.

In females, both are X chromosomes and in males X and Y both

chromosomes are present. The sex of the baby depends on which sperm fertilises the ovum, as male produces two types of sperms, one containing X chromosome and one containing Y chromosome. If sperm containing Y chromosome fertilises the ovum, the baby will be a boy or a male. If sperm containing X chromosome fertilises the ovum, the baby will be girl or a female.

8. There are 46 (or 23 pairs) of chromosomes in every normal human cell. Two out of these are sex chromosomes. The sex chromosomes are denoted as 'X' and 'Y' chromosomes. The 'Y' chromosome is present only in males. A gamete has only one chromosome. An egg has only X chromosome, whereas a sperm may have X or Y chromosome.
 - F When a sperm that has X chromosome fertilises the egg, the zygote would have two X chromosomes and would develop into a female.
 - F When a sperm that has Y chromosomes fertilises the egg, the zygote would have one X and one Y chromosome and develop into a male. Therefore, we can see that the sex of an unborn child is determined by the chromosome provided by the father.

HOTS

1. Because external fertilisation takes place in fishes and frogs. Their eggs are damaged by predators for food, so only survive and mature in frogs and fish.
2. Twins can be born when two sperms fuse an ovary and ovary splits into two or when two ovaries gets fertilised by two sperms.

Let's Enjoy

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

CHAPTER 9 (Age of Adolescence in Humans)

EXERCISE

- A
 1. (a) puberty
 2. (b) height
 3. (a) Increase in height
 4. (b) Embryo
- B
 1. puberty
 2. Endocrine
 3. sebaceous
 4. secondary sex characteristics
 5. Testosterone
- C
 1. Some adolescents become insecure as they find themselves unable to cope up with the changes taking place in their body, but soon they get adapted to these changes and things become normal.

2. Proper nourishment is very important because teenagers grow, their bones get elongated and physical development keep on taking place at the age of puberty.
 3. It is because in adolescence one is neither child nor an adult. It is a span of age from eleven years to nineteen years.
- D**
1. It is the voice box in our throat, which produces the sound we make.
 2. Estrogen is female reproductive hormone.
 3. Phase of life, when body changes to attain the reproductive maturity.
 4. Testosterone is male reproductive hormone.
- E**
1. Puberty refers to the stage when men and women become sexually matured.
 2. Sex organs refers to the part of the body that are involved in the process of reproduction.
 3. Different features which help to distinguish the male from females are called secondary sexual characters.
 4. Adolescence spans from the age of eleven years to the age of nineteen years, therefore they are also called teenagers.
 5. The voice box in boys become more grown up and elongated, which can be seen as protruding part of the throat. This part moves up and down while the boys speak. This visible larynx is called Adam's apple in boys.
 6. Chemicals which are secreted by various glands in the body for controlling and coordinating various activities.
- F**
1. The muscles of the body start growing along with bones also changing shape of the body during adolescence. In boys, the shoulders become broader and the chest becomes wider. The muscle grow more as compared to growth of muscles in girls.
In girls, the pelvic region widens, hips broaden, breasts develop and increase in size. Mammary glands develop inside the breasts.
 2. Sudden increase in height is one of the physical changes that take place at puberty. The bones of legs get elongated to increase the height of boys and girls. This change seems to be more prominent in girls earlier, but soon bodies of the boys also shoot up to attain the maximum height. The growth in height is also not same in all boys and girls. It depends upon the body and the genes inherited from parents.
Sometimes the changes are bit awkward, which gradually becomes symmetrical. Arms and legs become long, but face do not match the height, the body look unproportionate, as well the

body parts do not grow at the same rate. Slowly, all the parts become equally and symmetrically grown up resulting in proportionately grown up body. Proper nourishment is very important at this phase of body growth.

3. The most important change that take place during adolescence is the development of sex organs. At this stage, the sex organs start growing to reach the fully grown up stage and the boy or girl reach the reproductive maturity. In males, the testes and penis become completely grown up and start releasing sperms. In females, ovaries become enlarge, enable to release mature eggs. These changes are called reproductive maturity.
4. The sweat glands and the sebaceous glands become more active during adolescence. Over active oil or sebaceous glands, cause more secretions of oil which sometimes result in pimples and acnes in teenagers. This happens as the extra oil secreted by sebaceous glands becomes blocked in skin pores.
5. The hormones are released in our body by various glands. We know that testosterone and estrogen are male and female reproductive hormones respectively. Pituitary gland secrete hormones which further stimulate the testes and ovaries to secrete these reproductive hormones. These reproductive hormones, further bring about various changes in puberty.

HOTS

1. Many adolescents boy look awkward which gradually becomes symmetrical. Arms and legs become long, but face do not match the height the body look inappropriate as all the body parts do not grow at same rate.
2. The pelvic area broadens during puberty so that the girl prepares for giving child birth in the later stage of life.

Let's Enjoy

Do yourself.

CHAPTER 10 **(Force and Pressure)**

Just Do More (Pg 98)

1. Polishing, lubricating
2. Oil, grease
3. There is a chance of skidding the vehicle on slippery road.
4. Sports men wear spikes because it decreases pressure and help them to run easily on ground.
5. Sand or gravel is spread on a slippery ground to increase friction so that one do not slip while walking.

6. A non contact force is a force which acts on an object without coming physically in contact with it.

Just Do More (Pg 96)

1. We can move or stop moving object.
2. We can change shape of clay by applying force on it.
3. Some forces can be applied on an object only when the source of force comes in contact with the object.
4. The soles of your shoes wear out in a few months due to friction. The moving parts of a machines wear out with time due to friction.

Just Do More (Pg 99)

1. The force of attraction exerted by our earth is called the gravitational force.
2. The magnetic property of lodestone has been known since ancient times.
3. The use of a magnetic compass is to check the direction.
4. The force which results due to repulsion of similar charges or attraction of opposite charges is called electrostatic force.
5. When you rub a glass rod with piece of silk. You generate electrostatic force.

Just Do More (Pg 104)

1. Nails have pointed tip so that they can easily be mounted on the wall.
2. Pressure is measured in N/m^2 .
3. Two applications of pressure in our daily life are:
F We exert pressure while walking on floor.
F We exert pressure from our thumbs when we thumbnail photos on notice board.
4. If we fill a balloon with liquid we will notice the pressure exerted by liquids.
5. We can measure the atmospheric pressure with barometer.

EXERCISE

- A**
1. (c) dye clothes
 2. (c) Gravitational force
 3. (a) mechanical force
 4. (b) N/m^2
 5. (b) 760 mm
- B**
1. True
 2. True
 3. False
 4. False
 5. True
 6. False
- C**
1. (b) lodestone
 2. (d) engine
 3. (e) wearing out of sole
 4. (a) earth
 5. (c) transfer of electron

- D** 1. thrust 2. heat 3. friction 4. reducing
5. kilopascal (kpo) 6. pressure
- E** 1. Force is a push or a pull.
2. When the source of force comes in contact with the object it is called contact force. Contact forces are of the following types:
F Muscular Force
F Mechanical Force
F Frictional Force
3. Friction is the name given to the force that tries to stop materials sliding across each other. There is a friction between your hands. When you rub them together, and there is friction between your shoes and the ground when you walk along.
4. Friction wears out moving parts of the machines and it can also heat up the moving parts of a machine which can damage the machine. Therefore, to minimise the damage and to increase the efficiency of the machine, we use lubricates.
5. The weight exerted by the vertical column of all layers of air of atmosphere, on unit area of earth's surface is called the atmospheric pressure.
6. Fountain pens starts leaking at higher altitude. The pressure inside the pen is much higher than the pressure outside.
- F** 1. The effects of force on a moving object are–
F Force can change the speed of a moving object.
F Force can make a stationary object move.
F Force can change the direction of motion of moving object.
F Force can change the shape of an object.
2. Contact forces are of following types–
F **Muscular Force**– When we apply force of our muscles on an object, the force is called muscular force. For eg. lifting a bag, drawing water from well etc.
F **Mechanical Force**– The force applied by a moving object on a body is referred to as mechanical force. For eg. moving water applies force on the turbines to rotate it to produce electricity.
F **Frictional Force**– A ball moving on ground comes to rest after moving through some distance. Friction is the name given to the force that tries to stop materials sliding across each other.
3. We can reduce the effect of friction by the following methods:
F Polishing

- F Lubricating
- F Using ball bearing and wheels
- F Streamlining

4. The force of attraction of magnet is called as magnetic force. Large magnets are used to lift big iron pieces. The use of magnetic compass has been in vogue for a very long time.
5. We can measure atmospheric pressure with the help of barometer. It is kept upside down in a bowl of mercury. It does not matter if the barometer is tilted, as the vertical height of the mercury column stays the same. The column of mercury is held up by air pressure. Since, the atmospheric pressure varies day by day depending on weather, the height of mercury also varies. No pressure is exerted in the top of the liquid in the column because of the vacuum, so the pressure in the column is just the liquid pressure which is proportional to the depth.
6. Take a small container of tin having an arrow mouth. This empty container is under pressure from the air outside as well as inside. The air pressure on the inside is equal to the pressure on the outside of the container.
 Pour a little amount of water into the container and heat it. The container fills with steam and the air is pushed out. Now, stop heating and close the mouth of the container with a cork tightly.
 You will notice that the container gets deformed. It is because on heating the steam pushes the air of the container outside. When the container is corked, the steam present in the container condenses into water and the container gets evacuated. Now due to external atmospheric pressure the box gets deformed.
7. Take a small container of tin having a narrow mouth. This empty container is under pressure from the air outside as well as inside is equal to the pressure on the outside of the container. Pour a little amount of water into the container and heat it. The container fills with steam and the air is pushed out. Now, stop heating and close the mouth of the container with a cork tightly. You will notice that the container gets deformed. It is because, on heating, the steam pushes the air of the container outside. When the container is corked, the steam present in the container gets evacuated. Now due to external atmospheric pressure the box gets deformed.
8. Force/Weight = 200 N
 Area of contact = 5 m²
 Pressure = Force (f) / Area (A) = 200/5 = 40 N/m²

9. Force = 80 kg = 80 × 10 = 800 N
 Area of contact = 5 × 25 cm² + 5 × 25 cm² = 125 + 125 = 250 cm²
 Pressure = Force / Area = 800 / 250 = 3.2 N/m² = 3.2 N/m²

HOTS

1. It is because the gravitation force of the earth is greater than the gravitational force between the building. This is the reason earth will pull you with a larger force and we will not be pulled towards the building.
2. It is because on a rough surface vacuum cannot be created because of uneven surface whereas on smooth surface vacuum is created.

Let Enjoy

Do yourself.

CHAPTER 11 (Sound)

Just Do More (Pg 115)

1. Shrillness of sound is called its pitch.
2. Loudness and pitch.
3. Sounds which produces a pleasant effect on our ear are called musical sounds. For eg. sounds produced by musical instruments, songs etc.
4. If a body makes 1 oscillation in a second, we say that frequency of body is 1Hz.

Just Do More (Pg 117)

1. Sounds which seems unpleasant and harsh to the ears is called noise.
2. Undesirable, loud and harsh sounds causes noise pollution.
3. Ill effects of noise pollution are—
 F Disturbance
 F Lack of concentration
 F Health problems
 F Lack of sleep
 F Nervous tension
4. Use of loud speakers in religious function should be banned because they create noise pollution.

EXERCISE

- A** 1. (a) Air 2. (a) loudness 3. (b) eardrum
 4. (c) sound created by machines
 5. (a) reed instruments
- B** 1. True 2. False 3. False 4. False
 5. False

- C** 1. frequency 2. number 3. louder
 4. frequency of vibration 5. 20 Hz to 20,000Hz
 6. inaudible sounds 7. loud and harsh
- D** 1. Sound is a kind of energy which makes one hear.
 2. Number of variations produced in one second.
 3. Percussion instruments have a stretched skin whose vibrations produce sound.
 4. Sound which seems unpleasant and harsh to the ears.
 5. The disturbance produced in the environment by undesirable loud and harsh sounds from various sources is called noise pollution.
- E** Do yourself.
- F** 1. Vibrations are the main source of sound.
 2. Sound is always produced due to vibrations produced by anybody.
 3. Three characteristics of sound are—
 F Sound travels in form of wave.
 F Sound needs medium to travel.
 F Loudness of sound decreases with an increase in distance of the listener from the source.
 4. The disturbance produced in the environment by unfeasible loud and harsh sounds from various sources is called noise pollution.
 5. The main sources of noise pollution are domestic noise, neighbourhood noise, noise created by machines, noise created by vehicles, air and rail traffic etc.
 6. Musical instruments are of four types—
 F Stringed instruments
 F Wind instruments
 F Percussion instruments
 F Reed instruments
- G** 1. We can distinguish between two sounds or voices of same loudness and same pitch. Eg. We can identify any person from his voice in a group of people. Most vibrating objects produce sound of different frequencies simultaneously. Eg. musical instruments produce basic sound frequencies called fundamental along with other frequencies called harmonies. The harmonies differentiate the notes played on guitar from those on a sitar.
 2. Take a rubber band and tie its one end to a nail and pull the other end with your finger. With a finger of your free hand, pluck the

rubber band. You will see that rubber band starts vibrating, it also stops making sound, proving that sound is produced due to vibrations in the objects.

3. A vibrating object causes air molecules to vibrate. And these vibrations reach our ear. They are collected by the pinna and funneled into the eartube.

These then strike the eardrum which starts vibrating with the same frequency. This causes the delicate bones of the middle ear to vibrate. This stimulates tiny hair in the hearing organ which in turn send a signal to the auditory nerve takes the signal to the brain and we can then hear the sound.

4. Sounds having frequency less than 20Hz are not heard by human ears. Similarly, sounds having frequency more than 20,000 Hz are also not heard by the human ear. These sound are called inaudible sounds.

Whereas sounds having frequency between 20Hz to 20,000Hz are heard by human ears and are called audible sounds or the ultrasonic sounds. Ultrasonic sound is very useful in the field of medical science. It is used to form the images of the body and to study about the foetus in the uterus of the mother. Ultrasonic sounds are produced by earthquakes, simple pendulum, volcanoes and by some animals like whales.

5. Sounds differs like sound produced by drum is different from sound produced by tabla. Similarly, sound produced by a violin in different from that produced by a sitar on a guitar, voice of girl is different from that of boy. Voice of each boy is different from other boy or girl, these differences are due to the difference in their loudness, pitch or their frequency. These are called the characteristics of sound which differentiate one sound from other.

6. The effect of noise pollution on our health are–

- F Exposure to sudden high noise level can cause permanent hearing loss due to rupture of ear drum.
- F Noise pollution increases nervous tension which in turn creates problems like irritation, high blood pressure, anxiety.
- F It causes lack of concentration.
- F It disturbs the sleep and causes mental tension.
- F Sometimes, harsh and loud noises can cause partial or permanent hearing loss.

7. The measures which can help in controlling noise pollution in our environment are–

- F Strict action should be taken against people violating the law, made to check noise pollution.
- F More and more trees should be planted on the road so that they can absorb the noise.
- F People should be made aware of the ill effects of the noise pollution, so that they can help in checking noise pollution at individual level.
- F All vehicles should be fitted with soft horns or silencers, so that they cannot create noise on the road.
- F Machines should be designed in such a way that they create less noise. Moreover frequent lubrications of various parts of machines can also lessen the noise produced by them.
- F Factories and industrial units should not be allowed to work in residential areas.
- F Use of loud speakers in religious places and religious functions should be banned. If they are used, they should be used in limited area only, so that noise does not spread.

HOTS

1. It is because it is more than 20,000 Hz which is inaudible sound for humans.
2. He can guess with the help of sound, pitch, loudness of the voice of a person.

Let's Enjoy

Do yourself.

CHAPTER 12 (Electric Current) EXERCISE

- A**
1. (c) Distilled water
 2. (a) Lemon juice
 3. (b) anode
 4. (c) obtaining aluminum
 5. (c) making glass
- B**
1. electric
 2. Salt
 3. conductor
 4. electrolyte
 5. electrolysis
 6. electroplated
- C**
1. Those substances which allow the electric current to pass through them are known as electric conductors.
Whereas those substances which do not allow electric current to pass through them are known as insulators.
 2. The solution which conducts electric current and undergoes chemical changes is called an electrolyte.
Whereas aqueous solution of acids, alkalis and salts are electrolyte solutions, which do not conduct electric current are

called non-electrolyte.

3. Distilled water does not allow the electric current to pass through them. Whereas distilled water mixed with sodium hydroxide is a conductor of electricity and allows electric current to pass through them.
 4. The electrode connected to the negative terminal of the battery are called cathode. Whereas the electrode connected to the positive terminal of the battery is called anode.
 5. Positively charged ions are called anions while negatively charged ions are called cations.
- D**
1. The process by which the chemical reactions start in liquid on passing current through them.
 2. Those substances which allow the electric current to pass through them are called conductors.
 3. The electrode connected to the negative terminal of the battery.
 4. Positively charged ions are called anions.
 5. The process of depositing a thin layer of any superior metal over an object of a cheaper metal using electricity.
- E**
1. Touching an electric wire or a switch with wet hands can give you an electric shock.
 2. The process by which the chemical reactions start in liquids on passing current through them are called electrolysis.
 3. The electrode connected to the positive terminal of the battery are called anode.
Whereas the electrode connected to the negative terminal of the battery are called cathode.
 4. Positively charged ions are called anions while negatively charged ions are called cations.
 5. To see that chemical reactions, when electric current is passed through the water containing a little salt, we need an apparatus called voltaic cell.
- F**
1. We can convert non electrolytic water to an electrolyte by adding sodium hydroxide to it.
 2. The solution which conducts electric current and undergoes chemical changes is called an electrolyte. Aqueous solution of acid, alkalis and salts are electrolytes solution which do not conduct electric current are called non-electrolytes. For eg. kerosene, petrol, mustard oil etc. The process of breaking up of an electrolyte chemically on passing an electric current through it, is called electrolysis.
 3. (a) Kerosene oil – Non electrolyte solution

- (b) Solution of common salt- electrolyte solution
 - (c) Solution of copper sulphate- electrolyte solution
 - (d) Distilled water- Non electrolyte solution
 - (e) Distilled water containing Hydrochloric acid-electrolyte solution
 - (f) Mustard oil – non electrolyte solution
4. The process of depositing a thin layer of a metal on any conducting substances by the process of electrolysis is known as electroplating.
- Take a beaker and fill it half with solution of copper sulphate. Take copper wire, flatten it and join it with +ve terminal of the battery. Take a spoon or any other object like iron rod and connect it to the –ve terminal of the battery through a switch. Put this arrangement in the beaker containing copper sulphate solution. Now complete the circuit by switching on the switch and let the current pass for half an hour or so.
- Now switch off the current, and observe the spoon. Now you will see the spoon or the rod has been coated with copper and appear reddish in colour.
5. Arrange a voltaic cell and add copper sulphate solution in it to complete the electric current. You will see that some bubbles start arising in the solution and start collecting near the +ve end or anode while a layer of copper starts depositing on the –ve end or the cathode. The bubbles are of oxygen which arise due to the chemical reaction of water. This proves that the electric current can start chemical reaction.
6. Uses of electroplating are–
- F **Decoration purpose**– Some metals give better look and finish. Therefore, the objects of not so expensive metals are generally electroplated with expensive metals, such that they look more attractive and beautiful.
 - F **Protection against corrosion**– More reactive metals tend to get rusted often. To protect the objects made of such reactive metals, they are electroplated with less reactive metals.
 - F **Repairing finer machinery parts**– Finer parts of certain machines cannot be repaired by ordinary methods involving welding etc. Such fine parts are repaired by depositing the desired metal at the proper location electrolytically.

HOTS

1. The objects of not so expensive metals are generally electroplated with expensive metals, such that they look more attractive and

beautiful.

2. No, it is an electrolyte because it is conductor as mercury is a metal and metals conducts electricity.

Let's Enjoy

You have to arrange potassium iodide solution (KI), starch solution, a metal sheet, paper napkin, copper wires and battery. Now, dip the paper napkin in (KI) solution. Add a few drops of starch solution on the metal sheet and connect the metal sheet with -ve end of the battery with a copper wire. Now, spread the paper napkin dipped in KI solution, on the metal sheet. Your writing pad is ready.

Now, take another copper wire and connect it to the +ve end of the battery. Now hold this +ve wire with plastic gloves or with some pad of cloth and start writing on the paper napkin. Your electric pen is ready. All these activities should be done under the supervision of your teachers only.

CHAPTER 13 (Natural Phenomena)

Just Do More (Pg 132)

1. The energy of electricity that cannot flow and remain at rest in body.
2. Charges of atom are of two types positive and negative.
3. Because of electrostatic force
4. Negative charge

Just Do More (Pg 134)

1. Clouds charge tall buildings by the process of induction.
2. Lightning conductors are used to save tall buildings from lightning strike.
3. Lightning is useful because—
F It forms ozone layer.
F It fixes nitrogenous compounds for plants.
4. As tall buildings can get fire and get destroyed easily.

EXERCISE

- A** 1. (b) conductors 2. (a) static electricity
3. (c) electron 4. (b) lightning
- B** 1. False 2. False 3. False 4. True
5. False
- C** 1. conductors 2. glass rod 3. opposite 4. neutrons
5. destroy, cause
- D** 1. The electricity which cannot flow and remain at rest in a body is called static electricity.
2. Atmospheric electricity is produced when thunder storm strike.

It rains heavily and a dazzling, bluish light flashes with a thunder. This flash of light is called atmospheric electricity.

3. The dazzling, bluish light flashes with a thunder is called lightning.
 4. When heavy charge pass through small distances, air too becomes a conductor for a short while and a large amount of heat and light is released. This is called electric discharge.
 5. Lightning conductors are used to save tall buildings from lightning strikes.
- E**
1. The comb develops some force which attract or repel objects. When these objects are rubbed, they developed charge i.e., electric charge and got electrically charged. We call this electrostatic force.
 2. Electric energy produced by exchange of electrons.
 3. All atoms consist of protons carrying positive charge, electrons carrying negative charge and neutrons having no charge.
 4. The bright flash of light which we see in the clouds is called lightning. The sound energy produced when clouds of opposite charges come close to each other is called thunder.
 5. Lightning conductors are used to save tall buildings from lightning strike.
 6. After lightning the rain brings nitrogenous compounds which are very important for growth of plants. Lightning is also important in forming ozone layer.
- F**
1. When heavy charges pass through small distances, air too becomes a conductor for a short while and a large amount of heat and light is released. This phenomena is called discharge. The phenomena of discharge can be commonly seen in the gas lighter which we use to ignite our gas stove or when sparking takes place in a loose electric plug.
 2. The charging of the bodies is due to the transfer of electrons. When an object looses the electron, there is excess of the positive proton and thus the atom becomes, positively charged.
 3. Take an inflated balloon and stick it to the wall with help of a cellotape. Take another balloon and rub it with your dry hair. Now, bring this charged balloon near to uncharged balloon hanging from the wall. The charged balloon attracts the uncharged balloon.

So even the uncharged objects are attracted by the charged objects and it has also been established that the unlike charges also attract each other. So this cannot be a test of electrification. Now, pluck the balloon from the wall and rub it with your dry hair and bring both the charged balloon close to each other. Both

balloons repel each other. This proves that the repulsion is the only test for electrification.

4. The charging of the bodies is due to the transfer of electrons. When an object loses the electron, there is excess of the positive protons and thus atom becomes positively charged. When other atom gains the lost electron, the number of electrons become more than the protons and it becomes negatively charged. The electrically charged atoms are called ions and they are surrounded by an electrical field. Due to this field, charged particles exert force on each other even if they are not in contact with each other. This causes repulsion or attraction. This also establishes the fact that bodies rubbed against each other, acquire equal and opposite charge.
5. When clouds of opposite charge come close to each other heavy exchange of electrons take place causing production of large amount of energy in the form of light, heat and sound. The light and heat energy is seen as the lightning and sound energy is heard as a great thunder. The exchange of charges takes place through air, although air is an insulation. But when heavy charges pass through small distances, air too becomes a conductor for a short while and a large amount of heat and light is released This phenomena is called discharge.
6. This takes place by the process of induction. Induction is the process of charging another body without touching it. Clouds charge tall buildings and trees by induction. Buildings and trees get charged with opposite charge. Heavy exchange of charges take place releasing great energy and this can be dangerous as the building or trees can catch fire and get destroyed.

HOTS

1. It is because electrons are present in the outermost shell and can be easily removed.
2. Taller buildings are nearer to clouds as compared to small buildings therefore lightning strikes taller building easily as compared to normal buildings.

Let's Enjoy

Do yourself.

CHAPTER 14 (Light)

Just Do More (Pg 138)

1. Light always travel in a straight line as long as it travels in same medium. This is rectilinear propagation of light.
2. Reflection of light is throwing back of light by the objects.

3. If the beam of light is entirely reflected back it is called regular reflection.
4. When the rays of beam of light falls of uneven surface, they get reflected in different direction. This is diffused reflection.

Just Do More (Pg 142)

1. The phenomenon due to which the right hand scale of the objects appear as the left hand side, of the image formed by plane mirror is called lateral inversion.
2. Multiple reflection.
3. Splitting of white light in seven colours in called dispersion.
4. Violet, Indigo, Blue, Green, Yellow, Orange and Red (VIBGYOR)

Just Do More (Pg 145)

1. no light
2. cornea
3. myopia
4. hypermetropia

EXERCISE

- A**
1. (a) Pupil
 2. (a) refraction of light
 3. (c) translucent
 4. (c) Two
 5. (b) incident ray
- B**
1. False
 2. True
 3. True
 4. True
 5. True
 6. False
- C**
1. reflection
 2. incident ray
 3. point of incidence
 4. normal
 5. Louis Braille in 1820
 6. light
- D**
1. Reflection of light is throwing back of light by the objects, the amount of light thrown back i.e., the reflection of light depends on the material and nature of the surface.
 2. The splitting up of the white light into seven colour when a beam of light passes through the prism.
 3. In this eye defect the person can see nearer objects clearly but cannot see the far off objects.
 4. A person is said to be blind or visually impaired, when he/she is unable to see.
 5. It is a region below the yellow spot, where no light sensitive nerves endings are present. It is an area of no vision.
- E**
1. In myopia a person can see nearer objects clearly but cannot see the far off objects. This defect is due to the thickness of the eye lens. Ciliary muscles do not relax enough to see distant objects. This defect can be corrected by using a concave lens of appropriate focal length.
Whereas in hypermetropia the person can see far off objects clearly, but cannot see the near objects. This defect is due to thinness of eye lens. The ciliary muscles do not contract enough

to make the lens see nearer objects. This defect can be corrected by using convex lens of appropriate power.

2. When a cornea becomes opaque or the crystalline becomes opaque, in both cases, person is operated and eye sight is restored. This blindness is temporary.

Whereas in permanent blindness cornea makes an image but it is not transferred to the brain. This is permanent blindness.

3. The surface of new utensil is smooth. Therefore, if a beam of light falls on it, the entire beam is reflected in only one direction. This is regular reflection.

Whereas the surface of old utensil is not so smooth. When the rays or a beam of light falls on an object with an uneven surface, they get reflected in different direction. This is called irregular reflection.

4. If the beam of light falling entirely reflects in only one direction. It is called regular reflection.

Whereas when the rays of a beam of light falls on an object with an uneven surface they get reflected in different direction. This is called diffused reflection.

5. In placing mirror at 90° we get super imposed image.

Whereas in 60° placing we get a hexagonal image.

- F**
1. Reflection of light is throwing back of light by the objects.
 2. If a beam of light falls on a surface and the entire beam is reflected in only one direction. This is called regular reflection.
 3. **F** If we switch on a torch, it will throw straight light.
F If we switch on bulb, it will throw light in straight line.
 4. Virtual image cannot be caught on a screen. There is no actual meeting of the light rays.
 5. The image formed by one mirror works as object for other mirror. This is called multiple reflection.
 6. The seven colours are same as those seen in a rainbow i.e., Violet, Indigo, Blue, Green, Yellow, Orange and Red. It is called VIBGYOR.
 7. Braille is based on code of one to six dots which are raised. Each dot has a position. These dots make up letters of alphabets, number and all other things done in print.

- G**
1. The two laws of reflection are–
F When a ray of light falls on a reflecting surface, it is reflected in such a way that the angle of incidence is equal to angle of reflection. $\angle i = \angle r$
F The incident ray, the normal and the reflected ray, all lie in

the same plane.

2. The sunlight is a mixture of various colours. But it seems white to us. So, the splitting up of white light into its seven constituents colours is called dispersion.
3. The light reflected by an object enter our eyes through cornea. Crystalline lens focuses the image of the object on the retina. Retina converts these optical images received through crystalline lens into optical pulses. These optical pulses are then sent to the brain through optical nerve. The amount of light entering the eye through cornea is controlled by iris. It expands in bright light and thus contracts the pupil to allow controlled amount of light to enter the eye. In dark it contracts and increases the size of pupil to allow more amount of light to enter eye. The retina forms a small and inverted image of the object. The brain interprets it and forms the erect and correct sized image.
4. The defect of myopia can be corrected by using concave lens of appropriate focal length.
The defect of hypermetropia can be corrected by using convex lens of appropriate power.
5. In 1980s, a new Braille computer software was developed. Some other technical aids are also invented like voice recognition software, optical scanners and spherical computer keyboards. All these can translate documents from Braille. Speech technology can convert ordinary text into speech. All this has helped the visually impaired to march forward along with other normal people towards a brilliant future.
6. When a cornea becomes opaque or the crystalline becomes opaque, in both cases, person is operated upon and sight is restored. In case of opaque lens, it is removed by surgery and then an artificial lens is installed. When the cornea becomes opaque, it is removed and a healthy donated cornea is grafted in its place.

HOTS

1. The light reflected by the objects enter our eyes through the cornea. Therefore, they are called window of the world.
2. No, because only white light splits into seven colours. No, other colour can split or disperse.

Let's Enjoy

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

CHAPTER 15
(The Universe)
EXERCISE

- A** 1. (c) Moon 2. (a) Orion 3. (a) Ursa Minor
4. (b) venus 5. (b) 62
- B** 1. galaxy 2. milky way 3. Jupiter 4. orbits
5. Ursa Major 6. Halley's
- C** 1. A fixed luminous point in the night sky which is a large, remote incandescent body like the sun are called stars.
Whereas the celestial bodies moving in an elliptical orbit round a star are called planets.
2. The asteroids are rocky and metallic objects which revolve around the sun, between the orbits of Mars and Jupiter.
Whereas the process of rocks floating in space which get heated up on entering into the Earth's atmosphere and thus appear like stars are called meteors.
3. Pole star stands exactly over the north pole. It does not change its position.
Whereas the sparkling heavenly bodies seen in the sky are called stars.
4. Moons are the bodies that revolve around the planet.
Whereas the bright heavenly bodies in the universe which do not twinkle are called planets.
- D** 1. The universe is everything that exists-stars, planets, moons, other heavenly bodies.
2. Some of the bright heavenly bodies that do not twinkle at night in the sky are called planets.
3. The process of rocks floating in space which get heated up on entering into the Earth's atmosphere and thus appear like stars are meteors.
4. A group of stars which forms a recognisable form is called constellation.
5. Bodies like sun, planets, stars etc. are called celestial bodies.
- E** 1. We see only sun in the sky at day time because due to brightness of sun other heavenly bodies cannot be seen.
2. You can see the moon and thousands of stars twinkling in the sky at night.
3. The curved path of a celestial object or star, planet, moon in which they move in the universe.

4. Sun is a huge ball of gases majorly hydrogen and helium.
 5. Our solar system has eight planets. These planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
 6. It is due to the mild climate that earth has. Moreover, water and oxygen are present on earth to sustain life.
 7. The Great Red spot is a giant storm, bigger than the size of the earth on Jupiter.
- F.**
1. Stars are seen in the sky in groups. Each group has billion of stars in it. Such group of stars is called galaxy. The sun, the earth and other planets, and all the stars that you can see in the sky belong to a galaxy called milky way.
 2. The sun is the source of almost all energy on the earth as well as other planets.
 3. The temperature at the centre of sun is about 14 million degree celcius, while its surface temperature is about 6000 degree celcius.
 4. Venus is the hottest and brightest planet. This is because due to excessive heat, the crust of Venus softens and countless volcanoes erupt on Venus. Magma easily breaks and lava oozes out in all directions causing hot spots. It has a thick layer of carbon dioxide present on it, which makes it hot planet.
 5. Venus rotates east to west, instead of rotating west to east like other planets.
 6. Earth also revolves around the sun in its orbit. The axis of the earth is tilted to its orbit at an angle of $23 \frac{1}{2}^\circ$. Revolution around the sun and a tilt in the axis of the earth gives rise to the formation of seasons.
Due to elliptical orbit the earth is not always at the same distance from the sun. When northern hemisphere is tilted towards the sun, it is summer, while southern hemisphere has winter and vice versa. When earth is between these two positions, autumn and spring occur.
 7. It is closest planet to the sun. Its gravitational force is not strong enough to hold an atmosphere. Due to the absence of an atmosphere, the heat is quickly lost at night, and it becomes freezing cold.
 8. The part of the earth which faces the sun has day and the rest of portion has night. Slowly, the dark side comes in front of the sun and start receiving sun's rays and night turns into day. Similarly, the rest of the earth moves opposite to the sun and gets dark and night is formed. This cycle keeps on going continuously forming day and night at different parts of earth.

HOTS

1. The sun shines brightly during day, therefore stars are not seen in the sky.
2. Yes, it will float on water because its density is less than water.

Let's Enjoy

- A**
1. Meteors
 2. Pole Star
 3. Moon
 4. Universe
 5. Jupiter
 6. Mercury
 7. Sun
 8. Constellations
- B**
1. Ursa Minor
 2. Orion

CHAPTER 16

(Earthquake)

EXERCISE

- A**
1. (b) earthquake
 2. (c) seismograph
 3. (c) open space
 4. (c) hailstorms
- B**
1. magma
 2. surface and body waves
 3. richter
 4. tsunami
 5. Bhuj, Gujarat, 8.1
 6. intensity
- C**
1. Astronomy is a natural science that studies celestial objects and phenomena.
 2. The point on the surface of the earth, directly above earthquake's underground beginning is called epicenter.
 3. The rocks get unstable and slide causing damage to humans in mountain regions are called landslide.
 4. A mountain or hill typically conical having a crater or vent through which lava, rock fragments hot vapour and gas are or have been erupted from earth's crust.
 5. An instrument that measures and records details of earthquakes, such as force and duration.
- D**
1. Shaking or trembling of the earth due to sudden movement of rock under the crust of the molten.
 2. Instrument to detect and measure the intensity of an earthquake.
 3. The magnitude or intensity of an earthquake is measured by Richter scale.
 4. The two effects of earthquake are—
F It causes landslides.
F It causes damage to buildings.
 5. The whole world including the oceans and mountains have been

divided into various risk zones according to the probabilities of the occurrence and disastrous effects of the earthquakes. These zones are called seismic zone.

- E 1. The causes of earthquakes are–
- F The motion or sudden trembling of tectonic plates causes earthquake.
 - F The explosive violent gases during earthquake tries to escape upward. This lead to severe tremors on land or earthquakes.
 - F Human activities like extraction of mine, blasting of rocks, construction of dams, reservoirs and nuclear explosions are also one of the main causes of earthquakes.
2. The earth's lithosphere is divided into about 20 parts called tectonic plates. These plates float over the hot magma below the rate therefore to relative motion to each other. When these plates move and slide over each other, the rocks below get interlocked. When these sections of plates get over each other, pressure is built along a fault line. Earth cannot take the pressure and the plates manage to break free and release a lot of energy sending waves through various underground layers. This results in shaking of the earth, thus causes earthquake.
3. Volcanic activity is considered to be another main cause of earthquakes. Almost all volcanic eruptions result in earthquakes and many earthquakes cause volcanic eruption. The explosive violent gases during a volcanic eruption try to escape upward. This leads to severe tremors of high magnitude which depends upon the intensity of the volcanic eruption. The intensity of earthquake is quite high near the volcanoes but they spread only around few hundred square kilometers.
4. Human activities like extraction of mines, blasting of rocks, construction of dams, reservoirs and nuclear explosions are also one of the main cause of earthquakes.
5. The various effects of earthquake are–
- F Fire
 - F Flood and Tsunamis
 - F Damage to Buildings
 - F Landslides
 - F Deformed Lands
 - F Damaged to Towns and Cities
 - F Loss of human lives.

Flood and Tsunamis– Earthquakes shift large amount of water form the sea to create huge water waves which can be 40-50

meters high. These waves can be much disasterous.

Damage to Buildings – Buildings are damaged badly due to earthquake, specially the high rising building. Building collapse and people get trapped inside, causing huge damage of life and property.

6. The dangerous effects of an earthquake are–
 - F Fire
 - F Flood and Tsunamis
 - F Damage to Building
 - F Landslides
 - F Deformed land
 - F Damage to town and cities
 - F Loss of human lives
7. Safety measures to be taken during earthquake–
 - F Never use lifts, always follow staircase to exit.
 - F Stay away from the electric or telephone bells and trees.
 - F If you are travelling, stop your vehicle at the side of the road or drive slowly to move out of seismic area.
 - F If one can't come out of buildings one should hide oneself under heavy furniture like table, desk etc.
 - F Save your face or head from direct injuries.
 - F If no heavy furniture is available one should stand at the corners of the room so that if the roof crumbles, it does not fall on anyone's body.

HOTS

We will rush outside our classroom towards the playground of our school because it is an open area.

Let's Enjoy

Do yourself.

CHAPTER 17 (Conservation of Natural Resources) EXERCISE

- A**
- | | |
|----------------------|--------------------------------|
| 1. (b) distillation | 2. (c) dams |
| 3. (c) deforestation | 4. (a) Liquefied Petroleum Gas |
| 5. (b) Hydrogen | |
- B**
- | | | | |
|----------|---------|---------|---------|
| 1. True | 2. True | 3. True | 4. True |
| 5. False | | | |
- C**
- | | | |
|-------------------------------------|----------------|-----------|
| 1. conserve | 2. exhaustible | 3. Forest |
| 4. Overgrazing, pulling grass roots | | |

5. 450 6. refining 7. deforestation
- D**
1. Management of protection of natural resources is called conservation.
 2. The fuel which is formed from the dead bodies of the organisms.
 3. Cutting of the forest indiscriminately for human usage is called deforestation.
 4. Planting of new trees is called afforestation.
 5. At 450°C the crude petroleum is heated and various petroleum products are obtained. This is called fractional distillation.
- E**
1. Those sources of which can be used again and again for energy purposes and which can never get finished. For eg. solar energy. Whereas these sources which cannot be used again and again and can get finished by regular and indiscriminate usage are called non renewable resources.
 2. A liquid fossil fuel, which is found trapped between two non porous rocks under the surface of earth.
Whereas a compact solidified carbon which is a fossil fuel and is found buried under the earth are called coal.
 3. Planting new trees is called afforestation whereas cutting of trees is called deforestation.
- F**
1. Those sources which can be used again and again for energy purposes and which can never get finished. For eg. solar energy, air, water.
 2. The advantages of forest are–
 - F They maintain water cycle.
 - F They prevent soil erosion.
 - F They keep a check on flood and droughts.
 - F They provide us with wood, food, medicines etc.
 - F Forest are habitat for wild animals.
 3. We can conserve forest by:
 - F Practising afforestation
 - F Overgrazing should not be allowed by animals as it causes soil pollution.
 - F People should not be allowed to kindle any the kind of fire in the forest.
 - F We should look for alternatives of wood like metals etc.
 - F We should not cut trees unnecessarily.
 - F Cutting of trees from the forests should be done by permission of government.

- F Only those trees should be cut which are dead and old.
- 4. Coal is very important for human being because–
 - F It is one of the important means of energy for us.
 - F It is used as fuels in industrial units and as a domestic fuel also.
 - F Coke and coal gas is also produced by coal.
 - F It is also used to manufacture synthetic petroleum.
 - F It is used in the extraction of metals.
- 5. Petroleum is found trapped between two non porous rocks, under the surface of earth.
- 6. At 450°C the liquid is heated and various petroleum products are obtained by the fractional distillation of crude petroleum.
- G**
 - 1. Forests provide us wood. The wood we get from the forest is very indispensable for us. It is used to build our houses. In some area, people do not build houses with brick or stone. These houses are only built with wood, because these areas are prone to earthquakes. Doors and windows are built with wood. Wood is used as the main source of fuel in rural areas Wood is also used as fire wood in many industrial activities. Objects like furniture, utensils etc. are also made up of wood.
 - 2. The major problems caused by cutting of trees are–
 - F Roots of the trees hold the soil and if we will cut the trees the soil will get loose and fertile land will get converted into deserts.
 - F Scarcity of rains will also contribute in conversion of fertile soil into deserts.
 - F Soil erosion, flood and droughts are some major problems faced due to deforestation. Trees maintain balance of water on the earth so cutting of trees can cause imbalance in water cycle.
To avoid all these problems, conservation of forest is the only solution.
 - 3. Roots of the trees hold the soil and if we will cut the trees, the soil will get loose and fertile land will get converted into deserts.
Scarcity of rain will also, contribute in conversion of fertile soil into deserts.
 - 4. Petroleum is also fossil fuel. It is found trapped between two non porous rocks, under the surface of earth. It is a dark coloured fuel, having a foul smell. Petroleum is believed to have formed, over a period of million of years from organism that lived in the sea at that time. When these organism died, their bodies settled

on the seabed, and got covered with sand and clay. Over millions of years, heat and pressure changed the dead organisms into petroleum hydrocarbons.

5. To extract petroleum from the rocks, wells are dug in the earth. Crude petroleum is then extracted and sent to the refineries for their purification. At 450°C the liquid is heated and various petroleum products are obtained by the fractional distillation of crude petroleum. Paraffin wax, lubricating oil, fuel oil, kerosene oil, petrol, naphtha and liquefied petroleum gas are obtained as fractions. These products are used for various purposes. They are mainly used as domestic fuels and for running engines.
6. Paraffin wax, lubricating oil, fuel oil, kerosene oil, petrol, naphtha and liquefied petroleum gas are obtained as fractions.

HOTS

1. No, fossil fuels cannot be made in laboratory.
2. F Petroleum is less dense than water therefore it floats on water.
F Petroleum is immiscible, it does not dissolve in water and floats above the surface.

Let's Enjoy

- A Do yourself.
B Do yourself.

CHAPTER 18 (Air and Water Pollution) EXERCISE

- A**
- | | |
|---------------------------------|----------------------|
| 1. (c) atmosphere | 2. (a) nitrogen |
| 3. (a) chlorofluorocarbon | 4. (a) air pollution |
| 5. (a) biodegradable pollutants | |
- B**
- | | | | |
|----------|----------|----------|---------|
| 1. False | 2. False | 3. False | 4. True |
| 5. True | | | |
- C**
- | | |
|-----------------------|-----------------------------|
| 1. untreated | 2. level of CO ₂ |
| 3. global warming | 4. Chlorofluorocarbon |
| 5. green house effect | 6. Sulphur trioxide |
- D**
- | | |
|---------------------|-----------------------|
| 1. (e) Ozone layer | 2. (c) Pesticides |
| 3. (d) Methane | 4. (b) Sulphuric acid |
| 5. (a) Purify water | |
- E**
1. The presence in or introduction into the environment of a substance which has harmful or poisonous effect.
 2. Increase in the average temperature of the earth due to increasing amount of carbon dioxide in the environment.
 3. Rain water containing sulphuric acid due to mixing of sulphur

dioxide with water in clouds.

4. To make water free from suspended impurities and germs.
- F**
1. The presence in or introduction into the environment of a substances which has harmful or poisonous effect. Any unwanted material which can be harmful on consumption is called pollutant.
 2. The air is polluted by addition of unwanted and harmful substances is known as air pollution. The substances which contaminate the air are called air pollutants.
Eg. dust, flyash, harmful gases such as carbon monoxide, sulphur dioxide.
 3. Vehicles use fuels for working. When this fuel burns, its emits various poisonous gases like carbon monoxide, nitrogen dioxide and lead.
 4. The water present under the surface of earth is called underground water.
 5. Water that is suitable of drinking is called potable water.
 6. Thick weed is developed on the surface of water. This causes death of many plants and animals because the weeds does not allow sunlight and air to enter the water. This is called eutrophication.
 7. Water has to be treated to make it suitable for drinking.
- G**
1. Various fuels are burnt during different process in the industrial units. The combustion of various petroleum products in these units produce various pollutants like black smoke and poisonous gas like carbon monoxide, sulphur dioxide etc. which react with water in the clouds and form sulphuric acid. Sulphur dioxide is poisonous. It affects our lungs. It combines with the oxygen in the air to form sulphur trioxide (SO_3). This reacts with water in the clouds to form sulphuric acid (H_2SO_4). Rain mixed with sulphuric acid is called acid rain. It damages buildings and corrodes metal structures.
 2. Excess of carbon dioxide leads to rise of temperature of earth. The rise in temperature will cause melting of ice and thus will cause floods. This whole process is called global warming.
 3. Due to deforestation level of carbondioxide is increasing day by day. If we will continue to cut trees, the level of CO_2 will increase and it will trap the sunlight and cause the rise in temperature of the earth. This is called green house effect. The rise in temperature will cause melting of ice and thus will cause floods. This whole process is called global warming.
 4. We can take following measures to control air pollution–

- F Afforestation is one of the most important measures to protect our air from being polluted.
 - F Tall chimneys should be fitted in the factories, so that they exit their smoke high up in the atmosphere.
 - F Biogas should be developed as more preferable fuel instead of wood, kerosene and charcoal.
 - F Smokeless fuels like LPG and CNG should be preferred to other petroleum fuels.
 - F Increasing use of unleaded petrol in the vehicles. So that, lead can be prevented from being emitted in the atmosphere.
 - F More and more alternative and less polluting sources of energy should be used in factories and other industrial units.
 - F All motor vehicles should be maintained properly so that they comply with pollution norms.
5. It is the major cause of water pollution. From long time factories and other industrial units have been throwing their waste products in the rivers and lakes. These wastes contain harmful chemicals, dust and dirt. It gets mixed in water and make it harmful for usage by living organism. Highly poisonous compounds of lead, arsenic, and mercury are disposed off in rivers by the leather and chemical industries. Such water if consumed by humans or animals will prove to be fatal for them.
 6. The waste from the industries and from sewage should be treated before disposing off into the other reservoirs. The water should be treated in the industries and should be recycled before disposing off.
 7. Methods for purification of water are–
 - F Boiling- All germs are killed by boiling water for 15-20 minutes.
 - F Ultraviolet Light– A special type of light called ultraviolet light kills germs. It is used in several water purifiers available in the market today.
 - F Reverse Osmosis (RO)– Water is passed through a special membrane called a semipermeable membrane.
 - F Chlorination– Chlorine added to water in the form of chlorine tablets or bleaching powder kills germs.

HOTS

1. Yes, acid rain affects crops because the rain water percolates in the soil and crops take in harmful pollutants dissolved in it. This affects the yield and crop production.
2. The water which is found near surface of earth as it will have

pollutants in it.

Let's Enjoy

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

MODEL TEST PAPER 1

- A**
 - 1. (c) Weeding
 - 2. (c) polymer
 - 3. (a) Graphite
 - 4. (b) flora
 - 5. (a) Cat
- B**
 - 1. True
 - 2. True
 - 3. True
 - 4. True
 - 5. True
- C**
 - 1. The organism which are too small to be seen by the naked eyes and can be seen only through a microscope are called microorganisms.
 - 2. Process of combining various monomers to form polymers.
 - 3. Burning of substance in presence of oxygen.
 - 4. The material or protoplasm within a living cell, excluding the nucleus.
 - 5. Producing babies of one's own kind.
 - 6. Phase of life, when body changes to attain the reproductive maturity.
- D**
 - 1. (e) Sounding on being stuck
 - 2. (d) Tapioca
 - 3. (b) Unbreakable kitchenware
 - 4. (c) Mushrooms
 - 5. (a) Kindling temperature
- E** Do yourself.
- F**
 - 1. Soil is made loose by the method of tilling or ploughing. It is carried out by using a wooden or iron plough which is pulled either by an animal or by tractors. Long teeth of plough break up the lumps of soil.
 - 2. Salt, checks the growth of bacteria by forcing microorganism to loose water by a process called osmosis. It is used for preserving food like meat, fish, pickles etc.
 - 3. The ability of metals to be beaten into sheets is called malleability.
The ability of metals to be drawn into wires is called ductility.
 - 4. Different form of plants, animals and microorganisms present on Earth.

5. All cells perform different functions but have similarities. Their basic structure is the same. A general cell consists of cytoplasm, cell membrane, nucleus and different organelles both in plants and animals.
 6. The stage when men and women become sexually matured is called puberty.
- G**
1. Methods of food preservation:
 - F Cooling food stops microbes from growing and reproducing and hence preserves food.
 - F Heating food to a high temperature kills microbes.
 - F Chemical preservatives like sodium benzoate and sodium metabisulphate help control bacterial growth in jams, squashes and ketchups.
 - F Drying or dehydration of food consists of removing water from it. This stops microorganisms from growing as they cannot grow without water.
 - F After sterilising the food, it is canned in airtight containers. Many canned food items are available in the market.
 2. Plastics are non-biodegradable so they pose a threat to our environment. They cause blockage in the drainage system and pollute our environment. They cause soil pollution and do not allow soil to absorb water. Animals get killed after consumption of plastics. Plastic bags also contaminate the food stuff in them. Plastic bottles, broken containers or waste. Plastic causes a great threat as they cannot be reused and their disposal is very difficult.
 3. Take a small stick of wood and burn it. It will not burn immediately. It will take time to kindle the fire. Now once it starts burning, sprinkle some water on it. The stick stops burning because the water has absorbed the heat and has lowered down the temperature which is below the ignition temperature, so fire gets extinguished.
 4. Government is responsible for the management of wildlife sanctuaries. Here, birds and animals can live and breed in their natural habitat. In India, there are a large number of wildlife sanctuaries and parks. National parks protect both flora and fauna whereas wildlife sanctuaries protect only the fauna i.e., the animals.
 5. The cell membrane encloses the inner parts of the cell. It is a living structure and controls the entry and exit of some substance in and out of the cell. It gives shape and size to the cell and protects it. Water, minerals and some other substances can penetrate through this membrane. The waste material formed inside the

cell also get expelled from the cell through this membrane.

6. The process of fusion of an ovum and a sperm takes place in the oviduct of the female. The fertilised egg enters the uterus and get attached to its wall. Here the egg divides several times to form and embryo. This embryo develops into the baby and this process take time of nine months.

MODEL TEST PAPER 2

- A**
1. (c) Gravitational force
 2. (b) anode
 3. (b) incident ray
 4. (c) seismograph
 5. (b) Hydrogen
- B**
1. frequency
 2. electrolysis
 3. glass rod
 4. ursa major
 5. deforestation
- C**
1. Percussion instruments have stretched skin whose vibrations produce sound. Loudness is increased by striking the skin harder.
 2. The process of depositing a thin layer of any superior metal over an object of a cheaper metal using electricity.
 3. A group of stars which forms a recognisable form is called constellations.
 4. A mountain or hill typically conical having a crater or vent through which lava, rock fragments, hot vapour and gas are or have been erupted from earth's crust.
 5. The rise in temperature will cause melting of ice and thus will cause floods. This whole process is called global warming.
- D**
1. Those substance which allow the electricity to pass through them are called conductors. Whereas those substances which do not allow electricity to pass through them are called insulators.
 2. In myopia, the person can see nearer object clearly but cannot see the far off objects. This defect is due to thickness of eye lens. The defect can be corrected by using a concave lens of appropriate focal length.
Whereas in hypermetropia the person can see far off objects but cannot see the nearer objects. This defect is due to thinness of the eye lens. This defect can be corrected by using convex lens of appropriate power.
 3. Pole star stands exactly over the North pole. It stands at the end of tail or ursa minor. It does not change its place like any other star.
Whereas the sparkling heavenly bodies seen in the sky are called stars.
 4. Planting of trees is called afforestation. Whereas cutting down of trees is called deforestation.
- E**
1. Fountain pen starts leaking at higher altitude. This is because the

pressure inside the pen is much lighter than the pressure outside.

2. The main sources of noise pollution are–
 - F Domestic noise
 - F Neighbourhood noise
 - F Noise created by machines
 - F Noise created by vehicles
 - F Air and rail traffic
 3. The advantages of lightning are–
 - F If fixes nitrogenous compounds in the soil through rainfall. These nitrogenous compounds are very important for the growth of plants.
 - F Lightning is also very important in forming ozone layer.
 4. The whole world including the oceans and mountains have been divided into various risk zones according to the probabilities of the occurrence and disastrous effects of the earthquakes. These zones are called seismic zone.
 5. At 450°C the liquid is heated and various petroleum products are obtained by the fractional distillation of crude petroleum.
 6. Water has to be treated to make it suitable for drinking.
- F**
1. The three ways of increasing friction are –
 - F The soles of the shoes are also designed in such a way that increases the friction.
 - F In rainy season, sand or gravel is spread on slippery ground to increase friction.
It helps the people to walk on such slippery ground easily.
 - F Sportsman wear spikes to run on ground with ease. The soles of spikes have nails that increase friction. These nails give them a firm grip of the ground.
 2. Sounds having frequency less than 20Hz are not heard by human ears. Similarly, sounds having frequency more than 20,000Hz are also not heard by human ear. These sounds are called inaudible sounds.
Sounds having frequency between 20Hz to 20,000Hz are heard by human ears and are called audible sounds. Ultrasonic sounds is very useful in the field of medical science. It is used to form the images of the internal parts of the body and to study about the foetus in the uterus of the mother. Ultrasonic sounds are produced by earthquakes, simple pendulum, volcanoes and by some animals like whales.
 3. The number of protons and electrons in an atom are same so, +ve

charge cancels the -ve charge and the atom is neutral. The charging of the bodies is due to the transfer of electrons. When an object loses the electron and thus the atom becomes positively charged. When other atoms gain the lost electrons, the number of electrons becomes more than the protons and it becomes negatively charged. The electrically charged atoms are called ions and they are surrounded by an electrical field. Due to this field, charged particles exert force on each other even if they are not in contact with each other. This causes repulsion or attraction. This also establishes the fact that bodies rubbed against each other, acquire equal and opposite charge.

4. When a cornea becomes opaque or the crystalline becomes opaque in both cases a person is operated upon and sight is restored. In case of an opaque lens, it is removed by surgery and then an artificial lens is installed.

When the cornea becomes opaque, it is removed and a healthy donated cornea is grafted in its place.

5. Volcanic activity is considered to be another main cause of earthquakes. Almost all volcanic eruptions result in earthquakes and many earthquakes cause volcanic eruptions. The explosive violent gases during a volcanic eruption try to escape upward. This leads to severe tremors of high magnitude, which depends upon the intensity of the volcanic eruption. The intensity of an earthquake is quite near the volcanoes but they spread only around a few hundred square kilometers.
6. Various fuels are burnt during different processes in the industrial units. The combustion of various petroleum products in these units produces various petroleum products in these units like black smoke, poisonous gases like carbon monoxide, sulphur dioxide etc. which react with water in the clouds and form sulphuric acid. Sulphur dioxide is poisonous. It affects our lungs. It combines with the oxygen in the air to form sulphur trioxide (SO_3). This reacts with water in the clouds to form sulphuric acid (H_2SO_4). Rain mixed with sulphuric acid is called acid rain. It damages buildings and corrodes metal structures.

DISCOVERY

Science

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