

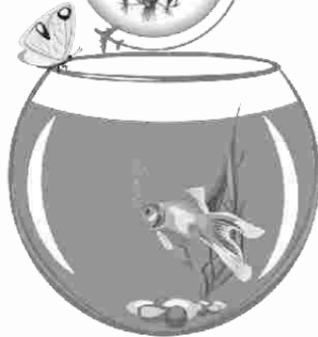


# Science



## Key Book

Book Seven



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**UNIT  
1****Human Organs**

**1. Answer the following questions:**

**I). Explain digestion in human beings.**

Ans. The digestive system consists of buccal cavity, oesophagus, stomach, small intestine and large intestine.

Chewing food break into particles and mixes with saliva, secreted from salivary glands. After chewing, the food is formed into a bolus by the action of the tongue and then swallowed. Peristalsis forces the bolus down the oesophagus to the stomach. It takes about 5 to 7 seconds for solid food.

**ii). Write the internal structure of heart.**

Ans. The heart has two sides, separated by a muscular septum. The right side passes deoxygenated blood to the lung, the left side passes oxygenated blood to the rest of the body. Both sides of the heart have two chambers. The upper atria collects blood from veins. The lower ventricles force blood into arteries.

**iii). What is the composition of blood?**

Ans. Blood appears to be a sticky red fluid. In fact, only about 55% of its volume is made of fluid, called Plasma. The remaining 45% of its volume consists of erythrocytes (red cells), a variety of leucocytes (white blood cells) and cell fragments, called thrombocyte.

**iv). What is skeletal system and what functions does it perform?**

Ans. If there were no bones in your body, we would like a floppy rack. We would not be able to sit, stand, breathe or talk.

All adults have 206 different bones. The biggest is the thigh bone and the smallest is the tiny stirrup bone inside each ear.

**Functions of Skeleton:**

The skeleton performs a number of functions.

**1. Support:**

All bones within the skeleton provide anchorage and give shape to the body.

**2. Protection:**

Cranium protects the brain.

Vertebral column protects spinal cord.

Rib cage protects the heart and lungs.

**3. Movement:**

Muscles are attached to all bones. Muscle contraction causes movement of bones except in the cranium (skull).

**v). Explain the central nervous system of the human body.**

Ans. Spinal cord is a hollow tube passing from the lower abdomen to the brain. It is protected in the backbone spinal cord consists of thousand of nerve cells which are concerned with conducting messages from skin and muscles to brain and from brain to muscles of the limbs and trunk. It controls many involuntary actions of the body.

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

**I). Define neuron.**

Ans. Nerve impulses are transmitted by highly specialized cells called neurons, have a cell body which contain the bulk of the cell organs and has a number of cytoplasmic extensions.

**ii). Differentiate between expiration and inspiration.**

Ans. Inspirations: When the pressure in the lungs is lower than atmospheric pressure, air moves into the respiratory system called inspiration.

Expiration : When the pressure in the lungs is high than atmospheric pressure air moves out of the respiratory system is called expiration.

**iii). What do you know about systole and diastole?**

Ans. The heart beat is myogenic, meaning that the contraction originates in the heart itself. Contraction of the heart muscles is known as systole and relaxation as diastole.

**iv). What is the function of villus in small intestine?**

Ans. The small intestine is lined by a single layer of cells (a simple epithelium). Resulting from digestion in the small intestine, carbohydrates have been hydro-lyesed to disaccharides and proteins hydro-lysed to dipeptide and tripeptide. Most absorption occurs in the small

intestine which is 6 meters long in adult human, numerous fold in the wall of the small intestine increase its surface area. The folds themselves have tiny finger like projection called villus.

v). **Write functions of medulla oblongata.**

Ans. Medulla oblongata forms the base of the brain where it connects with spinal cord. Medulla oblongata contains reflex centres for the control of heart beat, blood pressure, swallowing, peristalsis, breathing, coughing and sneezing.

**3. Fill in the blanks:**

- i). Mid-Brain controls the visual and auditory reflexes.
- ii). Tendons hold muscles to individual **bones**.
- iii). In human body lungs **kidneys** and **skin** are excretory organs.
- iv). Blood flows away from the heart in **arteries**.
- v). Digestion involves the break down of large, insoluble food molecules into **smaller** and soluble compound which can be absorbed.

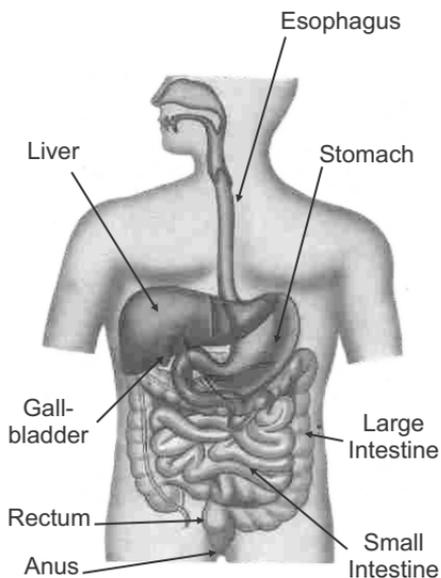
**D. Tick  for true and  for false statements:**

- i). Chewing food breaks it into particles and mixes it with saliva in buccal cavity. ✗
- ii). Blood from the capillaries return to heart via arteries. ✗
- iii). The heart beat is myogenic meaning that the contraction of the heart originates in the heart itself. ✓
- iv). Cerebellum forms the base of the brain where it connects with spinal cord. ✗
- v). Erythrocytes are manufactured in the bone marrow of all the bones of young mammals and flat bones of adults. ✗

**4. Match the columns:**

<u>Column A</u>	<u>Column B</u>
Oesophagus	skeletal system
Arteries	nervous system
Trachea	blood circulatory system
Urethra	respiration system
Neurons	excretory system
Joints	digestive system

5. Label the digestive system of human being:



UNIT  
2

# Transportation and Translocation in plants

**1. Fill in the blanks:**

- i). The casparian strip is a barrier to the solutes of vascular cylinder deposits.
- ii). Cohesion tension theory was presented by the botanist Henry Dixon .
- iii). First, air's drying power causes transpiration .
- iv). Hydrogen bonds are strong enough to hold water molecules together inside the xylem.
- v). At least 90 percent of the water transported from roots to a leaf evaporates right out.

**2. Encircle the correct answer in the following:**

- i). In phloem, organic compounds flow through .....
- (a) sieve tube                      (b) vessels
- (c) ✓ tracheids
- ii). Water evaporation from plant parts is called.....
- (a) translocation                  (b) ✓ transpiration
- (c) tension

- iii). Water transport from roots to leaves occurs by .....
- (a) pressure flow
  - (b)✓ cohesion-tension theory
  - (c) the pumping force of Xylem vessels.
- iv). In day time, most plants lose ..... and take up .....
- (a) water; carbon dioxide
  - (b)✓ oxygen; water
  - (c) carbon dioxide; water
- v). A ..... is a waxy, water proof covers on all plant surfaces exposed to the surroundings.
- (a)✓ epidermis
  - (b) cuticle
  - (c) xylem vessels

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

**I). Differentiate between source and sink.**

Ans. Source is any region of plant where organic compounds are being loaded into sieve tubes while sink in any plant region where products are used and stored.

**ii). Define transpiration.**

Ans. Mostly, water is lost, mainly through the many stomata in leaves, stems and other plant parts is a process called transpiration.

**iii). What do you know about translocation?**

Ans. Translocation is the formal name for the process that transports sucrose and other organic compounds through phloem. High pressure drives the process. Often, the pressure inside phloem's conducting tubes is five times higher than the air pressure inside an automobile tire.

**iv). How do plants conserve water?**

Ans. They used water in photosynthesis to produce their food.

**v). What is pressure flow theory?**

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

**C. Answer the following long questions:**

**I). How do roots control water uptake?**

Ans. Water molecules in soil are only weakly bound to clay particles, so, they readily move across root epidermis and continue on to a column of vascular tissue. This is the roots vascular cylinder. A cylindrical sheet of single cells is all that intervenes cylinder's xylem and phloem. The pipe line to the rest of the plant.

**ii). Explain cohesion-tension theory.**

Ans. Sometime ago, the botanist Henry Dixon came up with an explanation of how water is transported in plants. By his cohesion-tension theory, water inside xylem is pulled upward by air's drying power which creates a continuous negative pressure called tension. The tension extends all the way from leaves to the roots. This is called cohesion-tension theory.

**iii). What is transpiration? How does transpiration help in uptake of water?**

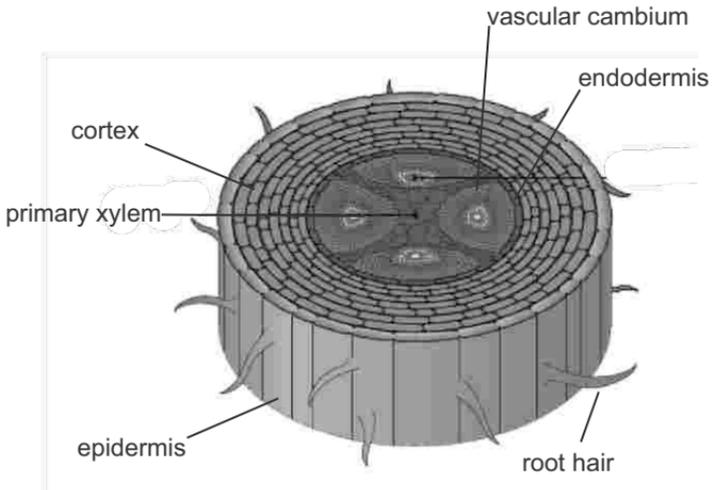
Ans. Plants secure only a fraction of the water they

absorb for growth and metabolism. Mostly, water is lost, mainly through the many stomata in leaves, stems and other plant parts is a process called transpiration. Far from being a waste, the process is vital for cell functioning.

**iv). Explain the distribution of organic compounds in plants.**

Ans. Xylem distributes water and minerals through plants the vascular tissues called phloem distribute organic products of photosynthesis. Like xylem, phloem have many conduction tubes, fibers and strands of parenchyma cells. Unlike xylem, it has sieve tubes through which organic compounds rapidly flow. Living cells form these long tubes. The cells are positioned side by side and to end. Their abutting and walls, known as sieve, are porous. Companion cells are pressed against the tubes. These cells help load organic compounds into neighboring sieve tubes.

4. Label the following diagram:



**UNIT  
3****Reproduction in Plants**

**1. Answer the following questions:**

**i). Explain modes of asexual reproduction in plants.**

Ans. Asexual reproduction occurs when the genetic material and cytoplasm of a single parent divides to form new individuals.

Asexual reproduction is usually confined to group of organism with relatively unspecialized tissue. It may occur by fission, sporulation, budding or fragmentation.

**ii). Write different parts of the reproductive parts of a plant.**

Ans. The male reproductive part of plants is stamen and female part is carpels.

**iii). What is pollination? Write its different types.**

Ans. Pollination occurs when a ripe pollen grain lands on the stigma of a plant of the same species there are two types of pollination.

**a. Self Pollination:**

It occurs when pollen is transferred from

another to stigma of the same plant.

**b. Cross Pollination:**

It occurs when pollen is transferred from the anther of one plant to the stigma of another plant. During cross pollination, pollen may be carried from one flower to another by wind or by other animals, notably by insects.

**iv). Write a detail note on structure of a seed.**

Ans. Seeds are of many colours, sizes and shapes. But they are not much difference in their internal structure.

**1. Testa:**

Testa is the hard outer covering which protects the internal structure.

**2. Tegmen:**

Tegmen is a membranous structure presents within testa to protect embryo.

**3. Endosperm:**

Endosperm is a mass of food tissue, formed by absorbing nutrients from the parent plants . It is used in germination of seed.

**4. Embryo:**

It is formed from diploid zygote. It is a tiny

plants whose parts grow to form a new plants.

v). **What is the difference between cross and self pollination?**

Ans. **Self Pollination:**

- ||| Transfer of pollens from anthers to stigma of same flowers of same plants.
- ||| No requirement of external agent.
- ||| It can occur even the flower is close.
- ||| It preserve parental characters.
- ||| Anthers and stigma mature at same time.
- ||| New varieties are impossible.

**Cross Pollination**

- ||| Transpose of pollens from anther of one flower to stigma of another flower or different plants of same species.
- ||| External agent is required.
- ||| It can occur when the flower is open.
- ||| It does not preserve parental characters.
- ||| Anthers and stigma mature at different time.
- ||| New varieties are possible.

vi). **Fruits are adapted to ensure dispersal of**

## seed they contain. How?

Ans.

Mechanism	Description of fruit	Example
Wind	Very light in weight; surface extension catch the wind.	  Sycamore      Dandelion
Explosion	Two compartments which violently split open as they dry out.	 Grose
Paper Pot	Holes through which seeds are released when fruits are shaken by the wind.	 Poppy
Animal	Adhesive hairs, spines or hooks which adhere to feather and abus fruits.	 Cleavers (a bur fruits)
Dispersal	Eaten but seed is deposited without damage in animal's feces.	  Apple      Orange  Blackberry

**2. Answer the following short questions:****i). Define reproduction.**

Ans. Reproduction is a process of continuity of the life of an organism on earth. The formation of an offspring similar to the parents is called reproduction.

**ii). How do animals help in dispersal of seeds?**

Ans. Adhesive hairs, spines or hooks which adhere to feather and these help in dispersal of seeds.

**iii). How do vegetative reproduction occur in strawberry?**

Ans. Adventitious roots develop where runner touches ground and a new plant develops from these points.

**iv). What is tissue culture propagation?**

Ans. Tissue culture propagation is used to produce hundreds or thousands of identical plants from a single mutant. These techniques are being employed to improve food crops, including corn, wheat, soya beans and rice.

**v). How do corolla help in pollination?**

Ans. **Corolla:** It lies within the calyx and consists of

a number of petals. These are large and coloured to attract insects for pollination.

**3. Fill in the blanks:**

- i). Calyx is consist of sepals.
- ii). Pollination occurs when a ripe pollen grain land on the stigma of a plant of the same species.
- iii). Yeast cells reproduce by budding.
- iv). A fruit protects the seed within.
- v). Cotyledons are seed leaves.

**D. Choose the correct answer:**

- i). It is a process of continuity of life:  
(a) respiration      (b) photosynthesis  
(c) ✓ reproduction
- ii). Sexual reproduction is the .....  
reproductive mode of flowering plant life cycle.  
(a) ✓ primary      (b) secondary  
(c) tertiary
- iii). These are large and coloured to attract the insects for pollination:  
(a) ✓ corolla      (b) calyx  
(c) androecium

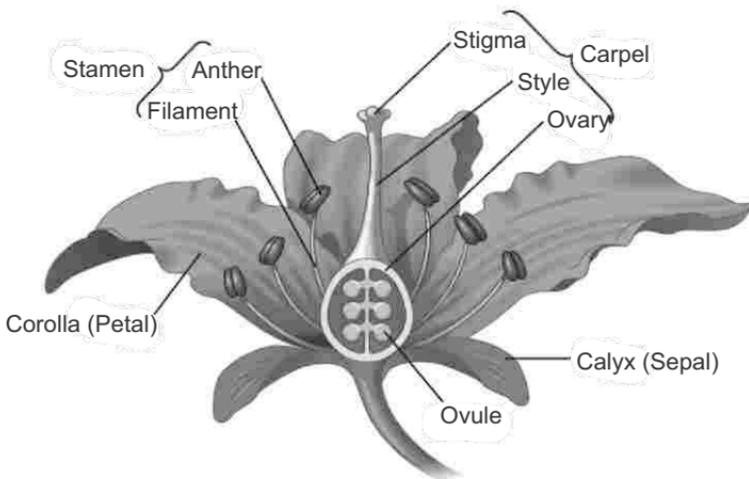
iv). It is the hard outer covering which protects the internal structure of seed:

- (a) tegmen
- (b) ✓ testa
- (c) endosperm

v). It is the first cell of the new plant:

- (a) female gamete
- (b) male gamete
- (c) ✓ zygote

**4. Lable the digestive system of human being:**



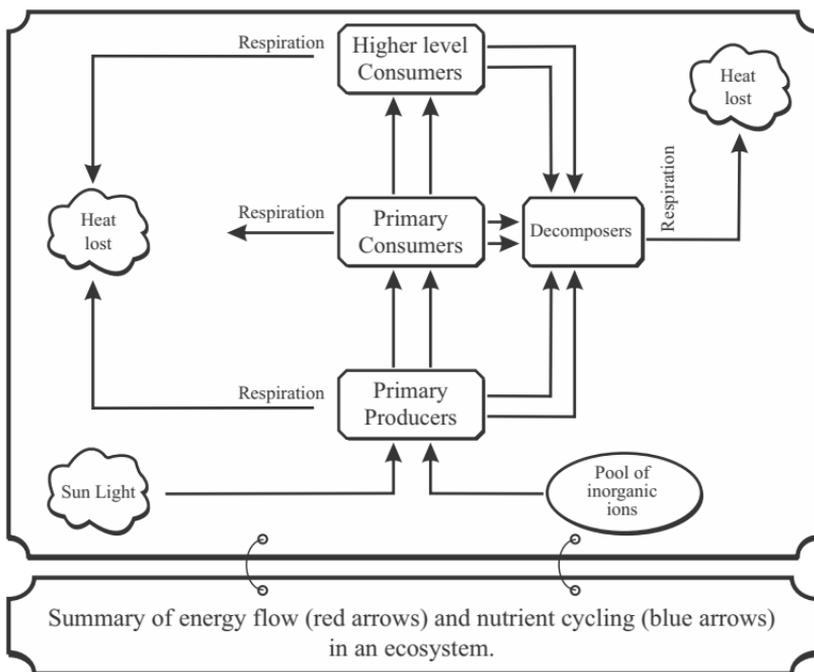
**UNIT  
4**

# Ecosystem

1. Answer the following questions:

I). How does energy flow in an ecosystem?  
Show with energy flow chart.

Ans. One of the basic characteristic of ecosystem is the flow of energy. The source of energy is sunlight reaching on earth. Light energy is found by the autotrophic components (plants) of ecosystems and made available to the heterotrophic component (animals) of ecosystem.



**ii). Write detail note on food chain and food webs.**

Ans. The trophic levels within an ecosystem are linked together. A primary producer may be eaten by a primary consumers, which in turn may be eaten by a secondary consumers and so on. This feeding sequence is called a food chain. The food web is complex form of food chain. The inter relationship of food chain is called food web.

**iii). Explain trophic levels.**

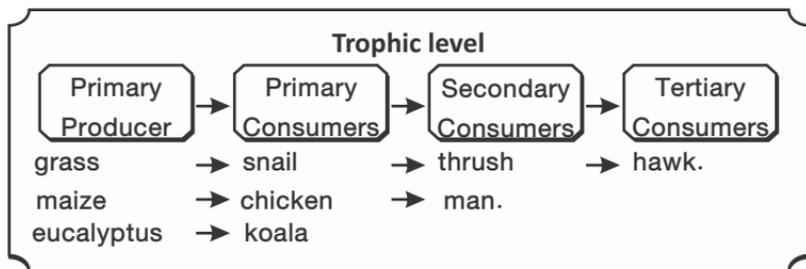
Ans. Energy and nutrients pass through ecosystem from autotroph (Primary Producers) to heterotrophs. Some heterotrophs are animals which feed exclusively only plants. They are called primary consumers.

Other heterotrophs are carnivore which eat animals and plants as secondary consumers or first carnivores, eat herbivores, a small number of animal as tertiary consumers (higher carnivores) eat other carnivores. Each of these feeding roles, primary producers, primary consumers, secondary consumers, tertiary

consumers, is called trophic level.

**iv). What are trophic structure and how are they measured?**

Ans. Here is the diagram of trophic structure and



they are measured from left to right.

**v). What is human impact on environment?**

Ans. Man lives in nature and depends on the resources of nature. Food, shelter and clothing are the primary requirements of a man. In order to obtain these, man has exploited natural resources to maximum that has resulted in undesirable changes in the natural habitats consequently some natural stokes of plants (forests) and animals (wild life) have disappeared. About 1000 animal species and all over 20,000 plant species have either become extinct or declared endangered. Deforestation has caused soil erosion. Similarly mineral resources are facing

exhaustion due to higher consumption. Also over population, urbanization, industrialization and mechanized agriculture has resulted in rapid increase in air, water and soil pollution.

All above mentioned human activities have lessened earth's ability to support a diversity of life including human them selves.

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

**i). What is an ecosystem?**

Ans. A community in certain a together with the non-living factors with which it interacts is called an ecosystem.

**ii). Write the components of an environment.**

Ans. The components of an environment are all living and non-living creatures.

**iii). What is difference between population and community?**

Ans. A group of living organisms of same species that occur together at one place and at one time is called population. A population is reproductively isolated from other such groups.

Populations of different species that live

together in the same habitat is called community.

**iv). What is a habitat?**

Ans. The type of the environment in which an organism lives is called its habitat. For example, habitat of birds are their nests, habitat of a fish is fresh water, river and stream.

**v). What are tertiary consumers?**

Ans. A small number of animals which eat other carnivores are called tertiary consumers. .

**vi). Define food chain.**

Ans. The trophic levels within an ecosystem are linked together. A primary producer may be eaten by a primary consumers, which in turn may be eaten by a secondary consumers and so on. This feeding sequence is called a food chain.

**vii). Which trophic level(s) do you occupy?**

Ans. The group of animals, including earth worms which feed on the partly broken down remains of both animals and plants. These animals called detritivores, are simultaneously

primary and secondary consumers.

viii). **What other name could you give to a primary consumers?**

Ans. Other name for primary consumers is heterotrophs.

ix). **If eucalyptus plants were harmed by parasites or fire. What would happen to the Koala?**

Ans. The Koala only eats eucalyptus leaves. So, he will have no food to eat.

x). **What are decomposers?**

Ans. The organisms like bacteria and fungi, normally digest the dead remains and waste products of every type of organisms. These are called decomposers.

**3. Fill in the blanks:**

i). Everything around us is including in **environment**.

ii). The study of the interaction between organisms and their environment is called **ecology**.

iii). An ecosystem is **vary** in size.

iv). One of the basic characteristic of ecosystem is flow of energy.

v). How an organism lives as well as where it lives, is called niche.

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

i). An ecosystem cannot regulate flow of energy. ✗

ii). A community in certain area together with the non-living factors with which it interacts is called population. ✗

iii). The network of food chains is called food web. ✓

iv). Koala only eats eucalyptus leaves. ✓

v). A particular type of ecosystem has definite and characteristic trophic structure. ✓

**UNIT  
5****Flowing of Matter****1. Fill in the blanks:**

- i). The temperatures on earth range from -500°C to +500°C.
- ii). The pressure of the atmosphere is equal to that of 760mm of mercury at sea level.
- iii). Molecules are continuously in motion.
- iv). Molecules move very fast in a gas.
- v). In a solid, the mutual attraction between molecules is so great that the molecule cannot slip away.

**2. Answer the following questions:**

- i). **Solids and liquids have surface, but gases do not, why?**

Ans. We know that air and water flow from one place to another, whereas solid do not, similarly, you see that a solid has a surface which we can feel by seeing and touching. A liquid also has a surface. That is why, we can see and touch the upper surface of water contained in a glass tumbler. Because their molecules are continues in fast motion and are

very far from each other so they have no surface.

**ii). A solid has a definite shape, but the shape of a liquid changes according to the vessel it is kept in. Why?**

Ans. Solids have shapes because their molecules are very close to each other while liquid molecules are far from each other and are in continuous motion shape.

**iii). Gases have no shapes. Can you give reason for this?**

Ans. Molecules move about very fast in a gas, due to this, they overcome the molecular forces of attraction and fly away in all directions. That is why, a gas goes on expanding until it fills all the available space. Therefore, a gas does not have a surface. We know that anything that does not have a surface cannot have a shape. Therefore, gases do not have shapes.

**iv). Leaving aside the examples given in this lesson, give example of two substances which are porous.**

Ans. Coal and cork are two substances which have

pores in them.

- v). **What factors will determine whether a substance will be in a solid, liquid or gaseous state?**

Ans. The inter molecular force determines the state of matter.

- vi). **Gases can be easily compressed. What are their uses?**

Ans. Gases can be compressed and so in a little space we can store huge quantity of gas for example, CNG.

**3. Choose the correct answer:**

i). Coaltar has a:

- (a) ✓ semi-solid property
- (b) solid property
- (c) liquid property

ii). Sponge is a good example of:

- (a) hard material
- (b) ✓ porous material
- (c) soft material

iii). Ordinary soil is:

- (a) ✓ porous                      (b) hard
- (c) odorous                      (d) sandy

iv. Which stone has no pores:

(a)✓ granite                      (b) rubber

(c) mud                              (d) sand

v. Our skin has:

(a)✓ pores                              (b) semi solid

(c) airy                                  (d) crystal

**UNIT  
6**

# Symbols, Formulae and Equations

1. Answer the following short questions:

i). Identify elements compounds and mixtures from the following:

**Water, Air, Soil, Sulphur**

Ans. Sulphur is element, water is compound while air and soil are mixtures.

ii). What is the main test for an element?

Ans. The main test for an element is to decompose it.

iii). Classify the following into elements and compounds:

Calcium, calcium oxide, aluminium, sugar, iron, zinc sulphate.

Ans. **Elements:** calcium, aluminium, iron.

**Compounds:** calcium oxide, sugar, zinc sulphate.

iv). Give two examples of each of the following mixture types.

(a) Solid in liquid, e.g sea water and sugar solution.

(b) Liquid in liquid lemon juice and water, water and alcohol.

(c) Gas in liquid Soda water, oxygen  
and carbon dioxide in water.

Ans. **Solid in liquid:** Sea water and sugar solution.

**Liquid in Liquid:** Lemon juice and water,  
water and alcohol.

**Gas in Liquid:** Soda water, oxygen and  
carbon dioxide in water.

v). **Explain formulae with examples.**

Ans. The group of atomic symbols representing the  
molecules formula. For example formula of  
hydrogen is  $H_2$  and chlorine is  $Cl_2$ .

vi). **Write two differences between compounds  
and mixtures.**

Ans. Two or more elements combine together to  
form elements or compounds or both. A  
mixture contains several separated while  
compound cannot easily be separated.

vii). **'He' is the symbol of helium. What does it  
represent?**

Ans. It represents that it is only one molecule of  
helium.

viii). **Write down the symbols of the following  
elements:**

**Potassium, Calcium, Phosphorus,**

**Nitrogen, Sulphur**

Ans.	Potassium	K	Phosphorus	P
	Calcium	Ca	Nitrogen	N
	Sulphur	S		

ix). **Write down the molecular formulae of the following compounds.**

**Carbon dioxide, Sulphuric Acid, Sugar, Ammonia, Nitric Acid, Phosphorus, Pentoxide, Aluminium Chloride, Sodium Hydroxide.**

Ans.	Carbon dioxide	$\text{CO}_2$
	Sulphuric Acid	$\text{H}_2\text{SO}_4$
	Sugar	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$
	Ammonia	$\text{NH}_3$
	Nitric Acid	$\text{HNO}_3$
	Phosphorus Pentoxide	$\text{P}_2\text{O}_5$
	Aluminium Chloride	$\text{AlCl}_3$
	Sodium Hydroxide	$\text{NaOH}$

**2. Answer the following long questions:**

i). **The properties and constitution of a compound are fixed.**

Ans. These are fixed because their structures do not change. They react in same proportion.

**ii). What do you understand by a balanced chemical equation?**

Ans. The balanced chemical equation tells us the number of molecules and atoms of reactants and products.

**iii). What information do we get from a chemical equation?**

Ans. A chemical equation provides us information about products and reactants and number of molecules and atoms.

**iv). What is done to make a chemical equation more informative?**

Ans. We include conditions in an equation to make it more informative.

**v). What do you understand by reaction and products?**

Ans. Reactants are elements or compounds taking part in a reaction while products are output of reaction.

**vi). According to mass, which element is the most abundant on the earth's crust?**

Ans. According to mass, oxygen is the most abundant element present on earth's crust.

vii). **What is its approximate percentage?**

Ans. Its approximate percentage is 47%.

**3. Fill in the blanks:**

- i). An element is made of only one kind of atoms and molecules.
- ii). A compound is formed by the combination of at least two elements.
- iii). The Properties of a compound are different from the properties of its constituent elements.
- iv). All the compounds are collections of their constituents.
- v). Chemical formula of Sodium Hydroxide is NaOH.

**4. Choose the correct answer:**

- i). On heating mercuric oxide (HgO) gives:
  - (a) hydrogen, oxygen
  - (b) helium, oxygen
  - (c)✓ mercury, oxygen
- ii). Zinc Oxide (ZnO) is formed by the reaction of Zinc and:
  - (a)✓ oxygen
  - (b) hydrogen
  - (c) carbon
- iii). The molecular formulae of potassium

dichromate:



iv). Sodium sulphate is.



v). Which is balance equation?



UNIT  
7

## Acids, Bases and Salts

1. Answer the following questions:

I). Give the popular and chemical names of at least three salts used in your daily life.

Ans. Sodium chloride NaCl  
Potassium nitrate  $\text{KNO}_3$   
Sodium Sulphate  $\text{Na}_2\text{SO}_4$

ii). Which acid and which alkali will react with each other to give nitre?

Ans.  $\text{HNO}_3 + \text{KOH} \longrightarrow \text{KNO}_3 + \text{H}_2\text{O}$

iii). Express the action of nitric acid on caustic soda by a chemical equation and give the names of the products.

Ans.  $\text{HNO}_3$

iv). How would you prepare:

- Crystals of copper sulphate from metallic copper?
- Ferrous sulphate from iron oxide?
- Milk of magnesia from magnesium oxide?

Ans. (a).  $\text{CuO} + \text{H}_2\text{SO}_4 \longrightarrow \text{CuSO}_4 + \text{H}_2\text{O}$   
(b)  $\text{Fe}_2\text{O}_3 + \text{SO}_4 \longrightarrow \text{FeSO}_4$



v). **Choose acids and alkalis from the following:**

$\text{H}_2\text{SO}_4$ ,  $\text{Ca(OH)}_2$ ,  $\text{Mg(OH)}_2$ ,  $\text{HCl}$ ,  $\text{HNO}_3$ ,  $\text{KOH}$ .

Ans. **Acids:**  $\text{H}_2\text{SO}_4$ ,  $\text{HCl}$ ,  $\text{HNO}_3$

**Alkalies:**  $\text{KOH}$ ,  $\text{Ca(OH)}_2$ ,  $\text{Mg(OH)}_2$

**2. Fill in the blanks:**

i). Acetic acid is present in vinegar while citric is present in lemon.

ii). Magnesium burns in the air to form magnesium oxide which is metallic oxide.

iii). Its aqueous solution turns blue litmus to red in colour.

iv). The chemical formula of slaked lime is Ca(OH)<sub>2</sub>.

v). In a neutralisation reaction an acid and an alkali combine to form a salt and water.

vi). The solution form by reacting  $\text{P}_2\text{O}_2$  with  $\text{H}_2\text{O}$  turns red litmus blue.

vii). For the preparation of soap oil and alkali are reacted together.

**3. Write 'T' against the true statement and 'F'**

against a false one out of the following statements.

- i). Orange juice turns blue litmus red.
- ii). Copper does not react with tamarind **T** ('imli') water.
- iii). Alum ('**F** kari') acts as an antacid.
- iv). Soaps are salts of fatty acids. **F**

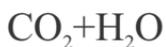
**4. Match the substances on the left side with the appropriate statements on the right side:**

- |                       |                             |
|-----------------------|-----------------------------|
| (a) vinegar           | (i) is an antacid.          |
| (b) sodium chloride   | (ii) used as a fertilizer.  |
| (c) milk of magnesia  | (iii) sour to taste.        |
| (d) Potassium nitrate | (iv) major salt of the sea. |

**5. Write an equation for the action of water on the following and mention whether the products are acids or alkalies:**

- (a) Magnesium oxide  
 $\text{MgO} + \text{H}_2\text{O} \rightarrow \text{Mg}(\text{OH})_2$  Alkali
- (b) Sulphur dioxide  
 $\text{SO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_3$  Acid
- (c) Potassium oxide  
 $\text{K}_2\text{O} + \text{H}_2\text{O} \rightarrow \text{KOH}$  Alkali

(d) Carbon dioxide



**6. Complete the following equation:**



→

→



- (c) Transparent (d) Translucent
- iv). The value of angle of reflection is always equal to:
- (a) Angle of refraction  
(b) Normal angle  
(c) Point of incidence  
(d)✓ Angle of incidence
- v). Image of an object in front of a plane mirror is of the same size as of:
- (a) lens (b) Image  
(c) Plane mirror (d)✓ Object

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

**i). Write the following definitions relating to spherical mirrors:**

- (a) Pole  
(b) Center of curvature  
(c) Radius of curvature  
(d) Focus  
(e) Focal length  
(f) Principal axis

Ans. **Pole:** The middle point of the spherical mirrors is called pole.

**Center of curvature:** The center of sphere whose segment is spherical portion is called center of curvature.

**Radius of curvature:** The radius of sphere is called radius of curvature of spherical portion.

**Focus:** The point where are reflected rays convert is called focus.

**Focal length:** The distance between pole of the mirror and focus is called focal length.

**Principal axis:** The line completing the pole and spherical portion and center of curvature is called principal axis.

**ii). Write the four names of natural sources of the light.**

Ans. Sun, Moon, Stars, firefly, etc.

**iii). Write down the names of five man-made sources of the light.**

Ans. Bulb, candle, tube light, search light, oil lamps etc..

**iv). What is lumen?**

Ans. Internationally accepted unit of brightness of source of light is lumen. One lumen is equal to 12.56-candles power and 700 lumens are

equal to 1 watt.

**v). What do we understand by umbra and penumbra?**

Ans. When moon is completely hidden behind earth shadow it is called umbra while the stage of entering or exiting from lunar eclipse is called penumbra.

**vi). Why only a glass is used to make a mirror? Why is silvering necessary?**

Ans. Shiny surface stops the absorption of light. Smoothness of the surface helps in the formation of a clear image. This is why, silvered glass is used in mirrors.

**vii). How is silver polish of the mirror protected?**

Ans. The glass offers a smooth surface, the silvering makes it shiny and the red paint reduces transmission of light and protects the silvering.

**viii). Write the laws of reflection of the light?**

Ans. i). Value of angle of reflection is always equal to angle of incidence.

ii). The incident ray, the reflected ray and

normal all are in same plane.

**ix). Write the names of the sources of the light, which are not hot.**

Ans. Firefly, moon and twinkle of stars are not source of light.

**x). Which of the following are luminous objects like camera, firefly, mirror, bumper of car, filament of bulb, diamond, etc.**

Ans. Luminous objects are firefly, filament of bulb.

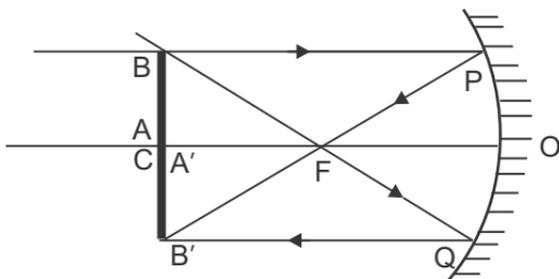
**xi). Distinguish the difference between the real and virtual images.**

Ans. The distance of the image from the mirror is equal to the distance of the object from the mirror. Lastly, the image of an object formed by a plane mirror is virtual. It means that image formed in the plane mirror cannot be obtained on a screen placed anywhere behind the mirror. The image that can be obtained on a screen is called real image.

**xii). Show by' a figure where the image of an**

**object is formed when the object positioned at the center of curvature.**

Ans.



xiii). How is the image of an object formed when the object is placed in front of a convex mirror'?

Ans. The image will be formed at the back side of the mirror at end imaginary distance.

xiv). Write the uses of concave mirror and convex mirror.

Ans. Convex and concave mirrors are used in shaving mirrors, in head lights in microscope in telescope, in spectacles and in back view mirror.

**4. Answer the following long questions:**

**i). Describe an experiment to explain that light travels in a straight line.**

Ans. Take three pieces of cardboard of the same

size, keep them together and make (fully aligned) a hole in each by driving a nail through all of them. Mount each cardboard upright on the table by using moulding clay, or plasticine or even kneaded flour as shown in fig. Take a candle of height equal to the hole in the cardboard. Mount the candle on the table and light it.

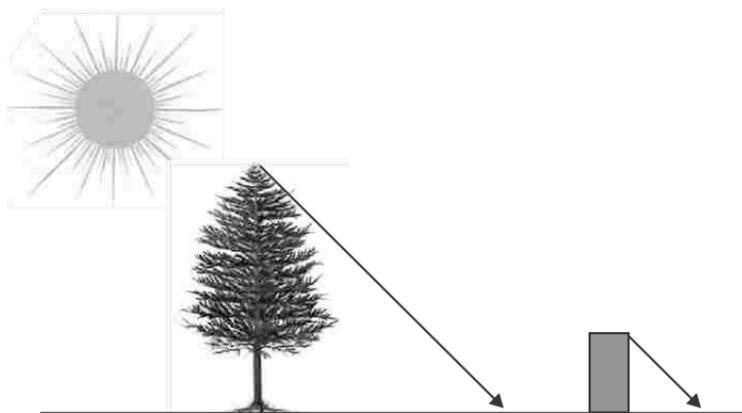
Adjust the three cardboards so that we see the flame through the hole of the third cardboard. Now check if all the three holes are in straight line or not: We can use a needle and a thread to check this. These two activities show us that the light travels 'in a straight line.

**ii). Write names of two transparent, two translucent, and two opaque objects.**

Ans. Some materials allow light to pass through it and some do not. We can see a doll kept in a polythene bag, and a coin kept at the bottom of a bucket filled with water. Can we see if this doll is kept inside a bag of brown paper, or if the coin is lying inside a box? Polythene and water both allow light to pass through them.

Therefore, substances like polythene and water are called transparent brown.

Brown paper and does not allow light to pass through it, therefore substances are called opaque.



Ground glass or tracing paper are such substances through which light can pass partially, It looks hazy when seen through them. Such substances are called translucent. An oily paper is also called translucent.

**iii). Why shadow of an object is casted? Why shadow of a transparent substance is not formed?**

Ans. Shadow is formed when light cannot pass through a body. So, we have shadow and when

it passes through a body it does not form a shadow so transparent substance have no shadow.

**iv). Describe the interesting facts about the shadow of an object formed by the sun.**

Ans. When we walk in the sun our shadows move with us. At the time of sunrise, shadow casts by body is very long. As the sun rises from higher and higher horizon our shadows decrease in image and become shortest at noon. After the noon, shadow of our body goes on length and just before sunset it is very long; why does it happen? Do the shadows always form one direction only.

**v). The length of a shadow 'of one meter rod in the sunlight is 70cm. At the same time the length of shadow of a tree is 5.6 meters. Calculate the height of the tree.**

Ans. By measuring the length of a shadow of a tree or of a building formed in the sunlight, we can calculate their height. Following activity shows how this is done.

Our object is to measure the height of a tree

without climbing it. To do this, on a sunny day, fix erect one meter long stick on the ground near the tree. In figure 4 AB is the meter stick and TR is the height, which is to be measured. The shadow of AB is shown by BC and the shadow of the tree is shown by RS. The sun is so far away from; the tree and the meter stick that the lines TS and AC can be considered parallel. This makes the ratio BC/AB equal to the ratio RS/TR.

$$\text{i.e. } BC/AB = RS/TR$$

Now with the help of a tape measure the length BC. We already know that

AB = 1 meter we can calculate the height of the tree TR after measuring the length RS also by a tape.

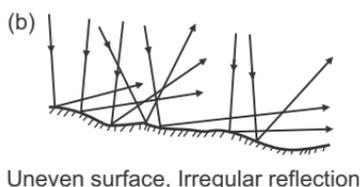
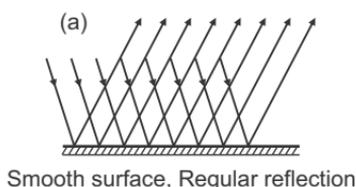
$$BC/1 \text{ meter} = RS/TR$$

$$TR = RS/BC \times 1 \text{ meter}$$

Thus, we have measured the height of the tree without climbing it by using the ratio method.

**vi). Explain regular and irregular reflection.**

Ans. In figure, the reflection of light from a mirror of uneven surface has been compared with the reflection of light from a mirror of smooth surface.



The reflected rays from an uneven surface are scattered in all directions. This is why, a clear image of the objects is not obtained from the mirror that has lost smoothness of its surface. Whereas due to the regular reflections from the mirror of smooth surface clear image is obtained. It is because, reflected rays from a mirror of this type move in a definite direction instead of scattering in all directions.

**vii). How many reflected rays can be there for one incident ray of light is falling on a plane mirror?**

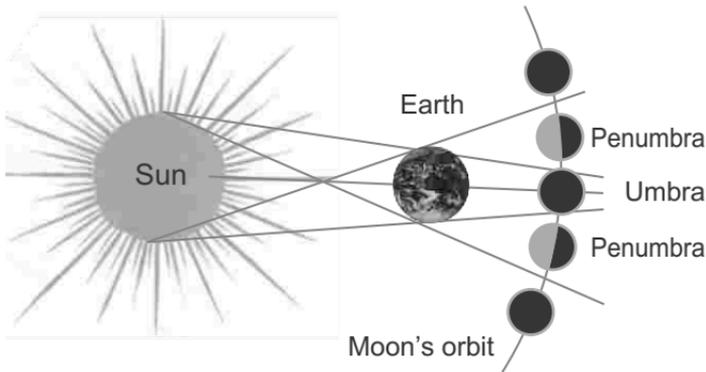
Ans. For one incident ray of light only one reflected ray will be formed.

**viii). What is meant by light from the earth?**

Ans. The reflection of sun's light from earth is called light from earth.

ix). **Show by figure the occurrence of Solar Eclipse.**

Ans. On a new-moon day the sun, the moon and the



earth are in a straight line, and shadow of the moon can fall on the earth and if we are in this shadow, then we shall not see that part of the sun which is covered by the moon. This event is called Solar Eclipse.

x). **How does a periscope work? Explain in detail.**

Ans. Periscope helps us to see on the other side of the wall. A simple periscope consists of along tube which bends at right on both ends.

i). Use periscopes are used in submarine people in submarine can watch the objects above the

water.

- ii). Battle tanks are also fitted with periscopes surface. The crew inside the tank can see every thing out side of the tank.

**UNIT  
9****Electric Charge****1. Fill in the blanks:**

- i). Ebonite rod gets charged with **negative** charge when it is rubbed with woolen cloth.
- ii). **Repulsion** occurs when charged glass rod is brought to another charged glass rod.
- iii). When the charged rod is brought to the disc of an electroscope its leaf is **open out**.
- iv). **Negative** charge is produced on ebonite rod.
- v). **Positive** charge is produced on a glass rod when it is rubbed with silk.
- vi). **Repulsion** is observed when two ebonite rods are rubbed with silk and are brought close to each other.

**2. Answer the following questions:**

- I). **Why is the paper cylinder initially attracted by a charged ebonite rod and later on repelled after being touched with the ebonite rod.**

Ans. Take a sheet of paper and roll it into a hollow

cylinder. Tie up one end of the cylinder with a silk thread and hang it from a stand. Now take an ebonite rod and charge it by rubbing with wool/flannel. This ebonite rod will be negatively charged. Now bring this charged ebonite rod near the paper cylinder. The cylinder will be attracted towards the rod. Now touch the cylinder with the charged rod. On doing so we observe that the cylinder is repelled by the rod. It would mean that rod has transferred some of its negative charge to the paper which causes the repulsion between the two. Thus, we can charge one object by bringing it in contact with a charged body. Charge produced by contact can be found by the following activity.



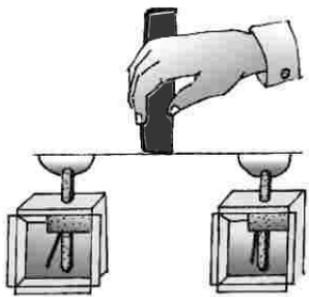
After being charged due to contact the paper cylinder repels the ebonitic rod

**ii). What is an insulator?**

**Give examples.**

**Ans.** Materials have different ability to transfer or

conduct charges. Though, plastic can be charged but it cannot conduct the charges between two electroscopes. Ability of a material to conduct electricity depends on the nature of the material. Metals are excellent conductor. Non-metals like wood, rubber, ebonite, plastic, glass, etc. are poor conductors. These are called insulators.



Flow of charges form one electroscope

### iii). What is static electricity?

Ans. Our body is a conductor of electricity. We can easily test this by charging an electroscope first and then touching disc of the electroscope. On doing so, the charge of the electroscope will transfer to earth through our body and the leaf of the electroscope will fold up. Stored up charged at a point is called static electric charge.

**iv). What is flow of electricity?**

Ans. Take two electroscopes and keep them side by side. Charge one electroscope by touching it with charged ebonite rod. Its leaf will spread out.

Take a wire of copper or aluminum and pass it through a hole in a cork or thermocol strip. Now by holding the cork strip, touch the two ends of the wire of the discs of two electroscopes. When we do so, leaf of the second electroscope also spreads out. Thus charges flow from the charged electroscope to the uncharged electroscope.

Now repeat this experiment by using a plastic thread or comb in place of the metal wire.

What do we observe? The leaf of the uncharged electroscope does not spread out. Contrary to the metal wire, the plastic thread is not able to let the charges flow from the electroscope to the other. This is called of flow of charges.

**v). What will happen if we touch the disc of charged electroscope and why?**

Ans. When we touch the disc of the electroscope

with a charged body say, by ebonite rod or glass rod, the leaf will open out. The separation of leaves will increase with increase in amount of charge given to the electroscope.

**vi). How an object can be charged by method of conduction?**

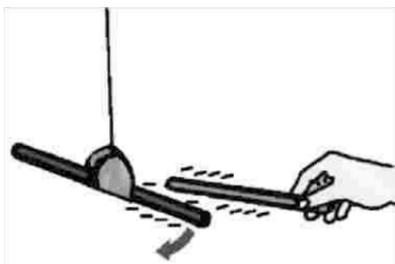
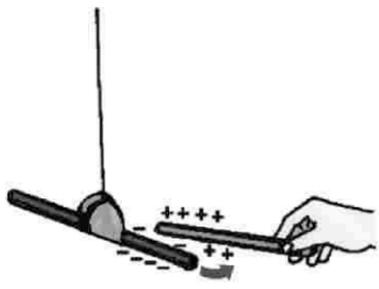
Ans. Conduction of electric charges mean transfer of charge from one place to another. When this happens, we say that electricity is flowing from one place to another.

**vii). Prove experimentally that a rubbed object and the rubbing being object both develop an equal amount of charges.**

Ans. Take an ebonite rod or a plastic ruler and suspend it as shown in figure below after rubbing it with wool or flannel, now charge another ebonite rod or plastic scale in the same manner and bring it close to the suspended rod. What do we observe?

The suspended rod moves away from the other one. Both the charged rods do not attract each other. It is clear that there is repulsion between

the rods having similar charges.



viii). **Why does a rubbed balloon stick, to a wall after it has been rubbed?**

Ans. Blow up a balloon and tie its mouth. Rub the balloon 10 from to 12 times against the dry hair. Now gently take it near a wall. What do we observe?

The balloon sticks to the wall, Why? We have charged the balloon rubbing it against the hair. The balloon sticks to the wall because of force of attraction between the charged balloon and the wall.



Repulsion between similar charges

ix). **How can we make electric charges to flow?**

Ans. Electric charge flow when there is a path for it.  
if we provide a path elective charges to flow.

x). **What is the function of a lightning conductor?**

Ans. The pointed end of the rod should be directed to the sky. If lightning strikes the building the metal rod will discharge it to the ground without damaging the building. It is called lightning conductor. We can observe such lightning conductors fixed on tall buildings.

xi). **How does a lightning conductor work?**

Ans. The lightning conductor places at the roof of the building when electricity strikes it passes to the earth with wire.

xii). **How does an electric cell work? Describe with a diagram.**

Ans. In this type of cell, chemical energy is converted into electrical energy. For use in our everyday lives, electric cells can be made from a dry paste-like chemical. This is called a dry-cell battery or simply a battery. Flashlight

batteries and camera batteries are electric cells. Batteries are also used in motor vehicles.

**xiii). Write a short note on electric generator.**

Ans. Dynamos and generators are a type of machine used to generate current electricity. Dynamo was invented by the scientist Michael Faraday. In a dynamo, a coil of wire spins between the two poles of a fixed magnet. This causes an electric current to be generated in the coil. In dynamos, mechanical energy is formed from the chemical energy of fuel oil. This mechanical energy is later converted into electrical energy. Use of dynamos in both rural and urban areas of Pakistan is increasing steadily. During power failures or load-shedding, dynamos or generators are used to temporarily power light bulbs and other electric equipment.

**xiv). What is load-shedding? How would we prevent the wastage of electrical energy?**

Ans. The demand for electricity in our country is increasing day by day due to increase in population and improvements in our standard of living. The production of electricity is also increasing gradually. However, the supply of electricity is not yet adequate to keep up with the demand of electricity. So, some shortage of electricity always persists. In order to compensate for this shortage, supply of electricity is cut off temporarily at certain places for certain periods of time in a pre-planned and pre-calculated way. This is called load-shedding. When load-shedding occurs somewhere, people obviously suffer, but if it is announced beforehand, we can all be prepared to share this temporary problem equally for short periods of time. However, if it becomes possible for us to generate sufficient amounts of electricity in our country, load-shedding will not be required

anymore.

**3. Choose the correct answer:**

i). Charges are always produce in:

- (a) pair                      (b)✓ pole  
(c) magnetic              (d) sound

ii). Transference of charges is called:

- (a)✓ flow                      (b) field  
(c) electricity              (d) electronics

iii). Non-metels are:

- (a) good conductor of electricity  
(b)✓ bad conductor of electricity  
(c) charged conductor bodies  
(d) none of these

iv). Lightning conductor discharge the lightning to the earth with:

- (a)✓ damage the soil  
(b) harming the building  
(c) harming the electric wiring

(d) out harming the building

v). How is current electricity generated?

- a) When plants remain buried underground for long periods of time.
- b) If electric cells and dynamos are used.
- c) When a substance absorbs the heat of the sun.
- d) ✓ When a substance is rubbed with another.

**UNIT  
10****Sound****1. Answer briefly:****i). What is sound?**

Ans. Sound comes from vibrations. These vibrations create sound waves which move through mediums such as air and water before reaching our ears.

**ii). What do we need produce sound?**

Ans. We need a vibrating body to produce sound.

**iii). What energy is used in musical instruments to make sound?**

Ans. Sound is a type of energy. Many things can be done using sound. Musical instruments can produce sounds because of vibrating sound energy.

**iv). Why do our throats vibrate when we speak?**

Ans. There are vocal cords inside our throats. They are used to generate sound.

**2. Answer in detail:****i). Why is sound called energy? Explain with two examples.**

Ans. We have seen ringing bells in schools. In order

to ring a bell, it must be struck. The bell creates vibrations because of the force exerted on it. Sound is created because of these vibrations.

Sometimes, houses vibrate when heavy trucks pass by. The windowpanes of the nearby houses rattle. If you stand on a bridge at that time, you will find that it also vibrates. So, you clearly understand that sound is a type of energy. Many things can be done using sound. Musical instruments can produce sounds because of this energy. Windowpanes are sometimes shattered by the tremendously loud sound emitted by jet planes or cannons. The membranes inside the ears can be injured, ears may bleed, and it may result in deafness.

**ii). Describe uses of sound energy in medical science.**

Ans. Sound also has its uses in the medical sector



Use of sound energy in the medical sector

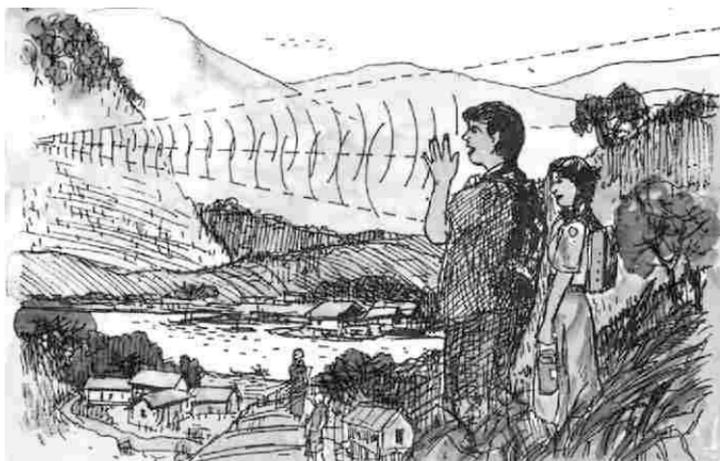
for diagnosis of diseases. Stethoscopes and other apparatuses use sound energy in order to determine diseases or measure blood pressure. Blind and deaf people can move around with the help of a sound device. The presence of submarines or icebergs under the sea can be determined by using sound waves.

**iii). Describe uses of sound energy.**

Ans. We use telephones, which produce sound energy also musical instruments and medical instruments use sound energy.

**iv). What is an echo?**

Ans. Have you noticed what happens when we shout in an empty room or in front of mountains, hills or high walls? Can you hear



Echo

your own voice again? What is it called? If someone shouts in a large open field or on the bank of a river, the sound waves bounce back if they are blocked by mountains or walls. Thus, the sound is heard again after a short interval. This is called an echo.

v). **What do you understand by sound pollution? Describe the harmful effects of sound pollution.**

Ans. We cannot do without sound. But loud and high-pitched sounds irritate us and have harmful effects on our bodies. This effect is called sound pollution.

People that work in very noisy environments may eventually become deaf. We must be careful to keep our environment free of sound pollution. Every country has its regulations that determine the permissible levels of sound for different areas. We all should know about these regulations and abide by them. It is a serious crime to make loud noises in or around hospitals, educational institutions and residential areas.

**vi). How does sound pollution occur?**

Ans. Sound pollution is produced in many ways like, horns of vehicles on the roads, noises from factories, noisy construction of buildings in the urban areas, using loudspeakers, etc. cause sound pollution. We have noticed that noises made by loudspeakers hamper study and other activities. Sound pollution may cause headaches, mental agitation, hearing impairment, high blood pressure, heart diseases, etc. Band music played at very loud volumes may even cause heart attacks in some cases.

**vii). Describe an experiment showing how sound is produced using ripples of water.**

Ans. Take a mug full of water. Hit a table or the floor with one end of the tuning fork. Quickly dip both the prongs of the tuning fork in the water. What happens? The water ripples and spills over the edges of the mug. Try to play on

guitars, violins, drums, sitar or whatever you can get. You will find that they all produce vibrations.

**viii). Explain how sound is produced by musical instruments.**

Ans. We have seen different kinds of musical instruments like flute, piano, ektara, dotara, dhol, tabla, drum, etc. The flute is played by blowing. There are holes in the body of the flute. The notes are produced by the flute can be changed by covering or uncovering these holes with fingers. Strings are used to create vibrations in cases of instruments like ektara, dotara, sitar, piano etc. In these instruments, the thicker and longer the string is, the heavier is the sound produced by it. If the string is thin and short, the sound produced by it will be sharp and high-pitched. The fingers or palms of the hands, or sticks are used to play the tabla, dhol, drum etc. The sounds produced

from these instruments are heavy. The sound of the flute is sharp.

**3. Choose the correct answer:**

- i). What is needed to produce a sound?  
(a)✓ vibration      (b) long string  
(c) flute              (d) tune
- ii). Which musical instrument is used a membrane to generate sound?  
(a)✓ guitar              (b) sitar  
(c) flute              (d) tabla
- iii). Which musical instrument is used strings to make sound?  
(a) flute              (b) table  
(c) dhol              (d)✓ piano
- iv). Which one uses echoes?  
(a)✓ ambulance      (b) television  
(c) watch              (d) ultrasonography

**4. Fill in the blanks:**

- i). Sound is a kind of energy.
- ii). Vibration of matter is needed to produce

sound.

- iii). Sound produces many kinds of **music**.
- iv). Tabla, dhol, drum, etc. use **Vibration** for making sound.
- v). The production of heavy sharp notes by ektara depends upon the **thickness** of the string.

**UNIT  
11****Earth and Universe**

**1. Answer the following questions:**

**i). What is a celestial body? Write down the names of some celestial bodies.**

Ans. The bodies other than planets are called celestial bodies for example, comet, nebulae and meteors. We can see bright twinkling stars or constellations are scattered over the sky, observe very carefully, and we shall notice a wide area like a white cloud. It will appear as if a long path of light and shadow is sweeping from the northern part of space to the southern part. This is called a galaxy. A galaxy is actually composed of trillions of stars and their planets and satellites. There are innumerable galaxies in space. Each galaxy contains millions of stars.

**ii). When and where can Venus be seen?**

Ans. Venus can be seen from north and south poles in November and December.

**iii). How long does it take for the earth to rotate once on its axis and revolve once around the sun?**

Ans. One complete rotation of the earth like this on its axis takes almost 24 hours. These 24 hours are collectively known as a day. This type of motion of the earth is called the diurnal rotation of the earth. During this rotation, the side of the earth which faces the sun experiences daytime, while the other side experiences nighttime. Days and nights thus occur because of the diurnal rotation of the earth.

**iv). What is the diurnal rotation of the earth? Describe it.**

Ans. The earth is rotating on its axis from the west toward the east. One complete rotation of the earth like this on its axis takes almost 24 hours. These 24 hours are collectively known as a day. This type of motion of the earth is called the diurnal rotation of the earth.

**v). Write down the names of the seasons in Pakistan.**

Ans. Pakistan is called the land of six seasons. The six seasons are: summer, rainy season, autumn, late autumn, winter and spring. These six seasons, come one after another in a certain sequence.

**vi). What is a comet? Describe Halley's Comet.**

Ans. Sometimes, a type of celestial body appears in the space. These bodies appear for sometimes and then they disappear. Comets are truly amazing things of the sky. They travel around stars. The British scientist Edmund Halley discovered a comet in the sky in the year 1682. It was named Halley's Comet after him. It can be seen every 76 years. According to his calculations, Halley's Comet has already been seen in 1834, 1910 and 1986, and it will be seen again in the year 2062.

**vii). Why do days and nights occur?**

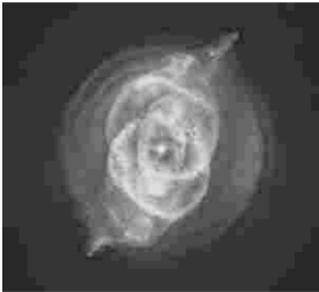
Ans. Everyday the sun rises in the east and sets in the west. Therefore, in ancient times people





vi). Days and nights occur on earth due to the **diurnal** rotation of the earth.

4. Write the names of following diagrams:



**Nebulae:**

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**Comets:**

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**Meteors:**

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**UNIT  
12****Science and Technology**

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

**i). What is science?**

Ans. Science is method of studying facts and calculating rules from these facts.

**ii). What is technology?**

Ans. Technology is advancement of science in any field using new methods.

**iii). Name a few types of technology used in the field of medical science.**

Ans. In the field of medicine, science and technology have allowed us to develop new types of medicines and equipment.

Previously, only X-rays were used in order to observe the state of the internal organs of the body. Now sound waves are used in ultrasonography to take pictures of the internal organs of the body. ECGs are used to detect heart diseases. Laser beams are used to perform many complex operations without causing any loss of blood. Modern medical

technology allows us to implant or transplant different malfunctioning organs. For example, it is now possible to implant artificial kidneys, or pacemakers in case of heart problems. Injections and vaccinations are used to provide protection from tuberculosis, diphtheria, whooping cough, measles and pox.

**iv). State the difference between science and technology with an example.**

Ans. Science is predefined thinking on a specific topic and producing results while technology is its practical implementation.

**v). Write down the names of five old types of technology.**

Ans. Steam engine, radio, agriculture, telescope, telephone.

**vi). Write down the names of five types of modern technology in the field of information technology.**

Ans. Internet, computers, mobile, smart board and routers.

**vii). What are remote controls? What purposes are they used for?**

Ans. Buttons also need to be pressed in order to increase or decrease the volume. However, a small device can now be used to do these things from a distance. Many of you know the name of this device, and many of you have probably used it. It is called a 'remote control'. The meaning of the term 'remote control' is to control something from a distance. It is also called a 'remote' in its shortened form. Apart from turning a TV on or off, changing its channels, or increasing or decreasing its volume, remotes are also used for many other purposes. For example, there are many remote-operated toys, stereo systems, DVD players, calling bells, fans, air-conditioners, doors etc many of you probably own remote-controlled toy cars.

**2. Answer in detail:**

**I). Describe the relationship between science and technology.**

Ans. Technology is practical implementation of

science.

**ii). What is agricultural technology? How does technology help in the field of agriculture?**

Ans. The ancient technology known as the plough is still used in many countries. In our country, animal-driven ploughs are used in conjunction with mechanical ploughs or tractors and power tillers, which are examples of modern technology. Low- lift pumps are used to lift water from deep wells, reservoirs, rivers and streams for irrigation purposes. Drum-seeders are used for seeding. There are also machines used for harvesting and threshing crops. These types of agricultural technology have made the jobs of farmers much easier. The invention of high yielding variety (HYV) of paddy and other food grain seeds are results of science and technology. Plants of (HYV) food grain have increased our grain yield by many times.

**iii). Mention a few examples of medical technology. Write down the names of the diseases which can be treated by them.**

Ans. In the field of medicine, science and technology have allowed us to develop new

types of medicines and equipment.

Previously, only X-rays were used in order to observe the state of the internal organs of the body. Now sound waves are used in ultrasonography to take pictures of the internal organs of the body. ECGs are used to detect heart diseases. Laser beams are used to perform many complex operations without causing any loss of blood.

**iv). Describe the effect of technology on the lives of human beings.**

Ans. Life of human being are becoming more secure and comfortable with the help of technology.

**v). Discuss the problems which arise out of the misuse of technology.**

Ans. Using mobile and internet very often is wastage of time and money. Use of mobile camera can also be harmful.

**vi). What are automatic doors? How do they open by themselves?**

Ans. Usually, we have to open latches or locks, or push or pull the doors in order to open them.

But automatic doors open by themselves, because of which they are known as automatic doors.

Actually automatic doors do not open by themselves.

When we go in front of such a door, or an object or machine is placed in front of it, a system detects us or the object's presence and turns on the switch which is used to open the door, causing it to open. This machine is called a sensor.

### 3. Fill in the blanks:

- i). Sound waves are used in ultrasonography machines.
- ii). The new piece of technology used for seeding crops is called a HYV.
- iii). Radio signals are used in TV remote controls.
- iv). Alexander Graham Bell invented telephone.
- v). Monitor of a computer is an example of its output unit.

**4. Choose the correct answer:**

i). What is the knowledge obtained from experiments and researches called?

- a) Technology                      b) Education  
c) ✓ Science                        d) Skill

ii). What is the name of the process through which the knowledge discovered by scientists is used to meet the needs of human beings?

- a) Skill                                b) ✓ Technology  
c) Experiment                        d) Science

iii). Which of these devices are used to take pictures of the internal organs of the body with the help of sound waves?

- a) ✓ E C G   m a c h i n e                      b )

Ultrasonography

- c) Camera                                d )

Stethoscope

iv). Which of these is used to detect broken bones inside the body?

- a) ✓ X-ray                                b) Laser  
c) ECG machine                        d) Stethoscope