

Based on the latest scheme of the CBSE and in accordance with
the latest guidelines & syllabus issued by NCERT



Science FAIR

8
Class



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Teacher's Help Book

- What's New
- Multiple Choice Questions (MCQs)
- Activity / Projects
- Science Olympiad Test Sheet



Crop Production and Their Management

- A. 1. Loosening and turning up the soil is called ploughing.
2. NPK, Urea
- B. 1. (a); 2. (b); 3. (b); 4. (d)
- C. 1. ploughing; 2. manure, fertilisers; 3. November, April; 4. chain system; 5. weeds
- D. 1. True; 2. True; 3. False; 4. True; 5. False
- E. 1. Zayed crops : Some crops are sown in between March and June, are called zayed crops. Some examples such as gourd, cucumber, watermelon etc.
2. Growing plants and rearing animals for food, clothing and other useful products is called agriculture.
3. The process of beating out the grain from the crop is called threshing.
4. The supply of water to crops at different intervals is called irrigation.
5. Pesticides are those substances that kill pests.
- F. 1. Manures : Manure is an organic substance obtained from the decomposition of plant or animal wastes. Farmers dump plant and animals waste in pits at open places and allow it to decompose. For example, vermicompost, neem ki khal (bark of neem).
Fertilisers : Fertilisers are chemical substances which are rich in a particular nutrient. These are manufactured in factories. Chemical fertilisers are easily soluble in water and easy to store and handle. Therefore, it is very popular with farmers. For example, NPK, Urea, etc.
2. The sources of irrigation are tubewells, rivers, canals, dams, etc. There are some traditional and modern methods for irrigation.
Moat, rahat (lever system) and dhekli are some traditional method of irrigate the field.
Tubewells, drip irrigation are the modern methods of irrigation. Pumps are commonly used for lifting underground water.
3. Production of fish is called fishery or pisciculture. Fishes are very good sources of proteins. Oil is obtained from some fish that is rich in vitamins A and D.
4. Nitrogen cycle is a natural cyclic process in which atmospheric nitrogen enters the soil and becomes a part of living organisms, before returning to the atmosphere.
Nitrogen cycle involves the following steps :
(i) Fixation of atmospheric nitrogen.
(ii) When plants and animals die, the nitrogenous compounds present in them are decomposed to ammonia and ammonium compounds.

- G. 1. Selection of good quality seeds is important task in the cultivation. Good quality seeds can give only good crops therefore sowing is also important part of it.
2. The most common fertilisers are NPK which is rich in nitrogen, phosphorus

2

Chapter

Microorganism

- A. 1. Cockroaches, Housefly; 2. Food poisoning, Plague
- B. 1. (c); 2. (a); 3. (b)
- C. 1. amoeba; 2. cholera; 3. Tobacco mosaic; 4. Lion
- D. 1. True; 2. True; 3. False; 4. True
- E. 1. Virus; 2. Bacteria; 3. Protozoa; 4. Fungi
- F. 1. lactobacillus; 2. harmful disease; 3. protozoa; 4. fungi
- G. 1. (i) Food is kept in refrigerator to prevent its decay by the growth of microorganism.
(ii) Edible acids, such as acetic acid or vinegar are common food preservatives.
2. The process of conversion of sugar into alcohol by the action of microbes, like yeast, is called fermentation.
3. (i) Antibiotics should be taken only on the advice of a qualified doctor.
(ii) Antibiotics taken unnecessarily may kill the beneficial bacteria in the body.
4. The process of one's body ability to resist a disease is known as immunity.
- H. 1. In 1929, a Scottish bacteriologist Sir Alexander Fleming was working on a culture of disease-causing Staphylococci bacteria in his laboratory. Suddenly, he found the spores of little green mould in one of his culture plates. He observed that the presence of green mould not only prevented the growth of bacteria but also killed many of these causing bacteria. From this mould, penicillin drug was prepared.
2. The process of prevention of food from spoilage and retaining their nutritive value for a long time is called food preservation. Food preservation means to keep the eatable items fresh for a longer time.
3. (i) Vegetables and fruits must be properly washed before they are eaten.
(ii) Maintain personal hygiene and good sanitary habits.
(iii) Vaccination to be given at suitable age to get immunity.
4. Sometimes, even stored food may get spoilt due to variety of reasons such as : (a) food not properly preserved, (b) improper cooking (c) change in temperature.
- Food poisoning could be caused due to the consumption of food spoilt by some microorganisms. Microorganisms that grow on our food sometimes produce toxic

substances which are harmful for our health. These toxic substances causing serious illness called food poisoning.

- I. 1. Microorganism decompose dead organic waste of plants and animals converting them into harmless substances. In this way, they help to keep the environment clean.
2. (a) Bacteria (c) Virus
(b) Virus (d) Bacteria

3

Chapter

Synthetic Fibres and Plastics

- A. 1. Thermosplastic, Thermosetting plastics; 2. Durable, water repellant
- B. 1. (b); 2. (a); 3. (b); 4. (d)
- C. 1. nylon; 2. saree; 3. plastic; 4. Rayon
- D. 1. True; 2. False; 3. False; 4. True
- E. 1. Polythene; 2. Terylene; 3. Bakelite; 4. Rayon; 5. Nylon
- F. 1. Thermoplastic, Thermosetting Plastic; 2. cable; 3. polymers; 4. biodegradable substances.
- G. 1. (i) It is used for making fishing nets, parachute fabrics etc., due to high tensile strength.
(ii) Wool blended with nylon is used to make socks, suits and carpets.
2. Thermoplastic : Thermo means heat and plastics means the ability to melt and mould. Thermoplastic is hard at room temperature, become soft and viscous on heating and again become rigid on cooling.
3. Coloured compound that are used to give bright colours to clothing is called dyes.
4. (i) Burning of plastic caused air pollution.
(ii) Plastic waste dumped in water causes water pollution.
(iii) Plastic waste dumped makes the place look ugly and provides homes for disease causing germs and insects.
5. (i) They do not shrink.
(ii) They are water resistant and easy to dry.
- H. 1. As a responsible citizen, we must remember the golden 4-R principle – Reduce, Reuse, Recycle and Recover. We should develop habits which are environment friendly.
- (i) We should use two types of bins – a green bin and blue bin for throwing waste. Green for biodegradable waste and blue for non-biodegradable wastes.
- (ii) We should not throw plastic throwaway bottles, polybags, wrappers, etc., on the roads.

2. Polyester is a polymer, which is produced from the coal, air, water and petroleum products. Polyethylene terephthalate (PET) is a well known polyester polymer.

Uses of Polyester :

- (i) It is used to making sails for sail boats.
 - (ii) It is used for making conveyor belts.
 - (iii) it is used for making water houses for fire-fighting operations.
3. Plastics are polymers which can be melted and moulded. There are two types of plastics :
- (i) Thermoplastics : Those plastics which have ability to melt and mould are called thermoplastics. e.g., buckets.
 - (ii) Thermosetting plastics : Those plastics which do not soften on heating and can not be reshaped. e.g., Bakelite.
4. Industrial fabric is usually made from man-made fibres like fibre glass, carbon and aramid fibres. It is used for non-appared for non-decorative uses.

Characteristics of Industrial fabric :

- (i) durable (ii) water repellant (iii) environmental friendly (iv) flame retardant.

These are used for insulation, electronics, filtration and protective garments.

I. 1. Polythene : Ethene

Nylon : Diacid Diamine

Polyester : Terephthalic acid and ethylene glycol.

2. (a) Plastics are bad conductor of heat. So cooking pans have plastic handle.
(b) When plastics are burnt, they produce toxic gases and smoke that causes air pollution.
(c) Due to high tensile strength of nylon, it is used for climbing ropes.

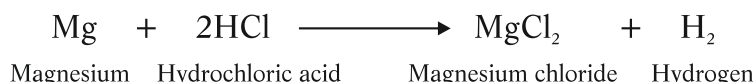
4

Chapter

Metals and Non-Metals

- A. 1. Making States, Cooking utensils; 2. Malleability, Ductility
- B. 1. (b); 2. (b); 3. (a); 4. (d)
- C. 1. Diamond; 2. Aluminium; 3. Aluminium; 4. Iron
- D. 1. False; 2. True; 3. True; 4. True; 5. False
- E. 1. Electrical wiring; 2. Making jewellery; 3. Thermometers; 4. Coating tapes; 5. Electric bulb filaments
- F. 1. liquid; 2. oxygen, water; 3. good; 4. good, electricity
- G. 1. The property of metal to be stretched into thin wire is called ductility.

2. When magnesium react with hydrochloric acid to form their respective salt with the evolution of hydrogen gas.

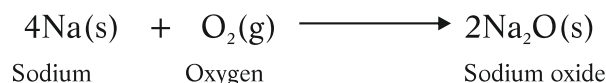


3. Metals : You might have seen many of metals in your daily life such as iron, copper, tin, gold, etc. In general, metals are hard and shiny in appearance.

Non-metals : In general, they are not so hard. Most of them have dull appearance. For example, phosphorus, sulphur.

4. An alloy is a homogeneous mixture of two or more metals. Alloys are made by mixing metals in molten state and sometimes non-metals. Such as duralumin, stainless steel.

- H. 1. Most of the metals react with oxygen to form metal oxides which are basic in nature. Metals like sodium combine rapidly with oxygen, many times they catch fire when exposed to air. To avoid this condition they are kept under kerosene oil.



2. Metals

(a) Generally solids

(b) Mostly white or Silver grey

Non-metals

(a) Generally solids or gases

(b) Colourless or coloured

3. Physical Properties of metals are as follows :

- Metals are generally grey or silver and yellow or brown in colour.
- Metals are lustre.
- Ductile in nature.
- Metals are malleable.
- Metals have high melting and boiling points.
- Metals have high tensile strength.
- High densities.

4. The original properties of metal changes when they are alloyed.

- They are resistant of corrosion and wear and tear.
- They are resistant to attack by chemicals.
- They are generally harder and tougher than the constituents metals.

- I. 1. Sodium and potassium combine rapidly to oxygen so they catch fire when exposed to air. To avoid this condition they are kept under kerosene oil.

2. Physical Properties :

(a) Ductility; (b) Conductivity; (c) Sonorous

Chemical Properties :

(a) Reaction with oxygen; (b) Reactivity with dilute acid

- A.** 1. Diesel, Kerosene; 2. L.P.G., C.N.G.
- B.** 1. (c); 2. (d); 3. (b); 4. (d)
- C.** 1. coke; 2. coaltar; 3. coal gas
- D.** 1. False; 2. False; 3. True; 4. False
- E.** 1. Petroleum; 2. Coal; 3. Coal distillation; 4. Methane
- F.** 1. Coal is one of the earliest used fossil fuels. It is hard and black in colour. It is found in deep mines, beneath the surface of earth and is extracted by mining.
2. Uses of Coaltar :
- (a) As a raw material for many dyes.
 - (b) As a water proofing, and insulating material for buildings and for surfacing of roads.
 - (c) In making paints, explosives, perfumes, plastics etc.
3. Petroleum is found trapped in underground rocks. This is why, it is called petroleum. Because of its importance in today's world it is referred as black gold.
4. Fuels like coal, natural gas and petroleum formed by the decomposition of animals and plants are called fossil fuels.
- G.** 1. Even long before the dinosaurs lived on this Earth, most of the Earth was just oceans with tiny sea organisms, called the phytoplankton. With the passage of time these organisms died and sank to the bottom of the sea and slowly got covered with silt and sand. The sand and sediments formed impervious sedimentary rocks. Pressure due to the weight of these rocks and heat of the Earth converted the dead plants and animals into petroleum.
2. Over long periods of time they make up, the Earth's surface is changed and seas and great rivers caused deposits of sand, clay and other mineral matter to accumulate burying the peat. Increasing deeper burial and the heat associated with it gradually changed the material to coal.
- Uses of coal :
- (i) Used as fuels for cooking in chulhas.
 - (ii) Used in many industries to produce organic compounds.
 - (iii) Used in thermal power plants to produce electricity.
3. Now-a-days consumption of natural gas increasing due to :
- (i) Easy transportation through pipelines directly to the site where it to be used.

(ii) Its used as a raw material for the manufacture of fertilisers and a number of chemicals.

(ii) It has less polluting characteristics.

4. PCRA (Petroleum Conservation Research Association) advices people how to save fuel :

(i) Avoid fast start and sudden braking automobiles.

(ii) Try to follow the 4R's principles – Reuse, Reduce, Recycle, Recover.

(iii) Use public transport wherever you can or form a car pool for everyday travel.

(iv) Switch off engine at traffic lights where you have to wait for longer durations.

H. 1. Inexhaustible natural resources : Those natural resources which are abundance in nature are called inexhaustible resources.

Exhaustible natural resources : Those natural resources which are limited in nature are called exhaustible natural resources.

2. Renewable resources : Those resources which are replenished called renewable resources.

Non-renewable resources : Those resources which are not replenished called non-renewable resources.

6

Chapter

Combustion and Flame

A. 1. Petrol, C.N.G; 2. Carbon dioxide, Foam type

B. 1. (d); 2. (c); 3. (a); 4. (a)

C. 1. Rapid combustion; 2. Ignition temperature; 3. Renewable; 4. CO₂; 5. blue

D. 1. True; 2. False; 3. False; 4. True; 5. True

E. 1. The minimum temperature at which a fuel catches fire is called Ignition temperature.

2. The process of burning fuels in presence of oxygen is called combustion.

3. Conditions necessary for burning of a substance are as follows:

(a) Presence of a combustible substance.

(b) Presence of a supporter of combustion.

(c) Attainment of ignition temperature.

4. When water is thrown on the fire, it cools the combustible substance below its ignition temperatures and this prevents the fire from spreading.

F. 1. At airport and petrol pumps, the fire extinguisher which is based o the principle of smothering the fire is used. These fire extinguishers are called hydrocarbon fire extinguishers. Example, sodium bicarbonate fire extinguisher.

2. (i) Burning of fossil fuels leads to global warming due to release of CO_2 .
- (ii) Burning of coal and diesel releases sulphur dioxide and petrol engines give off gaseous oxide of nitrogen. These oxides form acid rain when dissolved in water.
- (iii) Incomplete combustion of fuels releases CO_2 and carbon monoxide gas which is very poisonous and may even lead to death if inhaled in excess.

3. Types of fuels :

Solid Fuels : Solid fuels leave some ash or residue after combustion. For example, wood, coal etc.

Liquid Fuels : Most of the liquid fuels in use are the hydrocarbons which exist in the liquid phase at room temperature. For example, Petrol, diesel etc.

Gaseous Fuels : Some of the gaseous fuels exist naturally at room temperature and some are made by treatment of coal. For example, L.P.G, C.N.G etc.

4. **Flame :** Flame is a combustion produced only if the combustible substance gets vaporised.

Attributes of a good fuel :

- (a) Fairly cheap and easily available.
- (b) Easy to store and should not cause pollution of burning.
- (c) Should produce a large amount of heat energy.

- G. 1. It is because in incomplete combustion carbon burns to form carbon monoxide.
2. It is because during combustion some form of energy should be released.

7

Chapter

Conservation of Plants and Animals

- A. 1. Asiatic lion, Malabar grey hornbill; 2. Leopard, Red Fox
- B. 1. (b) 2. (c); 3. (b); 4. (d)
- C. 1. Pink headed duck, Indian cheetah; 2. flora; 3. wild animals; 4. differ; 5. threatened species
- D. 1. True; 2. False; 3. True; 4. True
- E. 1. (d); 2. (a); 3. (b); 4. (e); 5. (c)
- F. 1. Wildlife includes all the organisms either plants or animals other than cultivated or domesticated.
2. Project Tiger launched in 1st April, 1973-74 is one of our most successful conservation ventures in the recent times.

3. The existence of a diverse variety of plants, animals and microorganisms. This variety of living organism is called biodiversity.
 4. Extinct species are those species which are no longer living.
 5. (i) Forestry operations, grazing of animals and hunting of animals are prohibited.
(ii) Exploitation of habitat or wildlife is banned.
- G.**
1. Biosphere reserve is a specified area in which multiple use of land is permitted for preserving genetic diversity by dividing it into zones each for a particular activity. There are some important biosphere reserve listed below :
 - (a) Great Nicobar – Andaman and Nicobar
 - (b) Thar desert – Rajasthan
 - (c) Sunder Ban – West Bengal
 - (d) Nanda devi – Uttarakhand
 2. Hunting prohibited areas set up by an executive order are known as Sanctuaries. Wildlife Sanctuaries have the following features :
 - (a) The boundary of a Sanctuary is not limited by state legislation.
 - (b) These Sanctuaries provide protection and suitable living conditions to wild animals.
 3. Some steps for the conservation of wildlife are given below :
 - (a) To prevent hunting, killing and capturing of any animals.
 - (b) Hunting and killing of animals should be made a punishable offence.
 - (c) People should be educated about the need and modes of conservation of wildlife.
 4. Some important causes are as follows :
 - (a) Increase in human population
 - (b) Pollution
 - (c) Illegal hunting
 - (d) Natural disasters
 - (e) Global warming.
- H.**
1. Due to construction of a large number of towns and cities for human settlement, industrialisation and constructions of dams, mines etc. a large number of habitats like forests, ponds etc. were wiped out. Thus, this is true that human population effect less of biodiversity.
 2. If lion are totally killed in a forest, then ecological balance of nature will be disturbed and they will be extinct.

Cell : Structure and Function

- A.** 1. Robert Hooke; 2. Elephant, ant
- B.** 1. (c); 2. (b); 3. (a); 4. (a)
- C.** 1. Plastids; 2. egg; 3. prokaryotes
- D.** 1. True; 2. True; 3. False; 4. True
- E.** 1. tissue; 2. single; 3. vacuole; 4. necloplasm
- F.** 1. Eukaryotic cells have a well organised nucleus with a nuclear membrane.
2. In 1664, Robert Hooke observed a thin slice of dried cork under a microscope. He saw that the cork was made up of thousands of tightly packed rows of compartments. He coined the term cell for these compartments.
3. Nucleus is the control room of cell and is surrounded by a double membrane called nuclear membrane.
4. (i) Vacuole store food and a variety of nutrients that a cell might need to survive.
- (ii) They can even store the waste products so that the rest of the cell is protected from contamination.
- G.** 1. (a) Plastids : These organcells are not present in animal cells. Plastids which contain the green color pigment chlorophyll are called chloroplast.
- (b) Cytoplasm : The matter inside the cell membrane is called cytoplasm. It consists of a jelly like fluid with various structures, such as the nucleus, floating in it.
2. (a) Prokaryotic cells : The cells which do not have a well organised nuclear region due to the absence of nuclear membrane are called prokaryotic cells. Such as bacteria, blue-green algae.
- (b) Eukaryotic cells : The cells which have a well organised nucleus with nuclear membrane are called eukaryotic cells.
3. Cell membrane : A cell is essentially a tiny bag of living matter. The covering of this bag is called the cell membrane or plasma membrane. It maintains the shape and size of the cell and protects its contents.
4. Size of Cells
- | | |
|-----------------------|--|
| 150-250 μm | Mycoplasma bacteria |
| 1-10 μm | Most prokaryotic cells |
| 9 μm | Human red blood cell |
| 3 meters | Length of a nerve cell of giraffe's neck |

- H. 1. Cell wall is the cell organelles which are found only in plants.
 2. Plasma membrane acts like a sentry-allowing only some things to enter and leave the cell and stopping other. This is why is called selectively permeable.

9

Chapter

Reproduction in Animals

- A. 1. Hen, Frog; 2. Binary fission, Budding
 B. 1. (b); 2. (a); 3. (c); 4. (a)
 C. 1. Penis; 2. Vagina
 D. 1. Zygote; 2. sexual; 3. sexual, asexual; 4. ovary eggs
 E. 1. True; 2. True; 3. True; 4. False
 F. 1. Binary fission, budding, Fragmentation and regeneration are the different methods of asexual reproduction.

2. Fertilisation is the fusion of male gamete with female gamete.

3.

Asexual reproduction	Sexual reproduction
(i) The process which takes place without the formation of gametes	(i) The process which takes place with the formation of gametes.
(ii) Asexual reproduction observed only in lower animals such as amoeba.	(ii) Sexual reproduction can be observed higher animals such as cow, fox.

- G. 1. Answer on Page No.105

2. Each female lays hundreds of eggs at a time. The fertilised eggs are attached to twigs or plants below the surface of water. The tadpoles hatch out of the eggs. The natural process by which an animal, after birth or hatching, undergoes abrupt changes in its body structures until it reaches an adult stage is called metamorphosis.
3. Amoeba can reproduce by the method of binary fission. The binary fission in a fully grown amoeba starts when its nucleus lengthens and divides into two parts. After that, the cytoplasm of amoeba divides into two parts around each nucleus. In this way, a single parent amoeba divides to form two smaller daughter amoeba.
4. Oviparous animals : Many organism lay fertilised eggs in the external environment, where they develop into the young ones. The young ones hatch out from the egg and gradually develop into mature organism. These are called oviparous animals.

Viviparous animals : In other animals, the fertilised eggs develop into young babies in the mother's womb. A mother gives birth to young babies which grow into mature individuals. These are called viviparous animals.

- H. 1. It is a technology used to produce an animal that has the same genetic material as another living as previously existing animal.
2. Male reproduction system : Pair of testes, a pair of ducts, vas deferens, penis.
- Female reproductive system : Ovaries, fallopian tubes, uterus, vagina.

10

Chapter

Reaching the Age of Adolescence

- A. 1. Personal hygiene, Physical exercises
2. Increase in weight, voice changes
- B. 1. (a); 2. (c); 3. (d); 4. (a)
- C. 1. HIV; 2. XX, XY; 3. oral cancer; 4. menarche
- D. 1. (c); 2. (d); 3. (a); 4. (e); 5. (b)
- E. 1. Puberty is the age when a boy or girl becomes sexually mature to reproduce.
2. AIDS stands for Acquired Immuno Deficiency Syndrome. The disease AIDS is caused by a dangerous HIV virus.
3. The sexual cycle in females (or women) is called menstruation cycle.
4. The first menstrual flow which begins at puberty in women is termed as menarche.
- F. 1. You will notice that rate of development of secondary sex characteristics varies from individual to individual. Some may show changes suddenly and then slow down, while others may show changes gradually. Some are listed below :
- (a) Increase in weight
- (b) Shoulders and chest
- (c) Increase in height
- (d) Development of muscles
- (e) Increased activity of sweat and sebaceous glands
2. (a) Acne : Acne is a common problem among adolescents. It appears in boys and girls around the beginning of puberty. The hormonal changes that are happening inside your body cause the sebaceous glands to become more active. Most teenagers get acne on the face, neck, upper back etc.
- (b) Voice Change : Both girls and boys are affected by voice changes during their adolescence. In girls the voice becomes slightly deeper. In boys, the voice becomes high pitched.
3. (a) Pituitary gland : Growth hormone secreted by pituitary gland. It promotes

normal growth of bones, muscles and other organs before and after taking meals can prevent diseases.

- (b) Thyroid gland : Thyroxine is secreted by pituitary gland. It controls the rate of metabolism. Iodine is necessary for the synthesis of thyroxine.

4. Measures to reproductive health :

- (a) Personal Hygiene : It is needed to prevent the occurrence of diseases.
(b) It requires a balanced diet for that age group.
(c) Physical exercise keeps the body and mind fit. It gives relief from stress and keeps good mental health.

- G. 1.** The first reason is of genes that inherited from parents. Second is improper kind of diet and exercise.

2. 150 cm

11

Chapter

Force and Pressure

- A. 1.** Cleaning of floor by vacuum cleaner, drinking the cold drink

2. Lift a bucket, kick a football

- B. 1.** (c); **2.** (c); **3.** (d); **4.** (a)

- C. 1.** Muscular force; **2.** lubricants

- D. 1.** Muscular force; **2.** force; **3.** pressure; **4.** 9.8

- E. 1.** Pressure is a type of force that acts per unit area of an object.

2. Atmospheric pressure exerted by air due to its weight.

3. The force with which two objects attract each other in the Universe is called gravitational force.

4. (i) A force may speed up or slow down a moving object.

(ii) A force can change the shape and size of an object.

- F. 1. (a)** Contact Force : The force of which involves physical contact between two bodies on which they act are called contact forces. For example, Muscular force, frictional force.

(b) Non-contact Force : The forces do not involve physical contact between two bodies on which they act are called non-contact forces. For example, magnetic force, electrostatic force.

2. Electrostatic Force : The force of interaction, which exists between two charges, is called electrostatic force. For example, A plastic comb when rubbed on the hair (dry) and brought near a heap of pieces of paper, they are attracted by the comb.

3. A camel can walk easily on sand but it is difficult for a man to walk on sand. This is because a camel's feet have a large area according to man. The force weight falls on a large area of sand.
 4. An instrument called a manometer is used to measure liquid pressure. A manometer consists of a U-shaped tube containing a liquid. One end of the U-tube is open to the air and other end is attached to a thistle funnel through a flexible tube. The mouth covered with a tightly stretched rubber balloon of this funnel. To test it, squeeze the rubber balloon with your fingers. The liquid level goes up in open end and comes down in other arm. The difference of liquid levels in the two arms is the measure of pressure exerted by on the rubber.
- G.**
1. The pressure at the bottom of the sea is much greater than at the sea level. That is why deep sea divers wear specially designed suits to maintain this pressure.
 2. A ball rolling along the ground gradually slows down due to frictional force.

12

Chapter

Friction

- A.**
1. Spikes in shoes for players, provided grooves in tyres; 2. For walking, for writing
- B.**
1. (a); 2. (a); 3. (d); 4. (d); 5. (d)
- C.**
1. Making grooves; 2. sea boat
- D.**
1. reducing; 2. nature; 3. reduce; 4. fluid friction
- E.**
1. The opposing force that comes into play, when one body is actually sliding on the surface of another body. When the book is pushed harder and it starts sliding over the table, the friction between them is called sliding friction.
 2. (i) Soles of shoes are treaded to increase friction.
(ii) Tyres of vehicles are designed with grooves on the surface to increase friction.
 3. Lubricants : Lubricants are used to reduce friction between two bodies.
 4. (i) We would not be able to write without friction.
(ii) Thread of fabric would not stay tied together.
- F.**
1. We know that friction opposes motion and produces heat.
(i) It causes wastage of energy.
(ii) It generates heat.
(iii) It reduces speed.

After reading the above points, it is true to say that friction is a nuisance and we do not require it on our lives. If you think so, then think again and consider the following points.

- (a) We would not be able to walk without friction.
- (b) We would not be able to light a matchstick without friction.
- (c) Brakes on cars and trucks work because of friction.

Hence, it is clear that friction is a necessary evil for our daily lives.

2. Static friction : The friction that comes into play when the objects are at rest relative to each other is known as static friction.

Limiting friction : The maximum opposing force that comes into play when one body is just at urge of moving on the surface of another body.

3. When two solid surfaces come in contact with each other, they experience friction. Similarly, the objects in fluids also experience friction. Why do you think birds, fish, etc. have a streamlined body? This streamlined shape reduces the area of contact between the body and the fluid, hence reducing the friction.

- G. 1. Friction is less between glass and soapy hands. So it can easily slip from hand.
2. Because there is more friction due to the interlocking of rough surfaces.

13

Chapter

Sound

- A. 1. Guitar, Veena; 2. Nature of material, temperature
B. 1. (b); 2. (d); 3. (c); 4. (a); 5. (c)
C. 1. Trumpet; 2. vocal cords; 3. trumpet; 4. vacuum
D. 1. frequency; 2. amplitude; 3. infrasonic waves; 4. noise
E. 1. (c); 2. (d); 3. (b); 4. (e); 5. (a)
F. 1. True; 2. True; 3. True; 4. False
G. 1. **Amplitude** : It is a maximum displacement from the mean or normal position of a body.

Oscillation : Oscillation is used to and for motion of an object.

Time Period : The time taken by a body to complete one cycle of its to and for motion is called time period.

2. Noise is an unpleasant sound that often produces an irritating effect on us whereas music is a sound that produces or regular vibrations.
3. Noise pollution is one of most unwanted gift that modern civilization has presented with mankind. Noise pollution is a excessive sound pollution which arises by factories, motor-vehicle, excessive honking.

4. Time period : The time taken by a body to complete one cycle of its to and fro motion.
- H.** 1. See answer on Page-156
2. Noise pollution may lead to many health hazards :
- (i) It increases nervous tension, irritation, headache and high blood pressure.
 - (ii) Loud music during night time disturbs our sleep.
 - (iii) Prolonged exposure to high level noise can affect the ear-drum and may lead to temporary or even permanent loss of hearing.
3. Answer on page-156
4. Oscillation : Oscillation is to and fro motion of an object.
- (a) Amplitude : The distance by which the ball moves away from two central position is called the amplitude.
 - (b) Time period : The time taken by the pendulum for one oscillation is called the time period.
 - (c) Frequency : The number of complete oscillation made by a simple pendulum in one second is called its frequency.
- I.** 1. Dog, 2. Fox
2. (i) Tabla – Percussion instrument
- (ii) Violin – Stringed instrument
- (iii) Flute – Wind instrument

14

Chapter

Chemical Effects of Electric Current

- A.** 1. Rubber, plastic; 2. Protection, Decoration
- B.** 1. (c); 2. (a); 3. (a)
- C.** 1. Graphite; 2. distilled water; 3. tap water
- D.** 1. poor; 2. chemical; 3. positive; 4. electrical conductivity
- E.** 1. True; 2. False; 3. False; 4. False
- F.** 1. The decomposition of an electrolyte by passing an electric current through it, is called electrolysis.
2. Conductors are those substances that carry current or not. They may be good or poor according to conductivity of electric current.

3. The method of coating the metal's surface of a given article with a thin layer of superior metal with the help of electric current is called electroplating.
 4. A glass or plastic container containing two electrodes and the electrolyte is called voltmeter (or electrolytic cell).
 5. Electrodes are metal plates through which current enters or leaves the electrolytes.
- G.**
1. LEDs are Light Emitting Diode. In case of torch bulb the terminals can be connected to any pole of the battery but one has to be careful about the polarities of the battery while using LEDs. A LED normally comes with two wires that are called leads one of which is longer than other. The longer lead has to be connected to positive terminal of the battery and shorter lead to negative terminal of battery.
 2. When an electric current is passed through an electrolyte, chemical reactions take place. These chemical changes are caused by the passage of electric current through the solution and hence referred to as a chemical effect of current. There is a decomposition of electrolyte bringing about the following reaction :
- | | | | | |
|---|--|---------------------|---|-------------------|
| Water | $\xrightarrow[\text{(electrolysis)}]{\text{passing electric current}}$ | Hydrogen gas | + | Oxygen gas |
| (pinch of salt is mixed)
(Electrolyte) | | (Formed at cathode) | | (Formed at anode) |
3. Electrolyting refining means refining (purification) by electrolysis. Electrolytic refining is the most important and most widely used method by refining metals. Many metals, like copper, zinc, tin, silver, gold and nickel are refined by this method.
- H.**
1. (i) Protect from resting (ii) decorative articles
 2. Electrolyte

15

Chapter

Some Natural Phenomenon

- A.**
1. Earthquake, cyclone
 2. Protons (positive), electrons (negative)
- B.**
1. (c); 2. (a); 3. (d)
- C.**
1. pollution; 2. ocean; 3. drought
- D.**
1. thunder; 2. earthquake; 3. repel; 4. Earthing
- E.**
1. False; 2. True; 3. False; 4. True
- F.**
1. The process of electric discharge between clouds and the Earth or between different clouds causes lighting.

2. An earthquake is the shaking of ground due to tremors, both powerful and weak as a result of disturbances within the earth.
 3. (i) Remain indoors.
(ii) Don't go out with an umbrella with a metal cap.
 4. Epicentre is the point on the Earth's surface, directly above seismic focus.
- G.**
1. Seismograph is an instrument which is used to measure the intensity of an earthquake. An earthquake spread in the form of waves on the surface of the Earth. These are called seismic waves which can be detected with this sensitive instrument called a seismograph.
 2. For detection of charge on a body, an instrument is used called electroscope. Commonly used electroscope in laboratories is gold leaf electroscope. It has a metal lid connected to metal rod which has two thin gold leaves or coils attached to its end. This arrangement is kept inside a transparent glass jar. When you touch the metal lid of the electroscope with a charged plastic straw, the charge will pass through the metal rod to the gold leaves. Both the gold leaves acquire similar charges and get diverged due to repulsion. Hence, indicating that the body touching the electroscope is charged.
 3. We know that most of the Earth is covered by oceans, so earthquakes often happen in the oceans. Usually this just brings movement and ripples in water and does not cause damage. But sometimes the waves are so huge that it causes mass destruction. These huge waves are called Tsunami.
 4. (i) Building design should be taken from a qualified architect.
(ii) Houses which are made in high seismic zones, should be made out of wood often do much better during an earthquake than modern building.
(iii) If you are on ground floor close to the entrance you can try to run outside.
- H.**
1. Lightning occurs as a result of massive flow of electric charge from one cloud to another.
 2. Car can work as a shelter.

- A.**
1. Braille system; Talking device;
 2. Concave, Convex
- B.**
1. (b); 2. (a); 3. (b); 4. (d)
- C.**
1. Red; 2. eardrum; 3. tuberculosis

- D.** 1. multiple; 2. blind; 3. ciliary; 4. seven; 5. dispersion
- E.** 1. (e); 2. (c); 3. (a); 4. (b); 5. (d)
- F.** 1. The band of colours produced when white light is split up is called the spectrum.
 2. The ability of the eye to adjust the focal length of lens is known as accommodation.
 3. When a narrow beam of light is allowed to pass through a prism, it splits into seven colours. The process of splitting of white light into its seven constituents colours is called dispersion.
 4. Two laws reflection started as follows :
 (i) The angle of incidence is always equal to the angle of reflection.
 (ii) The incident ray, the normal at the point of incidence, and the reflected ray, all lie in same plane.
- G.** 1. (a) Myopia : Myopia is also known as short-sightedness. Thus the defect of vision in which a person can see nearby object but he cannot see a distant object. To correct this vision, spectacles with concave lenses are used.
 (b) Hypermetropia : It is defect of vision in which a person can see a distant object but cannot see a nearby object. Hypermetropia can be corrected by using spectacles with convex lenses.
2. See Answer on Page No. 195 and 196.
3. (i) Never use too bright or too dim light while reading.
 (ii) Wash the eyes with clean and cold water at least twice a day.
 (iii) Do not read in a moving vehicles.
 (iv) Consult a doctor in case of any injury to the eyes.
4. Braille system : Visually challenged people can read books printed in Braille. Braille is a system of presenting characters by raised dots. Combination of raised dots in a six-dot 'cell' make up different characters. The characters are read by touching them by fingers. This system was invented by Louis Braille.
- H.** 1. Myopia : By using concave lenses in spectacles.
 2. Myopia : By using concave lenses.

- A.** 1. Aryabhatt, EDUSAT
 2. Ursa major, Ursa minor

- B.** 1. (d); 2. (b); 3. (b); 4. (c)
- C.** 1. Orion; 2. Earth; 3. Uranus; 4. Mars
- D.** 1. (e); 2. (d); 3. (b); 4. (a); 5. (c)
- E.** 1. Venus; 2. 76; 3. Venus; 4. Asteroids, Mars, Jupiter
- F.** 1. False; 2. True; 3. False; 4. False
- G.** 1. Planets are heavenly or celestial bodies moving around the Sun. There are eight planets in the solar system.
2. Constellation : Constellation is a group of stars forming a recognisable shape or pattern.
- Meteors : Meteors are very small objects whose eccentric orbits can bring them into the Earth's atmosphere.
3. Artificial satellites are man-made objects which revolve around the Earth.
4. The universe is everything that exists – stars, planets, moons.
- H.** 1. See answer on Page No. 212
2. Jupiter is the biggest planet of the solar system and is more massive than all the other planets combined. Its mass is 300 times the mass of Earth. It rotates faster than any other planet. It is also very cold and is often referred to as the icy giant of the sky.
3. Orion Constellation : Orion is also called the hunter. Its Indian name is Mriga. It has seven bright stars. Four bright stars mark the shoulder and three stars mark its belt.
- Ursa Major : Ursa major is referred to as a summer constellation. It can be seen clearly in the northern part of the sky during the month of April. Its shape seems to form the outline of a great bear and also resembles a large ladle or a question mark. It contains seven bright stars.
- See Page No. 214 – for Diagram of Orion
4. Comets : Comets are the ball of frozen gases, dust particles and rocks that follow a regular orbit around the Sun. Comets appear as a bright head with a long tail. When a comet enters the Earth's atmosphere, it burns up. Halley's comet made its last two appearances in 1910 and 1986. It is again expected to be visible around 2062.
- I.** 1. Moon takes the same time as Earth to revolve round the Sun as well as to spin or rotate, once about its own axis.

- A.** 1. Flood, human waste; 2. Asthma, Lung cancer

B. 1. (c); 2. (c); 3. (d); 4. (b); 5. (d)

C. 1. forest fire; 2. solid waste; 3. compost

D. 1. carbon dioxide; 2. air; 3. ozone; 4. DDT; 5. nitrogen, Algal bloom

E. 1. (c); 2. (d); 3. (b); 4. (a); 5. (f); 6. (e)

F. 1. True; 2. False; 3. False; 4. False

G. 1. Various source of :

Water pollution : Industrial wastes, pesticides, Human wastes, etc.

Air pollution : Suspended particulate matter, excess of CO₂, SO₂ etc.

2. When sulphur dioxide gas combines with the oxygen in air to form sulphur trioxide. It reacts with water in clouds to form sulphuric acid. Rain mixed with sulphuric acid is called acid rain.

3. (i) Using less water and avoiding wastage of water at home.

(ii) Water harvesting, effective flood control should be done by building the dam and reservoirs.

4. Eutrophication is the gradual change or increase in the concentration of phosphorus, nitrogen, and other plants nutrients in an aquatic ecosystem.

H. 1. These devices describe as follows :

(a) Fabric filters : Polluted master is passed through fabric filters where it is absorbed by filled fabrics.

(b) Wet scrubber : Wet scrubber is a type of tank in which air pollutants are sprayed by jet and water before they reach the chimney.

(c) Electrostatic Precipitator : Electrostatic precipitator use to remove particles of solids such as carbon from waste gases. Electrostatic precipitator works on the principle of electrical charging of dust particles.

2. See answer on Page No. 226.

3. Preventions for Air pollution :

(i) Gaseous pollutants are controlled by using three methods such as combustion, absorption, and adsorption.

(ii) By using devices such as fabric filters, wet scrubber and precipitator.

Precautions for water pollution :

(i) By Biochemical treatment of water.

(ii) Industrial effluents should be treated and clarified before discharge into water bodies.

4. See Page No. 222 and 223 – For effect of Air pollution on Taj Mahal

- I. 1. Excessive carbon dioxide in the atmosphere traps the heat of the Sun and increases the temperature of the Earth. This is responsible for global warming.
2. Excessive use of fertilisers can increase the concentration of phosphorus and nitrogen which cause eutrophication.

Science Olympiad Test Sheet-I

1. (D); 2. (A); 3. (D); 4. (B); 5. (C); 6. (D); 7. (A); 8. (C); 9. (B); 10. (D); 11. (C); 12. (A); 13. (B); 14. (D); 15. (C); 16. (A)

Science Olympiad Test Sheet-II

1. (A); 2. (D); 3. (A); 4. (D); 5. (B); 6. (D); 7. (A); 8. (D); 9. (B); 10. (A); 11. (D); 12. (A); 13. (D); 14. (B); 15. (D); 16. (B)