

# Science Sight

Teacher Manual



Class 8

**Class-8**

**Chapter-1 Crop Production and Management**

**Exercise**

- A.** 1. (b)                      2. (a)                      3. (c)                      4. (c)  
5. (b)                      6. (d)                      7. (c)                      8. (d)
- B.** 1. Fertilizer              2. Cultivators              3. leveller              4. crumbs  
5. apiculture
- C.** 1. (f)                      2. (g)                      3. (e)                      4. (c)  
5. (b)                      6. (a)                      7. (d)
- D.** 1 T                      2. F                      3. F                      4. F  
5. T                      6. F                      7. T                      8. F
- E.** 1. Cashcrops              2. ploughing              3. weeds  
4. Pesticides              5. Threshing              6. Animal husbandry
- F.** 1. Practice of growing plants and rearing animals for food, fibre and other useful products is called agriculture.  
2. Different agricultural practices are:  
(i) Soil Preparation.  
(ii) Selection and sowing of seeds.  
(iii) Addition of manures and fertilizers.  
(iv) Natural methods for replenishing the soil with nutrients.  
(v) Irrigation.  
(vi) Protection of crops from weeds and pests.  
(vii) Harvesting, threshing and winnowing.  
(viii) Storage of crops.

3.

<b>Ploughing</b>	<b>Levelling</b>
<ul style="list-style-type: none"><li>• This is done to loosen and turn the soil and provide aeration.</li><li>• It is done using cultivators.</li><li>• It helps in removal of weeds.</li></ul>	<ul style="list-style-type: none"><li>• It is done to level the soil.</li><li>• It is done using levellers.</li><li>• It reduces loss of moisture.</li></ul>

4. Continuous plantation of crops in a field affects soil fertility- Plants utilize all the nutrients from soil which leads to depletion of nutrients in the soil. As a result soil fertility reduces drastically.
5. a) Kharif crops - Rice, maize  
b) Rabi crops - Wheat, mustard  
c) Weedicides - 2, 4-D, MCPA  
d) Pesticides- DDT, sulfur salts  
e) Traditional method of irrigation- Chain pump, rahat  
f) Modern method of irrigation- Sprinkler system, drip system
6. Pesticides are harmful because:  
• Pesticides are detrimental for the environment and produce considerable damage to ecosystems.

- Pesticides pollute air, water and soil.
- Pesticide exposure causes damage to immune system.

### HOTS

1. Agriculture involves practice of growing plants and rearing animals for food, fibre and other useful products, whereas plantation, is an estate on which crops such as coffee, sugar cane and tobacco are grown. Agriculture involves growing of crop cash and food crops wher platation involves growing of cash crops.
2. Yes, retaining stubble helps the soil in the field. It can decrease soil erosion and increase soil water content. Retaining stubble can increase labile carbon, which increases biological fertility of soil.

### Life Skills

Do it yourself.

## Chapter-2 Microorganisms

### Exercise

- |           |                         |                                     |          |          |
|-----------|-------------------------|-------------------------------------|----------|----------|
| <b>A.</b> | 1. (a)<br>5. (a)        | 2. none<br>6. (d)                   | 3. (a)   | 4. (d)   |
| <b>B.</b> | 1. cyst<br>5. bacterial | 2. Microbiology<br>6. bacteriophage | 3. Fungi | 4. plant |
| <b>C.</b> | 1. T<br>5. F            | 2. F<br>6. F                        | 3. T     | 4. T     |
| <b>D.</b> | 1. (b)<br>5. (d)        | 2. (c)<br>6. (a)                    | 3. (e)   | 4. (f)   |
- E.**
1. Microorganisms are found in soil, mudwater, sea, air, plants, animals and various utensils.
  2. The different shapes of bacteria are- spherical, rod, spiral, comma.
  3. Viruses are the smallest microorganisms. They cannot be seen under and ordinary microscopes. The size of viruses ranges from 0.015 micron to 0.2 micron. The shape of viruses varies from rod shaped, polygonal shperical or cubical.
  4. Pasteurization is technique used in large scale storage of milk. Milk is boiled at high temperature. followed by rapid cooling.
  5. Food preservation is a technique of treating food items to slow down or stop the growth of microorganisms as well as maintaining the quality, flavour, colour and texture of food item so that these can be stored for longer time.
  6. Algae are simple plant-like structures having no root, leaves and stem. They can make their own food as they have cholorophyll. Algae can be unicellular as well as multicellular. They can be classified green algae, red algae, brown algae and blue- green algae, based on the type of pigment they have.
  7. Bread, cake, idli, dosa etc are made by the process of fermentation.
  8. Vector is an organism that does not cause disease itself but spreads infection by conveying pathogens from one host to another. For example: Species of mosquito serve as vectors for the deadly disease malaria.
  9. Two methods of food preservation are:

Heating- High temperature kills the growth of microorganisms. This method is applied in our homes for the storage of milk and water everyday.

Canning- Many food items such fish, vegetables are kept in air tight containers. Microorganism cannot grow in the absence of air.

- F. 1. Antibiotics work by killing bacterial or preventing them from reproducing or spreading. They are derived from special microorganisms or other living systems, and are produced on an industrial scale using a fermentation process. For example- cefalenin- used for bacterial infection such as skin infection chest and throat.
2. Viruses show the characteristics of both living and non living things. They cannot reproduce themselves. They reproduce only inside a living body and use the energy of host organism to reproduce. Some examples of viruses are tobacco mosaic virus, AIDS virus, chickenpox virus etc.
3. Pathogen are microorganisms that cause number of diseases in plants and human beings. Diseases occur when these pathogens enter our body and begin to multiply. Carriers of diseases are air, water, some insects etc.
4. a) Antibodies- It is a protein produced by plasma cell that is used to neutralize pathogen such as bacteria and viruses.  
b) Vaccination- It is the administration of a vaccine to help the immune system develop protections from a disease.  
c) Antibiotic- Antibiotics kill bacteria or stop them from growing.
5. **Uses of microorganisms**  
(i) Some bacteria help in retting of flax and jute fibers which are then converted into ropes.  
(ii) Curing and ripening of tea leaves are done due to action of bacteria giving it a characteristic aroma and flavour.  
(iii) Bacterias are used in tanning of leather.  
(iv) A bacteria called mycodermi acetic help produce vinegar or acetic acid.  
(v) Agar and algin are used in preparation of medicines, food and cosmetics.  
(vi) Some sea algae such as Laminaria is used as fodder for sheep.
6. Advantages of food preservation are:
- It prevents the food from getting spoiled by the action of microorganism.
  - It increases the storage period of food materials.
  - It helps in the availability off seasonal at food.
  - It makes the transportation of food materials easy.

### HOTS

1. UV rays penetrate harmful pathogens in water and destroy illness causing microorganisms by attacking their genetic core.
2. Food grains are dried in sun to remove moisture from the food grains. Moist food will allow bacteria to grow on it.
3. Disinfectants contains 70% of alcohol. When mop water containing disinfectant was thrown on grass, the alcohol present in it dissolves the chlorophyll and decolourises it by changing its colour to yellow.

### Life Skills

Do it yourself.

### Chapter-3 Synthetic Fibres and Plastics

#### Exercise

- A. 1. (a)                      2. (d)                      3. (b)                      4. (a)                      5. (d)
- B. 1. glucose                      2. polymer                      3. Rayon  
4. Nylon, polyester                      5. Thermoplastics
- C. 1. (b)                      2. (d)                      3. (a)                      4. (c)
- D. 1. The process in which monomers link together to form a long chain is called polymerisation.  
2. Rayon is known as regenerated fibre because it is manufactured from natural resources like cellulose present in wood pulp.  
3. Properties of Acrylic are: It is light, soft and warm, it is resistant to moth and other insect. In Acrylic is used for making sweaters and blankets.  
4. Plastic do not react with chemicals therefor they are used to store water and chemicals.  
5. PET is a form of polyester. PET is polyethylene terephthalate. It is used for making bottles, utensils and films.

E. 1.

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• Strong and elastic.</li><li>• Resistant to moth and moulds.</li><li>• Wrinkles- resistant.</li><li>• Light durable and easy to wash.</li></ul>	<ul style="list-style-type: none"><li>• Do not absorb sweat.</li><li>• Should be ironed carefully as they may get damaged by high temp.</li><li>• Catch fire easily.</li><li>• Not comfortable to wear in hot and humid weather.</li></ul>

2. Pastic is a polymer. The word plastic means 'fit for moulding'.  
Properties of plastic are as follows:  
(i) Plastics are non-reactive.  
(ii) Plastics are poor conductor of heat and electricity.  
(iii) Plastics are light, strong and durable.

3.

Thermoplastics	Thermosetting plastics
<ul style="list-style-type: none"><li>• These get deformed easily on heating.</li><li>• These are soft</li><li>• It is used as a lubricant.</li><li>• Example- PVC and PTFE</li></ul>	<ul style="list-style-type: none"><li>• They do not melt on heating.</li><li>• These are hard.</li><li>• They are used in making electrical switches.</li><li>• Example- Bakelite and melamine.</li></ul>

4. Few steps that can be taken to prevent pollution caused by plastics are:
- Reuse all plastic that you have at home. Use empty soft drink bottles to store water. Use empty plastic containers to store things. Reuse polythene bags that you get from the market.

- We can also recycle it. Thermoplastic are easy to recycle since they can be melted and reshaped into other products. For example, a plastic bottle used to store beverages could be reformed into fibres of a jacket, Thermosetting plastics are not easy to recycle.

### Hots

1. Synthetic clothes catch fire easily so it is not advisable to wear synthetic clothes while working in the kitchen.
2. Bakelite is used as handles of kitchen utensils because it is a poor conductor of heat.
3. Cotton and paper are plant based fibre so they have some common properties therefore we get smell of the paper while burning cotton cloth.

### Life Skills

Do it yourself.

## Chapter-4 Materials: Metals and Non Metals

### Exercise

- A.**
- |        |        |        |        |
|--------|--------|--------|--------|
| 1. (c) | 2. (d) | 3. (a) | 4. (d) |
| 5. (a) | 6. (d) | 7. (d) |        |
- B.**
- |                  |             |          |         |
|------------------|-------------|----------|---------|
| 1. malleable     | 2. hydrogen | 3. basic | 4. gold |
| 5. galvanisation | 6. free     |          |         |
- C.**
- |        |        |        |        |
|--------|--------|--------|--------|
| 1. (e) | 2. (c) | 3. (a) | 4. (b) |
| 5. (d) |        |        |        |
- D.**
- |      |      |      |      |
|------|------|------|------|
| 1. T | 2. F | 3. F | 4. T |
| 5. F | 6. T |      |      |
- E.**
1. Metals are sonorous i.e, they produce ringing sound because they are hard whereas non metals are soft and therefore non-sonorous.
  2. Graphite, iodine, bromine and diamond.
  3. Silver, copper, gold, aluminium and graphite.
  4. Mercury - liquid  
Potassium- solid  
calcium- solid  
oxygen- gas  
Bromine- liquid
  5. Magnesium hydroxide- Magnesium, calcium hydroxide and calcium.
  6. Two uses of metals are:
    - Copper is used for making electrical wires.
    - Zinc is used for galvanising iron.
 Two uses of non metals are:
    - Diamond is used for making jewellery.
    - Graphite is used for making pencils.
- F.**
1. (i) Oxygen- This is the most important non metal. It is required by all living beings for respiration.
  - (ii) Nitrogen- It is used by plants to make proteins.
  - (iii) Chlorine- It is used to disinfect water.

(iv) Silicon- It is essential compound in mechanism of formation of bone and cartilage.

2. Sodium reacts vigorously with water to form sodium hydroxide and hydrogen gas along with evolution of large amount of heat.



3. Malleability- The property of metals by which they can be beaten into thin sheets is called malleability for example- gold.

Ductility- It is a property that allow a substance to be drawn into wire. For example-copper.

4. Activity- Do it yourself.

5. A reaction in which one element takes the place of another element in its compound is called displacement reaction. for example;



In above reaction Fe being more reactive than Cu displaces cu from its solution.

### HOTS

1. Immersion rods are made up of metals because metals are good conductor of electricity and heat. They get hot very soon and allow the passage of current and warm water.
2. Metals are sonorous therefore metallic bells produce ring sound whereas when wooden material collide with wooden material, no sound is produced as they are non sonorous.
3. Manu did not observe any change because zinc is more reactive than copper so copper could not displace zinc and no reaction took place.

### Life Skills

Do it yourself.

### Chapter-5 Coal and Petroleum

#### Exercise

- A.** 1. (c)                      2. (c)                      3. (b)                      4. (a)  
5. (b)                      6. (b)
- B.** 1. (e)                      2. (a)                      3. (b)                      4. (c)  
5. (d)
- C.** 1. T                      2. F                      3. T                      4. T  
5. F
- D.** 1. Do it yourself.
- E.** 1. The resources which are present in a limited amount in nature cannot be continually replenished are called exhaustible resources. For example- petroleum, coal, natural gas etc.  
2. Chemically, coal is a mixture of chemical substances containing carbon, hydrogen and oxygen in combined form, together with small amount of nitrogen and sulphur.

3. When coal is heated in the absence of air. The volatile impurities and moisture gets removed. The solid left behind is called coke. It is a greyish-black solid. It contains 98% carbon.
  4. CNG stands for compressed natural gas. It is a fuel that can be used in place of diesel. Its combustion produce fewer undesisable gases. Uses of CNG are:
    - It is used as a domestic and industrial fuel.
    - It is used as starting material for the manufacturing of a number of chemicals and fertilizers.
  5. We should save fossil fuels because they are limited and they are likely to get exhausted in the near future.
- F.**
1. Diagram-Do it yourself.
  2. Coal is formed from marsh swampy, plant based environment while petroleum is formed from organisms mainly marine environment in origin). Coal is bulky whereas petroleum is less bulky. Coal is in solid form whereas petroleum is in liquid form.
  3. Products of destructive distillation of coal are: Coke, coal tar and coal gas.  
 Uses of coke is, it is used in the extraction of iron and other metals. It is also used for preparation of fuel gases like producer gas and water gas.  
 Uses of coal gas is- It is used as an important industrial fuel because it produces a lot of heat on burring.  
 Uses of coal tar is - It contains many useful chemicals which are used to make inks, dyes, detergents etc.
  4. Fractions obtained on fractional distillation of petroleum are: Petroleum gas, petrol, diesel, kerosene, fuel oil and paraffin wax. It is based on the principle that different components have different boling points. The liquid with lowest boiling point vaporises first followed by evaporation of the next volatile component.
  5. CNG is preferred over other fossil fuels because it burns cleanly and does not produce any ash or smoke. It produces fewer harmful gases than other fossil fuels. It is also cheaper than other fossil fuels.

### HOTS

Burning of fossil fuels produce large amount of carbon dioxide. If we plants trees on a large scale. They will take up this carbon dioxide which will not lead to global warming.

### Life Skills

Do it yourself.

## Chapter-6 Combustion and Flame

### Exercise

- |           |   |        |        |        |
|-----------|---|--------|--------|--------|
| <b>A.</b> | 1. (b)  | 2. (c) | 3. (a) | 4. (b) |
|           | 5. (b)  | 6. (d) |        |        |
| <b>B.</b> | 1. F  | 2. F   | 3. T   | 4. T   |
|           | 5. T  |        |        |        |
| <b>C.</b> | 1. The process of burning of a substance in the presence of air or oxygen with the liberation of heat and light is called combustion. |        |        |        |



2.

<b>Combustible</b>	<b>Non-Combustible</b>
<ul style="list-style-type: none"> <li>• Substance that burn in air or oxygen to produce heat and light are called combustible substances.</li> <li>• For example: L.P.G., Wood etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Substance which do not burn in presence of air or oxygen to produce heat and light are non-combustible</li> <li>• For example: water, glass.</li> </ul>

3.

<b>Complete combustion</b>	<b>Incomplete combustion</b>
<ul style="list-style-type: none"> <li>• This type of combustion take place in adequate amount of air or oxygen.</li> <li>• It result in the formation of carbon dioxide, water, heat and light.</li> </ul>	<ul style="list-style-type: none"> <li>• This type of combustion takes place in inadequate amount of air or oxygen.</li> <li>• It result in the formation of carbon monoxide, soot, water, heat and light.</li> </ul>

4. Conditions necessary for combustion are:
- (i) Presence of combustible substance.
  - (ii) Attainment of Ignition temperature.
5. The temperature at which a particular substance burns in the presence of air is called its ignition temperature. Substances like alcohol, and petrol, have low ignition temperature that is why they are called inflammable substances.
6. Substance that produce heat and light energy on burning are called fuels.  
 Solid fuels- wood, charcoal.  
 Liquid fuels- Kerosene, petrol.  
 Gaseous fuel- Natural gas, petroleum gas.

7.

<b>Exhaustible</b>	<b>Inexhaustible</b>
<ul style="list-style-type: none"> <li>• The resources which are present in limited amount in nature, cannot be continually replenished and are likely to exhaust by various human activities are called exhaustible substances.</li> <li>• For example: forests, petrol, coal.</li> </ul>	<ul style="list-style-type: none"> <li>• The resource which are present in unlimited amount in nature. Can be replenished and are not likely to exhaust are called inexhaustible substance.</li> <li>• For example: air, sunlight.</li> </ul>

- D. 1. The different zones of candle flame are:
- The outer zone (blue zone): In this zone rapid and complete combustion of wax vapours. This is the hottest parts of the candle flame and complete combustion of wax products carbon dioxide water vapour and heat. This is also called non-luminous zone.
- Middle Inner zone (Luminous zone): It constitutes the major part of the flame and has moderate temperature. It consists of unburnt wax vapours that partially decompose to form free carbon which becomes hot and emit yellow light.

**Innermost zone:** This is the zone of unburnt wax vapours. It is the least hot part of the candle flame. It appears black and is dark zone of the candle. In this zone combustion does not take place.

2. Calorific value is defined as amount of heat produced in kilo joules when one gram of fuel is completely burnt. This unit of calorific value is kilojoule (kj). Important characteristics of ideal fuel are:
  - (i) It should have high calorific value.
  - (ii) Its ignition temperature should be low.
  - (iii) It should have a moderate rate of combustion.
  - (iv) It should be safe to handle, store and transport.
3. Fuels formed from buried, dead remains of organisms are called fossil fuels.
 

Formation of coal- When dead plant matter decays into peat and is converted into coal by heat and pressure of deep burial over millions of years.

Formation of petroleum- When large quantities of dead organism are buried underneath sedimentary rock and subjected to both intense heat and pressure, petroleum is formed.

Products obtained from refining petroleum	Uses
<ul style="list-style-type: none"> <li>• Petroleum gas</li> <li>• Petrol</li> <li>• Diesel</li> <li>• Kerosene</li> <li>• Fuel oil</li> <li>• Paraffin wax</li> </ul>	<ul style="list-style-type: none"> <li>• In the production of carbon black.</li> <li>• As a fuel for cars, bikes, scooter etc. As an aviation fuel.</li> <li>• As a fuel for buses, cars, ships etc.</li> <li>• As a fuel for stoves.</li> <li>• In some power plants for electricity.</li> <li>• For making shoe polish, grease etc.</li> </ul>

4. Four air pollutants with their harmful effects:
  - (i) Carbon fuels like wood, coal, petroleum release unburnt carbon particles which can cause asthma.
  - (ii) Incomplete combustion of fuel releases carbon monoxide which can suffocate a person to death.
  - (iii) Oxides of sulphur and nitrogen dissolve in rainwater to form acid rains which is harmful for buildings and crops.
  - (iv) Most of the fuels on burning release carbon dioxide, water and heat. Increased concentration of carbon dioxide causes global warming.

### HOTS

1. The friction due to rubbing of the phosphorus tip of the matchstick against the side of matchbox increases temperature of the tip to get ignited.
2. The green leaves contains water due to which ignition temperature of leaves increases and they do not catch fire easily while dry leaves have no water so they catch fire easily.

### Life Skills

Do it yourself.

## Chapter-7 Conservation of Plant and Animals

### Exercise

- A.** 1. (d)                      2. (c)                      3. (d)                      4. (b)  
5. (d)
- B.** 1. T                          2. F                          3. T                          4. F  
5. T
- C.** 1. Red data book contains all the information on the endangered species of plants and animals.  
2. Large scale cutting of trees is called deforestation. Afforestation is planting tees on a barren land.  
3. Tigers are endangered because of illegal hunting for their pelts, meat and body parts (used in folk medicine)  
4. Major threats to wildlife are climate change, hunting overexploitation, pollution, deforestation.  
5. Biosphere reserve protect large amount of animals and plants.  
As animals are in a closed area in which they are in open forest and are in natural habitat. So they are the best.
- D.** 1. Forest can be conserved by following methods:
- Overgrazing by animals in the forests should be stopped.
  - Large scale cutting of forest tree must be stopped and more trees should be planted in their place.
  - Plant more seedlings in the deforested area to develop new forest
  - Vanmahotsava should be observed by planting seedlings in large number.
  - Forest must be protected from insects and pest. The infected trees should be removed or treated with insecticides and pesticides ides.
2. Consequences of deforestation will be:
- It causes an increase in soil erosion, continued soil erosion can convert the land into a desert. This is called desertification.
  - It causes an increase in carbondioxide in atmosphere which leads to global warming.
  - It causes reduction in groundwater which can result in floods.
  - It causes shortage of products we get from forests.
3. The steps necessary for wildlife conservation are:
- Prohibition of hunting of listed threatened species.
  - Setting up and management of national parks, sanctuaries and biosphere reserves.
  - Control and management of captive breeding.
  - Protection of specific plants and natural habitat of animals.
4. Effects of deforestation are-
- It causes an increase in soil erosion, continued soil erosion can lead desertification.
  - It causes an increase in carbondioxide in atmosphere which leads to global warming.

- It causes reduction in groundwater which can result in floods.
  - It causes shortage of food products.
5. Population growth is threat because increasing number of population, against the limited resources are not sufficient for development and survival of mankind.
  6. Major steps taken by Government to conserve biodiversity in India are-
    - (a) Forest Conservation Act whose objective are-
      - To conserve forest as natural heritage.
      - To control movement of forest produce.
    - (b) Wildlife Conservation Act whose object are-
      - Prohibition of hunting of listed threatened species.
      - Control and management of captive breeding.
      - Reforestation which is redevelopment of forests by planting more trees in place of the trees destroyed.
  7. I U C N stands for International Union of Conservation of Nature. It publishes books that provide all the information on the endangered species of plants and animal. It is trying to create awareness about the endangered species.

#### HOTS

1. Rainfall is reduced in Cherapunji due to deforestation.
2. Overgrazing leads to land degradation which converts dry area into extremely arid land which loses its plants and animals and this leads to desertification.

#### Chapter-8 The Cell

##### Exercise

- A.**
- |        |        |        |        |
|--------|--------|--------|--------|
| 1. (b) | 2. (a) | 3. (d) | 4. (d) |
| 5. (c) | 6. (b) | 7. (a) | 8. (b) |
- B.**
- |      |      |      |      |
|------|------|------|------|
| 1. T | 2. F | 3. F | 4. F |
| 5. T | 6. F |      |      |
- C.**
- |                  |              |
|------------------|--------------|
| 1. Cell membrane | 2. Nucleus   |
| 3. Cytoplasm     | 4. Cell wall |
- D.**
1. Cell membrane is said to be semi permeable because it allows certain substances to enter or leave the cell.
  2. Plant and animals cells both are eukaryotic cell. They both contain membrane-bound organelles such as nucleus, mitochondria, golgi apparatus, lysosomes and ribosomes.
  3. Nucleus is called the control centre of the cell it contains genetic information for structure, development, metabolism and behaviour. It also controls cellular activities.
  4. Cell wall forms protective covering outside the cell membrane. It provides rigidity to the cell and protects the internal structure and cell membrane of the cell.
  5. Mitochondria is called the power house of the cell because they are responsible for the release of energy from food i.e. cellulose respiration.

6. Prokaryotic cells are those that lack a well defined membrane bound nucleus whereas eukaryotic cells have a well defined membrane- bound nucleus.
- E. 1. Lysosomes have tissue dissolving enzymes and help in the auto digestion of cell, i.e, they can digest their own cell.

2.

<b>Unicellular</b>	<b>Multicellular</b>
<ul style="list-style-type: none"> <li>• Organisms that have only single cell.</li> <li>• For example- amoeba, paramecium.</li> </ul>	<ul style="list-style-type: none"> <li>• Organisms that have more than one cell.</li> <li>• For example- human beings.</li> </ul>

3. Cells are the basic structural and functional unit of an organism. They are so small that they can only be seen on a microscope.

Cells exist in different shape and sizes. The size of the cell may be as small as micrometre and as large as few centimetres. Bacterial cell is the smallest which ranges from 0.1 to 0.5 micrometre. Nerve cells are the longest.

4. Once a cell is formed, it starts ingesting and digesting food and begin to grow in size. After reaching a certain size, it divides to form two cells. The new cells formed are called daughter cell and they are exact copy of their parent cell.

5. Prokaryotic cells- These are the cells that lack a well defined membrane bound nucleus. The genetic material is suspended freely in the cytoplasm. Example- bacteria, blue green algae.

Eukaryotic cell- These are the cells that have a well defined membrane bound nucleus. The genetic material is found enclosed within the nucleus. Example- plants and animals.

### HOTS

1. If a plant is not watered, there is no effect on vacuole.
2. Muscle cells have more number of mitochondria than skin cells because they do a lot of work which requires more energy.

### Life Skills

Do it yourself.

## Chapter-9 Reproduction in Animals

### Exercise

- |  |                  |   |        |
|--|------------------|---|--------|
| <b>A.</b> 1. (d)<br>5. (d)   | 2. (a)           | 3. (d)  | 4. (c) |
| <b>B.</b> 1. Reproduction<br>3. Binary fission<br>5. Spem testosterone |                  | 2. Roslin institute, Ian Willmut<br>4. ovipares |        |
| <b>C.</b> 1. VP<br>5. VP   | 2. OP            | 3. OP   | 4. VP  |
| <b>D.</b> 1. (c)<br>5. (b)   | 2. (d)<br>6. (a) | 3. (f)  | 4. (e) |

- E.**
1.
    - a) Fertilisation- Fusion of male and female gametes to produce a new organisms.
    - b) Foetus- When body parts of an embryo can be indentified it is called foetus.
    - c) Embryo- The developed mass of cells gets embredded in the wall of uterus which is called embryo.
    - d) Cloning- The process of producing identical organism from any other living part is called cloning.
  2.
    - a) Bacteria - Sexual.
    - b) Cow - Sexual
    - c) Hydra - Asexual
    - d) Paramecium - Asexual
  3. A small outgrowth called bud develops from one side of hydra's body. The bud either breaks off from the parent organism to grow into new individual or remains attached to the parent and grows more buds.
  4. Men has pair of testes that produce the male sex cell or male gamete know as sperm.
  5. When the eggs are fertilized outside the body, it is called external fertilisation. This process mostly occurs in amphibians. The eggs and sperms are released into water around the animals. When they are about to reproduce, the male and females swim close together.
  6. In asexual reproduction, living thing produces its offspring without the help of another individual. For example: bacteria, yeast etc.  
In sexual reproduction, both the parents are involved. For examples human beings, cows etc.
  7. Viviparous animals are those which give birth to their young ones for example- cow, buffalow etc.  
Oviparous animals are those which lay eggs. For example birds, snakes etc.
- F.**
1. After fertilisation, the zygote starts dividing continuously into a ball of cells. These cells develop into tissues and organs of the body. This developed mass of cells get embredded in the wall of the uterus which is called an embryo.
  2. Fusion of male and female gamete is called fertilisation. It is of two types: Internal fertilisation and external fertilisation.  
It is the first step of reproduction.
  3. Diagram- do it yourself.
  4. Diagram- do it yourself.

### HOTS

1. If one fallopian tube is blocked, it's still possible to give birth, as the eggs can travel through the other side of the body since there are two ovaries.
2. When ovaries release two eggs at a time and get fertilised by two sperms, fraternal twins are born.
3. Anu is lying because whale is a mammal and it does not lay eggs, it gives birth to young ones.

### Life Skills

Do it yourself.



- Change in body shape.
- Change in body shape.
- Change in voice.
- Development of hair.

Secondary characteristics of a girl are:

- Development and enlargement of breast.
- Initiation of menstrual cycle.
- Deposition of fat around hips.
- Hips broaden and pelvic region widens.

**HOTS**

1. If man is suffering from diabetes, his pancreas is not functioning properly because it secretes insulin which regulates blood sugar level.
2. GH (growth hormones) is not secreting properly.

**Life Skills**

Do it yourself.

**Chapter- 11 Force and Pressure**

**Exercise**

- |           |        |        |        |        |
|-----------|--------|--------|--------|--------|
| <b>A.</b> | 1. (b) | 2. (b) | 3. (a) | 4. (c) |
|           | 5. (c) |        |        |        |
| <b>B.</b> | 1. F   | 2. F   | 3. F   | 4. T   |
|           | 5. T   | 6. F   |        |        |
- C.**
1. A sharp knife has less area, thus pressure applied will be more, therefore, it is easier to cut vegetables with a sharp knife.
  2. Heavy tanks have broad chains called caterpillar tracks which increase area in contact. The tracks help the tanks to distribute its weight more evenly over a large area than wheels can.
  3. The pressure exerted by water deep under the sea is much greater than at the sea level. Hence, the deep sea divers wear special suits which protect them from extreme pressure.
  4. As altitude increases temperature and pressure decreases therefore there is a necessity of pressurised cabin in aeroplanes.
  5. The wall of dam is made thicker at the bottom because pressure exerted by a liquid increases with depth. A thicker wall is required to withstand a greater pressure.
- D.**
1. The body can move if the forces are unbalanced. If the body moves, it will move in the direction where the force is greater.
  2. Do it yourself.
  3. Mixer grinder are provided with rubber stands at the bottom so that there is no vibration transmitted to bench or table. If not given along with mixer it would sound noisy.

**HOTS**

1. Forces acting on a car are frictional force, thrust and air resistance. When car is moving with uniform velocity the forces are balanced.

**Life Skills**

Do it yourself.



## Chapter- 12 Friction

### Exercise

- A.** 1. (c)                      2. (b)                      3. (d)                      4. (a)
- B.** 1. reduce                      2. oppose                      3. increases  
4. fluid friction                      5. break pads                      6. wear and tear
- C.** 1. Friction opposes the relative motion between the two bodies in contact.  
2. The grooves and ridges in two bodies cause friction.  
3. The grooves and ridges get caught up with each other and slow down the motion which increases friction.  
4. To increase friction:  
• Sands and gravel are thrown on slippery ground during the rainy season.  
• It is then easier to walk on the ground without slipping.  
5. Making a body round in the front and arrow at the back to reduce friction with air, called air resistance.
- D.** 1. There are three different types of friction which are:  
Static friction- The friction that exists between two surfaces in contact when there is no relative motion between them i.e, when they are relatively at rest is called static friction.  
Sliding friction- The force of friction that opposes the relative motion when body is actually moving over the surface of another body is called sliding friction.  
Rolling friction- When a body rolls on the surface of another the force of friction between the two surfaces is known as rolling friction.
2. Friction between the surfaces in contact is less than the smooth surfaces and more for rough surfaces. More the roughness of a surface, larger is the number of irregularities and hence greater will be the friction.
3. Since no external forces are applied on the ball, so its speed will remain constant.
4. When an object is at rest initially it is very difficult to get the object to start moving, but once it starts sliding, it is easier to push in order to continue the motion. Thus, a smaller force is required to maintain a uniform motion. Hence, sliding friction is less than static friction.
5. Following are the disadvantages of friction:  
• Friction cause wastage of energy. This is because, to move a heavy object, a lot of energy is utilised.  
• Friction results in wear and tear of the parts that rub each other. For example, the soles of our shoes, the surface of tyres of vehicles, the moving parts of a machine wear out with time due to friction.

- Friction wears out the brake pads of vehicles gradually. As a result, brake pads of cycles have to be replaced quite often.

### HOTS

1. Tyres of truck will produce more friction so it will not overturn which help it to keep balance by making large surface but racing cars tyres are smooth because they have to rotate fast so to reduce friction and gain high speed structure of tyre like this.
2. The main reason for wear and tear of the parts of machine is the excess heat caused by friction.
3. A heavier object will press harder into the irregularities so, there will be great resistance to motion, i.e, greater friction. This is the reason why we find it difficult to move heavier objects.

### Life Skills

Do it yourself.

### Chapter- 13 Sound

#### Exercise

- A.** 1. (d)                      2. (b)                      3. (a)                      4. (a)
5. (b)
- B.** 1. Metre                      2. Frequency                      3. Flute
4. Ultra sonic                      5. Time period                      6. Frequency
- C.** 1. Sound waves are produced when something vibrates.
2. Speed of sound depends on many factors such as temperature, humidity in the air and flow of wind etc.
3. Time taken by particle of the medium to complete on vibration is called time period of an oscillation.
4. The range between 20 Hz to 20,000 Hz is audible range of frequency of sound waves for human beings.
5. Three different types of musical instrument are- flute, trumpet and tabla.
6. Noise pollution can-
- decrease the efficiency of a man.
  - cause blood pressure.
- D.** 1. Sound energy is produced when an object vibrates. The sound vibrations cause waves of pressure that travel through or medium such as air, water, wood or metal.
- Sound energy is a form of mechanical energy, for eg- A balloon popping, An airplane taking off.
2. We hear a sound when the waves reach our ears. Sound waves can travel through solids, liquids and gases. When sound is produced, it transfers its energy to the molecules of the air molecules. These air molecules, then start vibrating and, in turn, transfer energy to the neighbouring molecules and so on.

3. Aim- To show that sound can propagate through solids.  
 Material Required- Table  
 Procedure- Keep your ear on the table and tap the table gently with your hand.  
 Can you hear the sound produced tapping the table.  
 Observation- Sound is heard when the ear is kept on the table and it is tapped.  
 Conclusion- Sound propagates through solids.
4. Aim- To show that sound propagates through liquids.  
 Materials Required- Two metal rods, tub or bucket and water.  
 Procedure- 1. Take water in a bucket  
 2. Hold the metal rods in two hands and immerse them in water.  
 3. Strike the two metal rods inside the water.  
 Observation- The sound produced by hitting the metal rods inside the water is heard outside.  
 Conclusion- The above activity shows that sound propagates through liquids.
5. The presence of excessive and unwanted noise in the environment creates a condition called noise pollution.  
 Some steps can be taken to reduce noise pollution.
- Avoid very loud music that might hurt you as well as others.
  - Planting more trees help to reduce it.
  - Avoid unnecessary use of horns of the vehicles while travelling.

#### HOTS

1. Sonar uses sound waves to see in the water.
2. Sun is in the space and space is a vacuum, sound waves cannot travel through vacuum.

#### Life Skills

Do it yourself.

### Chapter- 14 Chemical Effects of Electric Current

#### Exercise

- A.** 1. (b)                      2. (d)                      3. (b)                      4. (c)
5. (b)
- B.** 1. ions                      2. electrolysis                      3. electrolytes
4. electrode                      5. light emitting diode
- C.** 1. T                      2. T                      3. T                      4. F
5. F                      6. T

- D.** 1.

Conductors	Insulator
<ul style="list-style-type: none"> <li>• Materials which allow electricity to flow through them.</li> <li>• for e.g. silver, copper.</li> </ul>	<ul style="list-style-type: none"> <li>• Materials which do not allow electricity to pass through them.</li> <li>• For example: plastic, wood .</li> </ul>

- The Process of splitting of an electrolyte with the help of electricity is called electrolysis.
- A substance which give ions when melted or dissolved in water is called electrolyte. For e.g sodium hydroxide, sulphuric acid.

Electrolyte	Non-Electrolyte
<ul style="list-style-type: none"> <li>A substance that conducts electric current in its solution or molten state.</li> <li>For example- Nacl (salt).</li> </ul>	<ul style="list-style-type: none"> <li>A substance that do not conduct electricity in its solution or molten state</li> <li>For example- glucose dissolved in water.</li> </ul>

Anode	Cathode
<ul style="list-style-type: none"> <li>The electrode that is connected to the positive termial of the cell or battery is called anode.</li> </ul>	<ul style="list-style-type: none"> <li>The electrode that is connect to negative terminal of the cell is called cathode.</li> </ul>

- The process of coating a metal with a layer of another metal using electrolysis is called electroplating. The application of electroplating are:
    - Decoration purpose.
    - Protection against corrosion.
  - copper
    - object
    - copper sulphate
  - The passage of an electric current through a conducting solution causes chemical reaction. That may cause formation of bubbles of a gas on the electrodes. Change of colour of solution etc.
- E.
- When iron nail is copper plated the electrolyte is copper sulphate solution. Copper rod is taken as anode and iron as cathode. Copper bring positive ion will go to the iron nail and sulphur negative will be at copper rod.
  - A cell consisting of an electrolyte and electrodes to allow free passage of electric current from an external source is called electrolyte cell.  
Diagram-Do it yourself
  - Diagram- Do it yourself
  - Electrodes are two poles by which an electric current enters or leaves the electrolytes. They are usually made of metals or graphite. They are connected to the cell or a battery. The electrode connected positive terminal is called anode connected to negative terminal is called cathode.

### HOTS

- It is highly dangerous to carry out electrical repairs during heavy downpour as during heavy downpour there is a high risk of electrocution ( death by electric shock) as water is good conductor of electricity.

2. Firemen cut off the main electrical supply because water is a good conductor of electricity. It may increase the chances of electric shock.
3. Copper sulfate is an ionic compound. The conduction of electricity is due to the ions in the ionic compound, when copper surface is dissolved in water, the ions dissociate and conduct electricity.

### Life Skills

Do it yourself.

## Chapter- 15 Some Natural Phenomena

### Exercise

- A.** 1. (b)                      2. (a)                      3. (a)                      4. (c)
5. (c)                      6. (b)
- B.** 1. Insulator              2. repel, attract      3. repel                  4. like
5. attracted
- C.** 1. T                      2. F                      3. F                      4. F
- D.** 1. An object or body which acquires electric charge is called a charged body.
2. The rapid expansion of air sends a disturbance in form of vibration through the air producing a loud sound. This loud sound produced during lighting is called thunder.
3. Sudden shaking or trampling of the earth is called earthquake.
4. The focal depth is a depth of seismic focus below the earth's surface.
5. Earthquake prone state in India are western and central Himalayas, Kashmir, North-eastern area, Rajasthan, Indo-Gangetic planes.
6. Plastic comb will attract pieces of paper as electrons from dry hair gets transferred to the comb and paper gets attracted as it has electric charge.
7. When a sweater is taken off it gets charged because of rubbing. These charge move in streams between the sweater and our body i.e, electric discharge takes place resulting in crackling sound.
8. On Richter scale the vibration of an earthquake with magnitude of 2 are 10 times greater in amplitude than those of an earthquake with magnitude of 1, this is the reason, it is not considered a linear scale.
9. An earthquake which measures 2 on Richter scale will be recorded by seismograph.
10. Damaging effect of earthquake depend upon magnitude and intensity.
- E.** 1. Precautions to be taken to provide protection against lighting:
- Do not take shelter under tall trees.
  - Do not carry an umbrella during a thunderstorm.
  - Avoid contact with poles, metal pipes, electrical wires, telephones etc.
  - Unplug electrical appliances like computer, T.V, refrigerator etc.
  - Do not sit in open vehicles like motor bikes, open cars etc.
2. a) Epicentre - The point on the surface of the Earth vertically above the seismic zone.

- b) Focus- The point at which earthquake originates.
  - c) Magnitude- The measure of amplitude of seismic waves.
  - d) Richter Scale- It is used to describe the magnitude of an earthquake.
3. We must always keep a kit ready with torch, extra batteries, first- aid material, water etc.
    - We should listen to the radio if possible.
    - We should take shelter under a table.
    - We should stay away from windows or hanging objects like mirror, wall hangings etc.
  4. Precaution to be taken to reduce damage caused by earthquake are:
    - (i) The building in an earthquake prone area must be designed to withstand major tremors. The building should have foundation on solid rock. Good quality material should be used for construction.
      - Tall furniture should be fixed into the walls in a manner that it allows the furniture independent movement.
      - Fire-fighting equipment should be in an easy to approach place in working order.
  5. A lightning conductor is a device which is used to protect tall buildings against lightning during a thunderstorm. It works on the principle of conduction of electricity through metallic substances.

### HOTS

1. Earthquake is more harmful because earthquake can occur anywhere and causes max damages whereas Tsunami occur in place near oceans and seas.
2. When we touch a charged body, it loses its charge because the charge gets transferred to the ground through our body.
3. We won't carry an umbrella because it contains metal parts which are good conductors of electricity and electric charges move into the umbrella and cause harm.
4. Air is an insulator but still conducts electricity under certain conditions for example: during a thunderstorm, extremely high voltage creates lightning bolts which jump from one cloud to another or to the ground. At these extreme situations, air will act as an insulator.
5. Taller buildings are more prone to lightning because they are closer to clouds, they have metallic poles which are good conductors of electricity.
6. Repulsion is the surest test of charge on a body as it indicates that the other object is charged and has a charge opposite to that of the first object. As like charges will repel each other and unlike charges attract.

### Life Skills

Do it yourself.

## Chapter- 16 Light

### Exercise

- A. 1. (a)                      2. (a)                      3. (a)                      4. (a)  
5. (a)                      6. (a)

- B. 1. incidence, equal                      2. virtual  
3. reflection                      4. same  
5. reflection                      6. spectrum

- C. 1. T                      2. T                      3. T                      4. T  
5. T

D. 1. a)

Regular reflection	Irregular reflection
<ul style="list-style-type: none"><li>• Reflection of light in one direction.</li><li>• Regular reflection takes place when beam of light strikes smooth surface.</li></ul>	<ul style="list-style-type: none"><li>• Reflection of light in difficult direction.</li><li>• Irregular reflection takes place when beam of light strikes rough surface.</li></ul>

b) Incident ray is a ray of light that strikes a surface whereas reflected ray is a ray of light that is reflected by the surface.

c) Angle formed between normal and incident ray is called angle of incidence whereas angle formed between normal and reflected ray is called angle of reflection.

2. Laws of reflection are:

(i) Angle of incidence is equal to angle of reflection.

(ii) Incident ray, reflected ray and normal all lie on a same plane.

(iii) When ray of light falls on smooth surface, it returns back in the same medium.

3. The phenomenon in which left of an object appears to be right in the mirror and vice versa is called lateral inversion.

For example- this property is used in writing the word AMBULANCE so that driver in other vehicle can easily spot the word AMBULANCE clearly in their rear view mirror and can immediately give it the way.

4. A reflection of light that is more than one is multiple reflection. We can see our hairstyle at the back of our head due to reflection between two mirrors. The reflection of our hair falls into the mirror at the back which the hairdresser holds and that reflection gets reflected into the mirror in front of us.

5. Multiple images are formed when two mirrors are placed at right angle to each other due to multiple reflection between two mirrors.

E. 1. Characteristics of light are- Reflection, Refraction, Dispersion and scattering.

2. Diagram- Do it yourself.

3. Periscope is an example of multiple reflection.

Working- It is a rectangular tube bent twice at angle of  $90^\circ$  at its two ends. Two

plane mirrors are fitted in it at  $45^\circ$ . The rays of light travelling from the object to be seen, fall on the first mirror, from where they are reflected and sent to the second mirror. The reflected light from the second mirror is received by the eyes of the observer, who is able to see the object.

4. First light enters the eye through cornea then the iris regulates the amount of light entering the eye by adjusting the size of the pupil. The eye lens is held in position by ciliary muscles. Ciliary muscles help in changing the focal length of eye lens then the eye lens focuses the image of the object on the retina. The surface of retina consists of sensitive receptors when light falls on these receptors, they send electrical signals to the brain through optic nerve.
5. To take care of our eyes we should follow following ways:
  - Do not read or work in dim or bright light.
  - Do not look at the sun or a powerful light like that of a welding machine directly.
  - Wash your eyes frequently with clean water.
  - Do not read while travelling. It causes eye strains.
  - Always read at the normal distance for vision.
  - Take frequent breaks while working on a computer.

#### HOTS

1. Rainbow is seen after heavy rainfall as when sunlight enters the rain droplet at a specific angle, it disperses the white light into seven different colours which forms a rainbow.
2. Diagram- Do it yourself

#### Life Skills

Do it yourself.

### Chapter- 17 Our Universe

#### Exercise

- A.** 1. (d)                      2. (d)                      3. (b)                      4. (c)
5. (c)
- B.** 1. Proxima centauri                      2. light year
3. Ursa minor                      4. Sirius
5. Natural                      6. red
7. sun                      8. 9.46 trillion
- C.** 1. (d)                      2. (e)                      3. (a)                      4. (b)
5. (g)                      6. (c)                      7. (f)
- D.** 1. Stars have high temperatures compared to planets. Stars are bright objects. Plants do not generate their own energy.
2. Galaxy is a scientific phenomenon whereas constellation are just work of out intended to help people to easily locate different set of stars on the sky.



3. Asteroids are rocky and metallic objects that revolve around the sun.
  4. Meteorite is the term given to a piece of a comet or asteroid that falls into the Earth's atmosphere and survives to hit the surface. They are usually found on the Earth's surface due to gravitational attraction.
  5. Comet is a small body of ice and dust that moves around the sun in an elongated orbit. Glowing gases and dust form the tail of a comet.
- E.**
1. Diagram- Do it yourself.
  2.
    - a) Orion Constellation- It is one of the most prominent and recognisable constellation in the southern sky. The arrangement of star of this constellation gives the appearance of a hunter with a bow. Some of the prominent stars of this constellation are Betelgeuse and Rigel. Orion is visible during winter season in the late evenings.
    - b) Jupiter- It is the largest planet in the solar system. The mass of the Jupiter is about 318 times of our Earth. It rotates very rapidly in our axis. It has 28 satellites out of which four large ones are visible with the help of a telescope.
    - c) Earth- It is the only planet in the solar system known to support life. Favourable temperature, presence of water and atmosphere and the protection by the layer from harmful UV rays are responsible for existence of life on the Earth.
    - d) Asteroids- They are rocky and metallic objects that revolve around the sun. They are actually too small to be considered as planets.
  3. Sunlight lights up half of the moon. As the moon revolves around the Earth, we see different parts of sunlit balls. The shapes of these parts are called the phases of the moon. When entire side facing the earth in sunlit, the moon appears as a full disc. This way we see different phases of the moon.
  4. The man-made satellite that are sent into space are called artificial satellites. Artificial satellites are useful to us in many ways such as:
    - Making contact with things in space and for communication.
    - Weather forecasting.
    - Conducting space Research.
    - Making accurate maps.
    - Implementing educational programmes.

### **HOTS**

1.
  - Both Mars and Earth rotate and revolve on an axis
  - Both Earth and Mars have four seasons each.
2. No we are not seeing it presently as it is 5 light years away.
  - Which means the light from it will reach us after 5 years.
3. No, it is not possible to achieve this planet it has very low temperature.

### **Life Skills**

Do it yourself.

## Chapter- 18 Pollution of Air and water

### Exercise

- A. 1. (b)                      2. (b)                      3. (a)                      4. (a)
5. (c)                      6. (a)
- B. 1. F                      2. F                      3. T                      4. F
5. T
- C. 1. Air contains 78.09% nitrogen, 20.95% oxygen, 0.93% argon, 0.04% carbon dioxide and small amount of other gases.
2. Burning of fossil fuels release a lot of carbon dioxide in air which result in global warming.
3. Global warming takes place due to carbon dioxide whereas acid rain takes place when pollutants such as sulfur dioxides and oxides of nitrogen combine with vapour.
4. The overall cause in temperature of the Earth due to trapping of heat by CO<sub>2</sub> layer leads to global warming. Global warming results in meeting of polar ice which causes a rise in sea level, leading to floods in the low lying coastal areas having fertile land.
5. Ozone layer protect us from ultraviolet rays from the sun.
6. The main types of water sources are surface water, ground water and salty water.
- D. 1. Global warming- The increased amount of carbon dioxide in air traps the heat radiated from the earth. This trapping of heat by CO<sub>2</sub> layer in air is called greenhouse effect. This lead to an overall increase in the temperature of the earth. The phenomenon is called global warming.
- Effects- Global warming results in melting of polar ice which causes a rise in sea level, leading to floods in the low lying coastal areas having fertile land.
- Prevention- Trees should not be cut and if they are cut, more trees should be planted.
- We should use CNG instead of petrol and diesel.
2. Man- made sources of air pollution:
- Burning of fuels like wood, cow dung cakes and coal.
  - Smoking cigarette causes a lot of air pollutions.
  - Use of synthetic materials for furnishing, chemical product like perfumes, hair sprays also pollute the air.
3. Pollution is contamination of the earth's environment with materials that interfere with the natural functioning of ecosystems- living organisms and their physical surrounding.
- Breathing in polluted air can cause respiratory problems and disease of lungs like Bronchitis, Pneumonia, TB.
  - CO, produced due to incomplete combustion of fuels like petrol etc. is poisonous and may lead to suffocation and even death.

- CFCs when released in air depletes ozone in ozone layer due to this UV rays reach the earth causing skin cancer.
4. Sources of water pollution are the wastes from households, industries, factories, acid rains, nuclear wastes, underground leakages in pipes, oil spills agricultural waste etc.  
To conserve water:
    - We can reuse water for washing and household tasks
    - We can plant more trees to maintain water cycle.
    - We can adopt water harvesting technique to replenish ground water.
  5. Fertilisers help in the growth weeds like algae in water body. This growth disrupts normal aquatic ecosystem. It blocks the oxygen and light affecting the rate of photosynthesis in plants. This affects the aquatic life. This is responsible for the large scale death of aquatic plants and animals.

### HOTS

1. Taj Mahal is getting discoloured because of air pollutants and acid rain. This rain corrodes the marble of monument which is known as marble cancer.
2. CO<sub>2</sub> is threat to environment as it leads to global warming.

Three ways to increase in rate CO<sub>2</sub> in air are-

- a) We can reduce burning of fossil fuels.
- b) We can plant more trees.
- c) We should use CNGs instead of petrol in vehicles

### Model Test Paper-1

- |           |        |        |        |        |
|-----------|--------|--------|--------|--------|
| <b>A.</b> | 1. (b) | 2. (b) | 3. (b) | 4. (d) |
|           | 5. (b) | 6. (d) |        |        |
- |           |             |                 |                                     |  |
|-----------|-------------|-----------------|-------------------------------------|--|
| <b>B.</b> | 1. leveller | 2. Microbiology |                                     |  |
|           | 3. Polymer  | 4. Gold         | 5. Roslin Institute, Kaith Campbell |  |
- |           |      |      |      |      |
|-----------|------|------|------|------|
| <b>C.</b> | 1. F | 2. F | 3. T | 4. F |
|           | 5. F | 6. F |      |      |
- |           |        |        |        |        |
|-----------|--------|--------|--------|--------|
| <b>D.</b> | 1. (e) | 2. (c) | 3. (a) | 4. (b) |
|           | 5. (d) |        |        |        |
- E.** 1. The plants that grow on their own are know as weeds.
  2. Microorganism are found in soil, mud water, sea, dead leaves, clothes and on human skin.
  3. The process in which small monomers link together to form a long chain is called polymerisation.
  4. Silver, gold, aluminium are good conductors of electricity.
  5. Coke is obtained when coal heats strongly in the absence of air. The solid left behind is called coke which contains 98% carbon.

<b>Exhaustible resources</b>	<b>Inexhaustible resources</b>
<ul style="list-style-type: none"> <li>• The resources which are present in a limited amount in nature.</li> <li>• For example: petroleum, natural gas.</li> </ul>	<ul style="list-style-type: none"> <li>• The resources which are present in unlimited amount in nature and can be replenished.</li> <li>• For example: air, sunlight.</li> </ul>

7. When the eggs are fertilised outside the body of the female, it is called external fertilisation. For example- In fishes, the eggs and sperms are released into the water around the animals and fertilisation takes place.

<b>Asexual</b>	<b>Sexual</b>
<ul style="list-style-type: none"> <li>• A living thing produces its offspring without the help of another individual.</li> <li>• For example: Amoeba</li> </ul>	<ul style="list-style-type: none"> <li>• A living thing produces its offspring with the help of another individual.</li> <li>• For example: human beings.</li> </ul>

- F. 1. (i) Soil preparation.  
 (ii) Selection and sowing of seeds.  
 (iii) Addition of Manure and Fertilizers.  
 (iv) Natural methods of replenishing the soil with nutrients.  
 (v) Irrigation.  
 (vi) Protection of crops from weeds and pests.  
 (vii) Harvesting, threshing and winnowing.  
 (viii) Storage of crops.
2. Antibodies- It is a protein produced by plasma cell that is used to neutralize pathogen such as bacteria and viruses.  
Vaccination- It is the administration of a vaccine to help the immune system develop protection from diseases.
3. Plastic is a polymer. The word plastic means fit for moulding.  
 Properties of plastics are as follows:
- Plastics are non-reactive.
  - Plastics are poor- conductors of heat and electricity.
  - Plastics are light, strong and durable.
4. Four non-metals importance for sustenance of life are:
- (i) Oxygen: It is required by all living beings to breathe.  
 (ii) Nitrogen: It is used by plants to make proteins.  
 (iii) Chlorine: It is used to disinfect water.  
 (iv) Silicon: It is essential compound in mechanism of formation of bone and cartilage.
5. Diagram- Do it yourself.
6. Calorific value is defined as amount of heat produced in kilo joules when one gram of fuel is completely burnt. The unit of calorific value is Kj. Important characteristics of ideal fues are:

- (i) It should have high calorific value.
  - (ii) Its ignition temperature should be low.
  - (iii) It should have moderate rate of combustion.
  - (iv) It should be safe to handle, store and transport.
7. After fertilization, the zygote starts dividing continuously into a ball of cells. These cells develop into tissues and organs of the body. This develop mass of cells get embedded in the wall of the cterus which is called an amtryo
8. Diagram- Do it yourself.

**Model Test Paper-2**

- A.** 1. (a)                      2. (a)                      3. (a)                      4. (d)  
 5. (b)                      6. (a)
- B.** 1. oppose                2. break pads            3. Ultrasonic  
 4. Time period        5. same                    6. same
- C.** 1. T                        2. T                        3. F                        4. F  
 5. F                        6. T
- D.** 1. (d)                      2. (e)                      3. (a)                      4. (b)  
 5. (g)                      6. (c)                      7. (f)

**E.** 1.

Endocrine glands	Hormones
Pituitary	T S H , G H
Thyroid	Thyroxine
Pancreas	Insulin
Adrenal	Adrenalin

2. The grooves and ridges in two bodies cause friction.
3. 20hz-20,000hz.
4. The process of coating a metal with a layer of another metal using electrolysis is called electroplating. Its applications are:
- (i) Decorative purpose.
  - (ii) Protection against corrosion.
5. Damaging effect of earthquake depends upon intensity and magnitude.
6. a) Regular reflection takes place when beam of light strikes smooth surface whereas irregular reflection takes place when beam of light strikes rough surfaces.
- b) Incident ray is a ray of light that strikes a surface whereas reflected ray is a ray of light that is reflected back by the surface.
- c) Angle formed between normal and incident ray is called angle of incidence whereas angle formed between normal and reflected ray is called angle of reflection.

7.

<b>Galaxy</b>	<b>Constellation</b>
<ul style="list-style-type: none"> <li>• A galaxy consists of billions of stars.</li> <li>• It does not form a shape of an animal or human.</li> <li>• There are about 100 billion galaxies.</li> </ul>	<ul style="list-style-type: none"> <li>• A constellation is a collection of a few stars.</li> <li>• It forms a shape of recognisable object like an animal or human being.</li> </ul> <p style="text-align: center;">There are only 88 constellation.</p>

- F.
1. Puberty is a stage of life when body becomes capable of reproduction.
  2. When an object is at rest- initially, it is very difficult to get the object to start moving, but once it starts sliding, it is easier to push in order to continue the motion. Thus, a smaller force is required to maintain a uniform motion. Hence, sliding friction is less than static friction.
  3. Do it yourself.
  4. Characteristics of light are:
 

(i) Reflection	(ii) Refraction
(ii) Dispersion	(iii) Dispersion
(iv) Scattering	
  5. Epicenter- The point on the surface of the Earth vertically above the seismic zone.  
Focus- The point at which earthquake originates  
Magnitude- The measure of amplitude of seismic waves.  
Richter scale- Used to describe the magnitude of an earthquake.
  6. Pollution is contamination of earth's environment with materials that interface with natural functioning of ecosystem- living organisms and physical-surrounding. It affects environment, animal and plant life in following ways:
    - Breathing in polluted air can cause respiratory problem and diseases of lungs like bronchitic, asthma etc.
    - CO produced due to incomplete combustion of fuels is poisonous and may lead to suffocation and even death.
  7. Fertilizers help in the growth of weed like algae in water bodies. This growth disrupts normal aquatic ecosystem. It blocks the oxygen and light affecting the rate of photosynthesis in plants. This affects the aquatic life.