Mehran Series

MAYARI

SCIENCE

For Class Seven

TEACHER GUIDE

Written By
Zohaib Ahmed Khan

Mehran Science Publication
Sukkur, Karachi, Lahore

INDEX

SECTION-A BIOLOGY

CHAPTER-1
STRUCTURE OF LIVING THINGS

EXERCISE

(A) ANSWER THE FOLLOWING QUESTIONS.

Q.1: What are the unicellular and multicellular organisms? Give two examples of each.

Ans: **Unicellular Organisms:**

Those animals and plants which are made of only one cell are called unicellular organisms, e.g. Amoeba, paramecium are the unicellular animals and Chlamydomonas, Euglena are the unicellular plants.

Multicellular Organisms:

Those animals and plants which are made of many cells are called Multicellular organisms. e.g. the human body is composed of billions of cells. Similarly of flowering plant is built of a countless number of cells.

Q2: How many parts of a cell are there? Name them.

Ans: Parts of cell:

A cell consists of these parts, a thin cell membrane, cytoplasm and a nucleus. Some of the functions of those parts of a cell are described below.

Q.3: What is cell membrane? Describe its functions.

Ans: The cell membrane:

Each cell is surrounded by a thin membrane called the cell membrane. With in the cell membrane, cytoplasm and the nucleus are present. In plant cell, the cell membrane is surrounded by a thick wall made up of cellulose. The cell membrane performs important functions in a living cell. Water, Oxygen, Carbon dioxide and food that enter or leave a cell have to pass through it.

Q.4: Where is cytoplasm found in the cell? Describe its characteristics.

Ans: The cytoplasm:

Each plant cell or animal cell is filled with a living substance called cytoplasm. It is in between the cell membrane and the nucleus. It is colourless, transparent and jelly like substance. Many types of solid and hollow bodies are also present in cytoplasm called the cell organells. In plants however, there is often a cavity in the centre, called the vacuole. But in animal cells many vacuoles are scattered in the cytoplasm.

Q.5: What are cell organells?

Ans: In animals, it generally lies in the centre of the cell while in plants it often lies near the side of the cell membrane.

Q.6: Describe the structure and functions of the nucleus.

Ans: The nucleoplasm network of fine threads are present called the chromatin network. As the nucleus is the controlling centre of the cell, therefore all chemical activities and life processes that occur in the cell, take place under the control of the nucleus. A cell cannot remain alive if its nucleus is removed. Nucleus plays an important role in cell division. From the above details, you can say that a cell is not only the unit of structure but it is also the unit of function. In other words you may say that "A cell is the basic unit of life".

Q.7: Write down five points that show difference between animal cell and plant cell.

Ans: The animal and plant cell can be identified on the basis of their structure.

ANIMAL CELL	PLANT CELL
Cell wall is absent in animal cell.	Cell wall is present in plant cell. It is made up of non-living substance, cellulose.
Cell membraane is the outer most structure of animal cell.	In plant cell it lies inside the cell wall.
Nucleuss generally lies in the centre of the cell.	Nucleus often lies near the side of the cell wall.
Many small vacuoles are present in the cytoplasm.	A large vacuole is filled with water liquid present in the centre of the cell.

Chloroplast is absent in animal cell.	In green parts of plants the cytoplasm contain small bodies called chloroplast. In chloroplast green pigments is present called chlorophyll.

Q.8: Write down the functions of flagella, pyrenoid, vacuoles, eye spot nucleus and chloroplast in Chlamydomonas.

Ans: **CHLAMYDOMONAS:**

It is unicellular green plant. It is oval or pear shaped. At the anterior end it bears two thread like structure called flagella.

Chlamydomonas swims into water with the help of flagella. It is surrounded by a cell wall which is made up of cellulose. Internally it is filled with cytoplasm.

The cytoplasm at its posterior end possesses a cup-shaped chloroplast. A pyrenoid is present in the chloroplast, which is a centre of starch formation.

Chlamydomonas has two vacuoles, which help in removing waste material and excess water.

A reddish eye-spot is present near the anterior end. It is sensitive to light and can distinguish between sun light and shade.

In the centre of the chloroplast there is a nucleus which controls all the functions of the cell.

Chlamydomonas prepares its food by the process of photosynthesis because it is a plant and has green colouring matter chlorophyll.

Q.9: How many parts of cytoplasm are there in amoeba? Name them.

Ans: AMOEBA:

It is unicellular animal found in fresh water ponds. When seen under a microscope it does not possess a constant shape because it keeps on changing its shape. It consists of clear cytoplasm which has two parts. Outer clear portion is called ectoplasm and inner granular part is called endoplasm.

Q.10: How does amoeba move, feed, respire and excrete waste products?

Ans: The Contractile vacuole disposes of waste matter. Food vacuole contain food particles. Amoeba moves feeds on small aquatic animlas. Amoeba repires through its surface.

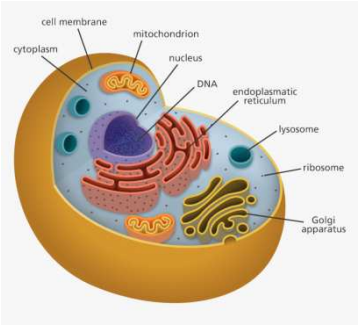
Q.11: How many types of vacuoles are present in amoeba?

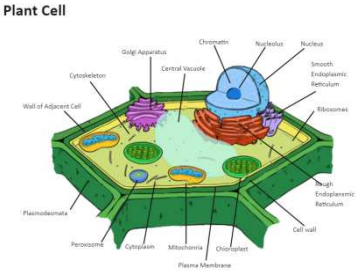
Ans: The endoplasm contains a nucleus which is not fixed at a place. As the amoeba moves, the nucleus also moves along with it. Beside the nucleus a contractile vacuole and many food vacuoles are present.

Q.12: Draw neat and labeled diagrams of the followings:

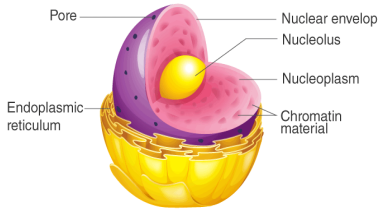
(1) Animal Cell (2) Plant Cell
(3) Nucleus (4) Chlamydomonas
(5) Amoeba

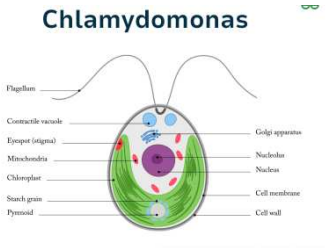
Ans: (1) Animal Cell (2) Plant Cell



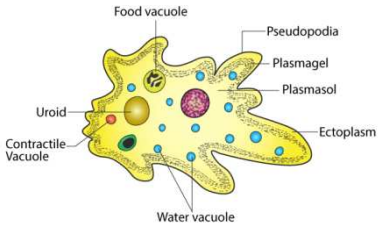


(3) Nucleus (4) Chlamydomonas





(5) Amoeba



B- CHOOSE THE CORRECT ANSWER FOR EACH BLANK.

(1) A _____ is the basic unit of life.
(a) Cell ✓ (b) Tissue
(c) Vacuole (d) Organ

(2) Nucleus is surrounded by a thin membrane called _____.
(a) Nucleoplasm
(b) Nuclear membrance ✓
(c) Cell membrance (d) Vacuole

(3) _____ plays an important role in cell division.
(a) Cell membrane (b) Cytoplasm
(c) Nucleus ✓ (d) Cell wall

(4) Cellulose is a _____ substance.
(a) Living (b) Non living ✓
(c) Soil like (d) All of these

(5) Many small vacuoles are present in _____.
(a) Animal cell ✓ (b) Plant cell
(c) Bacterial cell (d) None of these

(6) _____ swims in the water with the help of flagella.
(a) Amoeba (b) Chlamydomonas ✓
(c) Bacteria (d) None of these

(7) Paramecium is a _____ animal.
(a) Unicellular ✓ (b) Multicellular
(c) Non cellular (d) None of these

(8) In amoeba outer portion of the cytoplasm is called _____.
(a) Cytoplasm (b) Ectoplasm ✓
(c) Endoplasm (d) Mesoplasm

(9) Amoeba is a unicellular _____.
(a) Animal ✓ (b) Plant
(c) Both (d) None of these

(10) Chromatin network is found in the _____.
(a) Cell membrane (b) Cyptoplasm
(c) Nucleus ✓ (d) Chloroplast

C- FILL IN THE BLANKS WITH CORRECT WORDS:

(1) The most important part of cell is <u>nucleus</u>.
(2) Solid and hollow bodies in the cytoplasm are called <u>cell organells</u>.
(3) <u>Amoeba</u> does not have a definite shape.
(4) <u>Chloroplast</u> is a centre of starch formation in Chlamydomonas.
(5) Cell wall of plant cell is made up of <u>cellulose</u>.

(D) WRITE (T) FOR TRUE AND (F) FOR FALSE STATEMENT.

1. All living things are made up of cells. (T)
2. The human body is composed of only one cell. (F)
3. Cell is surrounded by thin membrane called the cell membrane. (T)
4. Nucleus controls the all activities of cell. (T)
5. Cytoplasm is colourless, transparent and cell like substance. (T)
6. Cell wall is present in animal cell. (T)
7. Chlamydomonas is a unicellular green plant. (T)

CHAPTER-2

FOOD AND DIGESTIVE SYSTEM

EXERCISE

(A) ANSWER THE FOLLOWING QUESTIONS.

Q1: Define: (1) Nutrition (2) Nutrient

Ans: The process through which we get energy and other materials from food is called nutrition and the food we get nutrition from nutrients.

Q2: Why is food important for us?

Ans: We drink and eat different types of food every day. All food substances contain different components and they perform different functions in our body. The main components of our food are as following:
(1) Carbohydrates (2) Fats (3) Proteins
(4) Minerals (5) Vitamins

Q3: What are carbohydrates? How do we get them? Describe their functions in our body.

Ans: Sugar and starch are called carbohydrates. We get sugar from sugar-cane, beet, milk and fruits, while starch can be obtained from wheat, rice, potato, ground nut, beet and turnip. Sweet substances like honey, jam, jelly, glucose, syrups and dates are included in carbohydrates. Carbohydrates are regarded as high energy food because they provided us energy in the form of heat.

Q4: What are the functions of fats and oil in our body?

Ans: **FATS AND OIL:**
Fats and oil are obtained from animals and plants. From animals we get milk which is processed to make cream, butter and ghee. We get oil from sunflower seeds, cotton seed (binola) and corn. The oil so obtained is called vegetable oil and it can be converted into banaspati ghee. Fats and oil are also very high energy. Foods they produce twice as much energy as we get from the same amount of carbohydrates.

Q5: Write down the function of proteins.

Ans: PROTEINS:
Proteins are obtained from such food as eggs, fish, meat, milk, cheese and pulses. These are necessary for bones and other orgianisms. They are needed to build muscles, bones and other tissues. They are also required for growth and repair of damaged cells. Growing children specially need such food which are rich in proteins.

Q6: Why are milk and eggs called complete food?

Ans: Milk and eggs are often called as complete food because they are not only rich in proteins but contains other essential components of food also.
MINERALS:
Minerals are found in small amount in different types of food such as, meat, grains, vegetables, fruits, milk, eggs and seafood.

Q7: Name the elements which are necessary for our body. Name the sources from which we get them.

Ans: Salt is also a mineral which contains sodium. Sodium is an element that is essential for our body. Other elements necessary for our body are calcium, phosphorus, iron, iodine, potassium, fluorine, manganese, sulphur and copper.

Q8: Explain the importance of minerals in our body.

Ans: Minerals play very important role in our body. Most minerals are necessary for our growth. Minerals are needed in the formation of bones, teeth cloting of blood and muscles functions.

Q9: What are vitamins and why are they essential for our body?

Ans: Vitamins are a group of very important chemical compounds. They do not provide energy to the body but they are essential for proper growth and functioning of the body. They are needed by the body in every small quantities. Their absence or deficiency causes various diseases.

Q.10: Describe the vitamins which are needed to our body.

Ans: Some vitamins which are needed to our body are described below:

VITAMIN-A:

It is naturally presented in milk, cod liver oil, carrot, bananas and green vegetables. It prevents night blindness and dry of skin.

VITAMIN-B

It is presented in whole wheat, fresh vegetables, milk, egg and meat. It prevents certain skin diseases called "beri-beri" and disorder of nervous system.

VITAMIN-C

Citrus fruits such as lemon and orange contain vitamin-C. It prevents gums bleeding disease called scurvy.

VITAMIN-D:

It is presented in cod liver oil and milk. It prevents weakness in bones called rickets.

VITAMIN-K:

It is present in liver and fresh vegetables. It helps in clotting of blood.

Q11: Define digestion. How many parts of digestive system are there?

Ans: Human food consists of proteins, carbohydrate fats, minerals and vitamins. Out of these proteins, carbohydrates and fats are insoluble in water. Thus, the conversion of insosluble food in the soluble form is called digestion.

Q12: Where does digestion start and what happen to the food in the stomach?

Ans: In stomach food is rolled over and over by the muscles of the stomach. During this process food is grinded and mixed with more digestive juices. The juices secreted by the glands present in the stomach are called gastric juices. These juices begin the digestion of proteins of food.

Q13: Where is the process of digestion completed and what happens to the undigested part of the food?

Ans: When the food is completely digested, it is absorbed by small blood vessels present in the wall or the small intestine. The undigested part of the food now passes into the large intestine where only water and minerals are absorbed. The waste material left after digestion and absorption is finally passed out through the anus.

Q14: Define photosynthesis. What are the essential conditions for photosynthesis?

Ans: PHOTOSYNTHESIS:

The process in which green plants make their food is called Photosynthesis.

ESSENTIAL CONDITIONS FOR PHOTOSYNTHESIS:

(i) Sunlight
(ii) Temperature
(iii) Water
(iv) Carbondioxide
(v) Chlorophyll

Q15: What happens to the excess water in the plant?

Ans: The excess amount is converted into starch, proteins and fats and is stored in the stem, roots, fruits and seeds. Thus, we can say that plants are the primary source of food in the world.

B- FILL IN THE BLANKS WITH SUITABLE WORDS:

(1) Glucose is the example of carbohydrates.
(2) Vegetable can be converted into banaspati ghee.
(3) Fats produce twice energy than carbohydrates.
(4) Sodium is obtained from salt.
(5) Iron is used in the formation of heamoglobin.
(6) lodine regulates the functions of thyroide glands.
(7) Vitamin A prevents night blindness.
(8) The disease in which gums bleed is called scurvy.
(9) Vitamin-K helps in clotting of blood.
(10) Digestion begins from the mouth and the esophagus
(11) Stomach secrets gastric juices.
(12) Photosynthesis happens is the day time when the sun shines.
(13) Saliva helps in the digestion of carbohydrates in mouth.
(14) Growing children used such food which is rich in proteins.

C- Choose the correct answer:

(1) Sugar and starch are called _____.
(a) Mineral (b) Vitamin
(c) Fats (d) Carbohydrates ✓

(2) _____ the juices secreted by the glands present in the stomach are called _____.
(a) gastric juice (b) saliva ✓
(c) chime (d) none of these

(3) _____ prevents weakness in bones.
(a)Vitamin A (b) Vitamin B
(c) Vitamin C (d) Vitamin D✓

(4) Gastric juice digests _____ in the stomach.
(a) Fats (b) Protein
(c) Carbohydrates (d) All of these✓

(5) During Photosynthesis _____ gas is involved.
(a) Oxygen (b) Nitrogen
(c) Carbon dioxide✓ (d) None of these

(D) WRITE "T" FOR TRUE AND "F" FOR FALSE STATEMENT.

1. Food does not give us energy to do work and play. (F)
2. Sugar and starch are called carbohydrates.(T)
3. Protein is needed to build muscles, bones and other tissues. (T)
4. Salt is also a mineral which contains sodium. (T)
5. Iodine regulates the functions of thyroid glands. (T)
6. Vitamin D prevents night blindness and dry of skin. (F)

CHAPTER-3

RESPIRATION AND EXCRETION

EXERCISE

(A) Answer the following questions:

Q1: What happens when coal is burnt in air?

Ans: When coal mixes with oxygen during the process of burning it produces carbon dioxide and energy in the form of heat Coal+ Oxygen ----→ Carbon dioxide +Heat. This heat energy is used for boiling water and some works while carbon dioxide is released in the air. This process is known as the oxidation.

Q2: Define respiration. Why is it important for living things?

Ans: As the plants are living so the process of respiration is found in them. In plants respiration takes place at all times in every cell. Plants obtain all energy required to them by the process of respiration. Food and oxygen are needed to obtain energy. Food is carried through the plant body by the tissue known as phloem and enters the cells as a solution with water. The energy produced the process is utilized by plant cells in making all material and carrying out other life process.

Q3: Define inhalation and exhalation.

Ans: The breathing process consists of inhalation and exhalation.

1. INHALATION:

During this process air comes or enters to the lungs through nostrils.

2. EXHALATION:

During this process carbon dioxide and water vapours are removed from the lungs through nostrils and mouth.

Q4: Describe the respiratory system of human.

Ans: The respiratory system in man consists of two lungs, trachea and its branches. The lungs are spongy and elastic in nature. They are pinkish in colour and joined to the bronchi (singular-bronchus) which join together to form trachea. Each bronchus enters one lung on its own side. Inside the lungs the branches is divided into the smaller branches known as bronchioles. Ultimately the bronchioles open into a bunch of thin walled air sacs called alveoli. They are known as functional units of lungs. The lining of each alveoli have got a network of capillaries. The trachea and bronchi are made up of rings of cartilage. These rings keep the trachea (wind pipe) open all the times. The trachea runs upward into the neck and is connected to the nasal passage through the throat. The entire air passage from the nostrils to trachea and bronchioles is lined by cells which are moistened by a thick sticky substance. As air is inhaled through nose it enters the air sacs or alveoli which are lined by microscopic blood capillaries. Red blood

cells present in the capillaries absorbed oxygen from the air. At the same time, carbon dioxide brought to the lungs from the body is released and exhaled.

Q5: Which gas is required in oxidation?

Ans: Oxygen enters the plant body through small pores called stomata present on the lower surface of the leaves. Oxygen dissolves in water present in the plant's body and reaches all the cell. This oxygen combines with glucose and the process of oxidation takes place.

Q6: Which gas is produced during oxidation?

Ans: During the process of oxidation, carbon dioxide and energy are produced. Carbon dioxide escapes into the atmosphere and is used again by plants in the process of photosynthesis.

Q7: Define excretion and describe the excretory system of man.

Ans: **EXCRETORY SYSTEM IN MAN**

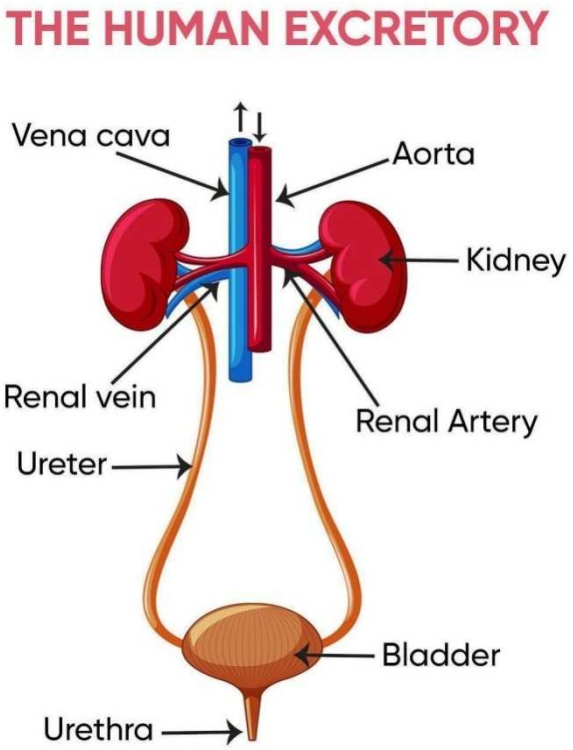
The removal of waste products such as urea and carbon dioxide produced in our body during the process of respiration is called excretion.

EXCRETION IN MAN:

The human body has lungs, kidneys and skin as excretory organs. The lungs remove carbon dioxide, kidneys remove urea in the form of urine and skin removes excess water with salt in the form of sweat.

Q8: Draw a neat and labeled of excretory system of man.

Ans:



B- FILL IN THE BLANKS WITH CORRECT WORDS:

(1) Coal+Oxygen ———> Carbon dioxide + Energy.
(2) The process in which energy is produced in the body from food is called Respiration.
(3) Breathing process consists of inhalation and exhalation.
(4) Lungs, branchi and its branches make the respiratory system.

(5) Bronchi divide into smaller branches called the bronchioles.
(6) Alveoli are the functional units of lungs.
(7) Oxygen enters the plant body through stomata.
(8) During the process of photosynthesis carbon dioxide, water and energy are produced.
(9) During respiration oxygen is used and carbon dioxide, water and energy are produced.
(10) For photosynthesis energy is obtained from the sunlight.
(11) Excretion removes water with some salts in the form of sweat.
(12) Each kidney consists of many small tubes called urinary tube.
(13) Urine is carried from the kidneys to the urinary bladder.
(14) Urine is passed out from the body through urinary bladder.
(15) The outer surface of each kidney is urethra.

(C) CHOOSE THE CORRECT ANSWER FOR EACH BLANK FROM THE GIVEN OPTIONS:

(1) During _____ carbon dioxide is removed from the lungs.

(a)Inhalation (b) Exhalation ✓
(c) Both (d) None of these

(2) _____ are spongy and elastic in nature.
(a) Lungs ✓ (b) Trachea
(c) Bronchus (d) Kidneys

(3) Trachea is made of rings of _____.
(a) Bone (b) Cartilage ✓
(c) Tendon (d) All of these

(4) Inner surface of each kidney is ____ in nature.
(a) Convex (b) Concave ✓
(c) Both (d) None of these

(5) _____ arises from the kidney and open into urinary bladder.
(a) Ureter (b) Urethra
(c) Urinary bladder ✓ (d) None of these

(6) _____ is called the process of oxidation.
(a) Respiration ✓ (b) Breathing
(c) Excretion (d) Circulation

(D) WRITE "T" FOR TRUE AND "F" FOR FALSE STATEMENT.

1. During inhalation air enters the lungs through neuron. (F)
2. The respiratory system in man consists of two lungs, trachea and its branches. (T)
3. Each bronchus enters in one lung on its own side. (F)
4. The lining of each alveoli have got a network of capillaries. (T)
5. Oxygen enters the plant body through small pores called stomata. (T)
6. Kidneys remove urea in the form of urine. (T)

CHAPTER-4

TRANSPORT SYSTEM IN HUMAN AND PLANTS

EXERCISE

(A) Answer the following question:

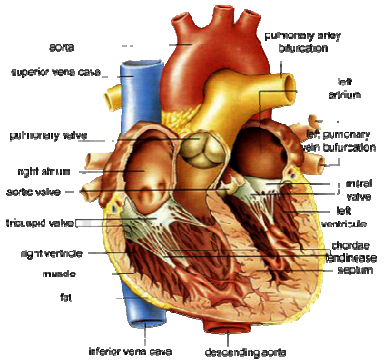
Q1: Write down the main points of blood circulation.

Ans: Blood circulation provides help in the transport of following materials:

(1) Blood transport oxygen from the lungs to all cells of the body and brings back carbon dioxide from the cells of the lungs.
(2) It carries hormones from glands to various parts of the body.
(3) It transports digested food from alimentary canal to all cells of the body.
(4) It brings waste materials from the cells to the kidneys to excret them out.

Q2: Draw a neat and labeled diagram of human heart.

Ans:



Q3: How many chambers are there in human heart?

Ans: There are four chambers in human heart.

Q4: Describe the internal structure of human heart?

Ans: **STRUCTURE OF HUMAN HEART:**

(1) The heart is a muscular organ. It is situated slightly to the left of the middle of the chest. This is why we feel our heart beats on the left side of our chest.

(2) The heart is composed of very strong muscles which enable it to work as a powerful pump. It is enclosed in a tough membrane called the pericardium.

(3) The heart consists of four chambers, two on the upper side and two on the lower side.

(4) The two upper chambers are known as atrium. The two lower chambers are known as ventricles.

(5) The atria and the ventricle on the right side and called right atria and right ventricle.

(6) The atria and the ventricle on the left side are called left atria and left ventricle.

(7) Internally the right atrium opens into the right ventricle and left atrium opens into left ventricle.

(8) The opening between right atria and right ventricle is guarded by tricuspid valves.

(9) The opening between left atrium and left ventricle is guarded by bicuspid valves.

(10) These valves control the flow of blood into the ventricles but do not allow it to go back to the atria once it has flowed out. Thus, they control the blood circulation.

(11) In between left atrium and right atrium a membranous wall is present called inter auricular spetum.

(12) In between left ventricle and right ventricle a membranous wall is present called inter ventricular spetum.

(13) The left part of the heart contains oxygenated blood from the lungs.

(14) The right part of the heart contains oxygenated blood from the entire body.

(15) Both the types of blood is prevented to mix with each other by the spetums which are present in between the atria and ventricles.

Q5: Describe the working of human heart.

Ans: WORKING OF THE HEART:

(1) The right atrium receives deoxygenated blood from two veins one from the upper part of the body and the other from the lower part of the body.

(2) The left atrium receives oxygenated blood from lungs through pulmonary vein.

(3) When right and left atrium are filled with blood. They contract at one time.

(4) The blood from the right atria pushes into the right ventricle.

(5) The blood from the left atria pushes into the left ventricle.

(6) When two ventricles are filled with blood they contract at one time.

(7) The blood from the right ventricle pumps to the lungs through the pulmonary artery.

(8) The blood from the left ventricle is pumped out to the main artery, the aorta, which divides into arches and smaller arteries to supply blood to all parts of the body.

Q6: What happens when the heart expands and contract.
Name the types of blood which is present in:
(1) Left atrium (2) Right atrium
(3) Right ventricle (4) Left ventricle

Ans: When the heart expands, it receives blood and when the heart contracts the blood is pumped out and it goes to the different parts of the body. When the heart contracts and expands the concerned valves open and close making a characteristic sound called the heart beat.

(1) LEFT ATRIUM:

Ans: Pulmonary vein.

(2) RIGHT ATRIUM:

Ans: Vein.

(3) RIGHT VENTRICLE:

Ans: Aorta.

(4) LEFT VENTRICLE:

Ans: Pulmonary artery.

Q7: Describe the composition of blood.

Ans: **COMPOSITION OF BLOOD**

(1) Blood is a mixture of cells suspended in a liquid called plasma.

(2) If the blood is allowed to stand in a test tube or a beaker for sometimes, it separates out into two layers, one above the other.

(3) The upper yellowish white watery layer is called the plasma.

(4) The lower dark red layer consists of red blood cells, white blood cells and platelets.

(5) These cells remain suspended in the plasma as the blood flows in the body.

Q8: Describe the functions of blood components.

Ans: **FUNCTION OF PLASMA:**

It helps in blood clotting.

FUNCTION OF R.B.C:

They contain a red chemical substance called the haemoglobin, which absorbs oxygen from the lungs and supplies it to the cells of the body.

FUNCTION OF W.B.C:

They provide defence to the body against germs and diseases.

FUNCTION OF PLATELETS

They play an important role in blood clotting.

Q9: How many types of vessels are present in the leaf of a plant? Describe their functions.

Ans: **TRANSPORT SYSTEM IN PLANTS:**

(1) If you examine carefully the lower surface of a leaf you will find a number of prominent markings called the veins of the leaf.

(2) There are two types of veins present in the leaves.

(3) The veins of a leaf are in fact a collection of very thin vessels, xylem and phloem.

(4) The vessels which bring water and dissolved salts from the roots to the leaves are called xylem.

(5) The leaves use water and salts in the preparation of food by photosynthesis.

(6) The vessels which transport prepared food from the leaves to the other parts of the plant are called phloem vessels.

(7) Xylem and phloem vessels run through out the plant body, right from the tip of the roots to the tip of the branches and leaves.

Q10: Define transpiration. How does it occur in plants?

Ans: **PROCESS OF TRANSPIRATION:**

(1) The process in which water evaporates from the surface of the plant is called transpiration. Most of it takes place from the leaves.

(2) Water absorbed by the roots, rises up and reaches the leaves. It reaches the cells of the leaves by flowing through the veins of the leaves.

(3) Water from the cells walls evaporates and the vapours accumulate into the spaces among the cells.

(4) These water vapours escape out slowly through the pores, called the stomata that are present on the lower surface of the leaves.

(5) Water rises from the roots to the leaves of plants due to transpiration.

(6) Water forms a continuous column right from the tip of the roots to the surface in the plant body.

(7) This column of water is pulled up as a whole by the transpirational pull.

(8) It is like this when we suck, liquid with the help of a straw, the liquid from the bottom end rises up to fill the straw.

B- FILL IN THE BLANKS WITH CORRECT WORDS:

(1) Blood transport oxygen from the lungs to the cells of the body.

(2) The heart is enclosed in a membrane called Pericardium membrane.

(3) Tricuspid valves are present between right atria and ventricle,

(4) The membranous wall present between the atrium is called inter auricular septum.

(5) Interventricular septum is present between Left ventricle.

(6) Plasma helps in blood clothing.

(7) Haemoglobin is present in red blood cells.

(8) Xylem vessels take food from the leaves and transport to other part of the plant.

(9) Stomata are the pores which are present in the leaf.

(10) White blood cells provide defence to the body against the germs.

C- CHOOSE THE CORRECT ANSWER FOR EACH BLANK.

(1) Blood brings _____ from the cells to the kidneys.

(a) Oxygen ✓ (b) Carbon dioxide
(c) Nitrogen (d) None of these

(2) Plants prepare their food by the process of _____.

(a) Excretion (b) Transpiration ✓
(c) Photosynthesis (d) None of these

(3) The opening between left atrium and left ventricle is guarded by valves.

(a) Valve (b) Biscuspid ✓
(c) Tricuspid (d) None of these

(4) Blood from the left ventricle is pumped out to the _____.
(a) Pulmonary vein (b) Pulmonary artery
(c) Aorta✓ (d) only pulmonary artery

(5) _____ have the ability to absorb oxygen.
(a) Platelets (b) W.B.Cs
(c) R.B.Cs ✓ (d) All of these

(D) WRITE "T" FOR TRUE AND "F" FOR FALSE STATEMENT.

(1) Blood transport oxygen from lungs to all cells of the body. (T)
(2) The heart is a muscular organ. (T)
(3) The left atria receives oxygenated blood from liver. (F)
(4) Blood is as mixture of cells suspended in a liquid called plasma. (F)
(5) Platelets provide defence to the body against germs and diseases. (F)

CHAPTER-5

SUPPORT AND NERVOUS SYSTEM

EXERCISE

(A) ANSWER THE FOLLOWING QUESTIONS:

Q1: How many types of skeletons are there? Name each type of skeleton?

Ans: There are two types of skeleton present in animals.
(A) Endoskeleton (B) Exoskeleton
Vertebrates including the humans possess a boney frame work inside the body called endoskeleton. Invertebrates including snails and insects possess exoskeleton. It is made up of Chitin.

Q2: Describe the types of bones present in the human body.

Ans: **HUMAN SKELETON:**
A human skeleton consists of 206 bones which have been divided into four types as below:

LONG BONES:
These are found in the legs, arms and chest. Long bones have hollow cavity which is filled a soft matter called bone-marrow.

FLAT BONES:
These are found in the skull and shoulder. These are flat and do not have hollow cavity and bone-marrow.

SMALL BONES:
They are found in the wrist and the ankle.

IRREGULAR BONES:
These bones are of irregular shapes, vertebrae and the hips-bone are examples of irregular bones.

Q3: Describe the functions of the skeleton.

Ans: **FUNCTION OF THE SKELETON**:

The skeleton in the human body performs different functions which are given below:

SUPPORT AND SHAPE:

The skeleton supports different body parts and gives them a specific shape.

PROTECTION:

Certain delicate and important organs of the body are protected by casing of bones.

EXAMPLE:

1- Skull protects brain.

2- Ribs protect lungs and heart.

3- Vertebral column protects spinal cord.

MOVEMENT:

Arms, legs, ribs and spine have several places of bone to joined to one another. This enables the body to bend, turn or twist in any direction.

Q4: Describe the major parts of brain.

Ans: The brain consists of three major parts:

(a) Cerebrum (b) Cerebellum

(c) Medulla oblongata.

The brain is made up of several sections each of which has different control functions.

It is composed of soft nerve tissues and is enclosed in a strong bony box, the cranium or cranial cavity.

Q5: Write the functions of the parts of brain.

Ans: The brain consists of 3 major parts:

(1) Cerebrum (2) Cerebellum

(3) Medulla oblongata

(A) CEREBRUM

It is also called the fare brain. It is the largest part of the brain. It is narrower in front and broader behind.

FUNCTION:

It controls and co-ordinates information from the environment through the ears, nose, tongue, eyes and skin. It is called chief set of senation.

B- CEREBELLUM:

It is called the mid brain. It is the largest part of the brain. It is narrower in front and broader behind.

FUNCTION:

It controls the posture of the body and balances and co-rodinates movement of the body part. If the cerebellum of a man is injured due to an accident, he staggers and loses his balance.

C- MEDULLA OBLONGATA:

It is called hind-brain. It connects the brain with the spinal cord.

FUNCTION:

It controls life processes such as respiration, circulation of blood and digestion.

Q6: How many pairs of nerves arise from the spinal cord?

Ans: **THE SPINAL CORD**:

(1) The medulla oblongata continues into the spinal cord. It is a long rod of nerve tissues. It runs through the entire length of the back bone.

(2) It gives of thirty one pairs of nerves on both sides called spinal nerves.

(3) These nerves are of two types: sensory nerves and motor nerves.

Q7: Describe the function of spinal cord.

Ans: (1) The spinal cord sends to the brain all the messages of the environment conveyed to it by the sensory nerves.

(2) The spinal cord carries orders from the brain to the motor nerves and acts according to the order.

(3) The spinal cord also acts independently of the brain in case where sudden response of the body is required.

Q8: How many types of nerves are there? Explain, each type of nerve.

Ans: NERVES:

(1) Nerves are the important part of the nervous system. They connect all of the body parts to the brain through the spinal cord.

(2) Nerves are the bundles of numerous fine fibers which convey messages to the brain. These fine fibers are called neuron (nerve cells).

(3) A neuron has a central cell body with one long branch and many small branches coming from it. The neurons are inter-connected through these branches.

(4) There are two types of nerves as described above.

(i) Sensory Nerves

(ii) Motor Nerves as described above.

(5) SENSORY NERVES:

These nerves carry messages from sense organs to bain and spinal cord. Due to these nerves we can see, hear, smell, touch and taste different things. For Example: Optic nerves

carry sensation from the eyes to the brain. It is from the brain, we come to know what we are seeing.

(6) MOTOR NERVES:

These nerves takes the messages from the brain and the spinal cord to the muscles or the glands in the body which respond by either contracting or the glands produce some secretion.

Q9: Define reflex action explain it with the help of examples.

Ans: REFLEX ACTION:

(1) A reflex-action is a sudden response to an external stimulus. It does not required will or thought.

(2) The stimulus in reflex action is carried quickly to the spinal cord which sends a message to the muscles.

(3) Sensory nerve and motor nerve are involved in reflection. The brain is not involved in a reflex action.

(4) Followings are the examples of reflex action.

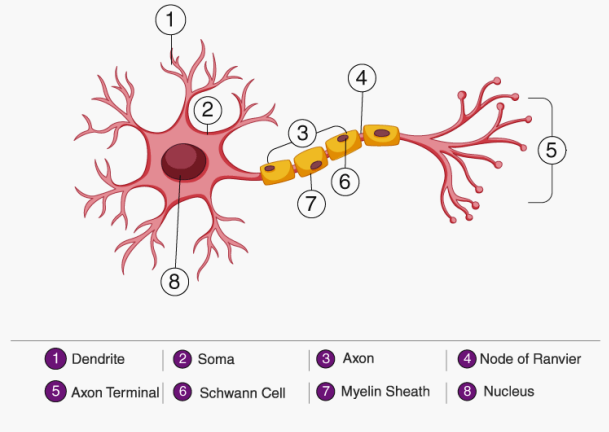
A- Watering of mouth on smelling or seeing good food.

B- The hand is draw back suddenly on touching a hot object unknowingly.

C- Whenever eyes are exposed to strong light then blinking occurs due to reflex action.

Q10: Draw a neat and labeled diagram of neuron.

Ans:



(B)- FILL IN THE BLANKS WITH CORRECT WORDS:

1- In insects the skeleton is made up of chitin.
2- Hollow cavity of the bones is filled with bone-marrow.
3- Flat bones are present in the shoulder and skull.
4- Cerebrum is called the chief set of sensation.
5- Medulla oblongata controls circulation of blood and respiration.
6- Ribs protect lungs and heart.
7- The spinal cord carries orders from the brain.
8- Sensory nerves take the message from the brain and spinal cord.
9- Sensory nerves and motor nerves are involved in relex-action.
10- Cerebellum is also called mid brain.

(C) CHOOSE THE CORRECT ANSWER FOR EACH BLANK FROM THE GIVEN OPTIONS:

1- _____ controls posture on the body.
(a) Cereberum (b) Cerebellum ✓
(c) Medulla (d) None of these

2- _____ protects spinal cord.
(a) Ribs ✓ (b) Hip
(c) Vertebare (d) All of these

3- _____ nerves take the message from sense organ.
(a) Motor (b) Sensory ✓
(c) Both (d) None of these

4- _____ is not involved in reflex action.
(a) Medulla (b) Brain ✓
(c) Spinal cord (d) All of these

5- The brain is present in a bony box called _____
(a) Cranium ✓ (b) Vertebral column
(c) Cerebellum (d) Medulla

(D) WRITE "T" FOR TRUE AND "F" FOR FALSE STATEMENT.

1. There are two types of skeleton. (T)
2. A human skeleton consists of 208 bones. (F)
3. Small bones are found in the wrist and the ankle. (F)
4. Vertebal column protects spinal cord. (T)
5. There are five types of nerves. (F)

CHAPTER-6

REPRODUCTION

EXERCISE

(A) ANSWER THE FOLLOWING QUESTIONS:

Q1: Define reproduction. Why is it called universal phenomenon?

Ans: REPRODUCTION:

Reproduction is the process through which living things (animals and plants) produce their own kind and continue their existence.

Reproduction is a universal phenomenon and it occurs in all living things. In this way, a new generation of plants and animals are formed.

Q2: How many types of reproduction are there?

Ans: TYPES OF REPRODUCTION:

There are two types of reproduction.

A- Sexual Reproduction

B- B- Asexual Reproduction

Q3: Describe sexual reproduction.

Ans: **(A) SEXUAL REPRODUCTION:**

In this type of reproductive cells (sperms and eggs) are involved.

Q4: What happens when male and female sex cells fuse together?

Ans: The male cell and female on maturation fuse to form zygote which later on develops and grow into the offspring.

Q5: Describe asexual reproduction. Give example.

Ans: A**SEXUAL REPRODUCTION**

In this type of reproductive cells (sperms and eggs) are not involved.

This type of reproduction happens in amoeba, bacteria hydra etc. Asexual reproduction in Amoeba is called fission. Asexual reproduction in hydra and yeast is called budding.

Q6: What do you know about the male sex cells or sperm in man?

Ans: An sperm has a small head and a tail. The head contains the nucleus and cytoplasm while the tail helps the sperm in swimming.

Q7: What do you know about female sex cells or eggs in women?

Ans: The eggs are very small but hundred times bigger than a sperms. The eggs travel down the oviduct into the uterus or womb.

Q8: How does fertilization occur in the sex cells of human?

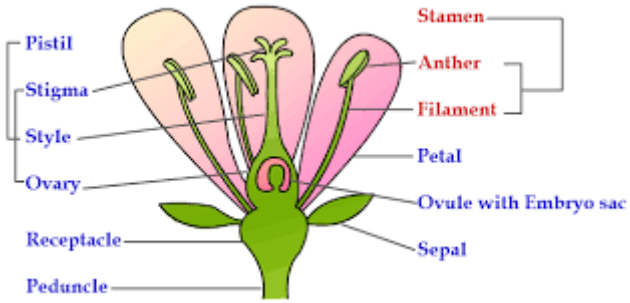
Ans: When swimming sperms reach near an egg, one of the sperm penetrates into the egg and its nucleus fuses with the egg nucleus. This fusain of male and female sex cells is known as fertilization. The cell formed after fertilization is called the zygote.

Q9: What happens to the zygote?

Ans: The zygote begins to divide soon after its formation. After repeated division it develops into an embryo which ultimately, takes the form of an individual.

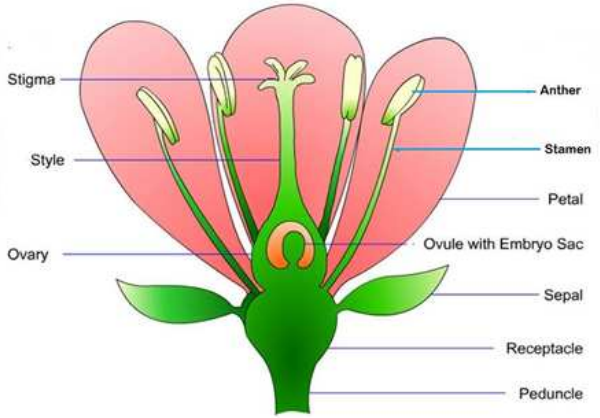
Q10: Describe the structure of a typical flower.

Ans:



Q11: Draw a neat and labeled diagram of a typical flower.

Ans:



Q12: Define pollination. How many types of pollination are there? Explain each.

Ans: POLLINATION:

Pollination is the process in which pollen grains are transferred from the anther to the stigma of the flower.

TYPES OF POLLINATION:

There are two types of pollination.

(1) Self Pollination (2) Cross Pollination

(1) SELF POLLINATION:

When the pollen grains are transferred to the stigma of the same flower self pollination occurs. It takes place only in bisexual flowers.

(2) CROSS POLLINATION:

When the pollen grains are transferred to the stigma of a different flowers, cross pollination occurs. It is better than self pollination.

Q13: What are pollen grains and ovules?

Ans: POLLEN GRAINS:

The anther produce pollen grains which contain male sex cells.

OVULE:

Ovules are the female sex cells.

Q14: What happens when the pollination is completed?

Ans: When pollination is completed the pollen grain begins to germinate and produces a long and thin tube is called the pollen tube.

Q15: How does fertilization occur in flower?

Ans: When pollination is completed the pollen grain begins to germinate and produces a long and thin tube is called the pollen tube. Pollen tube penetrates the stigma and passes down the style into the ovary where it enters the ovary and it enters the ovule which contains an egg. In the mean time, the nucleus of the pollen grain passes down through the pollen tube, reaches the tip of the tube and divides into two sperms. As the pollen tube reaches the egg it bursts releasing the sperms. One of the sperm

fuses with the egg and forms a zygote, or fertilized egg.

The zygote divides and redivides and forms an embryo. The ovule develops into a seed and the ovary grows to the form at fruit.

Q16: Describe the structure of a seed.

Ans: STRUCTURE OF A SEED:

A seed consists of the following parts:

(1) SEED COAT:

Each seed has a hard cover which is called seed coat.

(2) MICROPYLE:

A small opening in the seed is called micropyle through which seed absorbs water and gases.

(3) RADICALE:

It has a pointed end which on growing forms the primary root of the plant. It is also called future root of the part.

(4) PLUMULE:

It is the part of a seed which on growing forms the short of the plant. It is also called future stem of the plant.

(5) **COTYLEDONS:**

These are the special structure found in the seed. They may be one or two in number.

B- FILL IN THE BLANKS WITH CORRECT WORDS:

(1) In sexual reproduction sex cells are involved.
(2) Male sex cells are called sperm.
(3) Fertilized egg is called zygote.
(4) In amoeba reproduction occurs through fission.
(5) Budding is the type asexual reproduction.
(6) The common name of sperm and egg is reproductive cells.

(7) Stamen and carpel are the _____ parts of a flower.
(8) Group of sepals is called calyx.
(9) _____ small Pollination occurs is bisexual flower.
(10) When pollen grain germinates it forms long and thin pollen tube.
(11) Self pollination occurs in bisexual flowers.
(12) The anther produces pollen grain.
(13) Seed absorbs water through micropyly.
(14) Bean seed has two cotyledons.
(15) Food of the seed stored in cotyledons.

(C) CHOOSE THE CORRECT ANSWER FOR EACH BLANK.

1- _____ is the part of seed which on growing forms shoot.
(a) Radical (b) Plumules
(c) Calyx (d) Corolla

2- Monocot seed has _____ cotyledon.
(a) One ✓ (b) Two
(c) Three (d) Four

3- _____ consist of cotyledons, radical and plumules.
(a) Seed (b) Embryo
(c) Cotyledons (d) None of these

4- A group of petal is called.
(a) Calyx (b) Corolla
(c) Androceium (d) Gynoceium

(D) WRITE T FOR TRUE AND F FOR FALSE STATEMENT.

1. There are two types of reproduction. (T)
2. Stem is the reproductive organ of plants. (F)
3. Stamens form the outer most part of a flower. (F)
4. Sepals are generally green in colour. (F)
5. There are three kinds of pollination. (F)
6. Each seed has a hard cover which is called seed coat. (T)

SECTION-B CHEMISTRY

CHAPTER-7

MATTER

EXERCISE

(A) ANSWER THE FOLLOWING QUESTIONS:

Q1: What is matter? Name the three states of matter.

Ans: **MATTER:**

Matter may be defined as any thing that has weight and occupies space is called matter. It is found every where in the universe. All the things around you are matter for examples: pens, books, blackboard, cars, buses, milk, water etc are matter.

THREE STATES OF MATTER:

There are three states of matter which are under as following:

(1) Solid (2) Liquid (3) Gas

Q2: Why is matter found in three states? Give an example.

Ans: Matter is made up small particles and can be found in the form of solid, liquid and gas. The model, we use in science in all the three states is that the particles try to move apart due to the kinetic energy in them.

Q3: Describe the properties of liquids.

Ans: A- SOLID:

In liquids the attractive force among the particles is strong enough to hold the particles close to each other while the kinetic energy is also strong and the particles can move from one place to another in the liquid. In toher words we can say that the molecules of liquids are closed to each other but can continuing from one place to another.

Q4: Describe the properties of gases.

Ans: In gases the distance among the molecules is very large due to less binding force among them. That is why, they move freely from one place to another. The particles of gases are free and can move independently in any direction. Gases have no definite shape and no definite volume. Gases spread through out the space that is available and mix with any other gases that are present. That is why a small amount of perfume spreads through the whole of a room.

Q5: Define atom. Name the fundamental particles of atom.

Ans: ATOM:

The word "atom" is originally taken from the Greek word" Atoms which means "not cut". Atom was once thought unbreakable particle, but it has been proved that it can be broken into smallest particles.

FUNDAMENTAL PARTICLES OF ATOM:

(1) Electron
(2) Proton
(3) Neutron

Q6: Describe the characteristic of Electrons, Protons and Neutrons.

Ans: ELECTRON:

Electrons revolves around the nucleus is different paths called the orbits or shell. It carries a unit negative charge. So the extra nuclear part of an atom is negatively charged. But in an atom, the number of electrons is

always equal to the number of protons. That is why an atom on the whole has no charge on it. The mass of an electron is 1836 times less than a proton. So it is called the lightest particle of an atom.

PROTON:

A proton is a particles having a mass of one atomic mass unit (amu). A proton is 1836 times heavier than an electron so, it is a heavy particle of an atom. It carries a unit positive charge and so the nucleus of an atom is positively charged. The numbers of protons in an atom is called its atomic number.

NEUTRON:

A neutron is a neutral particle of an atom because it has no charge. Its mass is almost equal to that of a proton. But is 1842 times heavier than an electron. The number of neutrons is not equal to the number of protons like carbon, nitrogen and oxygen the number of neutrons is equal to that of protons. The sum of the protons and neutrons in the atom is called its atomic mass number, because both are the heavy particles of the atom.

Q7: Describe the structure of the following atoms with figure.
(1) Carbon (2) Nitrogen (3) Oxygen
(4) Sodium (5) Chlorine

Ans: (1) CARBON:

STRUCTURE OF CARBON ATOM:

It contains 6- Protons, 6- Neutrons and 6- Electrons. It is denoted by a symbol "C". Its atomic unit is 12 i.e 6 protons + 6 neutrons. Its atomic number is six (6) because it contains 6-

Protons in the nucleus. In carbon atom 6- electrons are present in two shell. i.e 2- Electrons in the first shell "K" and 4-Electrons in the second shell "L".

NITROGEN:

STRUCTURE OF NITROGEN ATOM:

Nitrogen atom contains 7 protons, 7 electron and 7 neutrons. It is denoted by a symbol "N". Its atomic mass unit is 14. Its atomic mass is 14. Its atomic number is 7 because 7 protons are present in the nucleus. In nitrogen atom 7 electons are present in two shells i.e 2 electrons in K shell and 5 electrons in L shell.

OXYGEN:

STRUCTURE OF OXYGEN ATOM:

Oxygen atom contains 8 proton, 8 electron and 8 neutrons. It is denoted by a symbol "O". Its atomic mass unit is 16. Its atomic number is 8 because 8 protons are present in the nucleus. In oxygen atom 8 electrons are present in two shell i.e 2 electrons in K shell and 6 electrons in L shell.

SODIUM:

STRUCTURE OF SODIUM ATOM:

Sodium atom contains 11 electrons 11 protons and 12 neutron. It is denoted by Na. Its atomic mass is 23. Its atomic number is 11 because 11 protons are present in the nucleus. In sodium atom 11 electrons are present in two shells i.e 2 electron in K shell and 7 electron in L shell.

CHLORINE:

STRUCTURE OF CHLORINE ATOMS:

Chlorine atom contains 17 electrons, 17 protons and 18 neutrons. It is denoted by Cl. Its atomic mass 35.5. Its atomic number is 17 because 17 protons are present in the nucleus. In nitrogen atoms 17 electronic are present in

shells i.e 2 electrons in K shell and 8 electrons in L shell and 1 electron in M shell.

Q8: Define molecule. How is molecule of oxygen formed?

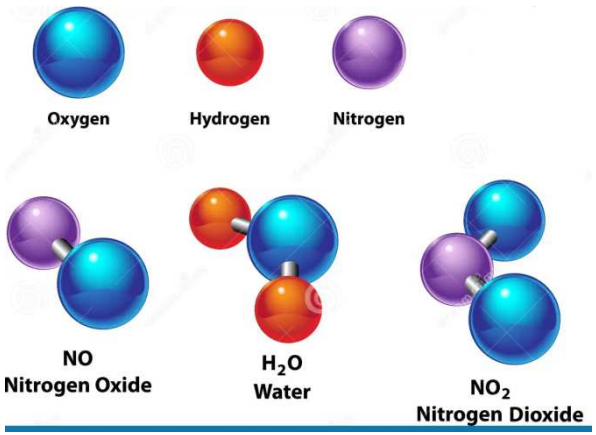
Ans: MOLECULE:

If the atoms combine with atoms of the same or different elements, the particle formed is called molecule.

The oxygen cannot exist single. It must combine with another atom of oxygen to form molecule of oxygen. It is called di-atomic molecule.

Q9: Draw the diagram of the following molecules.
(1) Hydrogen (2) Nitrogen (3) Water

Ans:



(B) Fill in the blanks with correct words:

1- Proton has a positive charge and neutron has no charge.
2- There are 17 protons and 17 electrons in chorine atom.
3- Number of proton is always equal to the number of electron in an atom.

4- The sum of protons and neutron is called the atomic mass of an atom.
5- Gas and liquid have no definite shape.
6- Solid and liquid have definite volume.
7- Nucleus and extra nuclear part are the two parts of an atom.
8- Proton and neutron are present in the nucleus of an atom.
9- Electron revolve around the nucleus of an atom.
10- Proton and neutron are found in the nucleus of atom.

(C) WRITE T FOR TRUE AND F FOR FALSE STATEMENT.

1. When water is cooled at 100C ^{0}. It becomes ice. (F)
2. Solids have definite shape and definite volume. (T)
3. The mass of electron is 1850 times less than proton. (F)
4. A neutron is a neutral particle. (T)
5. Electron revolves around the nucleus. (T)

CHAPTER-8

ELEMENT, COMPOUND AND MIXTURE

EXERCISE

(A) ANSWER THE FOLLOWING QUESTIONS:

Q1: Define element and give some examples.

Ans: An element can be defined as pure substance that can not be broken down into simpler substances by ordinary chemical processes.

Q2: Write down five properties of metals.

Ans: Most metals are hard and usually good conductors of heat and electricity. Metals are generally heavy. At ordinary temperature metals are found in the solid state except mercury e.g. gold, iron, copper etc. Many metals can be drawn out into wire and hammered into thin sheets. Silver, gold, iron and copper are such metals. Metals have a characteristic of luster.

Q3: Write down five properties of non metal.

Ans: **NON-METALS:**

Non-metals are soft (except diamond) and light. They are non-conductors of heat and electricity. Non-metal is found in all three states of matter. Solid, liquid and gas. For example sulphur (solid) bromine (liquid). They can not be drawn out into wire and hammered into sheets because they are either gases or brittle. Non-metal have no lusture.

Q4: Write down the characteristics of a compound with an example.

Ans: COMPOUND:

Some elements occur free in nature while some elements react with other elements to give a new type of substance. These substances are called compounds. In compounds, the atoms of the elements combine in a definite proportion. The properties of compounds are different from the properties of the elements from which they are formed. Energy is required or released during the formation of a compound.

A molecule of water is formed by two atoms of hydrogen and one atom of oxygen. Water is formed when both the gases are burnt together. Hydrogen and oxygen are gases while water is a liquid.

Hydrogen + Oxygen water

$H_2 + O \dashrightarrow H_2O$

(Two atoms gas + One atom gas)

= (One molecule liquid)

EXAMPLE:

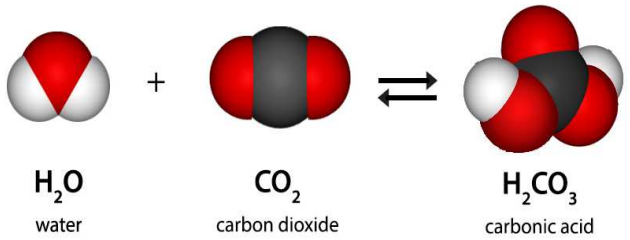
When carbon burns in air, one atom of carbon (solid) combines with two atoms, of oxygen (gas) to give one molecule of carbon dioxide (gas)

Carbon + oxygen carbon dioxide $C + O_2 \dashrightarrow CO_2$

(one atom solid) + (two atoms gas) = (one molecule gas)

Q5: Draw the diagram of the following molecules:
(1) Water
(2) Carbon dioxide
(3) Common Salt

Ans:



Q6: What do you mean by physical properties of a substance.

Ans: In physical properties if a substance, we observe its colour, taste, melting point, density, boiling point and its existence in different states. Sometimes there is a change in some physical properties of a substance. Such changes are called physical changes.

Q7: Write down the physical properties of water and wax.'

Ans: Pure water is a colourless, odourless and tasteless liquid. It freezes at OC^0 and boils at $100C^0$. Its density is one gram per cubic centimeter (1g/cm3) at 40 C^0. It exists in three states solid, liquid and gas. These are the physical properties of water.

PHYSICAL PROPERTIES OF WAX:

Wax is a solid substance. When it is heated, it becomes liquid. It becomes solid again on cooling. During this process, its physical properties changed but there is no change in its composition, such types of change in matter is called physical changes.

Q8: Define chemical property of matter.

Ans: **CHEMICAL PROPERTIES OF MATTER:**

The property of matter to form new substances is called chemical property and the changes that occur during the process are called chemical changes or chemical reactions.

EXAMPLE:

When hydrogen and oxygen gases are burnt, they form water, Hydrogen + Oxygen Water (gas) + (gas) (liquid).

Hydrogen and oxygen both are gases while water is a liquid. The composition of water is different from that of both the gases from which it is formed. It means water is different substance formed during the reaction.

Q9: Formation of water is a chemical change and Describe how?

Ans: The formation of water is a chemical change because water is formed when hydrogen and oxygen gases are burnt.

Q10: What happens when calcium hydroxide reacts with water?

Ans: When calcium hydroxide reacts with water then, they form calcium oxide and water.

Q11: Write down four points of difference between physical change and chemical change.

Ans:

PHYSICAL CHANGE	CHEMICAL CHANGE
This change is temporary.	This change is permanent.
It involves change in the physical properties of the substance.	It involves a change in the chemical properties of the substance.

It is easily reversible.	It is not easily reversible.
The composition of the substance does not change and no new substance is formed.	The composition of the substances change because new substances are formed with different properties from those of the original substance.

B- FILL IN THE BLANKS WITH CORRECT WORDS:

(1) Elements are arranged in a chart called the periodic table.
(2) Non-metals are present in all the three states of matter.
(3) Mercury is liquid metal.
(4) Two atoms of hydrogen and one atom of oxygen form water.
(5) One molecule of carbon dioxide consists of one atom of carbon and 2 atoms of oxygen gas.
(6) There are 8 electrons 8 protons and 8 neutron is oxygen atom.
(7) Six protons and six neutrons are present in the carbon atom.
(8) NaCl is the formula of common salt.
(9) In sodium atom there are 8 electrons in "L" shell.
(10) CO_2 is the chemical formula of carbon dioxide.

(C) CHOOSE THE CORRECT ANSWER FOR EACH BLANK FROM THE GIVEN OPTIONS:

1. _____ is found in liquid state.
   (a) Iodine (b) Fluorine
   (c) Chlorine (d) Bromine ✓

2. _____ is highly reactive element.
   (a) Sodium (b) Oxygen
   (c) Potassium ✓ (d) Sulphur
3. Atoms of all elements have two electrons in "K" shell except _____
   (a) Hydrogen ✓ (d) Helium
   (c) Lithium (d) Boron
4. Boiling point of water is _____
   (a) 0^0C (b) 10^0C
   (c) 37^0C (d) 100^0C ✓
5. _____ is a mixture.
   (a) Water (b) Sugar
   (c) Salt (d) None of these ✓

(D) WRITE "T" FOR TRUE AND "F" FOR FALSE STATEMENT.

1. Elements can be classified into metals and non-elements. (T)
2. Hydrogen and oxygen are Liquid. (F)
3. Chlorine is a pungent and Poisonous gas. (F)
4. Water exists in three states solid, liquid and gas. (T)
5. Calcium oxide reacts with water to give sodium nitrate. (F)

CHAPTER-9

FORCE

EXERCISE

(A) ANSWER THE FOLLOWING QUESTIONS:

Q1: Define the term force. What are its various functions?

Ans: A force is a push or a pull which is applied to on object to change its position. Force is measured by force meter.

Q2: Define a gravitational force by giving an example.

Ans: **Gravitational Force:**
The gravitational I that force which makes things fall toward the ground.
EXAMPLE:
Hold a ball in your hand and drop it from a certain height you will see that it falls to the ground.

Q3: How does the principle of action and reaction play an important role in our daily life?

Ans: The principle of action and reaction plays an important role in our daily life. Study the following examples of action and reaction:
When we walk on the ground, we push the ground downward and backward with out feet. This is our action on the ground.
The ground pushes us in the upward and forward direction due to which we walk.
This is the reaction of the ground on our feet.
The blades of helicopter revolve in horizontal direction and the reaction of air lifts the helicopter vertically upwards.

Q4: Give three examples of action and reaction from daily life.

Ans: EXAMPLE-1:
When we walk on the ground, we push the ground downward and backward with out feet. This is our action on the ground. The ground pushes us in the upward and forward direction due to which we walk. This is the reaction of the ground on our feet.
EXAMPLE-2:
The blades of helicopter revolve in horizontal direction and the reaction of air lifts the helicopter vertically upwards.
EXAMPLE-3:
Consider a book is lying on a table. It pushes the table downward with a force equal to the weight of the book. This is the action of the book on the table. In response the table also pushes the book upward with the same force this is called the reaction of the table on the book and hence the book does not fall on the ground.

Q5: Why does book lying on the table not fall on the ground?

Ans: A book is lying on a table. It pushes the table downward with a force equal to the weight of the book. This is the action of the book on the table. In response the table also pushes the book upward with the same force this is called the reaction of the table on the book and hence the book does not fall on the ground.

Q6: Define tension and give some examples.

Ans: Tension is a force produced in a body when it is stretched. Study the following examples:

EXAMPLE (1):

If two groups of boys pull a rope strongly each in their own side, the rope becomes tight. This tightening of the rope is due to the stretching force on to which is known as tension.

EXAMPLE (2):

We feel tension in a string of a flying kite. If we pull the ends of a rubber band, our finger will feel the tension of the rubber band.

Q7: Define friction. Explain it with the help of an experiment.

Ans: Friction is the force that resists the movement of one body on another body.

EXPERIMENT:

Place a wooden block on a table made up of wood. Tie it to a spring balance. Now pull the block and take the reading on the spring balance. This is the force of friction between the surface of the table and the wooden block. Now place the same wooden block on a table and take another reading. This will be the force of friction between these two objects. You will find that greater force is required to move the block on the rough table than on the smooth glass table. It is due to the greater force of friction in the first case and lesser in the second case.

Q8: Write down the advantages of friction.

Ans: **ADVANTAGES OF FRICTIONS:**

Friction enables us to walk without slipping. Vehicles move on the roads without slipping because the roads and tyres surfaces are rough. To stop moving vehicles, we use breaks which actually produce friction and slows down the vehicle and finally stops it.

Q9: Write down the disadvantages of friction.

Ans: **DISADVANTAGES OF FRICTION:**

The moving parts of a machine when rub against each other wear out and have to be replaced. Most machines do great deal of work just to overcome the force of friction.

Q10: Describe the methods of reducing friction.

Ans: **METHODS OF REDUCING FRICTION:**

The various parts of machines which are moving over one another are properly lubricated by oil and grease. Devices such as rollers, wheels and ball bearings are used to reduce friction. The front of the fast moving objects such as aeroplanes, made oblong to minimize air friction.

(B) COMPLETE THE FOLLOWING STATEMENTS WITH SUITABLE WORDS:

1- An object changes its position when it is <u>pushed</u> or <u>pulled</u>.

2- Force can change the <u>direction</u> and the speed of a <u>moving</u> object.

3- <u>Gravitational</u> force which makes things fall towards the ground.

4- Tension and applied force always act in opposite direction.
5- Friction enables us to walk without slipping.
6- To stop moving vehicles we use force.
7- An object at rest continues to remain at rest.
8- Push and pull is called force.

(C) WRITE "T" FOR TRUE AND "F" FOR FALSE STATEMENT.

1. The push and pull of objects is called force. (T)
2. The gravitational force is that force which makes things fall towards the ground. (T)
3. Force is measured by force meter. (T)
4. The ball exerts a certain force on the ground. This is known as action. (T)
5. Tension is a force produced in a body when it is stretched. (T)

(D) WITH THE HELP OF YOUR SCIENCE TEACHER DISCUSS THE TYPES OF FORCE.

Types of Force

CHAPTER-10

MACHINES

EXERCISE

(A) ANSWER THE FOLLOWING QUESTIONS:

Q1: Define machine, how does machine help us?

Ans: **MACHINE:**

A machine is a device that helps us to do work easier.

Machines help us to do many works. For example we generally use the handle of a spoon or a screw driver to open the lid of a tin. This makes it easier to open the tin cover.

Q2: Write down the names of some simple machines.

Ans: Simple machines are grouped into the following categories:

(1) Lever
(2) Wheel and Axle
(3) Pulley
(4) Inclined plane
(5) Wedge

Q3: Define the followings:

(1) Lever (2) Effort
(3) Weight (4) Fulcrum.

Ans: LEVER:

A lever is a rigid bar which can rotate about a fixed point called fulcrum. A lever is the simplest of all the machines.

EFFORT:

The force that the man is using on the lever is called the effort and it is denoted by (E).

WEIGHT:

The weight which he is trying to move is called the load and it is denoted by (L).

FULCRUM:

The point on the lever that does not move is called the fulcrum and it is denoted by (F).

Q4: How many types of lever are there. Explain each by giving examples.

Ans: TYPES OF LEVER:

There are three types of lever, depending upon the position of the effort (E), load (L) and fulcrum (F).

FIRST TYPE OF LEVER:

The first type of lever has its fulcrum between the load and the effort.

Examples: A common balance, a crowbar, a pair of scissors etc.

SECOND TYPE OF LEVER:

In the second type of lever the load, lies between the effort and the fulcrum.

Examples: Wheel barrow, bottle openers, ors of a boat and nut-crackers.

THIRD TYPE OF LEVER:

In the third type of lever the efforts lies between the load and the fulcrum.

Examples: An ice tongue, fishing rod, human arm, fire tong and a broom.

Q5: Define wheel and axle?

Ans: THE WHEEL AND AXLE:

A wheel is one of the greatest invention of man, we could hardly get along without wheel. But remember that wheel alone is not a simple machine. It becomes a machine when it is combined with an axle.

The wheel and axle machine based on the principle that wheel and axle have different

radii fixed on the same axis. The wheel and axle are used in many machines. They work together in lifting heavy loads such as pulling a bucket a water from a well. The wheel and axle are also used in a bicycle, in a door knob and steering wheel of a car or bus.

Q6: What is pulley? How do we use pulley?

Ans: PULLEY:

A pulley is a wheel with a groove made along its circumference. A rope fits into the groove, when the pulley wheel turns and the load which is attached to the other end of the rope is moved pulley can be used to lift heavy weights.

Q7: How many types of pulley are there, explain.

Ans: There are two types of arrangements of pulleys and rope.

A FIXED PULLEY:

Have you ever watched the flag being raised at your school? The man who raises the flag pulls down the rope. The rope passes over a pulley which is fixed to the top of the flag-pole. A pulley used to raise water from a wall is also an example of fixed pulley.

MOVEABLE PULLEY:

The moveable pulley moves along the rope. The one end of the rope is tied to a fixed support and the other end passes around the pulley. The free end of the rope is pulled with a force (P).A weight is hung from a hook fixed in the pulley.

Q8: Write the uses of fixed and moveable pulleys.

Ans: A moveable pulley is used to reduce the effort needed as compared to the weight.

A simple fixed pulley may be combined with a moveable pulley to change the direction and gain in effort at the same time.

A combination of several fixed and moveable pulley can be used for lifting heavy loads easily. This combination is called a block and tackle

Q9: Define inclined planes. Write its uses.

Ans: INCLINED PLANE:

It is also a simple machine. It is a slopping surface. It is just a wooden plank with a plane surface. You may have seen such slopping planks used in places where heavy things are to be lifted. Suppose we want to lift barrels off the ground on the trunk. The barrels are heavy, they are not easy to lift hence we use a planks of wood as an inclined plane.

Q10: Define wedge. Give some examples and uses.

Ans: WEDGE:

It is also a simple machine. A wedge is a sort of double inclined plane. We use wedges to split things apart or to cut or shape an object.

Example of wedge: An axe, a knife, a chisel a shaving blade and a pair of scissors are the example of wedge.

USE OF WEDGE:

A wedge is a very useful device which is generally used by woodcutter, blacksmith and gold smith.

B- FILL IN THE BLANKS WITH CORRECT ANSWERS:

1. Machine helps us to do work easier.
2. The point on the lever that does not move is called fulcrum.
3. Load is between the effort and fulcrum in second type of lever.
4. Seesaw is the example of first type of lever.
5. Computer is one of the important invention of man.
6. Wheel becomes a machine when it is combined with an axle.
7. Wheel and axle have different radii fixed on the some axis.
8. Human arm is the example of third type of lever.
9. The combination of fixed and moveable pulleys is called blocked and tackle.
10. Heavy drum can be loaded on the truck by using inclined plane.
11. Shaving blade is an example of wedge.
12. Machine can change the direction of things.

CHAPTER-11

HEAT

EXERCISE

(A) ANSWER THE FOLLOWING QUESTIONS:

Q1: Define heat. Why does a solid change into liquid when it is heated?

Ans: Heat is a form of energy associated with the molecular motion. When solids are heated then, solid changes into liquid because by supplying heat the starts vibrating and force of attraction between molecules of solid decreasing hence solid changes into liquid e.g: Ice changes into liquid when it is heated.

Q2: What do you know about the molecular motion in solid and gases.

Ans: Molecular motion in Solid:
In solid state the forces of attraction between the molecules are strong enough to hold the molecules in a rigid pattern. In solid, molecules move to and from in a line about their mean position.
Molecular motion in Gases:
In gases state the force of attraction between the molecules are weak, and the kinetic energy of the molecules enables them to move freely in all direction.

Q3: What is temperature?

Ans: The temperature of a body is a quantitative measure of its hotness. The temperature of any thing tell us how hot it is.

Q4: What is thermometer? Describe its construction.

Ans: For measuring the temperature of a body an instrument is used called the thermometer. A thermometer consists of a sealed glass tube of fine hair like diameter with a bulb at one end. The thermometer is filled with a liquid such as mercury or alcohol.

Q5: What are the centigrade and fahrenheit scales?

Ans: CENTIGRADE SCALE:
Centigrade scale is also called the Celsius scale. In the centigrade scale the freezing point of water or melting point of ice is OC^0 and the boiling point is water is $100C^0$.
The space between these points is divided into 100 equal parts. Each part is called a degree centigrade and the symbol is $1C^0$.
FAHRENEIT SCALE:
In the fahrenheit scale, the freezing point of water on melting point of ice is taken as 32^0F and the boiling point as 212^0F. There are 180 degrees between these two points compared with 100 degrees on the centigrade scale.

Q6: Convert the following centigrade scale into Fahrehiet scale.
(1) 100 ^{0}C (2) 200 ^{0}C (3) 129 ^{0}C (4) 75 ^{0}C

Ans: (1) 100 ^{0}C

Step 1 = $\frac{9}{\cancel{5}^{1}} \times \cancel{100}^{20}$

= 9 x 20

= 180

Step 2 = 180 + 32
= 212 ^{0}F

(2) 200 ^{0}C

Step 1 = $\frac{9}{\cancel{5}^{1}} \times \cancel{200}^{40}$
= 9 x 40
= 360
Step 2 = 360 + 32
= 392 ^{0}F

(3) 129 ^{0}C

Step 1 = $\frac{9}{\cancel{5}^{1}} \times \cancel{129}^{25.8}$
= 9 x 25.8
= 232.3
Step 2 = 232.3 + 32
= 264.2 ^{0}F

(4) 75 ^{0}C

Step 1 = $\frac{9}{\cancel{5}^{1}} \times \cancel{75}^{15}$
= 9 x 15
= 135
Step 2 = 135 + 32
= 167 ^{0}F

Q7: Convert the following Fahrenheit scale into Centigrade scale.
(1) 39 ^{0}F (2) 98.6 ^{0}F (3) 167 ^{0}F (4) 249 ^{0}F

Ans: (1) 39 ^{0}F
Step 1 = 39 – 32
= 7

Step 2 = $\frac{5}{9}$ x 7
= $\frac{35}{9}$
= 3.88 ^{0}F

(2) 98.6 ^{0}F
Step 1 = 98.6 – 32
= 66.6
Step 2 = $\frac{5}{9}$ x 66.6
= $\frac{333}{9}$
= 37 ^{0}F

(3) 167 ^{0}F
Step 1 = 167 – 32
= 135
Step 2 = $\frac{5}{\cancel{9}^{1}} \times \cancel{135}^{15}$
= 5 x 15
= 75 ^{0}F

(4) 249 ^{0}F
Step 1 = 249 – 32
= 217
Step 2 = $\frac{5}{9}$ x 217
= $\frac{1085}{9}$
= 120.5 ^{0}F

Q8: Describe an experiment which proves that solid expand on heating and contract on cooling.

Ans: **EXPANSION OF SOLID**:

On heating solids expand in all directions. The expansion in length is called as linear expansion.

EXPERIMENT:

Take a metal ball and a metal ring the size of the ball is such that it just passes through the ring when they are both at the same temperature.

Heat the ball for some time and place it on the ring you will see that the ball does not pass through the ring. This is because on heating the ball expands and the volume of the ball becomes greater than the volume of the ring.

This shows that when substances are heated they expand, when cooled they contract.

Q9: Prove that liquid expand on heating and contract on cooling.

Ans: EXPANETION OF LIQUIDS:

EXPERIMENT:

Take a flask, glass tube, stoppes coloured water, spirt lamp and a tripod. Fill the flask with coloured water and put a cork at the mouth of the falsk having a hole. Pass a glass tube through the cork. The water rises up the tube mark its level.

Now heat the flask for a few minutes, notice carefully that the water level in the flask falls for a few seconds, because the flask expands on heating first therefore water level in the

flask falls in the beginning. During the next few minutes the water level rises as the water begins to expand. Thus we can say that liquids also expand on heating. Liquids expands more than solids because molecules of the liquids are not closed as in solids.

Q10: Prove with an experiment that gases expand on heating and contract on cooling.

Ans: **EXPANSION OF GASES**:

Take a flat bottomed flask and put a cork having a hole. Now suck a little coloured water into the glass tube. Place a finger over the other end of the tube so that the water can not drop out. Fix the glass tube in the cork such that the drop of coloured water is about 5cm above the cork.

Air tight the flask and mark the lower of water drop heat the flask slightly. You will see after a few minuts that the coloured water drop begins to rise in the tube. Now allow the flask to cool, you will find that the water begins to fall in the tube. Thus we can say that gases expand on heating glass expand more that liquids because molecules of gases are at larger distance than liquids molecules.

(B) FILL IN THE BLANKS WITH CORRECT WORDS.

1. Matter is made up of very tiny particles called <u>atom</u>.
2. In <u>solid</u> state of matter the forces of attraction between the molecules are strong.
3. <u>Thermometer</u> is an instrument used to measure the temperature.

4. The normal body temperature of a person is 37^0C.
5. Boiling point of water in fahrenheit scale is 212^0F
6. 100 divisions of centigrade scale is equal to 32 divisions of fahrenheit.
7. The expansion in length is called as linear expansion.
8. Liquids have definite volume but no definite shape.
9. Gas have no definite volume and no definite shape.
10. Mercury or alcohol is used as a liquid in thermometer.

(C) CHOOSE THE CORRECT ANSWER FOR EACH BLANK.

1. The freezing point of water is 0^0C, its boiling point on Fahrenheit scale will be _____.
   (a) 32 ✓ (b) 35 (c) 37 (d) 40
2. In centigrade scale the normal body temperature of a person is _____.
   (a) 32^0 (b) 35^0 (c) 37^0 ✓ (d) 45^0
3. When molecules of a substance move faster then its temperature will be _____
   (a) low (b) Medium
   (c) High ✓ (d) None of these
4. When an object is cooled the kinetic energy of the molecules is _____
   (a) Increased (b) Decreased ✓
   (c) Same (d) None of these
5. Doctors use _____ thermometer for taking body temperature.
   (a) Clincial ✓ (b) Fahrenhiet
   (c) Kelrin (d) Centigrade

D. WRITE "T" FOR TRUE AND "F" FOR FALSE STATEMENT.

1. Heat is a form of energy associated with the molecular motion. (T)
2. The temperature of a body is a quantitative. (T)
3. Centigrade scale is also called Kelvin scale. (F)
4. The thermometer is an instrument used to measure the speed of light. (F)
5. The expansion in length of solid objects is called linear expansion. (T)

CHAPTER-12

LIGHT

EXERCISE

(A) Answer the following questions:

Q1: What happens when a bulb is lighted in the dark room?

Ans: When we enter a completely dark room we are unable to see the objects in the room. But when a bulb is lighted all the objects in the room becomes visible.

Q2: Define light. What are the natural sources of light?

Ans: LIGHT:
(Light is a form of energy which travels in the form of waves). The sun is the major source of light. Other stars also emit light. Thunder storm also produces flashes of lighting.

Q3: Describe some artificial sources of light.

Ans: Man has also invented quite a number of artificial ways of producing light. These sources of light are oil lamps, candle, torch, electric bulbs and tube light.

Q4: What happens when a potted plant is kept in the dark room for a week?

Ans: Keep one plant in the sun light and other inside a dark room. After about ten days you will see that leaves of the plant placed in the sun light are lush green where as the leaves of the plant inside the room have started withering.

Q5: What happens when rays of light strike the film of a camera?

Ans: when rays of light strikes the films of a camera then it reflects and enable us to see the objects.

Q6: Describe an experiment which prove that light travels in a straight line.

Ans: EXPERIMENT:

- Take the three pieces of card board and make a hole in the centre of each piece.
- Place the three card board pieces one behind the other at some distance.
- Set the three holes of the card board in a straight line.
- Place the lighted candle at one end of the board.
- Now observe the flame of the candle. Draw the opposite end of the candle through the holes.
- You can see the flame clearly the through the holes. Now disturb one of the card from its place what happens? Can you still see the flame of the candles?
- This experiment shows that light travels in a straight line.

Q7: Define the following terms:
(1) Reflection of light (2) Regular Reflection.
(3) Irregular Reflection (4) Plane Mirror

Ans: (1) Reflection of Light
When a ry of light strikes on the surface of a medium such as a mirror it comes back into

the same medium of light is called reflection of light.

(2) There are two kinds of reflection:

(i) Regular Reflection

(ii) Irregular Reflection

(3) If the surface is smooth and shining the reflection is called regular reflection.

(4) If the surface is not smooth. The reflection is called irregular reflection

(5) A plan mirror is just a thin, flat piece of glass which has a polished surface.

Q8: Define the following terms.

(1) Incident Ray (2) Reflected Ray

(3) Normal (4) Point of Incident

(5) Angle of Reflection

Ans: **INCIDENT RAY:**

The ray of light falling on the mirror is called the incident ray.

POINT OF INCIDENT:

The point where the incident ray strikes is called the point of incident.

NORMAL:

The line perpendicular to the mirror at the point of incident is called the normal.

ANGLE OF REFLECTION:

The angle between the reflected ray and the normal is called angle of reflection.

Q9: State the laws of reflection:

Ans: **LAWS OF REFLECTION:**

There are two laws of reflection. The incident ray, the reflected ray and the normal to the surface at the point of incident, lie in the same plane. The angle of incident and the angle of reflection are always equal.

Q10: What do you mean by lateral inversion? Explain by an image formed in the mirror.

Ans: **LATERAL INVERSION:**

When you stand in front of a plane mirror, you can see your image behind the mirror. If you move your right hand, the image appears to moves its left. Similarly your right leg appears as the left beg in the image. In fact the whole of right side of the image is due to the left side of the body. In the image the whole of the body appears to be invented side ways. This process is called lateral inversion.

(B) FILL IN THE BLANKS WITH CORRECT WORDS:

1. Light is a form of energy which enables us to see the objects.
2. Light helps green plants to make their food.
3. When light strikes the films chemical change occurs.
4. A plane mirror is just a thin, flat piece of glass which has a polished surface.
5. Angle of incident and angle of reflection are always equal.
6. The ray falling on the mirror is called incident ray.
7. The angle between the incident ray and the normal is called the angle of reflection.
8. The process in which a body appears to inverted sideways
9. Irregular reflection occurs only when the surface is not smooth.
10. The behavior of light in which it comes back in the same medium is called reflection of light.

(C) WRITE "T" FOR TRUE AND "F" FOR FALSE STATEMENT.

1. The Sun is the artificial source of light. (F)
2. Thunder storm also produces flashes of lighting. (T)
3. Light helps green plants to make their food. (T)
4. There are five laws of reflection. (F)
5. The ray of light falling on the mirror is called the incident ray. (T)

(D) DESCRIBE THE IMPORTANCE OF LIGHT FOR LIVING THINGS.

Importance of life for living things: