

# Science



Book Six



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**UNIT  
1****Organization of Life**

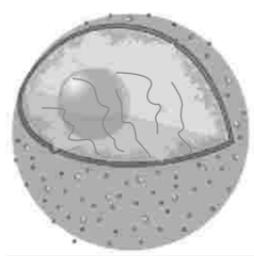
**A. Answer the following questions.**

i). Write a note on cytoplasm.

Ans. The living contents of cell are divided into nucleus and cytoplasm the two collectively form protoplasm. Cytoplasm consists of an aqueous ground substance containing a variety of cell organelles and insoluble wastes and storage products. The most important function of the cytoplasm is to act as a store house of vital chemicals. It is also a site for certain metabolic processes. In living cells the cytoplasm contains several cell organelles such as endoplasmic- reticulum, mitochondria, golgi complex. This is called cytoplasm.

ii). What is nucleus and why it is called cell brain of the cell?

Ans. Presence of cell nucleus was reported in 1831 by Robert Brown. It controls the life and activities of the cell. In animal cells, it generally occupies the central space,



**Nucleus**

while in the case of plant cells it is pushed towards periphery due to the presence of a large vacuole. Nucleus may be irregular or spherical in shape. Wing to its characteristics is called brain of cell.

iii). Differentiate between animal and plant cell.

Ans. There are main differences between plant cell and animals cell:

### Animal Cell

- The outer boundary in animal cell is cell membrane .
- Animal cell has many vacuoles scattered in cytoplasm.
- Nucleus is present in the centre of cell.
- Centrosome is present near nucleus.
- Animal cell does not posses chloroplast.



### Plant Cell

- Plant cell has an outer boundary of cell wall which is made up of rigid material called cellulose. A large vacuole is present in most of the plant cell.
- The nucleus is present on a side due to the presence of a large central vacuole.
- Centrosome is absent in plant cell.
- Plant cell possesses chloroplast which helps in photosynthesis.



iv). Write a short note on cell membrane.

Ans. Some organisms consist of a single cell and this single cell exists as an independent organism. They are called unicellular e.g.

Bacteria, Chlamydomonas, Amoeba are unicellular organisms.

- v). Write a detail note on different level of organization of life.

Ans. cell → tissue → organ → system → organism

### **Tissue level:**

organized into loose sheets or bundles performing similar functions. These are called tissues.

### **Organ and System Level:**

Different tissues having related functions assemble together in a structure to carry out there functions with great efficiency such structure are called organs and they are specialized to perform particular functions.

### **Individual (Whole Organism)**

Various organ systems in animals are assembled together to form an individual. The whole organism the various functions, processes, activities of an organism are co-ordinated in an animal. All the system works in co-ordination with each other for instance, if a man is engaged in continuous and hard exercise, not only his muscles are working but also there is an increase in the rate of respiration and heart beats to supply the muscles with increased oxygen and food which they need for continuous exercise.

**B. Fill in the blanks.**

- i). The smallest unit of body that carry out all activities of life is called cell.
- ii). Cell is the unit of structure and function of living organism.
- iii). The most important function of cytoplasm is to act as a store house for vital chemicals.
- iv). Presence of cell nucleus was reported in 1831 by Robert Brow.
- v). Different systems are assembled to form an individual.

**C. Tick  for true and  for false statements:**

- i). Nucleus is only visible when the cell is in dividing stage.
- ii). A chromosome is composed of DNA and proteins.
- iii). In unicellular organisms, a single cell exists as an organism.
- iv). Different cells have different sizes and shapes.
- v). The number of chromosomes in a human being are 45.

D. Match the column.

**Column A**

Cell

Nucleus

Cytoplasm

Chloroplast

Centrioles

**Column B**

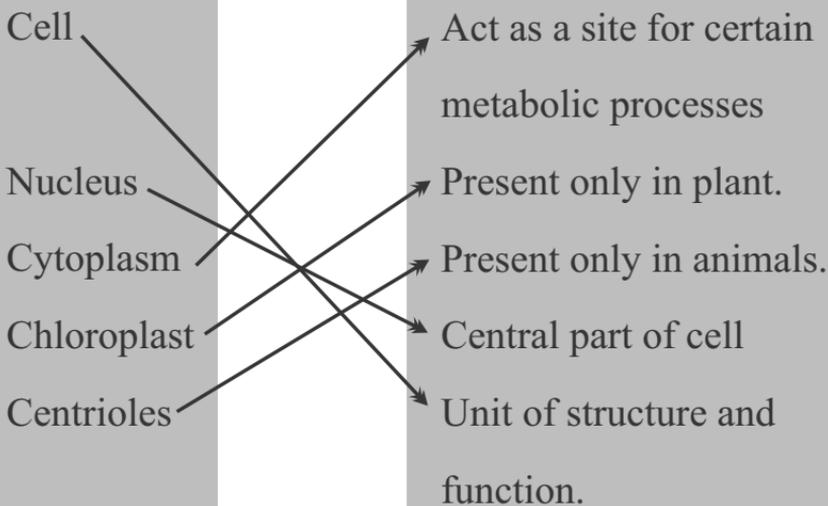
Act as a site for certain metabolic processes

Present only in plant.

Present only in animals.

Central part of cell

Unit of structure and function.



**UNIT  
2****Sense Organs**

i). What are receptors? Write their types and their functions.

Ans. Sense organs are the receptors of the body. They receive information about the condition both inside and outside of the body. These information are stimulus. Each stimulus (plural stimuli) is a form of energy that activates sensory receptors. The peripheral endings of a certain type of sensory neuron, which produces a response in the body structure. There are many types of receptors the in human body types and their function.

**For Example:**

**Mechanoreceptors:** Detect changes in pressure position or acceleration of all forms of mechanical energy.

**Pain Receptors:** Detect tissue damage.

**Thermoreceptor:** Sensitive to heat and cold.

**Chemoreceptors:** Detect chemical energy of substance dissolved in the fluid that bathes them.

**Osmoreceptors:** Detect changes in the solute levels of somebody fluid.

**Photoreceptors:** Detect difference in the energy of visible and ultraviolet light.

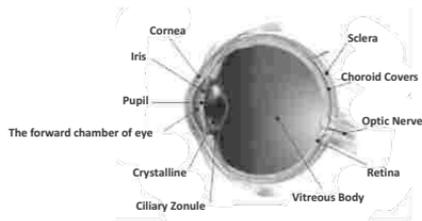
ii). Write the structure of human eye with diagram.

Ans. Each eyeball is held in a protective bony socket of skull, called an orbit. Two antagonistic pairs of rectus muscles are attached to the tough outer layer of the eyeball, the sclera. The sclera is white because of the numerous collagen fibers within it. However these collagen fibers are normally absent in the sclera covering the front of the eyeball, forming a transparent cornea through which light can pass.

Beneath the sclera is a layer of tissue containing blood vessels and melanin-containing cells, the choroid. At the front of eyeball, this choroid layer forms ciliary body, with suspensory ligaments that supports the lens, and the pigmented iris, which controls the amount of light entering the eye. Beneath the choroid layer is the layer of light sensitive cells "The retina" receptor neurons which synapse with light sensitive cells leave the center of the eyeball causing a break in the retina appropriately called the blind spot.

The ciliary body and lens separate the eyeball into two chambers. The anterior chamber is filled with watery aqueous humour, which is

secreted by the ciliary body. The posterior chamber is filled with a jelly-like vitreous humour. Vitreous humour supports the lens and aqueous humour maintains the shape of the anterior chamber of the eyeball.



iii). Write a detail note on sense of taste.

Ans. Tongue is the organ of taste. Sensory cells are present on the upper surface of tongue. These sensory cells are called taste buds. The sense of taste is a chemical sense because its receptors are excited by chemical stimuli. The chemical substances in the food that we eat.

iv). What are the different parts of ear and how do they work?

Ans. The outer ear consists of pinna.

i). Most humans are able to move their pinnas only slightly. Location of sound depends on the difference in the time when sound reaches each ear.

ii). The middle ear is an air filled cavity in the skull. It contains three small bones called ossicles which transmit vibration of the tympanic membrane to the membrane

covering a small oval hole in the skull, the oval window. These ossicles act like levers magnifying the vibrations of the tympanic membrane over twenty times. Since the middle ear is air-filled, damage would occur if the air pressure on each side of the tympanic membrane were very different. This is prevented by a connection between the middle ear and the pharynx by the eustachian tube.

iii). The inner ear is a bony cavity in the skull which is filled with a fluid called perilymph. The whole cavity is lined by membrane which forms the oval window and round window where it passes over holes in the bony cavity. Inside this cavity is a group of membrane bound structures containing endolymph and mechanoreceptor.

- The cochlea contains sound receptors.
  - The semi-circular canals contain receptors for movement of the head.
  - The sacculus and utriculus contain gravity receptors.
- v). Write note on (a) Sense of smell (b) Skin

Ans. **Sense of Smell:**

Nose is the sense organ of smell. Sensory cells in the roof of the nasal cavity are sensitive to

chemical. These cells detect chemical in the air given off by objects.

The sense of smell is vested in the olfactory epithelium, located on each side in the upper reaches of the nasal cavity. The olfactory epithelium contains numerous nerve receptor types of nerve cells that project small microvilli called olfactory hairs or cilia outward from the epithelium into the overlying mucus. It is the olfactory hairs that detect the different odors.

Those odor most easily smelled are first, the very highly volatile substance second, the substance that are highly soluble in fat.

### **Skin:**

It skin is the sense organ of touch, temperature, skin is very important for us, and we feel every thing with our skin such as pressure and pain. Skin has two main layers. The tough outer layer is called the epidermis. New skin cells grow underneath the epidermis to replace old skin cells. As the old skin cells die, they harden and flake away. The inner layer of skin is called the dermis. It is much thicker than the epidermis. It is packed with nerve endings, hair roots, sweat glands and tiny blood vessels.

**B. Answer the following short questions:**

i). What is the function of chemoreceptors?

Ans. It detects chemical energy of substance dissolved in the fluid that bathes them.

ii). What is the function of medial olfactory area and lateral olfactory area?

Ans. The medial olfactory area is responsible primarily for primitive function of the olfactory system such as eliciting salivation in response to smell, licking lips and causing an animal to stalk a juicy meal.

The lateral olfactory area is concerned with complicated responses to olfactory stimuli. Thus, recognition of a certain type of smell as belonging to a particular animal is a function believed to be performed by this area.

iii). What do you know about primary taste sensation?

Ans. Tongue is the organ of taste. Sensory cells are present on the upper surface of tongue. These sensory cells are called taste buds. The sense of taste is a chemical sense because its receptors are excited by chemical stimuli. The chemical substances in the food that we eat.

iv). What is hearing loss?

Ans. Conductive hearing loss can be corrected sometimes by surgery.

v). What is short sightedness?

Ans. If a person cannot see distant objects clearly but can see near object clearly, then he is suffering from short sightedness.

vi). What is long sightedness?

Ans. If a person cannot see the near object distinctly but can see the distant object clearly, then he is suffering from long sightedness.

vii). Define cataract.

Ans. The commonest causes of blindness is cataracts, is the clouding of the lens so that it becomes milky. This preserves light passing through and make reduce the vision. It can now easily be treated by removing the lens and replacing it with an implanted artificial lens or spectacles.

viii). What functions mammalian eye can perform?

Ans. The mammalian eyes can perform these functions.

ix). What are functions of vitreous and aqueous humour in eye?

Ans. Vitreous humour supports the lens and aqueous humour maintains the shape of the anterior chamber of the eyeball.

x). Write functions of ossicles in the ear.

Ans. The middle ear is an air filled cavity in the skull. It contains three small bones called

ossicles which transmit vibration of the tympanic membrane to the membrane covering a small oval hole in the skull, the oval window. These ossicles act like levers magnifying the vibrations of the tympanic membrane over twenty times.

**C. Fill in the blanks.**

- i). The middle ear is an air filled cavity in the skull.
- ii). Taste buds are composed of epithelioid taste receptor cells.
- iii). The tough outer layer of skin is called epidermis.
- iv). If a person cannot see the near objects distinctly, he is suffering from long sightedness.
- v). The \_\_\_\_\_ contains sound receptor in ear.

**D. Choose the correct answer.**

- i). Eustachian tube is present in:
  - (a) outer ear
  - (b) ✓ middle ear
  - (c) inner ear
- ii). The mammalian ear responds to:
  - (a) ✓ sound
  - (b) gravity and head movement
  - (c) both 'a' and 'b'

iii). The clouding of the lens so that it becomes milky is called.

- (a) long sightedness
- (b) short sightedness
- (c) ✓ cataract

iv). The sense of taste is ..... sense,

- (a) thermal
- (b) ✓ chemical
- (c) mechanical

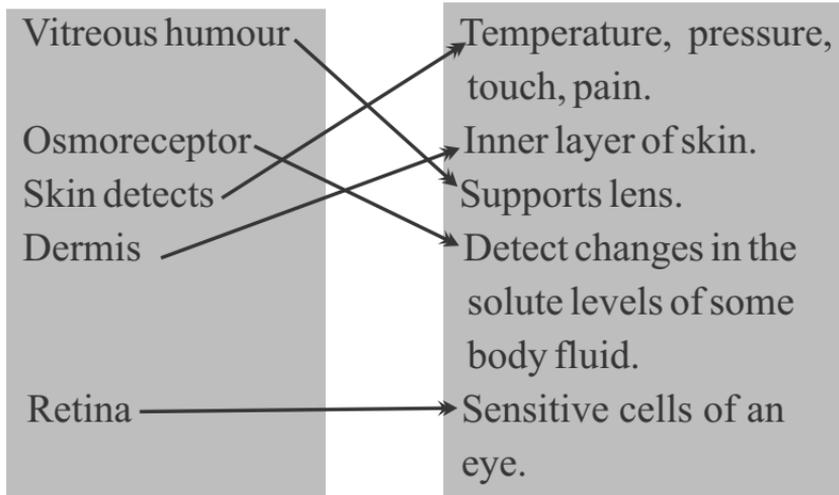
v). It detects tissue damaged:

- (a) chemoreceptor
- (b) ✓ pain receptor
- (c) mechanoreceptors

v). Match the column:

**Column A**

**Column B**



**UNIT  
3****Function of Plants**

**A. Answer the following questions.**

i). Write the three tissue systems in plants.

Ans. Stems, branches, leaves and roots have the same tree tissue system.

**The Ground Tissue:**

This system has basic functions such as food storage.

**The Vascular Tissue (xylem, phloem)**

This system threads through ground tissue and delivers water and solutes through the plant.

**The Dermal Tissue (Epidermis)**

This system protects all exposed surfaces.

ii). Differentiate between Monocot and Eudicot Plants.

Ans. Maples, roses, buttercups and beans are among the true dicots or eudicots. Lilies, orchids, ryegrass, corn and wheat are typical monocots. Both eudicots and monocots are made of the same tissues, organized in different ways. For instance, eudicot seeds have two cotyledons and monocot seeds have one. In dicot vascular bundles organized as a ring in ground tissue but in monocot vascular bundles distributed throughout ground tissue.

iii). How water is transported through plants?

Ans. Inside vascular tissues, water moves through a complex tissue called xylem. It has water conducting cells tracheid and vessel members.

**First**, air's drying power causes transpiration: the evaporation of water from all parts of the plant that are exposed to the air but most notably at stomata. This process puts the water in xylem in a state of tension that extends from roots to leaves.

**Second**, the collective strength of hydrogen bonds among water molecules which are confined within the narrow columns conducting tubes in xylem, imparts the cohesion to water. Hence, the narrow columns of water in xylem can resist rupturing under continues tension.

**Third**, water molecules continue to escape by transpiration that tension will desire the uptake of replacements from soil water.

The process by which water inside xylem is pulled upward by air is drying power which creates a continuous negative pressure called tension. The tension extends all the way from leaves to roots, is called Cohesion-tension theory.

iv). Differentiate between photosynthesis and respiration.

Ans. In plants respiration is a continuous process which occurs all the time day and night. During day time, the plants release more oxygen in photosynthesis than the amount they require for respiration. Thus, surplus oxygen is discharged from plants during day time. During night, the process of photosynthesis stops but respiration continues, plants take in oxygen and give  $\text{CO}_2$ .

v). How is food transported in plants?

Ans. Xylem distributes water and minerals through plants. The vascular tissue called phloem distributes organic products of photosynthesis. Phloem has sieve tubes through which organic compounds rapidly flow companion cells are pressed against the tubes. These cells help load organic compounds into neighboring sieve tubes.

**B. Answer the following short questions:**

i). What are Autotrophic organisms? Give one example.

Ans. Autotrophic organisms which can make their own food such as green plants make their own

food from an external supply of relatively simple inorganic nutrients.

ii). What is cohesion tension theory?

Ans. The process by which water inside xylem is pulled upward by air is drying power which creates a continuous negative pressure called tension. The tension extends all the way from leaves to roots, is called Cohesion-tension theory.

iii). How food is transported according to pressure flow theory?

Ans. According to the pressure flow theory, internal pressure builds up at the source end of the sieve tube system and pushes the solute-rich solution on towards any sink where solutes are being removed.

iv). What is translocation?

Ans. It is the formal name for the process that transports sucrose and other compound through phloem.

v). Define “source” and “sink”.

Ans. The source of the flow is any region of the plant where organic compounds are being loaded into sieve tubes.

**C. Fill in the blanks.**

- i). \_\_\_\_\_ of the flow is any region of the plant where organic compounds are being loaded into sieve tubes.
- ii). Phloem has sieve tubes through which organic compound rapidly flow.
- iii). Inside vascular tissues, water moves through a complex tissue called xylem.
- iv). Maples, roses, buttercups and beans are among the true dicot or eudicots.
- v). In dicots vascular bundles organized as a ring in ground tissue.
- vi). Oxygen is necessary for the process of respiration in plants.
- vii). In green plants Photosynthesis takes place in the cells contains green pigment called chloroplast.

**D. Tick  for true and  for false statements:**

- i). Stems are structural frame work for upright growth which help photosynthetic cells to harvest energy from sun.
- ii). Apical meristem activity and the lengthening of shoots and roots are the plant's primary growth.
- iii). Shoot epidermis is the plants absorptive interface with soil.

- iv). Cotyledons are leaf like structures commonly called seed leaves.
- v). Water moves through a complex tissue called phloem.

**UNIT  
4****Environment**

**A. Answer the following questions.**

i). What are the physical factors of an environment? Explain.

Ans. **Temperature:** Environmental temperature influence the ability of organisms in a population to survive and reproduce. There can be a marked difference in temperature within a single habitat.

**Light:** This affects the survival of all green plants since it is their source of energy for photosynthesis. The ability of plants to flower and for their seed to germinate is also affected by light. Whilst light intensity and wavelength have a lesser effect on animals.

**Currents:** Both water and air currents influences populations. If air, wind increase the loss of water and heat from the bodies of organisms also increase.

**Substratum:** The material on which organisms live affects their ability to survive. Sand is easily blown away by currents of air, offering an unstable surface. Streams with boulders have different inhabitants from those with gravel beds.

ii). Write a note on chemical factors of an environment.

Ans. A large number of chemical factors affect organisms, including the availability of

organic ions and presence of poisons. However, we shall consider just two water and oxygen. This is an important environmental factor. For example, water is an essential metabolite. In terrestrial environment, water availability depends on such factors as rainfall, rate of evaporation, rate of the loss through the soil.

iii). What are biotic factors of an environment?

Ans. The size of all populations is affected in some way by the presence of other organisms in the habitat. This section examines some of these biotic factors. All organisms need organic chemicals such as carbohydrate, lipids and proteins to stay alive. This food availability is a biotic factor. In most natural habitats there is a limit to the availability of essential resources such as food, space in which to grow or water. If there is not enough of one resource for all the members of a population, competition for that resource will reduce the rate of population growth i.e, It is a form of environmental resistance.

**Intraspecific competition:** Occurs between members of the same species.

**Interspecific competition:** Occurs between members of the different species the competition of type.

iv). What do you know about edaphic factors of an environment?

Ans. These are the physio - chemical factors which

affect soil. Many of the factors mentioned above, such as temperature and the availability of water and oxygen are edaphic factors when they apply to soil assessment of the impact of edaphic factor is usually made in relation to plant growth since it is traditionally farmers who have been most interested in this part of the environment.

v). Define the following:

(a) Population      (b) Community      (c) Ecosystem

Ans. A population is a group of individuals of the same species which occupies a particular habitat, for example, we would talk about the population of beetles living in a rotten tree stump. A community is a collection of population of plants and animals which occur together in both space and time. For example, our woodland is a community because a number of populations live together in it. Ecosystem does not has visible boundaries around.

**C. Fill in the blanks.**

i). Abiotic factors are the non-living components of an organisms's habitat.

ii). A community is a collection of population of plants and animal which occur together in both space and time.

iii). An ecosystem does not has visible boundaries around it.

iv). A population is a group of individual of the same species which occupy a

particular habitat.

- v). This affects the survival of all green plants since it is their source of energy for photosynthesis.

**D. Tick  for true and  for false statements:**

- i). Light intensity and wavelength have a lesser effect on plants.
- ii). There can be a marked difference in temperature within a single habitat.
- iii). The materials on which organisms live affect their ability to survive.
- iv). Water is not an essential metabolite.
- v). Edaphic factors are the physio-chem   
factors which effect soil.

**E. Match the column.**

**Column A**

**Column B**

Parasitism and symbiosis

Chemical factors

Physio-chemical factor affect soil

Physical factors

Water and oxygen availability

Community

Light

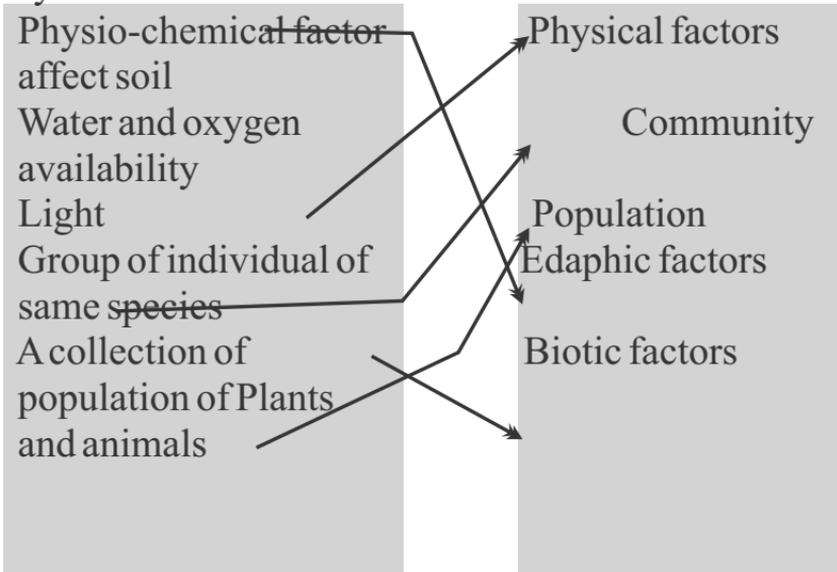
Population

Group of individual of same species

Edaphic factors

A collection of population of Plants and animals

Biotic factors



UNIT  
5

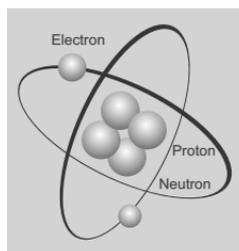
## Matter

A. Answer the following questions.

i). What is an atom? Write its structure.

Ans. Atoms are the smallest units that retain the properties of an element. All atoms are made of three kinds of subatomic particles: Protons, neutrons and electrons.

**Proton:** carries a positive charge. Protons are symbolized as ( $p^+$ ), an atom's nucleus (core) hold one or



more protons. It also holds neutrons, which has no charge. Zipping about nucleus are one or more electrons, which carry a negative charge ( $e^-$ ).

The positive charge of a proton and the negative charge of an electron balance each other. So, an atom that has the same number of electrons and protons has no net electrical charge.

ii). What do you know about elements? How do elements are arranged by Mendeleev?

Ans. Elements are substances that cannot be broken down by any ordinary type of chemical change into substances. The elements are the simplest forms of matter and the building stores for all other kinds of matter.

Elements were being classified in terms of chemical similarities long before their

subatomic particles were discovered. In 1869, Donitry Medeleev arranged the known elements into a repeating pattern based on their chemical properties.

iii). Define Isotopes and write the structure of isotopes of carbon.

Ans. All elements are defined by the number of protons in their atoms but an element's atoms can differ in their number of neutrons. We call such atoms isotope of the same elements.

Most elements in nature have two or more kinds of isotopes. Carbon has three, nitrogen has two and so on. A superscript number to the left of an element's symbol is the isotope's mass number (no of neutrons + no of protons) for instance, carbon's three natural isotope are  $^{12}\text{C}$ ,  $^{13}\text{C}$ ,  $^{14}\text{C}$ .  $^{12}\text{C}$  has six protons and six neutrons.  $^{13}\text{C}$  has six protons and seven neutrons.  $^{14}\text{C}$  has six protons and eight neutrons:

iv). How elements are classified? Make the difference between metals and non-metals.

Ans. The elements are divided into two classes, metals and non-metals which are quite different in their properties and chemical behaviors. Most people are familiar with common metals such as iron, lead, copper, tin, zinc, silver and gold. Non-metallic elements which are important for us to know are carbon, oxygen, hydrogen, nitrogen, sulfur, phosphorous, chlorine and iodine.

**Metals:**

- i). Metals are hard solids except mercury (Hg) which is liquid.
- ii). Metals possess a peculiar luster.
- iii). Metals can be hammered into sheets (malleable) or drawn out in wires (ductile).
- iv). Metals are good conductor of heat and electricity.
- v). Metals have high melting and boiling points.

**Non-Metals:**

- i). Non-metals are found in solid, liquid and gaseous state. These are soft except diamond.
- ii). Non-metals do not have luster or shine.
- iii). Non-metals can not be hammered into sheet or can not be drawn out in wire.
- iv). Non-metals are bad conductor of heat and electricity.
- v). Non-metals have low melting and boiling points.

v). How do molecules form?

Ans. An atom has about same number of electrons as protons. For most atoms, that's a lot of electrons.

vi). Differentiate between compound and mixture.

Ans. The smallest unit of matter is called an atom.

In a mixture, two or more molecules intermingle without chemical bond. For instance, we can make mixture by swirling water and sugar together. The proportions of elements in a mixture can vary. Compound are substances of fixed composition that result from the chemical union of two or most elements. Water is an example.

vii). Define the followings:

(a) Atom (b) Molecule (c) Atomic number

(d) Mass number (e) Compound (f) Mixture

Ans. **Atom:** Anything which has weight and occupies space is called matter. For example air, water. Matter exists in three forms i.e. solid, liquid and gas. The smallest unit of matter is called an atom.

**Molecule:** A molecule is simply two or more atoms of the same or different elements joined in a chemical bond.

**Atomic Number:** Each element has a unique atomic number or the number of protons in the nucleus of its atoms. For example, the atomic number for hydrogen, which has one proton is '1' and for carbon, with six protons it is '6'.

**Mass Number:** Each element also has a mass number, equal to total number of protons and neutrons in the atomic nucleus. For example, carbon with six protons and six neutrons has a mass number of '12'.

**Compound :**Compound are substances of fixed composition that result from the

chemical union of two or most elements. Water is an example.

**Mixture:** In a mixture, two or more molecules intermingle without chemical bond. For instance, we can make mixture by swirling water and sugar together. The proportions of elements in a mixture can vary.

- viii). Write the symbols of following elements:
- |                |                |               |
|----------------|----------------|---------------|
| (i) Sodium     | (ii) Iron      | (iii) Copper  |
| (iv) Mercury   | (v) Barium     | (vi) Fluorine |
| (vii) Nitrogen | (viii) Calcium | (ix) Neon     |
| (x) Chlorine   |                |               |

Ans. Sodium 'Na', Iron 'Fe', Copper 'Cu', Mercury 'Hg', Barium 'Ba', Fluorine 'F', Nitrogen 'N', Calcium 'Ca', Neon 'Ne', Chlorine 'Cl'.

**B. Fill in the blanks.**

- i). The elements are divided into two classes metals and non-metals.
- ii). Metals are hard, solid except mercury which is liquid.
- iii). An atom's nucleus hold one or more protons.
- iv). An atom that has the same number of electron and protons was no net electrical charge.
- v). Each element is equal to the total number of protons and neutrons.

**C. Tick  for true and  for false statements:**

- i). All elements are defined by the number of protons in their atoms.
- ii). Compounds are represented by their symbols. 
- iii). Symbols of sodium is 'S'.

- iv). Non-metals have low melting and boiling points.
- v). The elements after atomic number '92' are more stable.

D. Match the column.

Column A

Column B

Compound

Smallest unit of matter is made by atoms.

Mixture

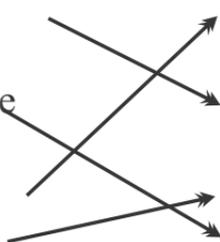
Two or more atoms  
Physically mix.

Molecule

Simplest form of matter.

Element

Chemically mixed with  
fixed proportion.



**UNIT  
6****Heat**

**A. Answer the following questions.**

i). What do you know about quantity and intensity of heat?

Ans. Firstly we define intensity of heat by a simple clinical situation will be used to illustrate the difference between these two terms. A nurse may be called upon to fill a hot water bottle from a large pitcher or kettle containing water at a temperature of 125°F. If one assumes the temperature of water in the pitcher to be the same as the temperatures of water in both containers will have the same intensity of heat (temperature). The number of water molecules in motion in the relatively small amount of water in the hot water bottle is much less, however, than the number of water molecules in motion in pitcher. The quantity of heat energy in each container differs although the intensity of heat or temperature is the same quantity of heat.

ii). What is difference between quantity and intensity of heat?

Ans.

iii). How can you measure temperature? Write detail note on types of thermometer.

Ans. One commonly recognized apparatus for measuring temperature is the thermometer. The ordinary thermometer makes use of the property of matter that most substances expand when heated and contract when cooled theoretically, any substance could be used as an indicator in a thermometer if a practical method for measuring its expansion and contraction could be found. This thermometer consisted of a hollow glass ball connected to an open tube. The open end of the tube was placed in a container of fluid, when the temperature of the air in the hollow ball fell, the air contracted and fluid rose in the tube. Conversely, when the temperature of the air in the hollow ball rose, the air expanded and pushed the fluid downward in the tube. A scale in back of the tube indicated the amount of rise or fall. Air is not an ideal substance to use in thermometer because it does not expand uniformly for each degree rise in thermometer. A substance commonly used in thermometer is mercury.

iv). How does temperature change the phases of matter?

Ans. When a liquid is heated, its molecules leave the surface of the liquid. Pressure developed by the molecules of the liquid as it is changing to a gas is known as the vapour

pressure of that liquid. The boiling point of the liquid is defined as the temperature at which its vapour pressure is equal to atmospheric pressure. At standard atmospheric pressure (760mmHg) water boils at 212°F or 100°C because it takes more heat to raise the vapour pressure to an atmospheric pressure greater than (760mmHg) the boiling point of a liquid increases as atmospheric pressure increases and vice versa.

v). Write a short note on sublimation.

Ans. Sublimation is a direct change from the solid to the vapour phase. Camphor and iodine exhibit this property. Define heat must be supplied to change the solid to vapour directly. This is called heat of sublimation during the winter, ice and snow may evaporate without passing through the liquid state first solid carbon dioxide known as dry ice and naphthalene (moth flakes) also pass directly from solid to the gaseous state.

**C. Fill in the blanks.**

i). Greeks believed that heat to be an invisible fluid without weight called caloric.

ii). Today scientists recognized that heat is a form of energy.

iii). Sum total of the Kinetic energy of all the molecules of which an object is composed, is called quantity of heat.

iv). The earliest thermometer devised by Galileo was an air thermometer.

v). A substance commonly used in thermometers is mercury.

**D. Tick  for true and  for false statements:**

I). There are 100 equal part called degrees on Celsius.

ii). The Fahrenheit scale was devised in 1714 by Anders Celsius.

iii). On Kelvin scale the lowest fixed point is known as absolute zero.

iv). The temperature at which a liquid changes to a solid is called its boiling point.

v). When the liquid is heated, its molecules leave the surface of liquid.

**UNIT  
7****Solutions**

**A. Answer the following questions.**

i). What is solution? Write its different types.

Ans. A solution is a special kind of mixture. As in any mechanical mixture each substance retains its original properties because no chemical combination has taken place also the quantities of the two components may be varied widely at will, although in the case of solutions variations is within certain limits (eventually a point is reached where no more salt or sugar will go into solution) that the dissolved substance has not been chemically changed by the process of solution, can be demonstrated by evaporating the water and recovering the salt and sugar unchanged in solid condition. Matter in all three states is capable of solution, although we meet more instances of the solution of solid in liquid. Water is the solvent more frequently employed. The solvent used should always be specified as well as the substance in solution. A solution in which water is the solvent is known as an aqueous solution.

ii). What is solubility? What is affect of temperature on solubility?

Ans. Most substances will not dissolve in unlimited quantities. The amount of the substance which has been dissolved in a definite volume of the

solvent is known as the concentration of the solution. The extent to which any given substance is capable of being dissolved in a given volume of a solvent is called its solubility in that solvent. Solubility is usually expressed in grams of the solute which can be dissolved in 100 ml (one thousandth of a litre) of the solvent, that is, in 100 gm when solvent is water. Increasing the temperature usually increases the amount of substance which can be held in solution. In a few substances (e.g. salt) temperature has little influence on the solution, while a very few solid substances (e.g. calcium hydroxide) are more soluble in cold water than in hot. All gases increase their solubility as the temperature is lowered and come out of solution, therefore, upon warming e.g. bubbles of dissolved air formed on sides of glass of tap water on standing at room temperature loss of dissolved oxygen from water on heating.

- iii). Differentiate between saturated and unsaturated solution.

Ans. When an excess of the solute has been shaken with the solvent for the sufficient time a certain maximum amount will be dissolved, and the solvent is then said to be saturated by the solute in solution. A saturated solution is one which contains all of the solute which is capable of holding in solution under the given conditions, when in contact with an excess of

the solute.

iv). What is crystallization? Explain.

Ans. If the solvent has been saturated at a high temperature and dissolved substance is less soluble at lower temperatures, the excess of solute above the amount needed to saturate the solvent at the lower temperature separates from the solution on cooling. The same effect is produced by evaporating some of the solvent from a saturated solution. If the substance separates from solution in regular, geometric in forms, the process is called crystallization, and small geometrically shaped particles of solid are known as crystals. The size of the crystal is determined chiefly by the rate of their formation, small crystallization producing large crystals and vice versa. Many substance do not separate out of solution in crystalline form and are said to be amorphous (without shape)

v). Make difference between true solution, colloidal solution and suspension.

Ans. With the help of following table we can differentiate them with each other.

True Solution	Colloidal Solution	Suspension
Clear transparent appearance.	Translucent but-opalescent appearance.	Cloudy or milky appearance, opaque
Particles in solution are single molecule so that they: a) cannot be seen b) do not settle out	particles in solution are large molecules or group of molecules. They a) can be seen b) show slight tendency to settle out.	Particles are large mass of molecule that. a) can be seen. b) show decided tendency to settle.

c) will pass both filter paper and membrane.	c) will pass through filter paper but not through animal membrane.	c) are too large to pass through either filter paper or membrane.
Show considerable elevation of boiling point, depression of freezing point.	Elevation of boiling point, depression of freezing point to some extent.	No effect on boiling and freezing point.

vi). Write uses of solutions.

Ans. Although water is the solvent of widest use, many other liquids are also useful solvents. Each substance varies as to the substance in which it most readily dissolves. This knowledge is put to advantageous use in removing stains. A spot of surgery material, fruit stain is usually dissolved away in water, turpentine is used for a paint stain. Sometimes the property of solubility is taken advantage for separating substance or for purifying a substance. Sand and salt may be separated by dissolving the salt in water and removing the undissolved sand by filtration. The most important consideration is that most substance enter into chemical reaction. For this reason and for easier administration and better absorption, drug and other medicinal agents are often given in the form of solution.

**B. Fill in the blanks.**

- i). Heating should not be employed, if the solvent is flammable.
- ii). A solution in which water is the solvent is known as component of a solution.

- iii). All gases increase in solubility as the temperature is lowered.
- iv). Small, geometrically shaped particles of solid are known as crystals.
- v). A \_\_\_\_\_ solution is one capable of holding in solution a large amount of solute.

**C. Tick  for true and  for false statements:**

- i). An intimate mixture of two substances in which one substance is so evenly dispersed through out the other is called suspension.
- ii). A dilute solution is one that contains little dissolved matter.
- iii). Increasing the temperature usually increases the amount of substance which can be held in solution.
- iv). Muddy water is an example of colloidal solution.
- v). Sometimes solubility helps in purification of substances.

**UNIT  
8****Work, Energy and Power**

**A. Answer the following questions.**

i). Write a note on work.

**Ans.** In the language of science, work is done only when a force causes an object to move through a distance in the direction of force. For example, when a child is lifted from one level to another, work is done.

The amount of work is determined by multiplying the force required to lift the child (his weight) by the distance he is moved in the direction of the applied force. Holding the child in one's arm while walking along a level floor does not involve work in term of science. The force applied in holding the child is perpendicular to and not in the horizontal direction of, the walking however, work is done in walking up a flight of stairs while holding the child because the force applied in holding the child and the motion are both upward.

In normal walking, work is done with each step as parts of the body are raised upward against the force of gravity. Work is measured by the product of the force and the distance through which the force acts,

$$W = F \times d$$

‘W’ represents the work, ‘F’ represents the

force applied and 'd' the distance the object moves.

ii). What is energy? Write its different types.

Ans. Energy is the capacity for doing work. Energy may manifest itself in various forms such as light, sound, heat or electric energy. It is said that energy can be neither created nor destroyed but may be transformed from one form to another. Einstein showed that even mass is a manifestation of energy and that mass may be transformed into forms of energy and forms of energy transformed into mass.

iii). What do you know about power?

Ans. Power is a term frequently misused in everyday. Speech as a synonym for both force and work. Power differs from both of these however, in that the element of time is included. Two persons or two machines may do exactly the same amount of work, however, one may do it slowly, the other more rapidly (that is, in less time) exerts greater power than the one performing the same amount of work over a longer period of time. The concept of power includes both the concept of work and that of time.

$$\text{Power} = \frac{\text{Work}}{\text{time}}$$

Power is defined as the time rate at which work is done.

iv). Write a note on energy crisis.

Ans. Since the early 1970s there has been increasing talk of an energy crisis. It has become generally realised that the Earth's known reserves of oil are rapidly running out. If there had continued to be a 5% annual growth in world demand for oil, as there was in the 1960s and even if technological advance had made possible a 100% recovery of oil from oil fields then all known oil reserves would have been used up by about 2050.

A world recession reduces demand and makes the oil last longer, but there is still a need to reduce oil consumption as much as possible and to reach for alternative forms of energy where possible.

v). What are the alternative sources of energy?

Ans. The realization that there is an energy crisis has spurred on the search for alternative source of energy. The principal sources used at present are oil, coal, nuclear, hydroelectric power and natural gas. Others which could become more widely used are as follows.

**B. Fill in the blanks.**

i). Power is defined as the time rate at which work is done.

ii). The molecules of a gas are in constant movement.

iii). The energy due to position and configuration is known as potential energy.

iv). There are many evidences of energy and of

transformation of energy in everyday.

v). Energy is the capacity for doing work.

**C. Tick  for true and  for false statements:**

i). The enormous movement of water around the world's coasts between high and low tides provides a very large source of energy.

ii). Energy is measured by the product of the force and distance through which the force acts.

iii). Power is the capacity for doing work.

iv). Energy may manifest itself in various forms.

v). The heat energy produced may be used to transform water into steam.

**D. Choose the correct answer.**

i). Geothermal energy is obtained by the:

- (a)  earth surface      (b) sun  
(c) wind

ii). Concept of power includes both the concept of ..... and time:

- (a) energy      (b)  work  
(c) power

iii). Hurricane, Typhoon or Cyclone Possess:

- (a)  kinetic energy  
(b) potential energy  
(c) chemical energy

iv). Potential energy of the body is due to:

- (a)  position      (b) m o t i o n  
(c) force

- v). Coal, oil and food stuffs are a source of:
- (a) ✓ potential energy
  - (b) chemical energy
  - (c) kinetic energy

**UNIT  
9****Simple Machines**

**A. Answer the following questions.**

i). Define simple machines and write the principle of a machine.

Ans. No matter how complex a machine may be its action can usually be analyzed as that of one or more of the so-called simple machine. A machine whether simple or complicated, is an apparatus for transferring or transforming energy. It is a device that receives energy from some source and applies it to do work in an appropriate manner. Machines may operate by receiving mechanical, heat, electrical, chemical or other forms of energy. When one object does work upon, energy is transferred to the object upon which the work is done. This is the main principal of simple machines.

ii). What is lever? How many types does it has?

Ans. Lever are grouped into three classes according to the relative position of three component the fulcrum, the effort and the load. We can say that lever has three types, e.g. First lever, second lever third lever land.

iii). How do wheel and axle work together?

Ans. Wheel is the wonderful innovation in the history of human being wheel can move heavy objects easily. Wheel read used in simple machines called wheel and axle. Wheel and axle is an adaptation of first class lever and

one of the commonly used simple machine. It consists of a wheel attached to a rod or axle so arranged that the wheel and axle move together. A steering wheel on an automobile is a common example of a wheel and axle. Doorknobs, screw driver, door keys and water faucets are modified form of this machine.

iv). Write construction and working of inclined plane.

Ans. A ramp used in building to join floors of different levels is practical example of the machine called an inclined plane. It is much easier to wheel a load (suppose patient) up a ramp (the length of the plane) than to raise him bodily from one level to the other (the height of the plane). The load is the combined weight of the patient and the wheel chair. The effort (E) is the force parallel to the length of the plane necessary to move the patient and the chair. The distance the effort moves is the length of the inclined plane (l), the distance the load (L) is moved vertically is the height of the plane or the distance between the two floor levels (h).

The law of inclined plane is expressed as

$$\text{Effort} \times \text{Length of inclined plane} = \text{Load} \times \text{height of inclined plane}$$

The efficiency of an inclined plane is influenced by the nature of the surface of the plane. If much friction exists, the efficiency is lessened. However, this friction may be of

advantage to prevent the object from sliding back down the ramp.

v). Write detail note on pulley, its uses and kinds.

Ans. A pulley consists of a wheel with a grooved rim called a sheave arranged to turn in a block. Pulleys are classified as:

**Fixed Pulleys:** If they are attached to some stationary objects.

**Movable Pulley:** If they are attached to the load and move along with the load.

The chief function of the pulley wheel is to equalize the tension of the rope on either side of it.

**Single fixed Pulley:** It only changes the direction of a force but does not change the value of force. The load moves up one inch when the effort pulls down one inch with a force equal to that of load.

**Single movable Pulley:** When a single moveable pulley is used and the ropes are parallel to each other, the effort applied is half that of the load. When the effort moves through "1" inch the load only moves '2' inch. For moving a heavy object such as a piano, a combination of fixed and movable pulleys called a block and tackle may be used. In such a combination the mechanical advantage increases as the number of ropes supporting the load increases.



half that of the load:

- (a) single fixed pulley
- (b) ✓ single movable pulley
- (c) combination of fixed and movable pulley

D. Match the column.

**Column A**

Lever

Pulley

Wedge

Inclined plane

Wheel and axle

**Column B**

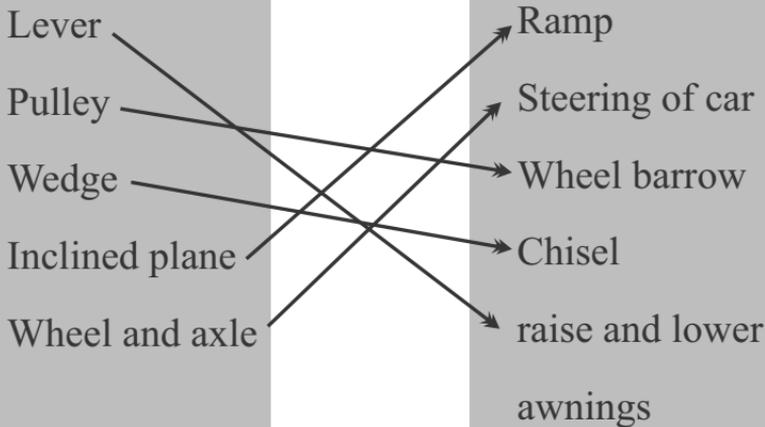
Ramp

Steering of car

Wheel barrow

Chisel

raise and lower awnings



**UNIT  
10****Light**

**A. Answer the following questions.**

i). What is light? Define luminous and non-luminous bodies.

Ans. Light is a form of energy which enables us to see the objects. A substance which gives off light energy is called a luminous body. The sun, burning candle and lighted bulb or a tube light are the examples of luminous body. A substance which does not give off light energy is called a non-luminous body. The moon is a non-luminous body, but it reflects the light of the sun.

ii). What happens when something comes into the way of light?

Ans. **Reflection of Light:** As we know that light travels in straight lines until something comes into its way.

When a beam of light falls upon the surface of a piece of matter, the light may be either absorbed, transmitted or reflected.

iii). What is reflection of light?

Ans. When light falls on a smooth and shiny surface. It bounces off in one particular direction. When a ray of light strikes on the surface of a medium such as a mirror, it comes back into the same medium such as air. This behaviour of light is called reflection of light. This bouncing off of light is called reflection

of light.

iv). State laws of reflection.

Ans. Take a paper and fix it on a drawing board with the help of thumb pins. Draw a line M on paper and fix a mirror on this line.

Draw a line AB on the paper. Try to look the line AB in the mirror. Draw another line CD in the direction of its image with help of a ruler.

Now draw an angle of  $90^\circ$  at the point where the line AB and CD meet. The line AB represents incident ray and line CD represents reflected ray. The perpendicular LN is called normal. Angle between incident ray and normal is called angle of incidence while angle between normal and reflected ray is called angle of reflection.

Measure both the angles with protector. What did you observe? Yes, the both angles are same. It is known as two laws of reflection.

i. The incident ray, normal and reflected ray line are on the same plane.

ii. Angle of incidence and angle of reflection are same.

v). Write down the differences between regular and irregular reflection.

Ans. If light rays fall on a smooth shiny surface of a material and angles of incidence and angles of reflection of all rays are same, then it is called regular reflection.

When parallel rays of light fall on an uneven surface of a shine material, the rays scatter is

different directions. In this case angles of incidence are different from angles of reflection. Such reflection is called irregular reflection.

- vi). Define the following:  
transparent, material, translucent material, opaque materials, incident ray, reflected ray, angle of incident, angle of reflection.

Ans. **Transparent Materials:** Light can pass through some materials like glass and water. These materials are called transparent materials.

**Translucent Materials:** The materials which allow some light to pass are called translucent materials. For example, paper, frosted glass, oiled paper and polythene etc.

**Opaque Materials:** Materials which do not allow any light to pass through them are called opaque materials. Light cannot pass through them.

Wood, stones, metals, rubber porcelain etc. are some examples of opaque materials.

**Incident Ray:** The ray of light falling on the mirror is called the incident ray.

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

**Reflected Ray:** The ray which is reflected from the point of incidence is called the reflected ray.

**Angle of Incident:** The angle which the incident ray makes with the normal called the

angle of incidence.

**Angle of Reflection:** The angle which the reflected ray makes with the normal is called the angle of reflection.

vii). What is a mirror? Describe its types.

Ans. A simple piece of glass can reflect some rays of light. If we coat one of its side with a thin layer of silver, then it can reflect more light rays. Such a piece of glass is called mirror. The silver side of mirror is protected by a layer of varnish or paint. A mirror can reflect almost all light rays.

**Types of Mirror:** Plane mirror spherical mirror concave mirror, convex mirror.

**I. Plane Mirror:**

If the mirror is flat then it is called plane mirror.

**ii. Spherical Mirror:**

If the mirror is of curved shape, then it is called spherical mirror. A spherical mirror may be convex or concave.

**a. Concave Mirror:**

If the inner surface of a spherical mirror is reflecting, then it is called a concave mirror.

**b. Convex Mirror:**

If the outer surface of a spherical mirror is reflecting, then it is called convex mirror.

viii). Give some uses of mirrors.

Ans. **Uses of Mirrors:**

1. Plane mirrors are used in houses for combing, shaving etc.
2. Concave mirror is used in microscope and

telescope.

3. Concave mirror is used by doctors in ophthalmoscope, for the medical examination of ear, throat and eyes.
  4. Concave mirrors are used in search lights and spot lights. they are also used in the head light of automobiles.
  5. Convex mirrors are used in automobiles to see traffic coming from behind.
- xi). Explain the term: Incident Ray, Point of Incidence, Reflected Ray, Normal.

Ans. **Incident Ray:** The ray of light falling on the mirror is called the incident ray.

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

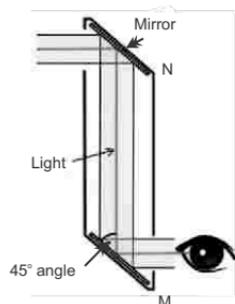
**Reflected Ray:** The ray which is reflected from the point of incidence is called the reflected ray.

**Angle of Incident:** The angle which the incident ray makes with the normal called the angle of incidence.

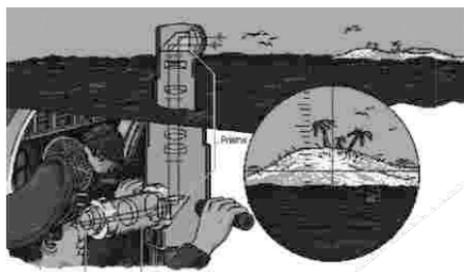
**Angle of Reflection:** The angle which the reflected ray makes with the normal is called the angle of reflection.

- x). What do you know about the Angle of Reflection and the Angle of incidence?

Ans. It consists of adjustable parallel plane mirrors 'M' and 'N'. The mirrors are placed in tube one above the other and



facing each other at an angle of  $45^\circ$  to the horizontal.



- xi). What do you know about regular and irregular reflection?

Ans.

- xii). Describe the construction and uses of simple periscope?

Ans. **Uses of Periscope.**

- i). Periscope are used in submarine. People in a submarine can watch the objective above the water surface.
- ii). Battle tanks are also lifted with periscopes. The crew inside the tank can see every thing outside tanks.

**B. Fill in the blanks.**

- I). Opaque materials do not allow light to pass through them.
- ii). On side of a mirror is coated with thin layer of \_\_\_\_\_.
- iii). Incident ray, reflected ray and normal lie in the same plane.
- iv). Porcelain is an opaque material.
- v). Light rays spread is all directions.
- vi). Light ray travels in a straight line.

- vii). concave mirror is used in search light.
- viii). The inner side of convex mirror is reflecting.
- ix). Smooth shine surface causes regular reflection.
- x). A plane mirror is flat piece of glass.
- xi). Light travels in a stright path.
- xii). In reflection, light is turned back in the same medium.
- xiii). The turning back of light is called reflection.
- xiv). When reflected rays are also be parallel, then reflection is called irregular .

**C. Tick  for true and  for false statements:**

- i). We cannot see through opaque materials.
- ii). Wood is an example of transparent material.
- iii). Air is a medium.
- iv). Incident ray, normal and reflected lie in the same plane.
- v). In reflection of light, angle of incidence is not equal to angle of reflection.
- vi). Irregular reflection is due to uneven surface.
- vii). Spherical mirrors are of flat shape.
- viii). Plane mirror is of curved shape.
- ix). Doctors use convex mirror to examine eyes of patients.
- x). The outer surface of a convex mirror is reflecting.

**D. Choose the correct answer.**

- i). Most of the light rays can pas through:  
(a) opaque materials  
(b) ✓ transparent material  
(c) translucent material
- ii). We cannot see clearly through:  
(a) ✓ glass (b) rubber  
(c) frosted glasses
- iii). We cannot see through:  
(a) water (b) paper  
(c) ✓ metal
- iv). Bouncing back of light is called:  
(a) refraction (b) penetration  
(c) ✓ reflection
- v). The light rays fall on a surface of an objects are called:  
(a) reflected rays  
(b) ✓ incident rays  
(c) light rays
- vi). In reflection of light, angle of incidence of equal to angle of:  
(a) reflection (b) refraction  
(c) ✓ none of them
- vii). Reflection of light is consist of:  
(a) two laws (b) three laws  
(c) four laws
- viii). Mirror is a piece of:  
(a) metal (b) wood (c) ✓ glass
- ix). The inner side of a concave mirror is:  
(a) plane (b) ✓ reflecting  
(c) transparent

x). The mirrors used in headlight of automobiles are:

(a) plane

(b) convex

(c) ✓ concave

E. Match the column.

**Column A**

Rubber

Water

Polythene

Reflection

Regular reflection

Micro scope

Ophthalmoscope

Spherical mirrors

**Column B**

bouncing back of light

translucent material

smooth surface

concave mirror

transparent material

opaque material

concave and convex

eyes

**UNIT  
11****Electricity**

**A. Answer the following short questions:**

i). Write down the few applications of electricity.

Ans. We all know electricity. Application of electricity is seen in almost every area of our daily life lamp are lighted and fans rotate in the houses, office and shops with the help of electricity. Mills and factories are run by electricity.

ii). Define static electricity.

Ans. The electricity which is confined or which remains static within a body is called static electricity.

iii). What do you mean by frictional electricity?

Ans. Explain to static energy we are given a simple activity. This electricity is also called frictional electricity, as it is produced by friction.

iv). Explain briefly current electricity.

Ans. The electricity, which flows through a body continuously and in a definite direction is called current electricity.

v). Define thunderclaps.

Ans. It is raining season. Terrible thundering sound is heard after a little while we all have this experience this flash of gloring light is called lightning and terrible sound we hear is called rumbling of clouds or thunderclaps.

**B. Answer the following questions.**

I). What is the difference between statical electricity and current electricity?

Ans. Rub a plastic comb with a woollen cloth. The comb attracts small bits of paper. Therefore statical electricity has been produced in it. Electricity that goes from one place to another or one body to another by flowing through a substance is called current electricity. The electricity that we always use for lighting lamp, rotating fans, running mills and factories, lighting torch is current electricity.

ii). Write a note on conductors and non-conductor.

Ans. Substances through which electricity can easily move or flow are called conductors. Some examples of conductors are iron, copper, gold, silver and often metallic substances, human body, earth, mercury, most air and water.

**Note:** Which electricity cannot flow, are called non-conductors or insulator. Some examples of non-conductors are glass, wood, porcelain, plastic, paper, silk, rubber, ebonite, dry air etc.

iii). What are the sources of current electricity?

Ans. If our houses or schools have electrical connection, lamp is lighted just pressing a switch. Again a torch can also be lighted by pressing its switch. Electricity energy has been transformed into light energy in both the case. But sources of electricity of houses and

source of electricity of torch are not same. Electrical connection is made in a house by drawing wire from a long distance. But perhaps two or three batteries have been used in torch. Source of electricity of torch light is the battery or electric cell where as electricity comes to houses from electricity generating centre.

iv). Write a note on thunder.

Ans. Sometimes highly charged clouds come near to the earth. The lightning discharge occurs between the clouds and the earth, piercing the atmosphere this is called thunder. the higher body is over the surface of earth the nearer it is to the cloud. For this thunder generally strikes on top of high buildings and trees. Thunder may strikes even head of man standing in the field. Building cracks and trees of men die due to occurrence of thunder. It is not safe to remain standing under a tree during storm and rain. It is not essential for cloud to come very close to earth for occurrence of thunders they may be thunder from a rod laying at a distance of four to five kilometers. sound heard along with thunder is called thunderclap. Benjamin Frankline discovered first that electricity in clouds is the cause of thunder.

v). What is meant by lightning conductor?

Ans. In order to protect higher building from ravages of lightning discharges a metallic rod

is fixed at the highest place of the building. Sharp and tapering upper end of this rod remains higher above the roof other end connected to a thick metal wires is buried under the earth. This rod remains closer to cloud than other part of building. As a result while there is thunder it strikes this rod. The rod is a metallic substance therefore it is a conductor. So, electricity contained in thunder passes directly to the earth through the rod. As a result there is no damage to the building.

**C. Choose the correct answer.**

i). Capacity to doing work:

- (a) wood (b) rubber  
(c) ✓ electricity (d) glass rod

ii). Change of same nature:

- (a) ✓ repel each other  
(b) attract each other  
(c) neutralized each other  
(d) suspended each other.

iii). Electricity can flow through:

- (a) wood (b) iron  
(c) ✓ copper (d) gold

**D. Fill in the blanks.**

i). Electricity is a kind of energy .

ii). Charge has two kinds.

iii). Glass is good example of non-conductor .

**UNIT  
12****Rocks and Minerals**

**A. Answer the following questions.**

i). Write down the kinds of rocks?

Ans. We have learnt in the previous class that we are surrounded by rocks of different kinds. Rocks are made up of natural material. We know that there are many kinds of rocks on the earth. Scientists often study about the ways in which rocks are made. Rocks usually are grouped according to the ways in which they are formed. There are three ways and there are three groups.

ii). How igneous rocks formed?

Ans. We know that deep down inside the earth, it is still very hot. The temperature deep below the surface of the earth is so high that some materials are in liquid form. Scientists call this liquid material magma. In a volcano the magma is come out in a molten stream is called lava. When the magma reaches the surface of the earth, it cools quickly and forms a rock. Often however the magma does not reach the surface of the earth. In this case, it cools slowly and finally gets converted into rock. Rocks formed by the hardening of the fiery hot liquid magma are called Igneous rocks.

iii). How sedimentary rock formed?

Ans. The first rocks on the earth were igneous rocks. The igneous rocks are slowly broken

down by wind, rain and flowing water in due cause, they crumble into tiny bits. Rivers carry these tiny bits of rocks into the sea. The rocky material (bits of rocks, soil and sand) along with sea shells and skeleton of tiny sea animals settles in layers upon the sea bottom, such materials are called sediments such rocks are called sedimentary rocks.

Most sedimentary rocks were formed under water however, some of the places that were once under water are now dryland. For this reasons, sedimentary rocks are found in almost any place.

iv). How metamorphic rocks formed?

Ans. The intense heat and pressure inside the earth changes the igneous rocks and the sedimentary rocks into a new kind of rocks. Such rocks are called metamorphic rocks.

v). Define an ore?

Ans. Many useful metals are found in rocks or mixed with ores. Those minerals from which the metals may be extracted profitably are called ores metals like iron, aluminum, copper and zinc are extracted from their ores.

vi). Explain the formation of coal.

Ans. Coal is valuable and useful material found underground. Millions of years ago, dense forests and swamps become buried under the earth. Many layers of sedimentary rocks were formed on them. Due to great pressure and high temperature, the dead vegetable matter

got changed into peat, lignite and coal. Through this process coal is formed.

vii). Write a note of liquid petroleum.

Ans. Petroleum is a valuable liquid fuel found in rocks underground. High petroleum oil wells are found under the sea too. Millions of years ago, land and sea animals got buried in the earth. The dead bodies of animals that were buried changed into crude oil and natural gas by the action of heat and pressure on it. Deep wells are drilled into the oil-bearing rocks to extract crude petroleum oil. Petrol is used as a fuel for bikes, cars, scooters and aeroplanes. Diesel oil is used as fuel for buses, trucks, railway engines and sea ships.

viii). State the names of some useful substances which are obtained from petroleum.

Ans. This crude oil is refined in refineries and many products like petrol, kerosene oil, diesel oil, paraffin wax, vaseline, lubricating oil and petrochemicals are obtained.

ix). Describe the importance of metals to man.

Ans. Aluminum is the most abundant metal in the earth's crust. Thus, a treasure of different metals is hidden in rocks. Utensils, furniture, machines, coins, vehicles, jewellery and machine tools are made of metals. Gems and precious stones like diamond, emerald, ruby, sapphire, topaz and zircon are also found in rocks.

x). State one use of each of the following: pumice, granite marble, mica and quartz.

Ans. Quartz is used in radio and electronic industry.

**B. Fill in the blanks.**

i). Rocks are made up of natural material.

ii). Scientific called the liquid material under earth magma .

iii). Igneous means fire-formed .

iv). Magma is a moisture of different material.

v). Conglomerate is called pudding stone.

vi). Metamorphic rocks are changed rocks.

vii). Coal is used as a fuel .

**C. Choose the correct answer.**

### Column A

### Column B

potassium salts

sedimentary rocks

igneous rocks

metamorphic rocks

paraffin wax

diamond

gneiss

precious stone

petroleum

obsidian

flint

plant nutrient

