



**KARNATAKA GOVERNMENT**

**INSTITUTE OF SCHOOL EDUCATION**

**BENGALORE ZILLA PANCHAYAT**

**DISTRICT INSTITUTE OF EDUCATION AND TRAINING , BENGALURU DISTRICT**

# **SCIENCE QUESTION BANK**

## **'SANKALPA'**

**TOWARDS FRUITFUL RESULT**

**ACADEMIC YEAR**

**2024-25**

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# CHAPTER-1 CHEMICAL REACTIONS AND EQUATIONS

## CHEMICAL REACTIONS AND EQUATIONS

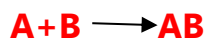
CHEMICAL EQUATIONS

TYPES OF CHEMICAL REACTIONS

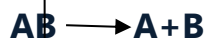
WRITING CHEMICAL EQUATIONS

BALANCING CHEMICAL EQUATIONS.

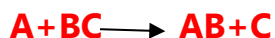
CHEMICAL COMBINATION



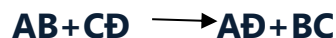
CHEMICAL DECOMPOSITION



CHEMICAL DISPLACEMENT



CHEMICAL DOUBLE DISPLACEMENT



REDOX REACTIONS

THERMAL DECOMPOSITION



PHOTOLYTIC DECOMPOSITION



ELECTROLYTIC DECOMPOSITION



CORROSION

RANCIDITY

**I.FOUR ALTERNATIVES ARE GIVEN FOR EACH QUESTION. CHOOSE THE MOST APPROPRIATE ONE :-**

**1.Among the following reactions , Which reaction is possible**

1.  $\text{FeSO}_4 + \text{Pb} \longrightarrow \text{PbSO}_4 + \text{Fe}$       2.  $\text{ZnSO}_4 + \text{Fe} \longrightarrow \text{FeSO}_4 + \text{Zn}$   
3.  $2\text{AgNO}_3 + \text{Cu} \longrightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{Ag}$       4.  $\text{PbCl}_2 + \text{Cu} \longrightarrow \text{CuCl}_2 + \text{Pb}$

**Ans - 3)  $2\text{AgNO}_3 + \text{Cu} \longrightarrow \text{Cu}(\text{NO}_3)_2 + 2\text{Ag}$**

**2. The chemical reaction  $2\text{Mg} + \text{O}_2 \longrightarrow 2\text{MgO}$  is an example for,**

- 1) Combination reaction      2) Decomposition reaction  
3) Displacement reaction      4) Double displacement reaction

**Ans – 1) Combination reaction**

**3.From the following reactions we can say that,**



- 1) Zinc and lead are more reactive elements than copper  
2) Zinc and lead are less reactive elements than copper.  
3) Zinc and lead are as reactive to that of copper  
4) Zinc and lead react with each other.

**Ans – 1) Zinc and lead are more reactive elements than copper**

**4. Antioxidant that is used in chips packet is**

- 1) Hydrogen 2) Nitrogen 3) Carbon dioxide 4) Sulphur

**Ans:-2) Nitrogen.**

**5. In four test tubes namely a)Nacl b) Kcl c)  $\text{Na}_2\text{SO}_4$  d) $\text{Na}_2\text{CO}_3$  solutions is taken and to each of them  $\text{BaCl}_2$  solution is added. The test tube in which white precipitate is formed is**

- 1) a 2) b 3) c 4) d

**Ans:- 3) c.**

**6. Following substance is used in the Manufacture of cement .**

- 1)  $\text{CaO}$  2)  $\text{Ca}(\text{OH})_2$  3)  $\text{CaSO}_4$  4)  $\text{CaCO}_3$

**Ans:- 1)  $\text{CaO}$**

**7. The form of energy used in decomposition of  $\text{AgBr}$  which is used in black and white photography is**

- 1) Electric current 2) Heat 3) Sunlight 4) wind.

**Ans:- 3) Sunlight.**

**8. The decomposition of vegetable matter into compost is an example for**

- 1) Oxidation reaction.
- 2) Endothermic reaction
- 3) Reduction reaction
- 4) Exothermic reaction.

Ans:- **4) Exothermic reaction**

**9. Magnesium ribbon surface has to be sanded slightly and cleaned to remove**

- 1) Chloride layer
- 2) Oxide layer
- 3) Hydroxide layer
- 4) Carbonate layer

Ans:- **2) Oxide layer.**

10. Among the following which is not the method of preventing corrosion

- 1) Anodising
- 2) Galvanisation
- 3) Chromium painting
- 4) passing the Nitrogen..

Ans:- **4) passing the Nitrogen**

## II ANSWER THE FOLLOWING QUESTIONS IN 1-2 SENTENCES EACH:-

**1. Name the method by which we are going to balance chemical reactions.**

Ans: Hit and trail method.

**2. List out the changes that happen during chemical change.**

Ans: Change in state, change in color,  
evolution of gas, and change in **temperature.**

**3. Why should we balance a chemical equation?**

Ans: As per the law of conservation of mass, mass can neither be created nor be destroyed, hence we should balance a chemical reaction.

**4. Respiration is an example for exothermic reactions. why?**

Ans: Heat and energy is liberated or released.

**5. On heating in a test tube green coloured crystals turns into brown colour. Which type of chemical reaction is taking place here, and write its equation.**

Green coloured ferrous sulphate crystals turned into brown coloured ferric oxide by undergoing decomposition reaction.



## III ANSWER THE FOLLOWING IN 2-3 SENTENCES EACH:-2M

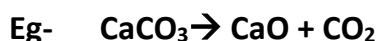
**1. What are chemical combination reactions? Give examples.**

Ans: A reaction in which two or more reactants react together to form a single product is called combination reactions.

Eg-  $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$

**2. What are decomposition reactions? Give examples.**

Ans: Reaction in which a single reactant breaks down to give two or more simpler products is called decomposition reactions.



**3. What are displacement reactions ? Give examples.**

Ans: A reaction in which highly reactive element replaces the less reactive element is called displacement reactions.



**4. What are double displacement reactions? Give examples.**

Ans:-A reaction in which there is exchange of ions between the reactants is called double displacement reactions.



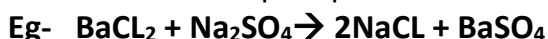
**5. Differentiate between exothermic and endothermic reactions.**

Ans:

Sl no	Exothermic reaction	Endothermic reaction
1.	A reaction in which heat is released is called exothermic reaction.	A reaction in which heat is absorbed is called endothermic reaction.
2.	$\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2$	Melting of ice.

**6. What are precipitation reactions?**

Ans: A reaction in which precipitate is formed is called precipitation reactions.



**7. Manufacturers of chips flush the packets of chips with nitrogen gas. Why?**

Ans: To prevent the chips from getting oxidised or to prevent rancidity.

**8. Differentiate between oxidation and reduction reactions.**

Ans;

Sl no	Oxidation	Reduction
1.	Addition of oxygen or Removal of hydrogen or Loss of electrons	Removal of oxygen or Addition of hydrogen or Gain of Electrons
2.	Eg- $2\text{Cu} + \text{O}_2 \rightarrow 2\text{CuO}$	Eg- $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$

**9. Define the following**

- a) Rancidity                      b) Corrosion

Ans: a) **Rancidity**- When fats and oils are oxidised, their smell and taste change. This is called rancidity.

b) **Corrosion**- Eating away of the metal by the activity of air ,water and chemicals present in the air is called corrosion.

Eg-Rusting of iron, black coating on silver.

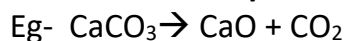
**10. How do you prevent therancidity of the food ?**

1. By keeping the food materials in the air tight container.
2. By keeping in refrigerator.
3. By adding anti-oxidants.

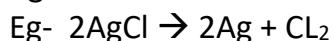
**IV ANSWER THE FOLLOWING IN 3-4 SENTENCES EACH :-**

**1. Explain three types of decomposition reactions with the help of balanced chemical equations for each.**

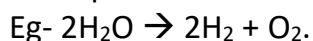
Ans: **Thermal decomposition**: Decomposition reaction is carried out by heating.



**Photochemical decomposition** : Decomposition reaction is carried out when exposed to sunlight.

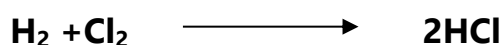


**Electrolytic decomposition** : Decomposition occurs when electric current is passed through the aqueous solution of compound.

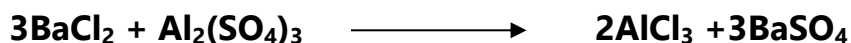


**2. Write the following chemical reactions statements into balanced chemical equation.**

1. Hydrogen gas reacts with chlorine to form hydro chloric acid.

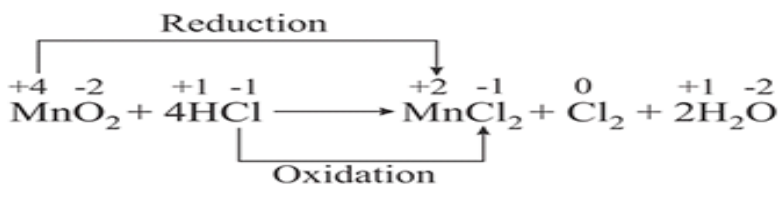
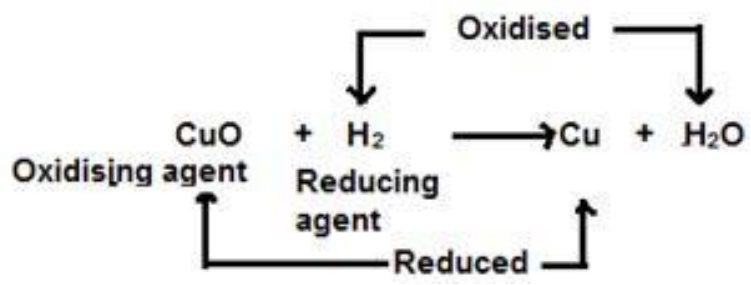


2. Barium chloride reacts with aluminium sulphate to form aluminium chloride and precipitate of barium sulphate.

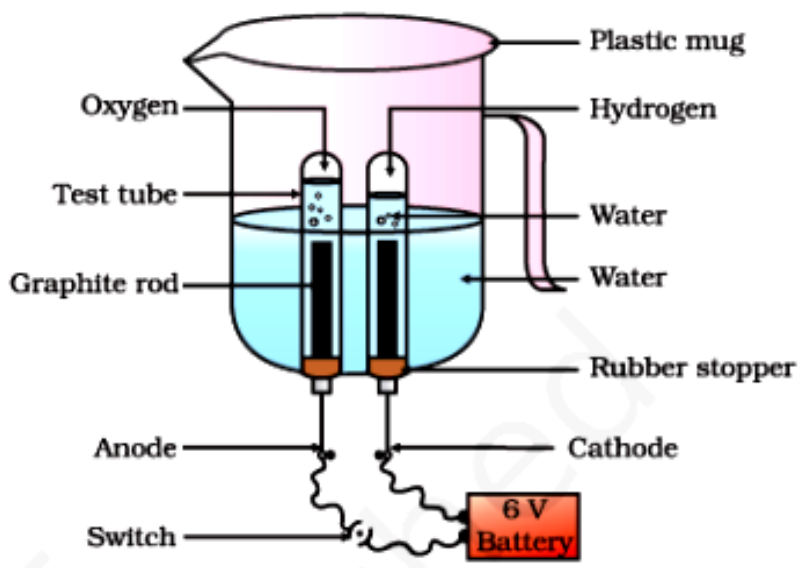


**3. What are redox reactions ? give example.**

The reactions in which both oxidation and reduction takes place simultaneously are called redox reactions.



4. Draw a diagram of Electrolysis of water.





## CHAPTER-2 ACID, BASES AND SALTS



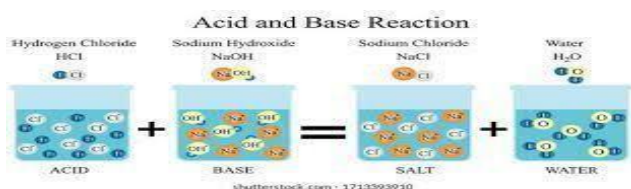
### CHEMICAL PROPERTIES OF ACIDS AND BASES

Reaction with metals

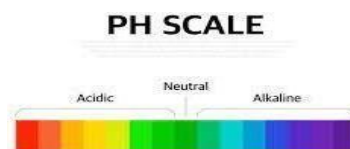
Reaction with metal carbonates and metal Hydrogen carbonates

Reaction between acid and a base

### WHAT DO ALL ACIDS AND BASES HAVE IN COMMON



### HOW STRONG ARE ACID OR BASE SOLUTIONS ???



### IMPORTANCE OF PH



SALTS, FAMILY OF SALTS

Bleaching powder



Baking soda, Washing soda, Plaster of Paris.

**I FOUR ALTERNATIVES ARE GIVEN FOR EACH QUESTION ,CHOOSE THE MOST APPROPRIATE ONE:-**

1) The chemical formula of bleaching powder

- 1) CaOCL 2) CaOC 3) CaOCL<sub>2</sub> 4) CaOCL<sub>3</sub>

**Ans: 3) CaOCL<sub>2</sub>**

2) Identify the chemical from Chlor alkali process which is used for degreasing metals

- 1) NaOH 2) CL<sub>2</sub> 3) H<sub>2</sub> 4) Hcl

**Ans: 1) NaOH**

3) The compound used for making surfaces smooth

- 1) Na<sub>2</sub>CO<sub>3</sub> 10 H<sub>2</sub>O 2) CaSO<sub>4</sub>1/2H<sub>2</sub>O 3) NaHCO<sub>3</sub> 4) CaOCL<sub>2</sub>

**Ans: 2) CaSO<sub>4</sub>1/2H<sub>2</sub>O.**

4) The acid responsible for pain and irritation by bee-sting

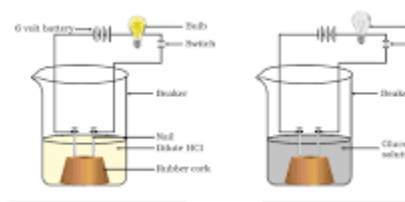
- 1) Citric acid 2) Lactic acid 3) Oxalic acid 4) Methanoic acid.

**Ans: 4) Methanoic acid**

5) The strength of acids and bases depends on the number of

- 1) OH<sup>-</sup> and H<sup>+</sup> 2) H<sup>+</sup> and OH<sup>-</sup> 3) H<sup>+</sup> and H<sub>3</sub>O<sup>+</sup> 4) OH<sup>-</sup> and H<sub>3</sub>O<sup>+</sup>

6)



In the 1<sup>st</sup> picture the bulb is glowing and in the 2<sup>nd</sup> picture bulb do not glow

1) In the 1st picture the solution taken must be strong acid and ions are available

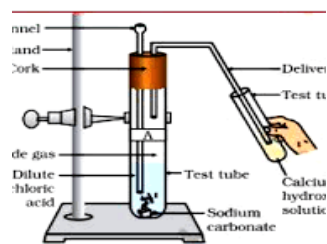
2) In the 2nd picture the solution taken must be distilled water no free ions are available.

3) In the 1<sup>st</sup> picture the solution taken must be very diluted acid and no ions available.

4) In the 2<sup>nd</sup> picture the solution taken must be glucose and no free ions are available.

**Ans: 1) In the 1st picture the solution taken must be strong acid and ions are available.**

7)

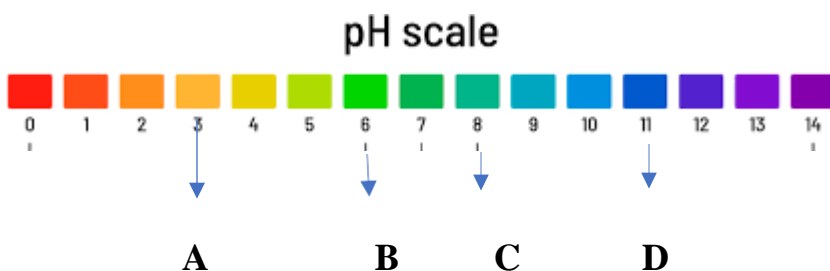


In the picture given the gas evolved and collected from the delivery tube into the test tube which turns  $\text{CaCO}_3$  milky

1)  $\text{CO}$  2)  $\text{CO}_2$  3)  $\text{H}_2$  4)  $\text{H}_2\text{O}$

**Ans: 2)  $\text{CO}_2$**

8)



The most acidic amongst the above given data

1) A and B 2) C and D 3) A 4) D

**Ans: 3) A**

## **II ANSWER THE FOLLOWING QUESTIONS:-**

**1) List out the properties of acid.**

**Ans:**

- Acids are sour in taste
- pH values are in the range of 1-6
- Good conductors of electricity
- Turns blue litmus red
- Corrosive in nature
- Proton donor.

**2) List out the properties of base**

**Ans:-**

- Bases are bitter in taste
- pH values are in the range of 8-14
- Turns red litmus blue
- Conducts electricity in their aqueous state.
- Soapy in texture
- Proton acceptor.

**3) What are olfactory indicators?**

**Ans:-**The substances whose odor changes in acidic or basic media are called olfactory indicators. Ex- Onion, vanilla extract.

**4) What are neutralization reactions?**

**OR**

**How does an acid and base react with each other?**

**Ans:** The reaction between an acid and base to produce a salt and water is known as neutralization reactions



**5) Name the gas released when a metal reacts with acids. How will you test for the presence of this gas? Illustrate with an example.**

**Ans: Hydrogen gas**



**We can test hydrogen gas evolved by burning H<sub>2</sub> gas with a candle which makes a pop sound.**

**6) Name the compounds used in the following,**

- 1) In baking industry-      Ans ) Sodium hydrogen carbonate**
- 2) As an antacid-            Ans ) Sodium hydrogen carbonate**
- 3) As a fire extinguisher-    Ans) Sodium hydrogen carbonate.**
- 4) To support the fractured bones- Calcium sulphate hemihydrate.**
- 5) To remove the permanent hardness of water- Sodium carbonate.**

**7) Plaster of Paris is stored in moisture proof containers. Why?**

**Ans: Plaster of Paris reacts with water or moisture content and then sets.**

**8) Pickles and sour substances are not stored in copper and brass vessels. Why?**

**Ans; Pickles and sour substances has acids in them they corrrode the vessels and produce harmful substances which are inedible and not good for health.**

**9) List out the products produced in chlor-alkali process and state its uses.**

**Ans: At cathode Hydrogen gas is released**

**Uses- Fuels, margarine, ammonia for fertilizers**

**at anode- Chlorine gas is released.**

**Uses- Water treatments, swimming pools, PVCs and CFCs**

**Near cathode solution- Sodium hydroxide**

**Uses- Soaps and detergents, paper making, artificial fibers.**

**10) What are the chemical names of the following, how are they produced?**

**Write down any two uses**

**1) Bleaching powder**

**2) Baking powder**

**3) Washing soda**

**4) POP**

**Ans:-1) Calcium sulphate hemihydrate ( $\text{CaOCL}_2$ )-Bleaching powder is produced by the action of chlorine on dry slaked lime.**



**Uses-**

- Bleaching cotton and linen in textile industry
- Oxidizing agent
- Disinfecting drinking water
- Bleaching wood pulp in paper factory

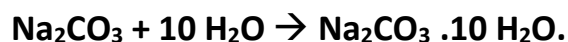
**2) Baking powder- Sodium hydrogen carbonate ( $\text{NaHCO}_3$ .) It is produced by reaction between sodium chloride with ammonia. Water and carbon dioxide.**



**Uses-**

- Manufacture of baking powder
- As antacid
- Soda acid fire extinguisher.
- Used in bakery.

**3) Washing soda-Sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) Recrystallization of sodium carbonate produces washing soda.**



**Uses;**

- Glass, soap and paper industry
- Manufacture of borax

- Cleaning agent
- Remove permanent hardness of water.

4) POP-Plaster of Paris – calcium sulphate hemihydrate(  $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ )

On heating gypsum at 373 K it loses water and pop is formed



Uses;-

- Supporting fractured bones
- Making toys
- Materials for decoration
- Making surfaces smooth.

### III ANSWER THE FOLLOWING QUESTIONS:-

1) You have been given two solutions 'A' and 'B'. The PH of A is 4 and PH of B is 9. Which solution is more acidic and why?

Ans: The PH of solution A is more acidic as it produces more hydrogen ion concentration than the solution of B with PH 9 which is basic.

2) You have been given three solutions in three test tubes 1,2, and 3 respectively. These test tubes have distilled water basic and acidic solutions respectively. You have been given only blue litmus paper. How are you going to identify the content of the test tubes?

Ans: If it shows slight change in color than it is distilled water, if it shows no change in color than it is basic and if it shows color change from blue to red than it is acidic.

3) Two students, X and Y want to prepare dilute  $\text{H}_2\text{SO}_4$  Student X adds  $\text{H}_2\text{SO}_4$  to water slowly with constant stirring and cooling, whereas Y adds water to  $\text{H}_2\text{SO}_4$ . Which one has followed the correct method and why?

Ans: Student X is correct, and Y is wrong. Dilution or dissolving of an acid or a base in water is highly exothermic.

If water is added directly the mixture will splash and causes burns.

The glass container may also break due to excessive local heating.

4) Dry pellets of base X when kept in open absorb moisture and turns sticky. This X is formed in chlor alkali process as a by-product. Write the chemical name and state its uses.

Ans; X is sodium hydroxide.

Uses-

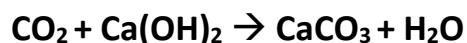
- Soaps and detergents
- Degreasing agent

5) Toothpastes used for brushing are generally basic. Justify

Ans: For cleaning the teeth, to neutralize excess acids produced in mouth when pH is lower than 5.5 and to prevent tooth decay.

6) A salt X is taken in test tube and about 2ml of HCL is added. Colourless and odourless gas y is produced which turns lime water milky due to the formation of Z . Identify X,Yand Z write down the chemical equation.

Ans: Salt X is  $\text{Na}_2\text{CO}_3$ . Y is  $\text{CO}_2$  and Z is  $\text{CaCO}_3$



7) A person is suffering from excessive acidity in his stomach. He has been suggested to drink homemade soda. After he takes it his problem reduces and he gets relief. What type of reaction might have taken place?

Ans: Neutralization reaction. Homemade soda is mild base it reacts with acid to produce salt and water and nullifies its effect and reduces irritation.

8) What are the colour changes of an acidic basic and neutral solution with methyl orange, phenolphthalein and litmus paper?

Indicator	Acid solution	Basic solution	Neutral solution
Blue litmus solution	Red	No change in colour	No change in colour
Red litmus solution	No change in colour	Blue	No change in colour
Methyl orange	Red	Yellow	Orange
Phenolphthalein	Colourless	Red	Colourless

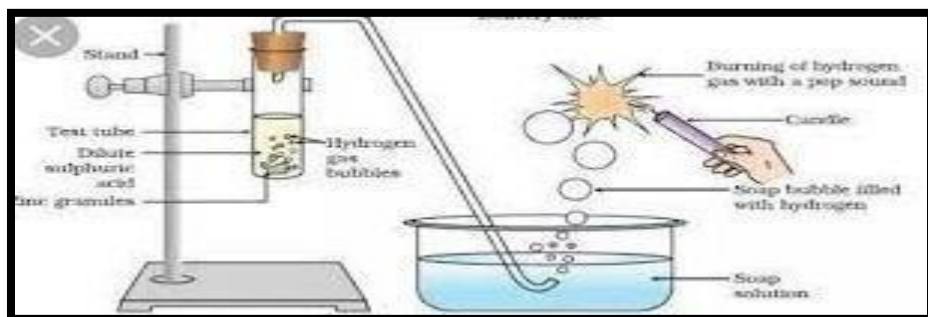


9) Name the acid present in antsting and give its chemical formula.

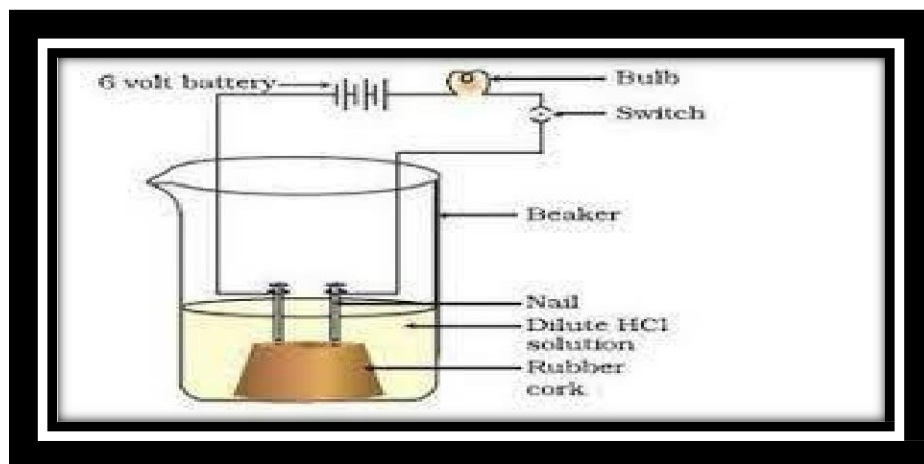
Ans : Ant sting contains methanoic acid and the chemical formula is  $\text{HCOOH}$ .

10) Draw a diagram showing the reaction of zinc granules with dilutesulphuricacid.

Ans:

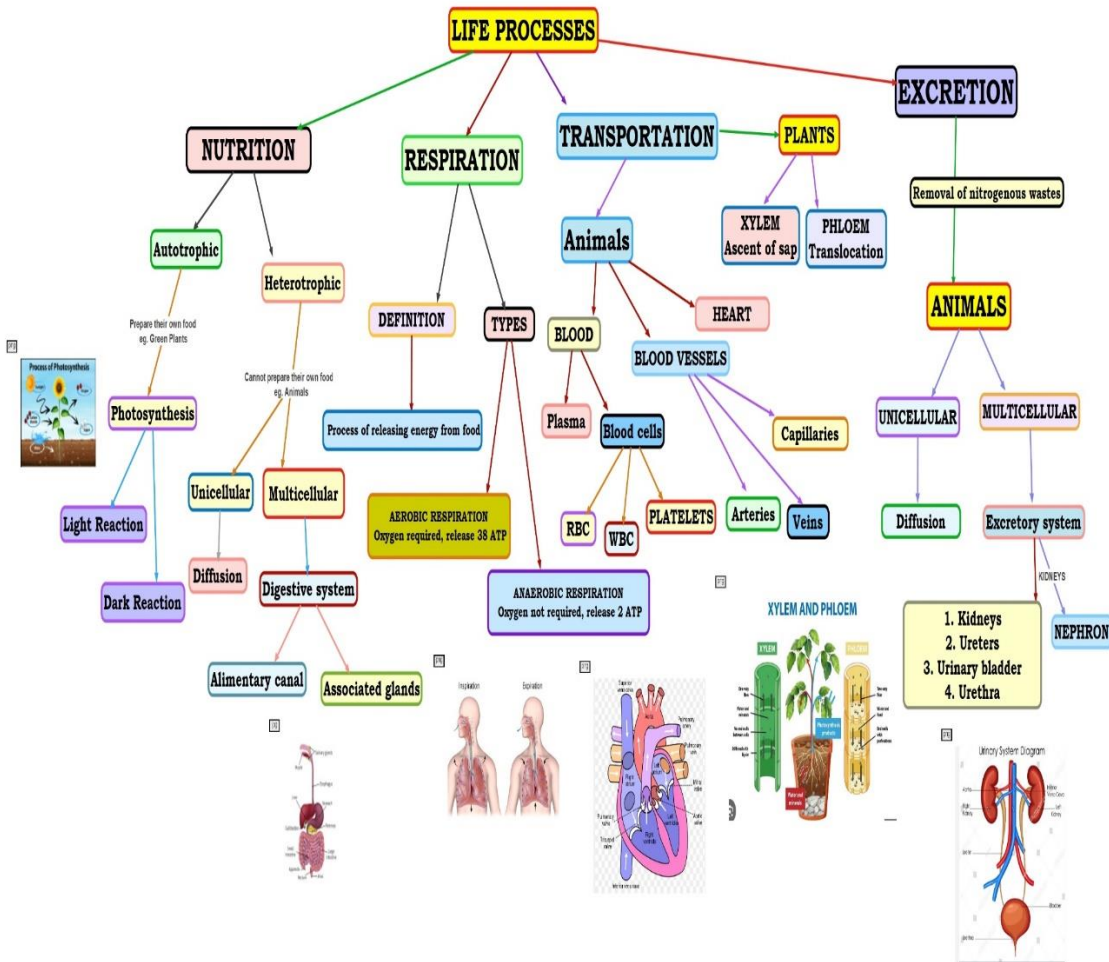


11) Draw a diagram showing acid solution in water conducts electricity.Ans;



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# Chapter - 5 “LIFE PROCESSES”



## 1. What is transportation of materials?

It is the process of movement of oxygen, CO<sub>2</sub>, waste substances and secretion of glands from the region of availability to the region of storage or excretory organs.

## 2. What is transpiration?

The process of loss of water from the plant body in the form of water vapor especially through stomata is called transpiration.

## 3. Define Translocation?

Transport of soluble products of photosynthesis through phloem is called translocation.

## 4. What is the role of valve in veins?

Valves prevent the backflow of blood in veins.

**5. Write the functions of Lymph?**

It helps in production of antibodies and transportation of fat.

**6. What do you mean by double circulation of blood?**

Blood goes through the heart twice during each cycle in the body is known as double circulation.

**7. Differentiate between Xylem and phloem?**

Xylem - water conducting tissue.

Phloem- food conducting tissue.

**8. What is the normal blood pressure of a healthy person?**

The normal blood pressure of healthy person is 120/80 mm Hg.

**9. What is excretion?**

The process of removal of nitrogenous waste substances produced during metabolic activities of the body is called excretion.

**10. Which is the structural and functional unit of human kidney?**

Nephrons

**11. Name the major nitrogenous waste filtered by kidney?**

Urea

**12. Which process is helpful during kidney failure?**

Dialysis.

**13. What is the function of capillaries?**

Helps in exchange of materials between blood and cells through tissue fluid.

**14. Give reason:**

**a) 'Ventricles of the human heart have thick wall.'**

Since ventricles have to pump blood into various organs.

**b) 'It is necessary to separate oxygenated and deoxygenated blood in mammals and birds.'**

Since they need more energy to maintain their body temperature constant.

**15. Which molecule is formed during the first step of cellular respiration by the breakdown of glucose molecule in cytoplasm?**

Pyruvate.

**16. Which are the factors essential for photosynthesis?**

The Factors essential for photosynthesis: Carbon dioxide, water, minerals, sunlight and chlorophyll.

**17. Mention the types of respiration and write any two differences between them.**

The two types of respiration are: i) Aerobic respiration ii) Anaerobic respiration

Aerobic respiration	Anaerobic respiration
Atmospheric oxygen is utilised	Atmospheric oxygen is not utilised
Liberates more energy with carbon dioxide and water	Liberates less energy with ethanol and carbon dioxide
Takes place in mitochondria	Takes place in higher levels of organisms
Takes place in cytoplasm	Takes place in lower organisms like yeast

**18. What is the major function of xylem in plants?**

In plants the major function of xylem is the transportation of water

**19. “The rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms.” Why?**

Because, the amount of dissolved oxygen is fairly low compared to the amount of oxygen in the air.

**20. “The body temperature of frogs and lizards depend on temperature in the environment.” Justify**

Both frogs and lizards have three chambered heart. Oxygenated and deoxygenated blood mix in the heart. Production of energy became slightly less. This energy cannot be used for maintaining constant temperature.

**21. The site of complete digestion of carbohydrates, proteins and fats is**

Ans.: small intestine

**22. In humans, how is the digested food absorbed by the blood?**

Absorbed by finger like projections Villi present in small intestine

**23. Eating chapathi by chewing it very slowly tastes sweeter. Why?**

While chewing chapathi saliva is secreted. Chapathi contains starch. The salivary amylase breaks down starch into simple sugars.

**24. Mention the function of blood in transporting necessary materials.**

- Blood plasma — transports food, carbon dioxide and nitrogenous wastes
- RBC — Carries oxygen
- Many other substances like salts are also transported by blood.

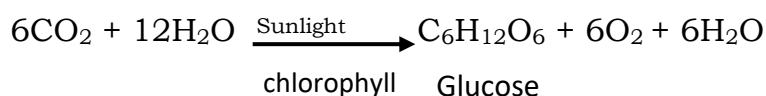
**25. Mention the events that occur during this process and represent this process by balanced chemical equation**

Events that occur during photosynthesis are:

- Absorption of light energy by chlorophyll.

- Conversion of light energy into chemical energy.
- Splitting of water molecules into hydrogen and oxygen molecules.
- Reduction of carbon dioxide into carbohydrates.

**Equation:**



**26. Explain the stages of ‘double circulation’ of the blood in humans.**

Transportation of blood in heart:

- Oxygen-rich blood from the lungs comes to the left atrium.
- When the left atrium relaxes and contracts then blood gets transferred to left ventricle
- When the left ventricle contracts the blood is pumped out to the body through aorta.
- De-oxygenated blood comes from the body to the right atrium.
- As the right atrium contracts the blood get transferred to the right ventricle.
- On contraction of right ventricle, the blood goes to the lungs for oxygenation.

**27. What is blood pressure? Name the instrument and unit used to measure blood pressure.**

The force that blood exerts against the wall of arteries is called blood pressure. Blood pressure is measured with an instrument called sphygmomanometer and in mmHg.

**28. Write the important components and their functions of blood.**

The components of blood are

- i) Plasma: It helps in the transport of nutrients, salt waste materials, Hormones and antibodies.

- ii) Red blood corpuscles: helps in the transportation of oxygen and carbon dioxide.
- iii) White blood corpuscles: helps in protection by destroying disease causing micro organisms
- iv) Blood platelets: helps in the synthesis of thromboplastin for the clotting of blood.

**29. List any three differences between artery and vein.**

<b>Artery</b>	<b>Vein</b>
i. Carry oxygenated blood away from the heart except pulmonary artery.	<b>i.</b> Carry deoxygenated blood towards the heart except pulmonary vein.
ii. Mostly deeply situated in the body	<b>ii.</b> Superficial and deep in location
iii. Have thick, elastic walls	<b>iii.</b> Thin walled

**30. Four chambered heart in Mammals is efficient than three chambered heart of reptiles. Give reason.**

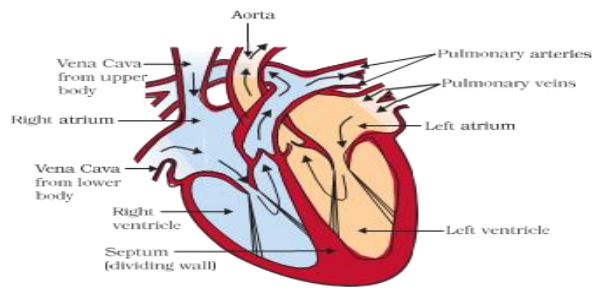
Four chambered heart prevents mixing of oxygenated and deoxygenated blood. Such separation allows a highly efficient supply of oxygen to the body. This is useful in animals that have high energy needs such as birds and mammals, which constantly use energy to maintain their body temperature.

**31. What are the methods used by plants to get rid of excretory products?**

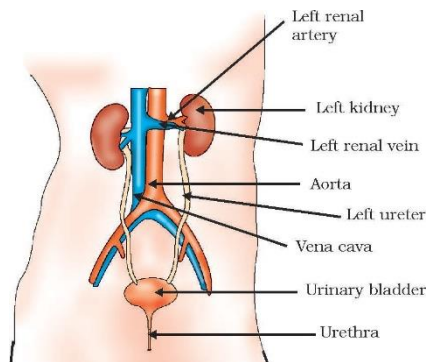
Methods to get rid of excretory products in plants:

- Excess of water removed by transpiration
- Remove oxygen and carbon dioxide gases through stomata
- Waste products and dead cells in vacuoles by shedding leaves / barks
- Resins and gums get store in old xylem
- Diffusing certain wastes into surrounding soil.

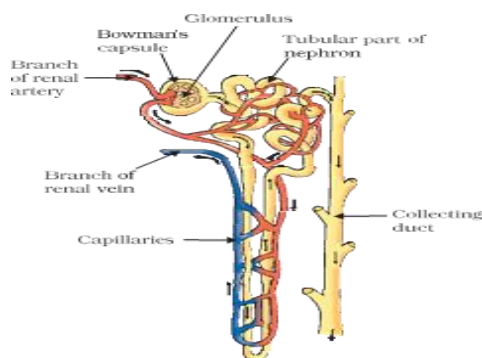
**32. Draw a neat labeled diagram of human heart?**



**33. Draw a neat labelled diagram showing excretory system of man?**



**34. Draw a neat labelled diagram of basic unit of kidney or Nephron?**



**35. How are the functions of arteries, veins and capillaries are interrelated in the circulation of blood?**

- Arteries carry blood away from the heart to various organs of the body. On reaching an organ or tissue, the artery divides into



smaller and smaller vessels to bring the blood in contact with all the individual cells.

- Exchange of material between the blood and surrounding takes place across the thin wall of smallest vessels, the capillaries.
- The capillaries then join together to form veins. Veins convey the blood away from the organ or tissue. Veins collect the blood from different organs and bring it back to the heart.

**36. How does transportation of water take place over the heights in a plant?**

- At the roots, cells in contact with the soil actively take up ions.
- This creates a difference in the concentration of these ions between the root and the soil.
- Water moves into the root from the soil to eliminate this difference.
- There is a steady movement of water into root xylem, creating a column of water that is steadily pushed upwards.
- Evaporation of water molecules from the stomata of leaves due to transpiration creates a suction which pulls water from xylem cells of root.

**37. Compare the functions of xylem tissue with that of phloem tissue.**

Xylem	Phloem
Transport water and minerals / inorganic materials	Transport food / organic materials
Flow of materials is unidirectional	Flow of materials is in two directions (upward and downward)
Xylem tracheids and vessels transport materials from root to shoot	Sieve tube and companion cells transport materials to all the parts from leaves
Works by suction pressure	Works by osmotic pressure

**38. Explain the process of exchange of gases that take place through stomata in plants.**

In plants the large intercellular spaces and all the cells are often in contact with air, due to this CO<sub>2</sub> and oxygen are exchanged by diffusion here. This means Gases can go into cells and away from them and out into the air / atmosphere.

**39. Explain the digestion of food materials in stomach and small intestine.**

**Stomach:**

- Gastric glands present in the wall of the stomach release hydrochloric acid, pepsin and mucus
- Hydrochloric acid creates an acidic medium which facilitates the action of pepsin.
- Pepsin digests protein.

**Small intestine:**

- It receives pancreatic juice and bile juice.
- Bile juice makes the food alkaline.
- Bile salts emulsify the fats in the small intestine.
- Trypsin helps to digest the proteins.
- Lipase breaks down the emulsified fats.
- Enzymes present in the small intestinal juice convert proteins into amino acids, complex carbohydrates into glucose and fats into fatty acids and glycerol.

**40. Explain the role of xylem and phloem tissues in the transportation of materials in plants.**

**Xylem:**

- Water conducting tissue.
- In xylem tissue, vessels and tracheids of the roots, stem and leaves are interconnected to form a continuous system of water-conducting channel reaching all parts of the plant.

- Transpiration (loss of water through stomata) creates suction pressure and creates a column of water.
- This steadily pushes the water upward with dissolved minerals in it.

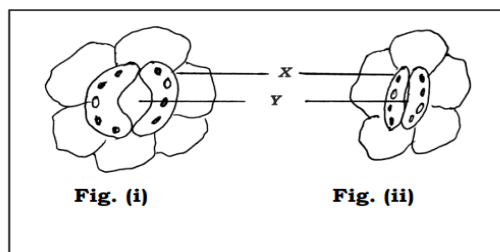
**Phloem:**

- Food conducting tissue.
- Phloem translocate soluble products of photosynthesis, amino acids and other substances from the leaves to storage and growing organs.
- Translocation takes place in sieve tube with the help of companion cell, both in upward and downward directions.
- Osmotic pressure helps water to move into the phloem tissue and moves other materials from the phloem to other tissues.

**41. How is the structure of human heart supportive in transporting oxygenated blood and deoxygenated blood? Explain.**

- Human heart has different chambers.
- The valves present in between the chambers prevent backward flow of blood separated by dividing wall septum
- Septum is responsible for creating separate pathways to transport oxygenated and deoxygenated blood.

**42. Observe the given below figures:**



**a) Which figure indicates the massive amount of exchange of gases? Why?**

Fig. (i) / Open stomata

It is because the stomatal pore is open.

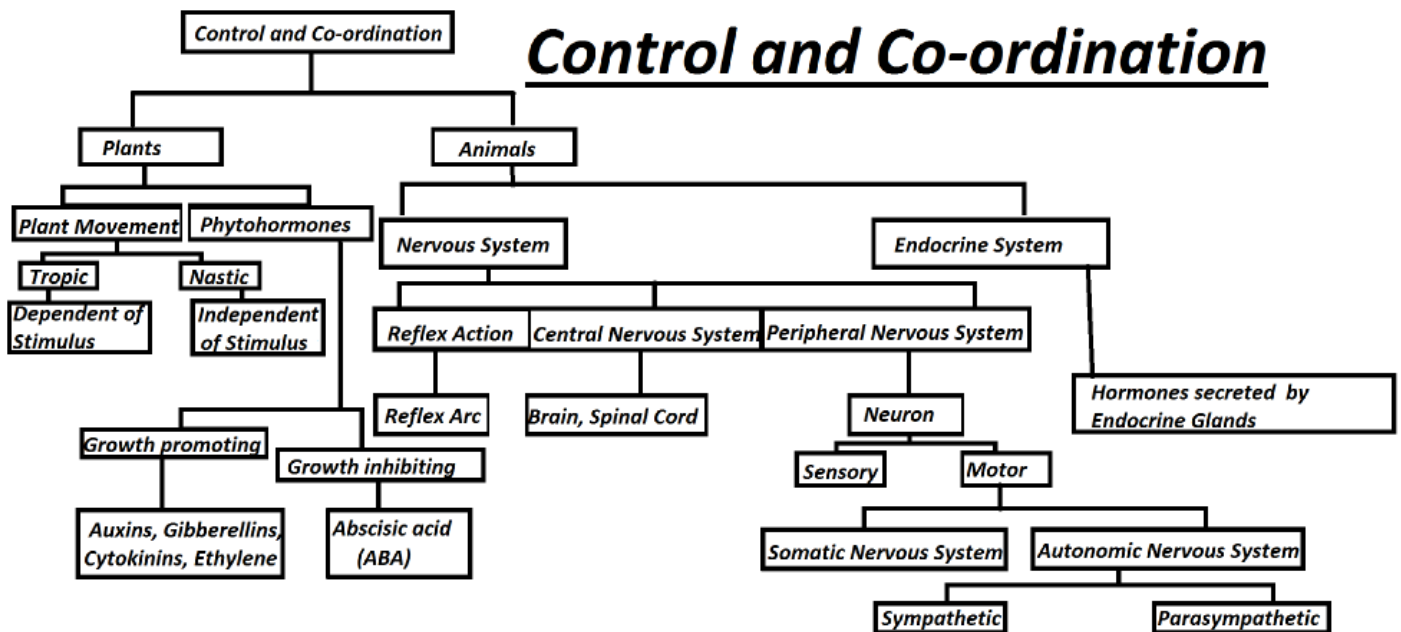
b) Name the parts X and Y. What is the function of other part X?

X — Guard cell

Y — Stomatal pore

Regulates opening and closing of stomatal pore

## Chapter – 6 “CONTROL AND COORDINATION”



### MULTIPLE CHOICE QUESTIONS

1. In a neuron, conversion of electrical signal to a chemical signal occurs at/in

- A. cell body    B. nerve endings    C. dendritic end    D. axon

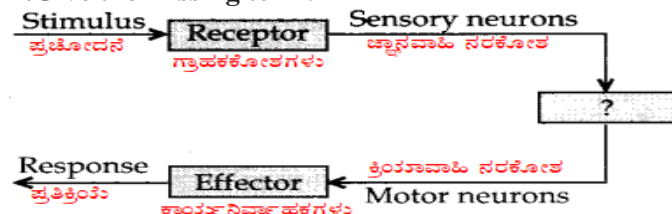
2. Electrical impulse travels in a neuron from

- A. Dendrite → axon → nerve endings → cell body  
 B. Cell body → dendrite → axon → nerve endings  
 C. Dendrite → cell body → axon → nerve endings  
 D. Nerve endings → axon → cell body → dendrite

3. Junction between the terminal end of a motor nerve and a muscle is called

- A. cell junction    B. neuro muscular junction    C. neural joint    D. Synapse

4. Give the missing term.



- A. Spinal cord    B. Brain    C. Cranial nerves    D. Relay neuron

**5. Hormone responsible for bending of the plant towards light is**

- A. auxin      B. gibberellin      C. abscisic acid      D. cytokinin

**6. Spinal cord originates from**

- A. cerebrum      B. medulla      C. pons      D. Cerebellum

**7. Growth of plant roots towards or away from moisture is**

- A. geotropism      B. hydrotropism      C. chemotropism      D. Phototropism

**8. Select the mis-matched pair**

- A. Adrenaline: Emergency Hormone      B. Abscisic acid: Stress Hormone  
C. Pituitary : Master gland      D. Thyroxin: Growth Hormone

**9. The hormone that triggers the fall of mature leaves and fruits from plants is due to**

- A. auxin      B. gibberellin      C. abscisic acid      D. cytokinin

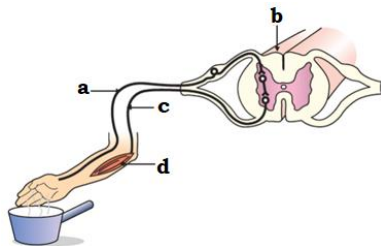
**10. Which hormone brings about development of mammary gland?**

- A. Estrogen      B. Progesterone      C. Testosterone      D. Oxytocin

**11. The growth of pollen tubes towards ovules is due to**

- A. hydrotropism      B. chemotropism      C. geotropism      D. Phototropism

**12. The parts (a), (b), (c) and (d) shown in given Figure are**



- A. a) Muscle b) Sensory neuron c) Motor neuron d) Spinal cord  
B. a) Sensory neuron b) Motor neuron c) Spinal cord d) Muscle  
C. a) Sensory neuron b) Spinal cord c) Motor neuron d) Muscle  
D. a) Muscle b) Spinal cord c) Motor neuron d) Sensory neuron

### Answers

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>B</b>	<b>C</b>	<b>B</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>B</b>	<b>D</b>	<b>C</b>	<b>A</b>	<b>B</b>	<b>C</b>

### IMPORTANT QUESTIONS AND ANSWERS

**1. Name the two systems in the organisms which help in control and coordination?**

- (1) Nervous system      Endocrine system

**2. What is neuron?**

The basic structural and functional unit of a nervous system is called neuron.

**3. What is a reflex action? Give an example.**

An automatic response to a stimulus is called reflex action.

*Example:* withdrawal of hand from hot object.

**4. Name the center of reflex action?**

Spinal cord.

**5. What is the role of dendrites?**

The role of **dendrites** is to carry nerve impulses towards the cell body of a neuron. It receives information from axon of other neuron through synapse.

**6. What is synapse?**

A small gap between two neuron, which convert chemical impulses to electrical impulses.

**7. What is the role of axon?**

**Axon** conducts impulses away from the cell body to another neuron or tissue through synapsis.

**8. What is reflex arc?**

The pathway of nerve impulses involved in the reflex action is called the reflex arc.

**9. Mention the three divisions of human nervous system.**

- i) Central nervous system (CNS)
- ii) Peripheral nervous system (PNS)
- iii) Autonomous nervous system (ANS)

**10. Mention the two parts of central nervous system of human beings.**

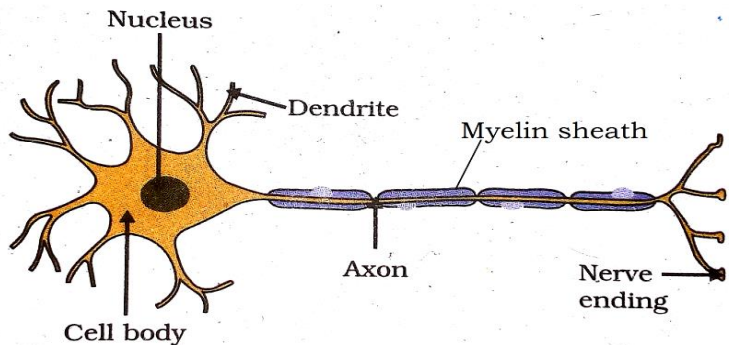
The CNS includes the brain and spinal cord.

**11. Name the two parts of peripheral nervous system of human beings?**

Cranial nerve arising from the brain and spinal nerves arising from spinal cord.

## 12. Explain the structure and function of neuron?

The basic structural and functional unit of a nervous system is called neuron.



### Structure of neuron

- The part consisting of a prominent nucleus is the cell body/cyton.
- The short brush like structures arising from the cell body is called dendrites.
- The long extension of the cell body is the axon.
- The axon ends in a bunch of branches called nerve ending.
- The axon is covered by a fatty sheath called myelin Sheath.

### Function of neuron

- The information, acquired at the end of the dendritic tip of a nerve cell sets off a chemical reaction
- This reaction creates an electrical impulse.
- This impulse travels from the dendrite to the cell body, and then along the axon to its end.
- At the end of the axon, the electrical impulse sets off the release of some chemicals.
- These chemicals cross the gap, or synapse, and start a similar electrical impulse in a dendrite of the next neuron.
- A similar synapse finally allows delivery of such impulses from neurons to other cells, such as muscles cells or gland.

**13. Mention its five components of reflex arc?**

. The five components of reflex arc:

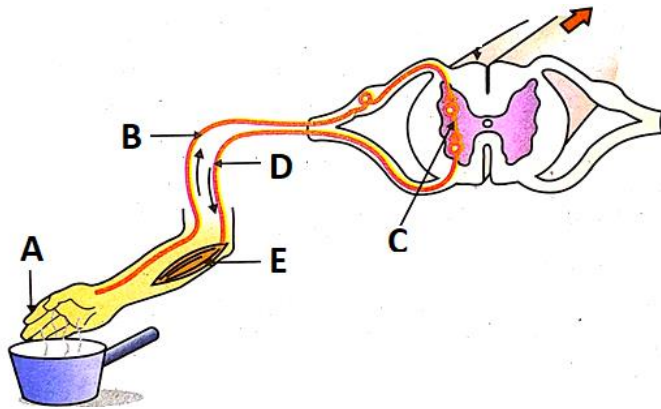
- (i) **Receptor** (sense organs): Receives the stimuli.
- (ii) **Sensory neuron**: That conducts impulse from receptor to spinal cord. (Afferent)
- (iii) **Association neuron**: Transmits impulses from sensory neuron to motor neuron. (Mixed)
- (iv) **Motor neuron**: Pass impulses to the effectors. (Efferent)
- (v) **Effectors**: The organ which gives proper response

**14. Observe the given diagram and name the parts labelled**

**A, B, C, D, and E, and write their role.**

**OR**

**Draw a labeled illustrative diagram of reflex arc involved in reflex action when we touch a hot plate.**



**A- Receptor** (sense organs): Receives the stimuli.

**B- Sensory neuron**: That conducts impulse from receptor to spinal cord.  
(Afferent)

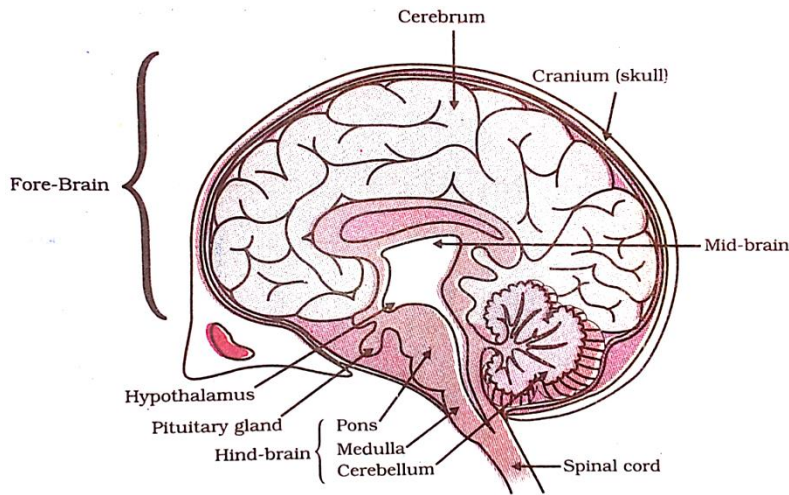
**C- Association neuron**: Transmits impulses from sensory neuron to motor neuron. (Mixed)

**D- Motor neuron**: Pass impulses to the effectors. (Efferent)

**E- Effectors**: The organ which gives proper response.



**14. Draw the vertical section of human brain.**



**16. Write the functions of fore brain, Mid brain and Hind brain of human beings?**

Parts of brain		functions
Fore brain	cerebrum	Cerebrum controls the functions of perception of smell, sight, and hearing, ability of speech and movements of various parts of the body.
	hypothalamus	It regulates the body temperature, water balance, appetite and sleep. It also controls autonomic nervous system and pituitary gland.
Mid brain		Which serves as a centre for certain visual and auditory (hearing) reflexes. The mid-brain contains a group of nerve cells which regulates involuntary actions of muscles
Hind brain	pons	It regulates respiration, facial expression and mastication.
	Medulla oblongata	It regulates the involuntary actions like blood pressure, salivation and vomiting, coughing, sneezing.
	cerebellum	It controls activities like walking in a straight line, riding bicycle, picking up a pencil.

**15. Explain how brain and spinal cord are protected?**

A delicate organ like the brain, which is important for a variety of activities, needs to be carefully protected. For this, the body is designed so that the brain sits inside a body box. Inside the box, the

brain is contained in a cerebrospinal fluid-filled balloon which provides further shock absorption. If you run your hand down the middle of your back, you will feel a hard, bumpy structure. This is the vertebral column or backbone which protects the spinal cord.

**16. How does the nervous tissue cause action?**

Brain collects information around the body through nerves. Makes decisions based on information and conveys decisions to muscles for action.

When a nerve impulse reaches the muscle, the muscle fiber must move. Muscles cells have special proteins that change both their shape and their arrangement in the cell in response to nervous electrical impulses. New arrangement of these proteins gives the muscle cells a shorter form and this leads to movement of the muscle. After the action is over, reverse process takes place and the muscles take their original size and shape.

**“ COORDINATION IN PLANTS”**

**17. What is tropism? OR What is meant by tropic movement?**

The directional response of the plants towards or away of the stimulus such as light, water, gravity, etc., is known as **tropism**.

**18. Name the types of movements in plants.**

- a) Growth dependent or Tropic movement
- b) Growth independent or nastic movements

**19. Explain the movements in the mimosa pudica ( ‘touch me not’ plant).**

**20. Name the types of tropism And explain?**

- a. **Phototropism:** it is the movement of a part of the plant in response to light.

Shoot generally grow towards light and are said to be **positive**

**phototropism**

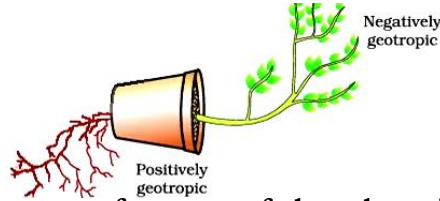
While roots away from the light and are said to be **negatively**

**phototropism**

b. **Geotropism:** it is the upward and downward growth of shoots and roots in response to the pull of earth or gravity.

If the plant moves in the direction of gravity it is called **positive geotropism**

If the plant part moves against the direction of gravity, it is termed as **negative geotropism.**



c. **Chemotropism:** it is movement of a part of the plant in response to a chemical stimulus.

d. **Hydrotropism:** it is the movement of a part of the plant in response to water.

## 21. What are Plants hormones?

The chemical substances that are naturally produced in plants and are capable of regulating the important processes of plants.

## 23. Explain the role of growth regulators or growth hormones found in plants.

**(a) Auxins:** Auxins promote cell elongation and division, helps in the formation of roots and seedless fruits. It also leads to apical dominance and phototropism.

**(b) Gibberellins:** They initiate cell division, cell elongation, induce flowering, lead to development of fruits. In some plants they also induce elongation of stem.

**(c) Cytokinins:** which promote cell and delay aging in leaves. It also helps in opening of stomata. They enhance chloroplast development in leaves.

**(d) Abscisic Acid (ABA):** Abscisic acid retards growth, promotes leaf and fruit fall and causes dormancy of seeds and bulbs. It also causes wilting of leaves.

## 24. How do auxins help in bending of stem towards light?

### Explain.

When growing plants detect light, a hormone called auxin, synthesized at the shoot tip help the cells to grow longer. When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot. This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light. Thus, plant appear to bend towards light.

## “HORMONES IN ANIMALS “

### 1. Define the Hormones?

The chemical substances secreted by endocrine glands are called hormones.

### 2. SOME IMPORTANT HORMONES AND THEIR FUNCTIONS

Sl. No.	Hormone	Endocrine gland	Functions
1.	Growth hormone	Pituitary gland	Stimulates growth in all organs, <b>deficiency causes Dwarfism and gigantism</b>
2.	Thyroxin	Thyroid gland	Regulates carbohydrates, protein and fat metabolism for body growth, <b>deficiency causes Goiter</b>
3.	Testosterone	Testes (Male gonads)	Development of male sex organs
4.	Estrogen	Ovaries (Female gonads)	Development of female sex organs, regulates menstrual cycle, etc.

5.	Adrenaline	Adrenal gland	Regulates the heart beat rate, breathing rate and blood pressure
6.	Releasing hormones	Hypothalamus	Stimulates pituitary gland to release hormones
7.	Insulin	Pancreas	Regulates blood sugar level in the body. <b>Deficiency cause Diabetes mellitus</b>

**3. Why are some patients of diabetes treated by giving injections of insulin?**

Insulin hormone regulates blood sugar levels. If this is not secreted in proper amounts, the sugar levels in the blood rises. This causes many harmful effects. Deficiency of insulin secreted by pancreas also reduces uptake of glucose sugar by the body tissues. This causes harmful on the working of vital organs of the body. To treat harmful effects of increased level of blood sugar, the diabetic patients are provided insulin by injections of insulin.

**4. What happens if are we suffering from iodine deficiency?**

Iodine is deficient in our diet, there is a possibility that we might suffer from goitre. One of the symptoms in this disease is a swollen neck.

**5. Why is it important for us to have iodised salt in our diet?**

Iodine is necessary for the thyroid gland to make thyroxin hormone.

.....

## Chapter 11: Electricity

Sr No	Physical Quantity	S I Unit	Symbol
1	Strength of the current	Ampere	Amp
2	Potential difference	Volt	V
3	Resistance	Ohm	$\Omega$
4	Charge	Columb	C
5	Power	Watt	W
6	resistivity	Ohm metre	$\Omega\text{m}$

1. The instrument which used to measure the presence of electric current is .....
  - a. Ammeter
  - b. Voltmeter
  - c. Galvanometer
  - d. Rheostat
2. The instrument which used to measure the potential difference is .....
  - a. Ammeter
  - b. Voltmeter
  - c. Galvanometer
  - d. Rheostat
3. Ammeter is always connected in ..... with the circuit.
  - a. Series
  - b. Parallel
  - c. Any ways
  - d. None of the above
4. The device used to change the resistance at many times in the electric circuit is
  - a. Electric generator
  - b. Electric motor
  - c. Galvanometer
  - d. Rheostat

5. Voltmeter is always connected in ..... with the circuit.
- Series
  - Parallel
  - Any ways
  - None of the above
6. The function of fuse is .....
- Supplies electrical energy
  - Measures Electric current
  - Measures potential difference
  - Protects the circuit
7. Joule's Law of heating is given by
- $H = IRt$
  - $H = I^2Rt$
  - $H = IR^2t$
  - $H = IRt^2$
8. The relation that establishes relation between Potential difference, Current in the circuit is given by
- $V = IR$
  - $I = \frac{V}{R}$
  - $R = \frac{V}{I}$
  - All the above
9. The power of an electrical appliance can be calculated by the relation
- $P = VI$
  - $H = I^2Rt$
  - $V = IR$
  - None of the above
10. The commercial unit of electrical energy is
- kW h
  - W h
  - kW
  - W
11. What is an electric circuit?
- Continuous and closed path of an electric current is called circuit.

12. Define electric potential difference.

- a. Potential difference between any two points in an electric circuit carrying some current is the work done to move a unit charge from one point to another.

13. State Ohm's law

- a. At constant temperature, the potential difference between two ends of a current carrying conductor is directly proportional to the electric current flowing through it.

$$V \propto I$$

$$V=IR$$

14. Mention the factors on which the resistance of a conductor depends.

- a. Length of the conductor
- b. Area of cross section
- c. Temperature
- d. Nature of the conductor

15. Explain the application of heating effect of electric current in an electric bulb

- a. The electric heating is also used to produce light, as in an electric bulb. Here, the filament must retain as much of the heat generated as is possible, so that it gets very hot and emits light. It must not melt at such high temperature. A strong metal with high melting point such as tungsten (melting point 3380°C) is used for making bulb filaments.

16. How does fuse protects electrical appliances?

- a. Fuse protects circuits and appliances by stopping the flow of any unduly high electric current. The fuse is placed in series with the device. It consists of a piece of wire made of a metal or an alloy of appropriate melting point, If a current larger than the specified value flows through the circuit, the temperature of the fuse wire increases. This melts the fuse wire and breaks the circuit.

17. Series connection not used in domestic circuits. Explain

- a. In a series circuit the current is constant throughout the electric circuit. Thus it is obviously impracticable to connect an electric bulb and an electric heater in series, because they need currents of widely different values to operate properly).



Another major disadvantage of a series circuit is that when one component fails the circuit is broken and none of the components works. Hence series connection not used in domestic circuits.

18. The resistors  $R_1$ ,  $R_2$  and  $R_3$  have the values  $10 \Omega$ ,  $20 \Omega$  and  $60 \Omega$  respectively, which have been parallelly connected to a battery of  $24 \text{ V}$  in an electric circuit. Then calculate the following :

- a. The current flowing through each resistor
- b. The total current in the circuit
- c. The total resistance of the circuit.

$$\text{i) } I_1 = \frac{V}{R_1} = \frac{24 \text{ V}}{10 \Omega} = 2.4 \text{ A}$$

$$I_2 = \frac{V}{R_2} = \frac{24 \text{ V}}{20 \Omega} = 1.2 \text{ A}$$

$$I_3 = \frac{V}{R_3} = \frac{24 \text{ V}}{60 \Omega} = 0.4 \text{ A}$$

$$\text{ii) } I = I_1 + I_2 + I_3$$

$$= (2.4 + 1.2 + 0.4) \text{ A}$$

$$= 4 \text{ A}$$

$$\text{iii) } \frac{1}{R_p} = \frac{1}{10} + \frac{1}{20} + \frac{1}{60} = \frac{1}{6}$$

$$\frac{1}{R_p} = \frac{1}{6}$$

$$R_p = 6 \Omega.$$

19. A bulb is marked  $220 \text{ V}$  and  $40 \text{ W}$ . Calculate the current flowing through the bulb and its resistance. 2 ma

a. Given: p.d =  $220 \text{ V}$

$$P = 40 \text{ W}$$

$$I = ?$$

R=?

Wkt  $P = VI$

$$I = \frac{P}{V}$$

$$I = \frac{P}{V} = \frac{40}{220}$$

$$= \frac{4}{22} = \frac{2}{11} \text{ amps}$$

Now to find R ,

Wkt  $V = IR$  (Ohms law)

$$R = \frac{V}{I}$$

$$I = \frac{220}{2/11} = \frac{220 \times 11}{2} = 110 \times 11 = 1210 \Omega$$

20. The resistivity of manganese wire of length 1 m is  $1.84 \times 10^{-6} \Omega \text{ m}$  at  $20^\circ\text{C}$ . If the diameter of the wire is  $3 \times 10^{-4} \text{ m}$ , what will be the resistance of the wire at that temperature

a. Given  $\rho = 1.84 \times 10^{-6} \Omega \text{ m}$

$l = 1 \text{ m}$

$d = 3 \times 10^{-4} \text{ m}$

R=?

Wkt,

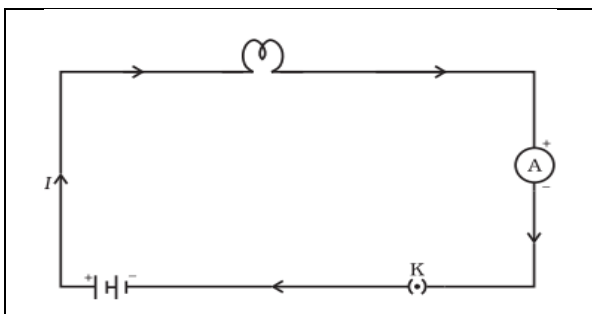
$$R = \rho \frac{l}{A} = 1.84 \times 10^{-6} \frac{1}{3 \times 10^{-4}}$$

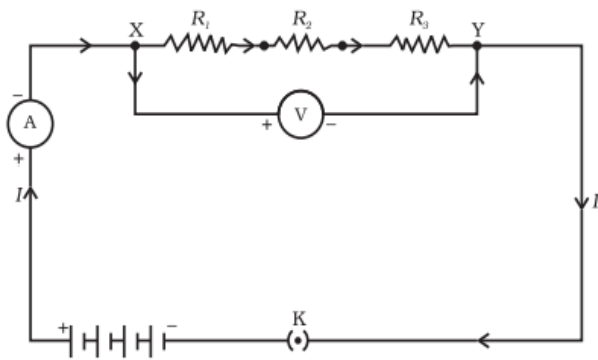
$$\frac{1.84 \times 10^{-2}}{3}$$

$$0.61 \times 10^{-2} \Omega$$

Practice Diagrams and label the parts

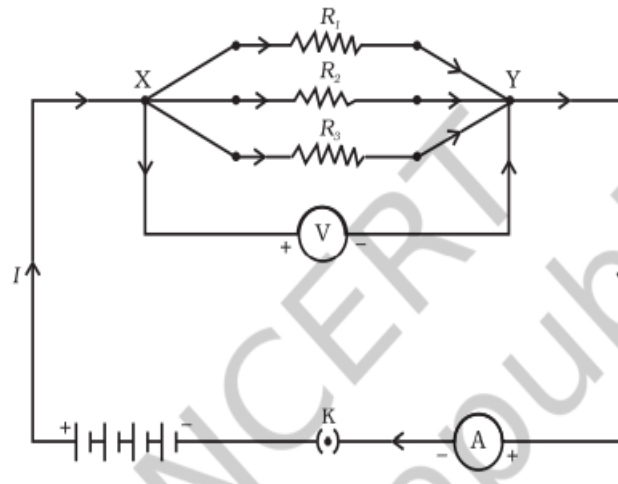
Circuit Diagrams





**Figure 12.6** Resistors in series

said to be connected in parallel.



## Chapter 12 Magnetic effects of electric Current

### 1. When does the galvanometer show deflection in the Oersted experiment?

- When the two ends of the conductor are connected to the two terminals of the battery
- When the two ends of the conductor are connected to the one terminal of the battery
- When one end of the conductor is connected to one terminal of the battery
- all the above

**2. The law that explains the direction of electric current in straight current carrying conductor is \_\_\_\_\_**

- a) Coulomb's law   b) Ohm's law   c) Joule's law   d) Maxwell's right hand thumb rule

**3. The magnetic field produced by a circular coil is in the shape of \_\_\_\_\_ (b)**

- a) Congruent circles   b) concentric circles   c) square   d) rectangle

**4. The strength of the magnetic field at all the points of a solenoid is \_\_\_\_\_ (b)**

- a) Zero   b) equal   c) one   d) infinity

**5. When a current carrying conductor is placed in a strong magnetic field it \_\_\_\_\_ (a)**

- a) Deflects   b) doesn't move   c) thrown away   d) demagnetizes the fields

**6. The law on which the electrical motor works is \_\_\_\_\_ (c)**

- a) When a current carrying conductor is placed in a strong magnetic field it deflects
- b) Fleming's right hand rule   c) Fleming's left hand rule
- d) Electromagnetic induction

**7. The potential difference in domestic wiring is \_\_\_\_\_ (a)**

- a) 220V   b) 750V   c) 0V   d) 440V

**8. What do you mean by magnetic effect of electric current?**

Any current carrying conductor produces a magnetic field around it. This effect is called magnetic effect of electric current.

**9. The circular coil produces the magnetic field in the shape of concentric circles even though it is not a straight conductor. Why?**

Because a circular coil is made of innumerable tiny straight current carrying conductors.

**10.What is electromagnet?**

The magnet produced by passing electric current through a magnetic substance is called electro magnet.

**11..What is electric motor?**

The device that converts electrical energy into mechanical energy is called electric motor.

**12.Name the law on which the electric motor works.**

Flemings Left hand rule.

**13.State Fleming’s left hand rule.**

The thumb forefinger and middle finger of left hand or kept mutually perpendicular to each other and the forefinger giving the direction of the magnetic field And the middle finger given the direction of electric current then the thumb gives the direction of the Mechanical energy.

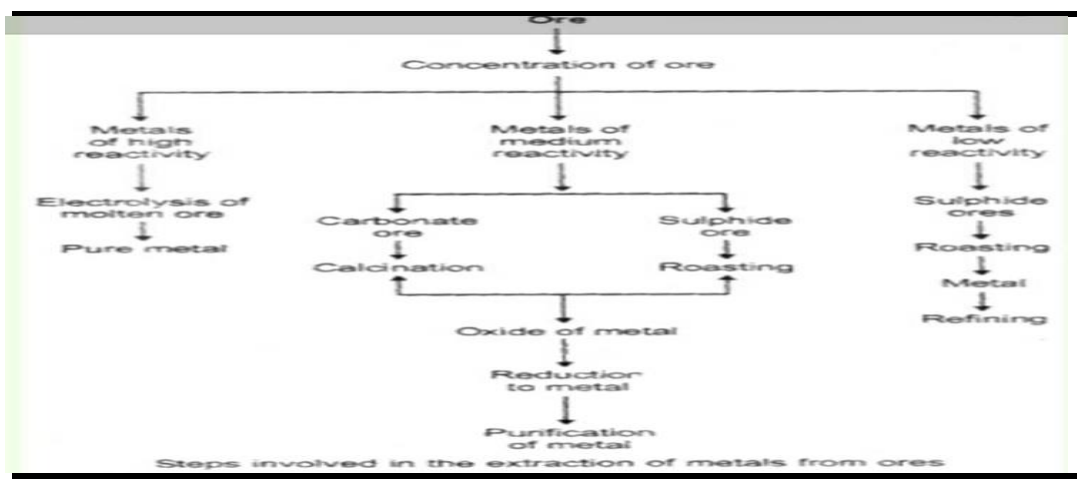
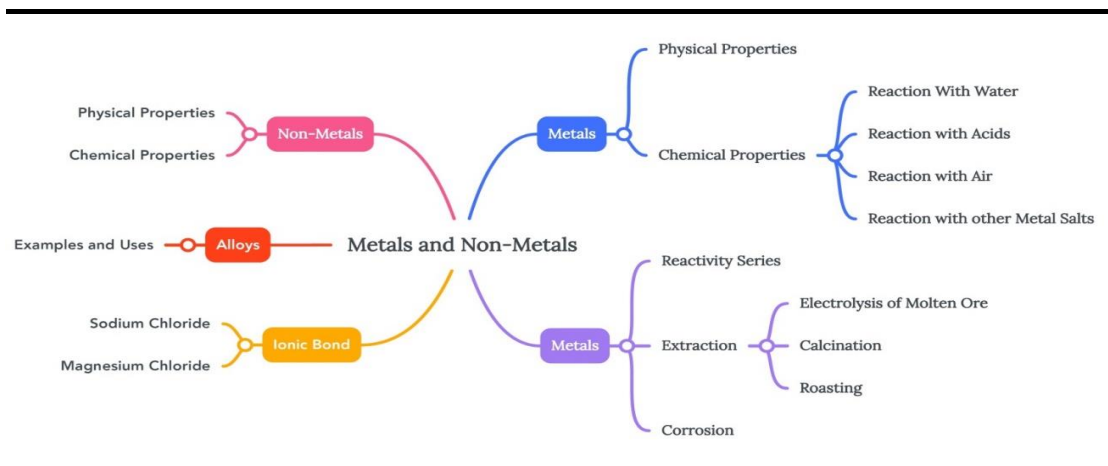
**14.What is overload?**

If the live wire contacts directly the neutral wire then it is called overload.

Or

If the voltage in the circuit suddenly increases above 220 v then it is called over load.

## CHAPTER 3-METALS AND NON-METALS



**Name the following.**

- 1) Liquid metals: Mercury and Gallium
- 2) Liquid metal: Bromine
- 3) Most reactive metal: Potassium
- 4) Good Conductor Metal: Silver, Copper
- 5) Good conductor of electricity: Graphite
- 6) Metals in free form: Gold, Silver, Platinum
- 7) Shiny metal: Iodine
- 8) Most malleable and ductile metal: Gold
- 9) Amalgam forming metal: Mercury
- 10) Gas liberated when metals react with Acids: Hydrogen

## 2. What is lustre?

Metals have a shiny surface in their pure state. This is called metallic **lustre**.

## 3. What is malleability?

Metals can be beaten into thin sheets. This property of metal is known as **malleability**.

## 4. What is Ductility?

The ability of metals to be drawn into thin wires is called **ductility**.

## 5. What is Sonorous?

The property of metals to produce sound when struck against a hard surface is called **Sonorous**.

## 6. Write the allotropes of carbon.

Diamond and graphite

## 7. Why school bells are made of metals?

Because metals are sonorous produce sound when struck against a hard surface.

## 8. Why these metals are used for making cooking vessels?

Because metals are good conductors of heat and have high melting points.

## 9. Name the metals that can be cut with a knife. Give reason

Alkali metals such as lithium (Li), sodium (Na), potassium (K) can be cut with a knife.

Because they have low densities and low melting points.

## 10. Define reactivity series

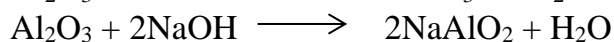
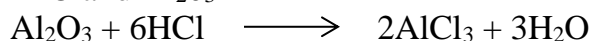
The reactivity series is a list of metals arranged in the order of their decreasing activities.

$K > Na > Ca > Mg > Al > Zn > Fe > Sn > Pb > H > Cu > Hg > Ag > Au$

## 11. What are amphoteric oxides? Give two examples of amphoteric oxides.

The metallic oxides which show the properties of acids as well as bases are called **amphoteric oxides**. It means that they react with both bases and acids to form salt and water.

e.g. ZnO and Al<sub>2</sub>O<sub>3</sub>



## 12. What is thermite reaction? Write the equation and explain its application.

When iron oxide reacts with Aluminium powder, it is reduced to iron and a large amount of thermal energy is released. Such a type of reaction is called **thermite reaction**.



**Uses:** It is used to join railway tracks or cracked machine parts. This process is called **thermite welding**.

### 13. What is an alloy? Why are alloys better than metals?

An alloy is a homogenous mixture of two or more metals or a metal and a non-metal.

- By alloying we can get the desired properties.
- Durability is high.
- Can prevent corrosion.

### 14. Prepare a table showing alloys, their composition, and uses.

Alloys	Constituents	Uses
1. Stainless Steel	Fe+C+Cr+Ni	Utensils and medical instruments
2. Brass	Zn+Cu	Decorative materials and Switches
3. Bronze	Sn+Cu	Medals and Statues.
4. Solder	Pb+Sn	Joining wires

### 15. What are ionic compounds or electrovalent compounds? Write their properties.

The compounds formed in by the transfer of electrons from a metal to a non-metal are known as **ionic compounds** or **electrovalent compounds**.

#### Physical Properties of Ionic compounds:

**Physical state:** Ionic compounds are dense materials that are somewhat hard. These compounds are usually brittle and crumble under pressure.

**Melting point and Boiling point:** Ionic compounds have higher melting points and boiling points because stronger ionic bonds between molecules require more energy to break.

**Solubility:** Ionic compounds are generally soluble in water and insoluble in organic solvents such as kerosene, petrol etc.

**Electrical conductivity:** In the solid state, ionic compounds do not allow electricity to pass through them because the rigid structure of solids prevents the movement of ions, but in the liquid state, ionic compounds do allow electricity to pass through them.

### 16. What is calcination?

The **carbonate ores** are changed into oxides by heating strongly in limited air.



### 17. What is roasting.

The **sulphide ores** are converted into oxides by heating strongly in the presence of excess air.



### 18. Metals such as potassium and sodium are kept immersed in kerosene oil. Give reasons

Metals such as potassium and sodium react so vigorously that they catch fire if kept in the open. Hence, to protect them and to prevent accidental fires, they are kept immersed in kerosene oil.

### 19. What is Allotropy? Give examples.



The same elements having same chemical property but different physical property is called Allotropy. Ex: Diamond and Graphite

**20. Define corrosion.**

The surface of some metals like iron undergoes corrosion when exposed to moist air for a long time. This phenomenon is called corrosion.

**21. What are precautions to be taken for preventing corrosion?**

Iron corrosion can be prevented by painting, oiling, greasing, galvanizing, chromium plating Anodizing or alloying.

**22. What is rust?**

When iron is exposed to air for a long time, a brownish layer forms on it, which is called rust.

**23. Name the method of extracting metals at the top of the reactivity series.**

Electrolytic purification.

**24. When metals react with nitric acid cannot release hydrogen why?**

Hydrogen gas is not released because the metal is behaved each with nitric acid, the nitric acid is a powerful oxidizer and redefines the nitrogen oxide which produces water, which one produces nitrogen oxide.

25. a) How do silver and copper objects lose their luster? How does galvanization preserve ferrous materials?

b) Aluminium oxide is “double oxide”, why

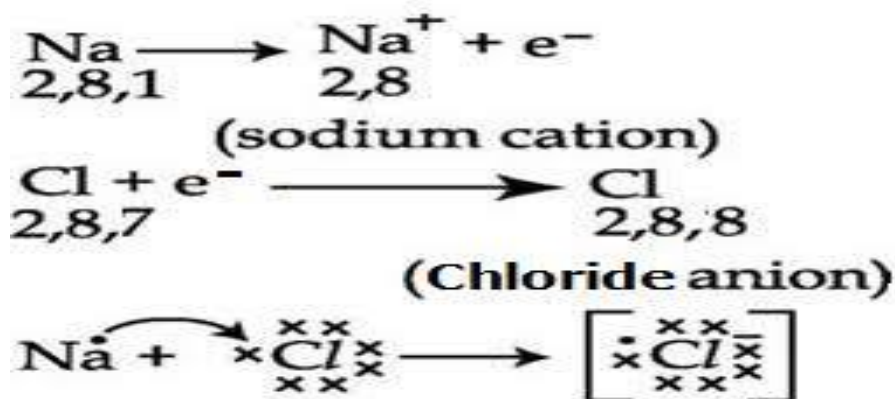
a) When silverware is exposed to air it forms a black layer of sulphur di oxide with sulphur.

Copper reacts with moist carbon dioxide in the air to form a green layer of copper carbonate.

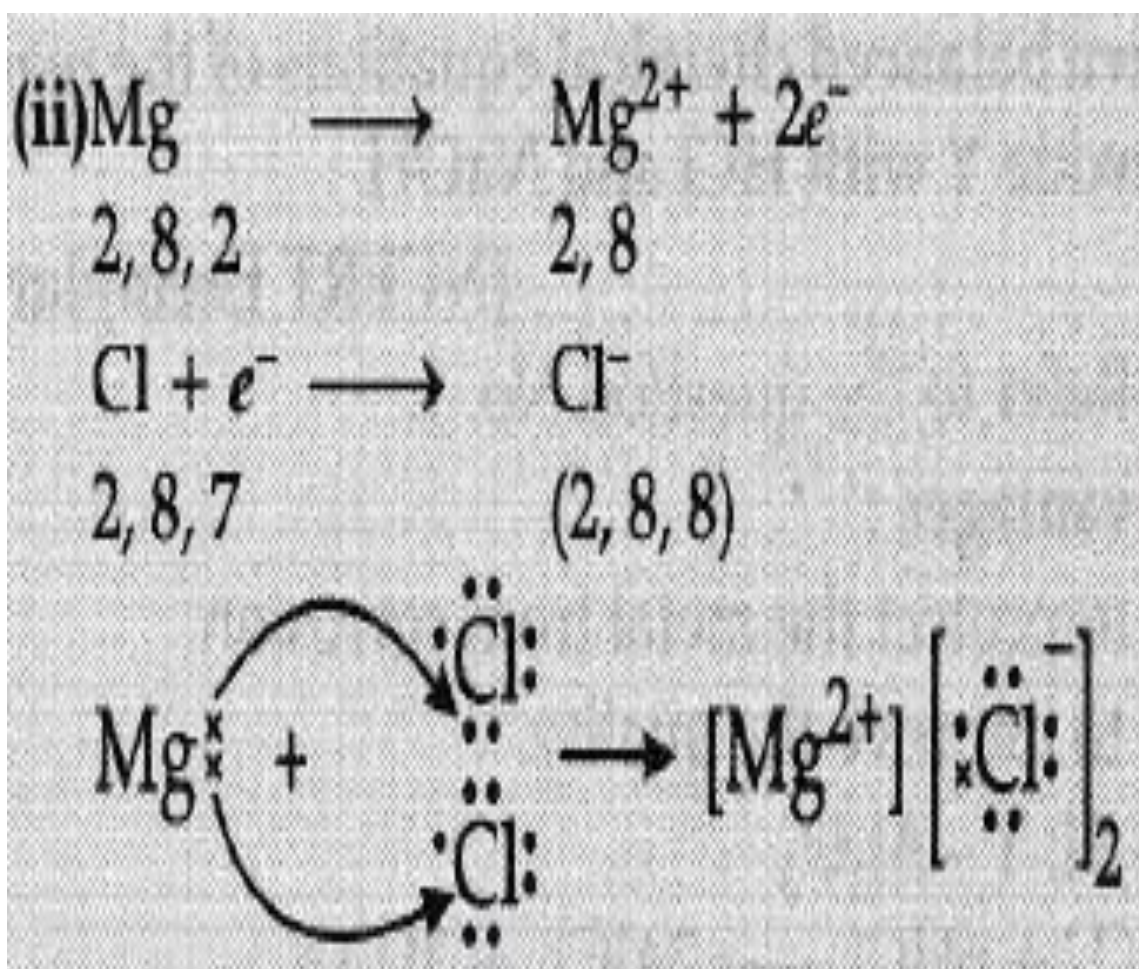
The zinc coating formed by galvanizing reacts with oxygen to form a zinc oxide layer that prevents further oxidation.

b) Aluminium oxide reacts with both acids bases to form salts and water.

**25. Show the formation ionic bond in sodium chloride dotted structure.**

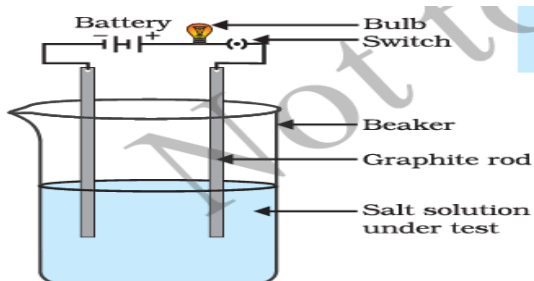


26. Show the formation ionic bond in magnesium chloride dotted structure.



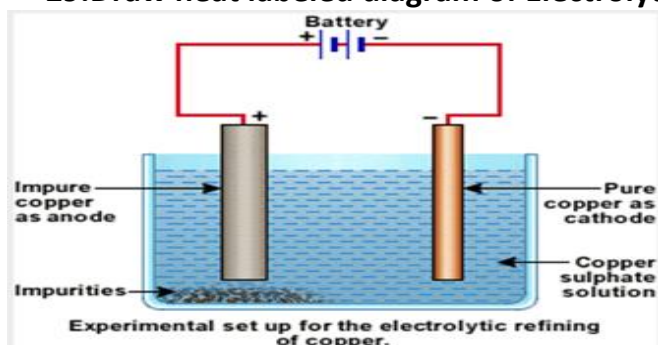
27. What causes calcium to float on water when calcium oxide reacts with water?  
Because, the hydrogen bubbles produced stick to the water.

28. Draw neat labelled diagram of Testing the conductivity of a salt solution.

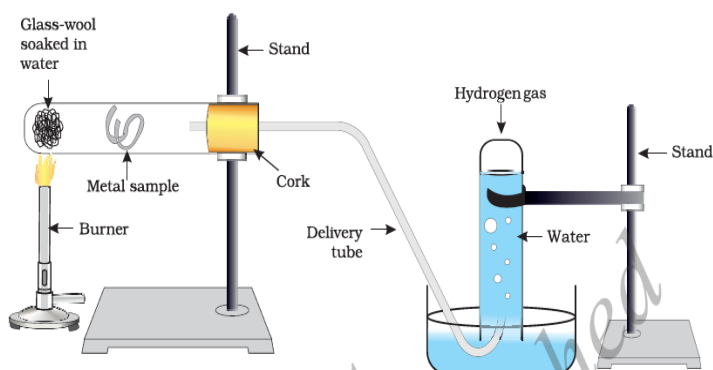


**Figure 3.8**  
Testing the conductivity of a salt solution

29. Draw neat labeled diagram of Electrolytic refining of copper.

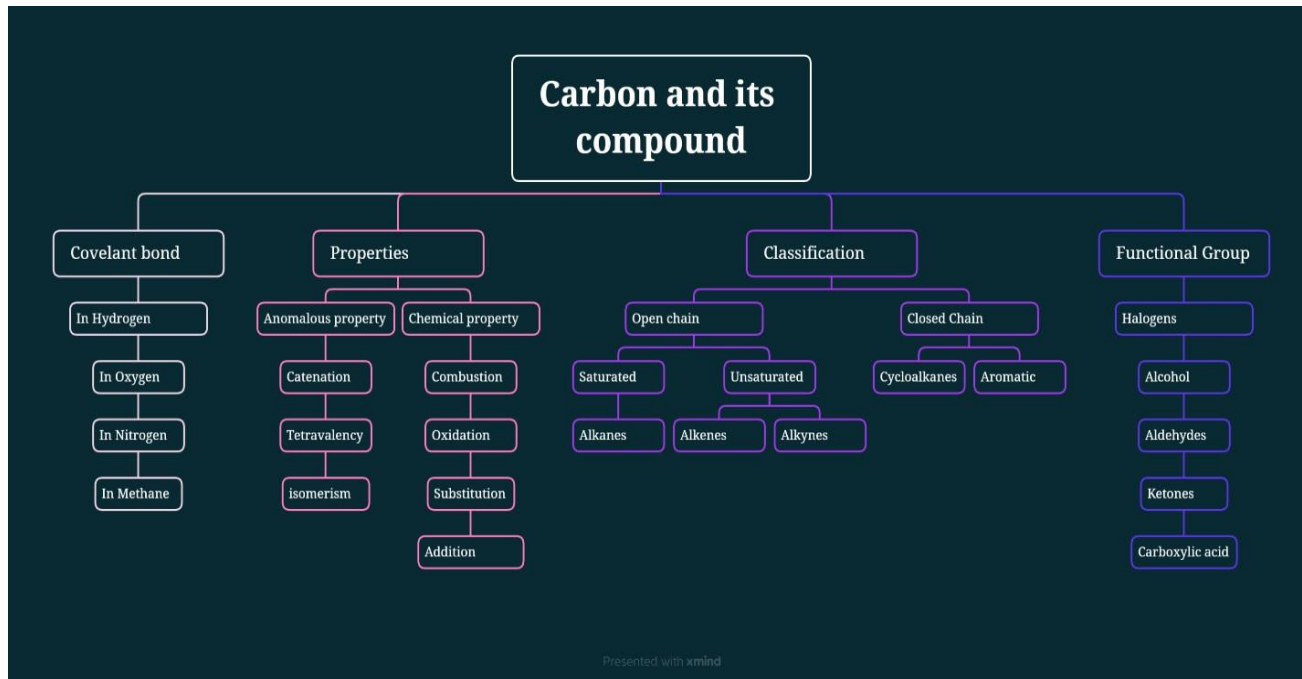


30. Draw neat labeled diagram of showing action of steam on metal.



**Figure 3.3** Action of steam on a metal

## Chapter 4 Carbon and its compounds



I. Four alternatives are given for each of the following statement/questions. Choose the most appropriate one.

1. Number of covalent bonds in  $C_2H_6$  :

- (a) 6                      (b) 7                      (c) 8                      (d) 9      **Ans: (b) 7**

2. Ions responsible for hardness of water

- a)  $Ca^{2+}$  and  $Na^+$                       b)  $Ca^{2+}$  and  $K^+$   
c)  $Ca^{2+}$  and  $Mg^{2+}$                       d)  $Mg^{2+}$  and  $Na^+$

**Ans: c)  $Ca^{2+}$  and  $Mg^{2+}$**

3. General formula of Alkanes is

- a)  $C_nH_{2n}$                       b)  $C_nH_{2n-2}$   
c)  $C_nH_{2n+1}$  d)  $C_nH_{2n+2}$       **ans: d)  $C_nH_{2n+2}$**

4. Valency of carbon in alkanes and alkenes is

- a) 2                      b) 4

c) 6

d) 1

Ans: **b) 4**

**5. Molecular formula of benzene is**

a) C<sub>2</sub>H<sub>6</sub>

b) C<sub>6</sub>H<sub>12</sub>

c) C<sub>6</sub>H<sub>6</sub>

d) C<sub>3</sub>H<sub>6</sub>

Ans: **c) C<sub>6</sub>H<sub>6</sub>**

**6. The catalyst used to convert unsaturated hydrocarbons into saturated hydrocarbons.**

(a) Carbon (b) Magnesium (c) Nickel (d) aluminium **c) Nickel**



**7.**

**Identify the chemical bond shown in the given figure.**

(a) Ionic bond

(b) covalent bond

(c) hydrogen bond (d) polar Bond **ans: b) covalent bond**

**8. Butanone is a four carbon compound. The functional group found in this organic compound is**

(a) Ketone

(b) aldehyde

(c) alcohol

(d) carboxylic acid

**Ans: a) Ketone**

**Answer the following (1 mark questions)**

1. **What are the unique features of carbon?** Tetravalency and catenation

2. **What is tetravalency?**

Valency of carbon is 4 as it has 4 valence electrons. Hence it is termed as tetravalency.

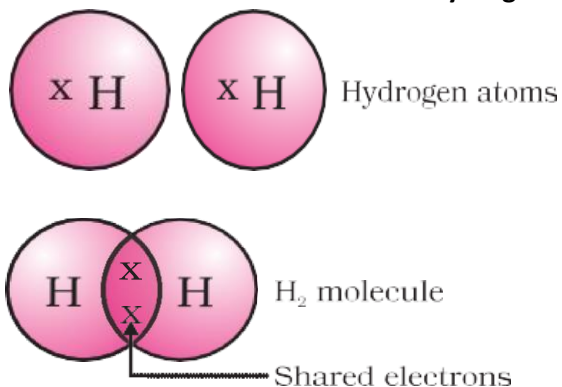
3. **What are hydrocarbons?**

Hydrocarbons are binary compounds of hydrogen and carbon only.

4. **Sometime cooking gas burns with yellow flame. Give reason.**

During the combustion insufficient supply of oxygen is responsible for incomplete combustion and hence gas burns with yellow flame.

5. **Draw electron dot structure of hydrogen molecule.**



6. **What is catenation?**

Carbon can link with its own atoms by sharing the electrons to form a huge molecule. This property is known as catenation.

7. **What are the different types of catenation?**

Open chain

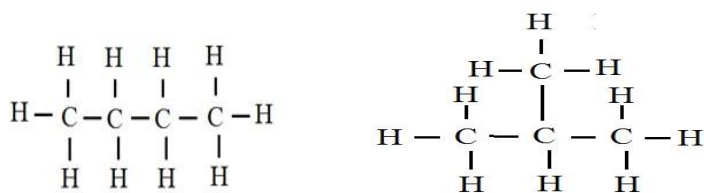
Branched chain

Closed chain

8. **Define isomerism.**

The phenomenon of exhibiting the same molecular formula but different structures by the organic compounds is called isomerism.

Example: butane and isobutane



9. **What are homologous series? Give examples.**

A series of compounds in which the same functional group substitutes for hydrogen in a carbon chain is called a homologous series. Ex: Alkanes.

**10. What is functional group?**

Functional groups may be defined as an 'atom' or a 'group of atoms' which makes a carbon compound (or organic compound) reactive and decide its properties regardless of the length and nature of carbon chain.

**11. What is saponification reaction?**

On treating with sodium hydroxide the ester is converted back to alcohol and sodium salt of carboxylic acid. This reaction is called saponification.

**12. Write the molecular formula of the first three members of homologous series having functional group-OH.**

$\text{CH}_3\text{OH}$ ,  $\text{CH}_3\text{CH}_2\text{OH}$ , &  $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ ,

*Answer the following questions. 2 mark questions*

**1. What are the important features of Homologous series?**

- Homologous series have same chemical properties
- They have same general molecular formula
- Successive member differ by a  $\text{CH}_2$  formula unit

Ex:  $\text{C}_2\text{H}_4$  ,  $\text{C}_3\text{H}_6$

**2. Explain the formation of micelles during the cleansing action.** Inside water, a unique orientation forms clusters of molecules in which the hydrophobic tails are in the interior of the cluster and the ionic ends on the surface of the cluster. This results in the formation of micelles. This forms an emulsion in water and the micelle thus helps in pulling out the dirt in water and we can wash our clothes clean.

**3. How and why detergents are better than soaps in hard water containing calcium and magnesium ions?**

The charged ends of detergents do not form insoluble precipitates with the calcium and magnesium ions in hard water. Thus, they remain effective in hard water.

**4. What is Oxidation reaction? Write the reaction of conversion of alcohol into carboxylic acid.**

The process of addition of oxygen or removal of hydrogen to the reactant is called Oxidation reaction.

The Alkaline potassium permanganate or acidified potassium dichromate are oxidising agents which add oxygen to alcohol and convert them into carboxylic acids.

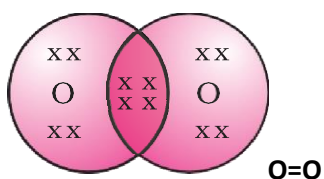


**5. Explain the formation of oxygen molecule.**

Atomic number of oxygen is 8

Its electronic configuration is 2, 6

To attain octet it needs two more electrons. Hence it shares two electrons with another oxygen atom to form (O<sub>2</sub>) molecule with double covalent bond.



**6. What is Addition reaction? Give example.**

Reactions in which hydrogen is added to unsaturated compounds to form a saturated compound in presence of catalyst like nickel.



**7. What is Substitution reaction? Give example.**

A reaction in which an atom or group of atoms replaces another atom or group of atom. The reaction of saturated hydrocarbons in presence of sunlight with chlorine is an example of substitution reaction.



**8. Mention four differences between Saturated and Unsaturated hydrocarbons?**



saturated hydrocarbons	unsaturated hydrocarbons
I. Only single bond is present in between carbon-carbon atoms.	I. Double or triple bonds are present in between carbon carbon atoms.
II. Substitution reaction occurs.	II. Addition reaction occurs.
III. It burns with blue flame.	III. It burns with sooty flame.
IV. Less reactive	IV. More reactive.

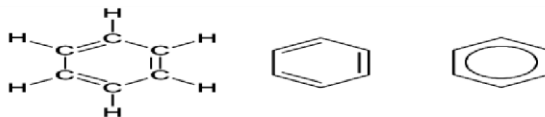
**9. Write the properties of alkenes.**

- Alkenes are unsaturated hydrocarbons.
- These hydrocarbons contains a double bond between any two successive carbon atoms.
- Name of alkenes ends with a suffix - ene.
- They have a general formula -  $C_nH_{2n}$

**10. What are aromatic hydrocarbons? Give examples with the structure.**

The organic compounds with a ring structure having alternative double bonds are called aromatic Hydrocarbons.

Ex: Benzene  $C_6H_6$



*Answer the following questions. 3/4 mark questions*

- 1. List out the different kinds of hydrocarbons with their general molecular formula, types of covalent bond and type of chain structure.**

Hydrocarbons	General formula of hydrocarbons	Types of covalent bond	type of chain
Alkane	$C_nH_{2n+2}$	Only single bonds	Open chain
Alkene	$C_nH_{2n}$	One double bond + single bonds	Open chain
Alkyne	$C_nH_{2n-2}$	One triple bond + single bonds	Open chain
Cycloalkane	$C_nH_{2n}$	Only single bonds	Closed chain
Aromatic HC		Alternative single bonds and double bonds	Closed chain

2. Draw the electron dot structure with the example of methane and ethane, stating the properties of alkanes.

1. Alkanes are saturated hydrocarbons.
2. There is only single bonds in the hydrocarbon chain of alkanes.
3. Names of Alkanes end with a suffix -ane.
4. General molecular formula of alkanes is  $C_nH_{2n+2}$
5. Alkanes are usually less active.
6. They undergo substitution reaction.

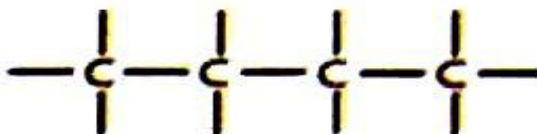
Sl.No	Name of the alkane	Molecular formula	Electron dot structure
1	Methane	<b>CH<sub>4</sub></b>	
2	Ethane	<b>C<sub>2</sub>H<sub>6</sub></b>	

1. Define - catenation. Write the different kinds of catenation.

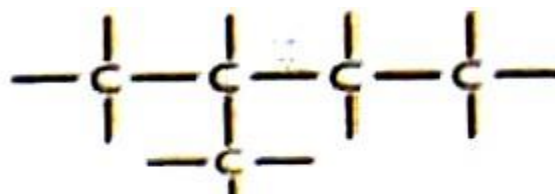
CARBON ATOMS CAN FORM LONG CHAINS BY SHARING THEIR VALENCE ELECTRONS WITH OTHER CARBON ATOMS. THIS UNIQUE PROPERTY OF CARBON IS KNOWN AS CATENATION.

Types:

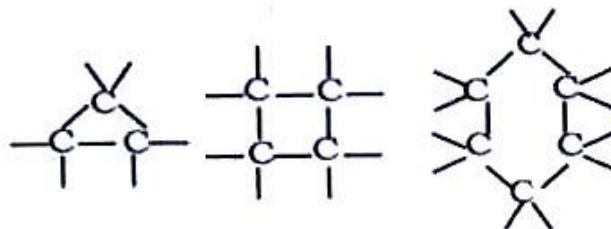
1. Straight chain



2. Branched chain



3. Ring structure



**2. Write the properties of alkenes. Write the electron dot structure of ethene and propene.**

1. Alkenes are unsaturated hydrocarbons.
2. There is only one double bond between any two successive carbon atoms in the hydrocarbon chain.
3. Names of Alkenes end with a suffix - ene.
4. General molecular formula of alkenes is  $C_nH_{2n}$
5. Alkenes undergo addition reactions and are more reactive than alkanes.

Sl.No	Name of the alkene	General formula $C_nH_{2n}$	Molecular	Electron dot structure
1	Ethene	$C_2H_4$		
2	Propene	$C_3H_6$		

**3. Write the properties of alkynes. Write the electron dot structure of ethyne and propyne.**

1. Alkenes are unsaturated hydrocarbons.
2. There is only one triple bond between any two successive carbon atoms in the hydrocarbon chain.

3. Names of Alkynes end with a suffix - yne.

4. General molecular formula of alkanes is  $C_nH_{2n-2}$

5. Alkynes undergo addition reactions and are more reactive than alkanes and alkenes.

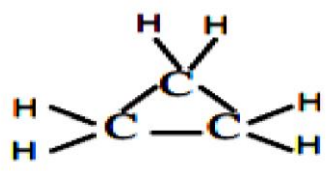
Sl. No	Name of the alkyne	General formula $C_nH_{2n-2}$	Molecular	Electron dot structure
1	Ethyne		<b><math>C_2H_2</math></b>	$H-C \equiv C-H$
2	Propyne		<b><math>C_3H_4</math></b>	$\begin{array}{c} H \\   \\ H-C \equiv C-C-H \\   \\ H \end{array}$

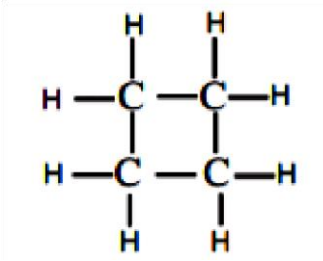
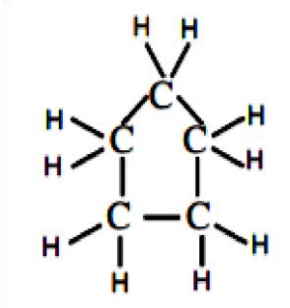
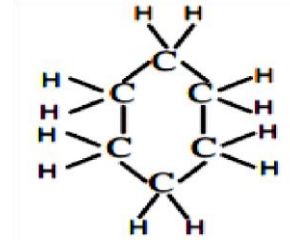
4. Write the properties of cycloalkanes. Write the electron dot structure of first four members.

Closed ring structure

General Molecular formula  $C_nH_{2n}$ .

Saturated but cyclic.

Sl.No	Name of the Cycloalkane	General Molecular formula $C_nH_{2n-2}$	Electron dot structure
1	Cyclopropane		<b><math>C_3H_6</math></b> 

2	Cyclobutane	$C_4H_8$	
3	Cyclopentane	$C_5H_{10}$	
4	Cyclohexane	$C_6H_{12}$	

**5. Give scientific reason for the following.**

**A. Clean the air vents of the LPG stoves frequently.**

Air hole blockage leads to insufficient oxygen supply. This leads to wastage of fuel and also causes air pollution

**B. Why is sometime LPG burn with a yellowish flame?**

Because of insufficient oxygen supply causes incomplete combustion. Hence LPG burns with a yellowish flame.

**C. Saturated hydrocarbon fuels are better than unsaturated hydrocarbon fuels.**

Because usually unsaturated hydrocarbons burn with a yellowish flame, this causes air pollution. Saturated hydrocarbons burn with a clean flame and yield more energy.

**6. What are functional groups? List out different functional groups with their formulae.**

Functional groups may be defined as an 'atom' or a 'group of atoms' which makes a carbon compound (or organic compound) reactive and decide its properties regardless of the length and nature of carbon chain.

Hetero atom	Class of compounds	Formula of functional group
Cl/Br	Halo- (Chloro/bromo) alkane	—Cl, —Br (substitutes for hydrogen atom)
Oxygen	1. Alcohol	—OH
	2. Aldehyde	$\begin{array}{c} \text{H} \\   \\ -\text{C} \\    \\ \text{O} \end{array}$
	3. Ketone	$\begin{array}{c} -\text{C}- \\    \\ \text{O} \end{array}$
	4. Carboxylic acid	$\begin{array}{c} \text{O} \\    \\ -\text{C}-\text{OH} \end{array}$

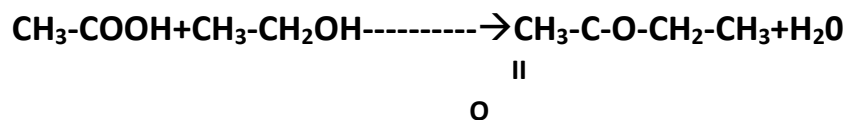
### 7. List the uses of Ethanol.

It is used in alcoholic drinks.

It is used in medicines such as tincture iodine, cough syrups and many tonics 8. What are esters? Write their uses.

Esters are the organic compounds formed by the reaction of an acid with an alcohol.

Ex Ethanoic acid reacts with ethanol to give an ester



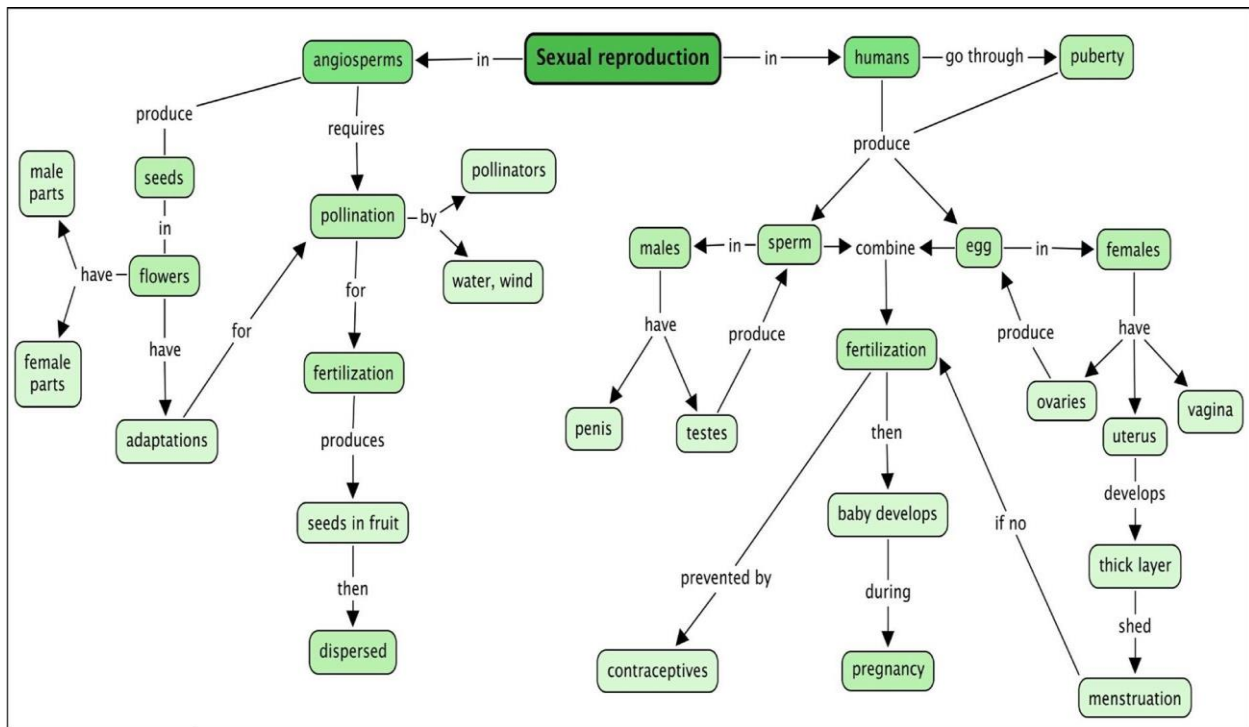
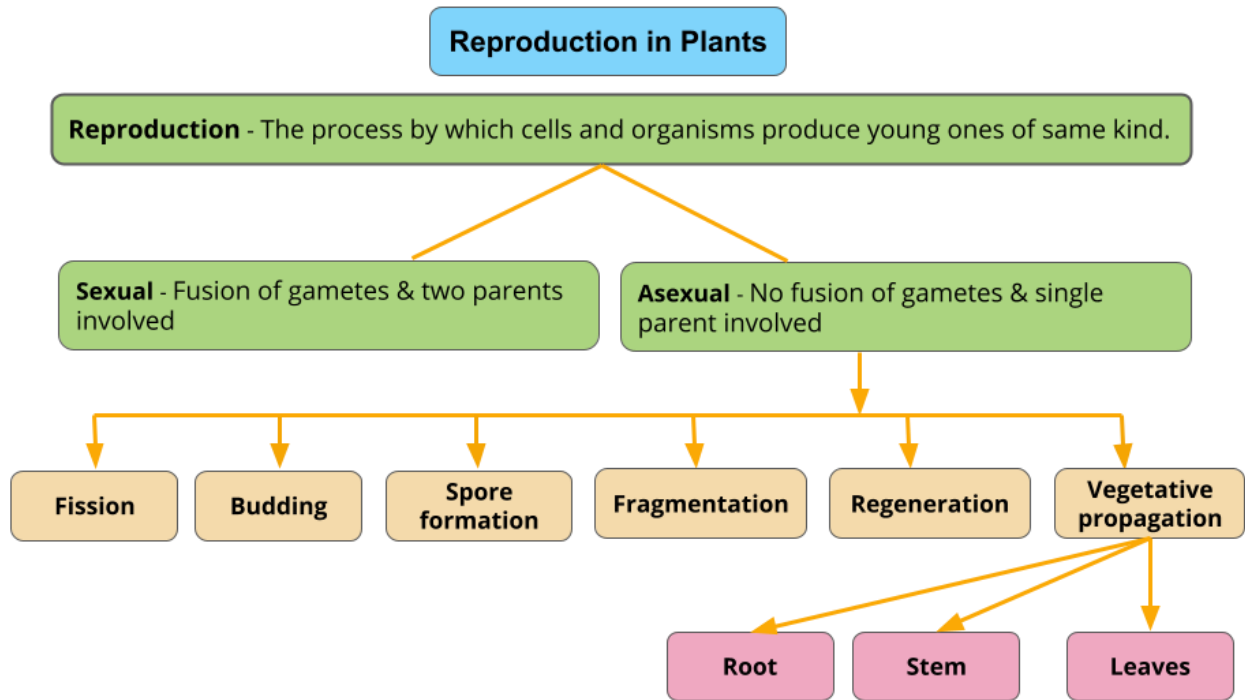
**Uses-**Used in making perfumes and as flavoring agents,

Used in making soaps

### 10. How do detergents clean well even in hard water?

Detergents are sodium salts of sulphonic acids or ammonium salts with chlorides or bromide ions. The charged ends of these compounds do not form insoluble precipitates with the calcium and magnesium ions in hard water. Hence they are effective even in hard water.

# CHAPTER-7. HOW DO ORGANISMS REPRODUCE



## **I. MULTIPLE CHOICE QUESTIONS:**

**1) The part of seed which develops into future shoot is,**

- 1) Radicle 2) Plumule 3) Cotyledon 4) Stigma.

**2) Plumule.**

**2) The embryo gets nutrition from the mother's blood with the help of a special tissue called**

- 1) Placenta 2) Cervix 3) Fallopian tube 4) Ovary.

**1) Placenta.**

**3) Identify the sexually transmitted disease caused by bacteria**

- 1) AIDS 2) Warts 3) Syphilis 4) Herpes.

**3) Syphilis.**

**4) Which of the following is the correct sequence of parts of flower from outer to inner whorl?**

- 1) Sepal----stamen----Petal----carpel 2) Sepal----Carpel-----stamen-----Petal

- 3) Sepal----Petals-----Carpels----Stamens 4) Sepal---Petal--Stamen----arpel.

**4) Sepal----Petal----Stamen-----Carpel.**

## **II. ANSWER THE FOLLOWING:**

**5. Define reproduction. Why is it important?**

It is a process by which organisms are able to produce new organisms of their own kind.

It is important to maintain continuity of species or life.

**6. Name the substances that contribute to the construction of blueprints of the body structure of**

organisms.

DNA (Deoxy ribose nucleic acid)

**7. What are the advantages of sexual reproduction over asexual reproduction?**

A. Sexual reproduction leads to variation due to recombination of genetic material DNA. These variations are essential for survival of species. On the contrary, asexual reproduction does not bring about variations.

B. Sexual reproduction promotes diversity of characters in offspring by providing genetic variations.

C. Genetic variation leads to the continuous evolution of various species to form better and better organisms

**8. Why does menstruation occur? Or what happens if egg is not fertilized?**

Every month uterus prepares itself for implantation of fertilized egg. Its lining becomes thick and spongy. But if fertilisation does not occur then this lining is not required any more. Hence, the thickened lining of the uterus breaks down along with blood vessels. The degenerated part of uterus along with the blood moves out of the vagina in the form of bleeding, called **menstruation**. It occurs in response to low level of oestrogen and progesterone hormone.

**9. How does the embryo get nourishment inside the mother's body?**

The embryo gets nutrition from the mother's blood with the help of a special tissue called **placenta**. This is a disc which is embedded in the wall of uterus. It contains finger-like projections villi on the embryo's side of the tissue. On mother's sides are blood spaces, which surround the villi. This



provides a large surface area for glucose and oxygen to pass the mother to the embryo and waste products from embryo to mother

**10. What are the different methods of contraception?**

- a. **Barrier methods:** In this method, physical devices such as condom, diaphragm, cervical cap and Copper-T are used.
- b. **Chemical method:** use of spermicidal jelly by woman, oral pills and vaginal pills.
- c. **Surgical method:** In surgical method, a small portion of vas deferens in male and the oviduct of female, is surgically removed or ligated. It is called **vasectomy in male** and **Tubectomy in females**.

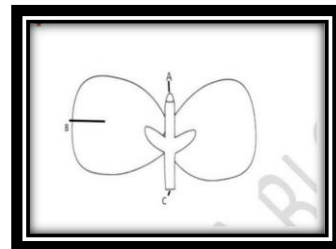
**11. Name the sex hormones secreted by male and female sex organs in human beings. State one Functions of each**

Testosterone is produced by the testicle (male sex organs) and oestrogen and progesterone are produced by ovary (female sex organ).

**Function of testosterone:** It brings about changes in appearance seen in boys at the time of puberty.

**Function of oestrogens:** helps in the development of secondary sex characters like breast development

**12. Identify the part-C mentioned in the given figure below. What does this develop into?**



C is radicle. It grows into future root.

**13. Why is the testis located outside the abdominal cavity in human males?**

Sperm formation requires a lower temperature than the normal body temperature.

**14. Name the sexually transmitted disease caused by virus.**

Warts, AIDS.

**15. What is fertilisation?**

Ans:-Fertilisation is defined as the fusion of a male gamete (sperm) with the female gamete (ovum) to form zygote.

**16. What are sexually transmitted diseases?**

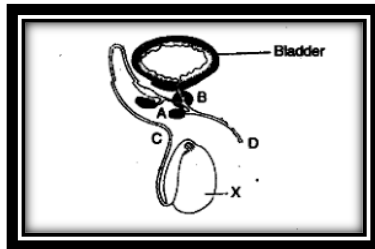
Ans:-An infection transmitted through sexual contact caused by bacteria, virus.

Eg: AIDS, Gonorrhoea.

**17. Differentiate between Self-pollination and Cross Pollination.**

Sl no	Self-pollination	Cross pollination
1	The transfer of pollen occurs in the same flower.	The transfer of pollen from one flower to another
2	Do not need any pollinating agents	This is achieved by agents like wind, water, or animals

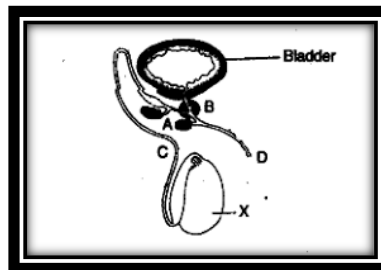
**18. Identify the part-C in the given human male reproductive system in the figure given below, What happens if it is blocked?**



C is vas deferens.

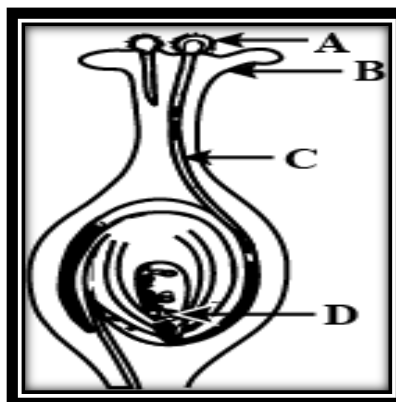
If the vas deferens in male is blocked sperm transfer will be prevented.

**19. What happens if X do not produce the hormone at right age?**



X is Testis it produces testosterone hormone. It brings about secondary sexual characters in boys at the time of puberty. If this hormone is not produced at right age the appearance of secondary sexual characters gets delayed.

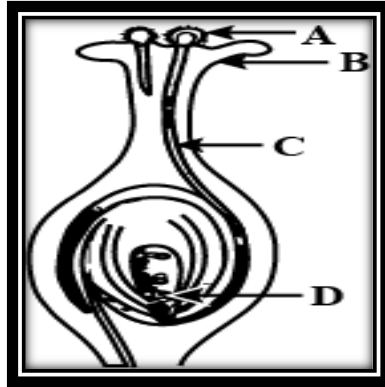
**20. What is the role of C labelled in the given figure below.**



Ans:-C is the pollen tube . The main function of this pollen tube is to carry male gametes to female germs cells for fertilization.

**21. Draw a diagram of germination of pollen on stigma and label the following.**

- a) The part enclosing female reproductive part
- b). The part that grows to carry pollen to ovary.



**22. Briefly describe the functions of the following,**

**1. Placenta 2) Scrotum 3) Vas deferens**

1. Placenta- It transfers nutrients, oxygen from maternal blood to growing foetus.
2. Scrotum- It keeps testes at a lower temperature that is about 2°C less than the body Temperature
- 3 Vas deferens- It passes the sperms from testes to penis.

**23. Why is sexual mode of reproduction important?**

1. It creates complexity and diversity
2. It enhances the rate of chances of survival.
3. This is very important in terms of evolution.
4. This produces variable offspring creating diversity and variation among population.
5. 5 It deletes the unwanted genes.

**24. What happens when the egg is not fertilised?**

- If the egg is not fertilised it lives for about one day, since the ovary releases one egg every month
- The uterus also prepares itself every month to receive a fertilised egg.
- Thus its lining becomes thick and spongy. This is required for nourishing the embryo if fertilization had taken place.
- If the egg is not fertilised the lining is not needed any longer. So the lining slowly breaks and comes out of vagina as blood and mucous.
- This cycle takes place roughly every month and it is known as menstruation.

\*\*\*\*\*

## Chapter 8 : Heredity

1. When a round green seed (RRyy) is crossed with a wrinkled yellow seed (rrYY) of a pea plant, the seeds produced in this F<sub>1</sub> generation will be:

A. Round green      B. Wrinkled yellow      C. Wrinkled green      D. Round yellow  
Ans : D.  
Round yellow

2. Which of the following traits is hereditary?

A. Weight reduction due to hunger      B. Removal of a rat's tail through surgery  
C. Muscle development in athletes      D. Type of ear pinna

Ans : D. Type of ear pinna

3. A pure tall pea plant (TT) was crossed with a dwarf pea plant (tt). The ratio of pure tall pea plants and dwarf plants produced in the F<sub>2</sub> generation is:

A. 3:1      B. 1:1      C. 1:3      D. 2:1

Ans : B. 1:1

4. Which of the following is a hereditary trait?

A. Knowledge gained from reading books      B. Eye color  
C. Attached earlobes      D. Shape of the nose

Ans : A. Knowledge gained from reading books

5. An organism does not pass on experiences gained during its lifetime to its offspring because they are:

A. Hereditary traits      B. Acquired traits      C. Dominant traits      D. Recessive traits

Ans : B. Acquired traits

6. A pure pea plant producing dominant round yellow seeds is crossed with a pure pea plant producing recessive wrinkled green seeds. In this Mendelian experiment, the number of plants having round green seeds in the F<sub>1</sub> generation is:

A. 0      B. 1      C. 3      D. 9

**Ans : A) 0**

7. Observe the following table showing the different forms of pea plants:

Seed Color	Flower Position
Green (G)	Axillary (A)
Yellow (g)	Terminal (a)

What is the gene pattern representing green seeds at the terminal of the stem?

(A) gGAa      (B) GgAa      (C) GgAA      (D) Ggaa

Ans : (D) Ggaa

8. What are chromosomes?

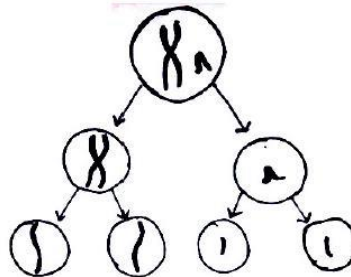
Ans : Structures that contain nucleic acid and proteins found in the cell nucleus of living cells.

9. How is it possible for only one trait among two different traits that have different alleles to be considered dominant?

Answer: In organisms that reproduce sexually, there are two alleles for each trait. When they are different, only one trait is expressed. This trait can be considered dominant.

10. Briefly explain the causes of stability in DNA and variability in the next generations of organisms with the help of the followir

Ans :



A. The stability of DNA by replication is essential for maintaining the body design of an organism. Therefore, reproduction is associated with the stability of the number of species.

B. Variability in certain organisms may provide them with some survival advantages. Thus, variability can sometimes be beneficial for the survival of species.

11. Explain the concept that the experiences gained by an organism during its lifetime are not hereditary with the help of an example.

Answer: Changes in somatic cells do not transfer to the DNA of germ cells. For example, the offspring of a dancer cannot automatically become dancers just because they were born to a dancer. If a rat's tail is cut off at birth, the offspring will still be born with tails. Therefore, the experiences gained by an organism during its lifetime do not cause any changes in the DNA. Hence, acquired experiences are not hereditary.

12. How do Mendel's experiments demonstrate that traits are inherited independently? Explain.

Answer: In Mendel's dihybrid experiment, round green seeds (RRyy) and wrinkled yellow seeds (rrYY) pea plants are crossed. The resulting F<sub>1</sub> generation plants have round yellow seeds (RrYy). When these F<sub>1</sub> plants are subjected to self-pollination, the resulting F<sub>2</sub> generation exhibits round yellow, round green, wrinkled yellow, and wrinkled green plants in the ratio of 9:3:3:1. This experiment shows that both seed shape and colour traits are inherited independently.

13. How do traits express themselves as dominant and recessive in Mendel's experiments?

Answer: In Mendel's monohybrid experiment, when tall and dwarf plants were crossed, all plants in the F<sub>1</sub> generation were tall. This indicates that the tall trait is dominant, while the dwarf trait is recessive. When these tall plants from the F<sub>1</sub> generation were self-pollinated, the F<sub>2</sub> generation produced tall and dwarf plants in a ratio of 3:1.

14. When a tall (TT) pea plant is crossed with a dwarf (tt) pea plant, represent the results in a checkerboard and write the ratio of plant types.

<b>Gametes</b>	<b>T</b>	<b>t</b>
<b>T</b>	<b>TT</b>	<b>Tt</b>
<b>t</b>	<b>Tt</b>	<b>tt</b>

**Genotypic Ratio - Pure tall (TT) : Tall (Tt) : Pure dwarf (tt)**

**1 : 2 : 1**

**Phenotypic ratio - Tall: Dwarf = 3:1**

15. When a tall plant with red flowers (TtRr) is self-pollinated, represent the plants produced in the F<sub>2</sub> generation with the help of a checkerboard. What is the reason for traits not found in parental plants appearing in the next generation?

In the F<sub>2</sub> generation:

	TR	Tr	tR	tr
TR	TTRR	TTRr	TtRR	TrRr
Tr	TTRr	TTrr	TtRr	Ttrr
tR	TtRR	TtRr	ttRR	ttRr
tr	TtRr	Ttrr	ttRr	ttrr

Tall plants with red flowers = 9

Tall plants with white flowers = 3

Dwarf plants with red flowers = 3

Dwarf plants with white flowers = 1

According to Mendel's law of independent assortment, when there are more than one pair of traits, each trait segregates independently from other traits, allowing traits absent in the parents to appear in the offspring.

16. Plants producing round yellow seeds (RrYy) are subjected to self-pollination. Represent the results of the dihybrid cross in a checkerboard. Indicate the types of plants produced in the F<sub>2</sub> generation.

Ans : Round Yellow Seed (RrYy)

Self-Pollination F<sub>1</sub>: RrYy x RrYy

Gametes	RY	Ry	rY	ry
RY	RRYY	RRYy	RrYY	RrYy
Ry	RRYy	RRyy	RrYy	Rryy
rY	RrYY	RrYy	rrYY	rrYy
ry	RrYy	Rryy	rrYy	rryy

In the F2 generation:

Round yellow = 9

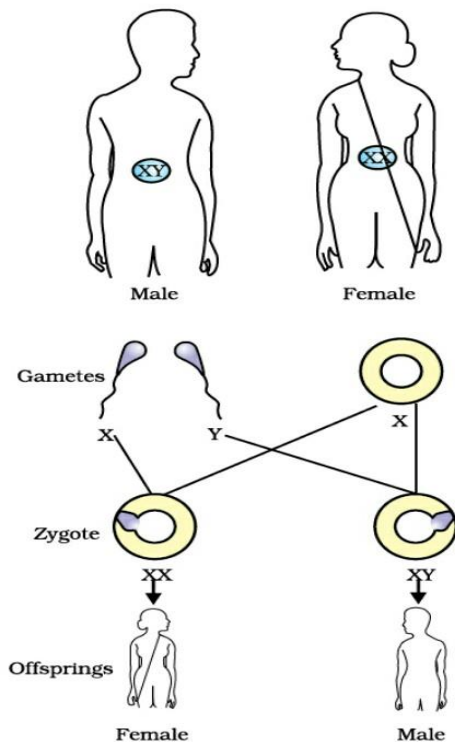
Round green = 3

Wrinkled yellow = 3

Wrinkled green = 1

**17. Explain sex determination in humans.**

**Answer:** Women have a complete pair of sex chromosomes, both of which are called X chromosomes. However, men have an unmatched pair, one being a normal-sized X chromosome and the other a smaller Y chromosome. Therefore, women have XX, and men have XY. If the child inherits an X chromosome from the father, the baby will be a girl, and if the Y chromosome is inherited, the baby will be a boy.



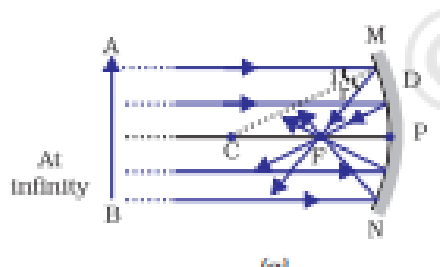
## Chapter9: Light-Reflection and Refraction

I Choose the correct option from the four choices provided with each question.

1)The property of an Image formed by a plane mirror out of the following is.....

- A)Size of the image is equal to the object
- B)Image formed as far behind the mirror as the object is in front of it.
- C)Image is always virtual and erect.
- D)All the above

2)With respect to the optical instrument in the below figure, the correct feature among the following is .....



- A)F is the principal focus
- B)PF is the focal length
- C)PC is the radius of curvature
- D)All the above

3)The focal length of a spherical mirror is 2m, the radius of curvature of the mirror is .....

- A)1m
- B)2m
- C)4m



D)0.5m

4)For a concave mirror, the position of the object where, the nature of the image got is virtual and erect is .....

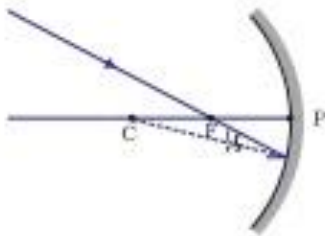
A) Beyond centre of curvature

B)Between centre of curvature and principal focus

C)At infinity

D)Between pole and principal focus

5) In the figure below, the correct path of the reflected ray is .....



A)through centre of curvature

B)reflects back through principal focus

C)Parallel to the principal axis

D)reflects obliquely to the principal axis

6)With respect to the use of mirrors , the correct use out of the following is.....

A)convex mirrors are used as shaving mirrors

B)Concave mirrors are used in torches

C)Concave mirrors are used in rear view mirrors

D)All the above

7) In convex lens, the position of the image when the object is placed at  $2F_1$  is .....

- A) At  $F_2$
- B) Between  $F_2$  and  $2F_2$
- C) At  $2F_2$
- D) Beyond  $2F_2$

8) An optician prescribes corrective lens of power  $+4.0$  D. The correct feature of the lens out of the following is .....

- A) Convex lens
- B) The focal length of the lens is  $+0.25$  m
- C) Converging lens
- D) All the above

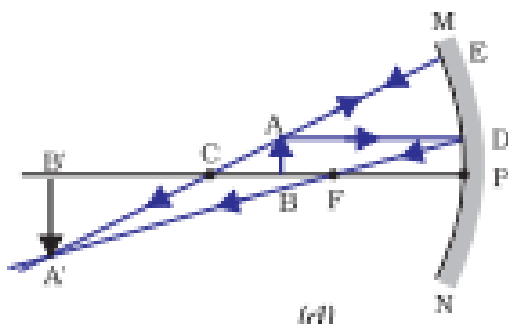
II Answer the following

1) State the laws of reflection.

Ans i) The angle of incidence is equal to the angle of reflection

ii) The incident ray, the normal to the mirror at the point of incidence and the reflected ray, all lie on the same plane.

2) Draw a neat ray diagram of image formation in a concave mirror when the object is placed between C and F. What is the position, size and nature of the image formed?



Ans

Position: Beyond C

Size : Enlarged

Nature: Real and Inverted

3) Name the mirror which always gives virtual, erect and diminished image.

Ans Convex mirror

4) Name the mirror which always gives virtual, erect and the image of same size as object.

Ans Plane mirror

5) Name the type of mirrors used in following situations

i) Headlights of vehicles

ii) Security mirrors in stores

iii) Solar cookers

iv) Rear view mirrors in vehicles

Ans

i) Headlights of vehicles : Concave mirror

ii) Security mirrors in stores : Convex mirror

iii) Solar cookers : Concave mirror

iv) Rear view mirrors in vehicles : Convex mirror

6) For a spherical mirror, answer the following

i) Mirror formula

ii) Magnification formula

iii) Nature of image based on the sign of magnification

Ans:

i) Mirror formula

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

ii) Magnification produced in mirrors

$$\text{Magnification } m = \frac{h^i}{h} = -\frac{v}{u}$$

iii) Nature of image based on the sign of magnification in mirrors

If magnification is negative the image is real and inverted.

If magnification is positive the image is virtual and erect.

7) A convex mirror used for rear-view on an automobile has a radius of curvature of 3.00 m . If a bus is located at 5.00 m from this mirror, find the position, nature and size of the image.

Solution

Radius of curvature,  $R = +3.00$  m;

Object-distance,  $u = -5.00$  m;

Image-distance,  $v = ?$

Height of the image,  $h' = ?$

Focal length,  $f = R/2 = +\frac{3.00 \text{ m}}{2} = +1.50$  m (as the principal focus of a convex mirror is behind the mirror)

Since  $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

$$\text{or, } \frac{1}{v} = \frac{1}{f} - \frac{1}{u} = +\frac{1}{1.50} - \frac{1}{(-5.00)} = \frac{1}{1.50} + \frac{1}{5.00}$$

$$\begin{aligned} &= \frac{5.00 + 1.50}{7.50} \\ v &= \frac{+7.50}{6.50} = +1.15 \text{ m} \end{aligned}$$

The image is 1.15 m at the back of the mirror.

$$\text{Magnification, } m = \frac{h}{h} = -\frac{v}{u} = -\frac{1.15 \text{ m}}{-5.00 \text{ m}}$$

$$= +0.23$$

The image is virtual, erect and smaller in size by a factor of 0.23 .

8) State the laws of refraction.

Ans

(i) The incident ray, the refracted ray and the normal to the interface of two transparent media at the point of incidence, all lie in the same plane.

(ii) The ratio of sine of angle of incidence to the sine of angle of refraction is a constant, for the light of a

given colour and for the given pair of media. This law is also known as Snell's law of refraction. (This is true for angle  $0 < i < 90^\circ$ )

9) What is refractive index of a medium? Refractive index of water is 1.33. What does it mean?

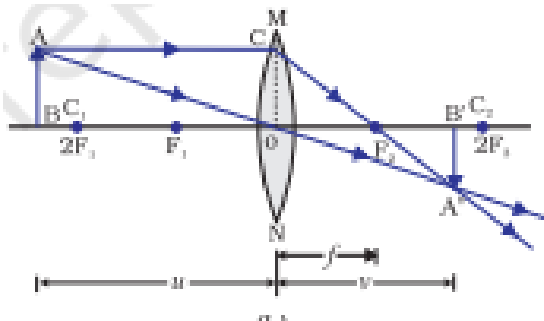
Ans. When light travels from one medium to another, the speed of light changes. This is measured by Refractive index. It is the ratio of speed of light in air to the speed of light in the medium.

$$\text{Refractive index} = \frac{\text{speed of light in air}}{\text{speed of light in medium}}$$

Refractive index of water is 1.33 means when the light passes from air to water, the ratio of speed of light in air to the speed of light in water is 1.33.

$$\text{Refractive index of water} = \frac{\text{speed of light in air}}{\text{speed of light in water}} = 1.33$$

10) Draw a ray diagram of image formation in a convex lens when the object is placed beyond  $2F_1$ . Also mention the nature and size of the image.



Ans

Nature- Real and inverted

Size - Diminish

11) For a spherical lens, answer the following

i) Lens formula

ii) Magnification formula

iii) Nature of image based on the sign of magnification

Ans

i) Lens formula

$$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$$

ii) Magnification formula

$$\text{Magnification } m = \frac{h^i}{h} = \frac{v}{u}$$

iii) Nature of image based on the sign of magnification in lenses

If magnification is negative the image is real and inverted.

If magnification is positive the image is virtual and erect.

12) A concave lens has focal length of 15 cm . At what distance should the object from the lens be placed so that it forms an image at 10 cm from the lens? Also, find the magnification produced by the lens.

Solution

A concave lens always forms a virtual, erect image on the same side of the object.

Image-distance  $v = -10$  cm

Focal length  $f = -15$  cm;

Object-distance  $u = ?$

Since  $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$

or,  $\frac{1}{u} = \frac{1}{v} - \frac{1}{f}$

$$\begin{aligned}\frac{1}{u} &= \frac{1}{-10} - \frac{1}{(-15)} = -\frac{1}{10} + \frac{1}{15} \\ \frac{1}{u} &= \frac{-3 + 2}{30} = \frac{1}{-30} \\ \text{or, } u &= -30 \text{ cm}\end{aligned}$$

Thus, the object-distance is 30 cm .

Magnification  $m = v/u$

$$m = \frac{-10 \text{ cm}}{-30 \text{ cm}} = \frac{1}{3}; +0.33$$

The positive sign shows that the image is erect and virtual. The image is one-third of the size of the object.

13) Define power of a lens. What is the SI unit of power of lens? If a lens is having a power of -2.5 D what type of lens is it?

Ans The power of lens is defined as the reciprocal of its focal length.

$$P = \frac{1}{f}$$

The SI unit of lens is Dioptre. It is denoted by D

The lens of power -2.5D is negative therefore it is a concave lens.

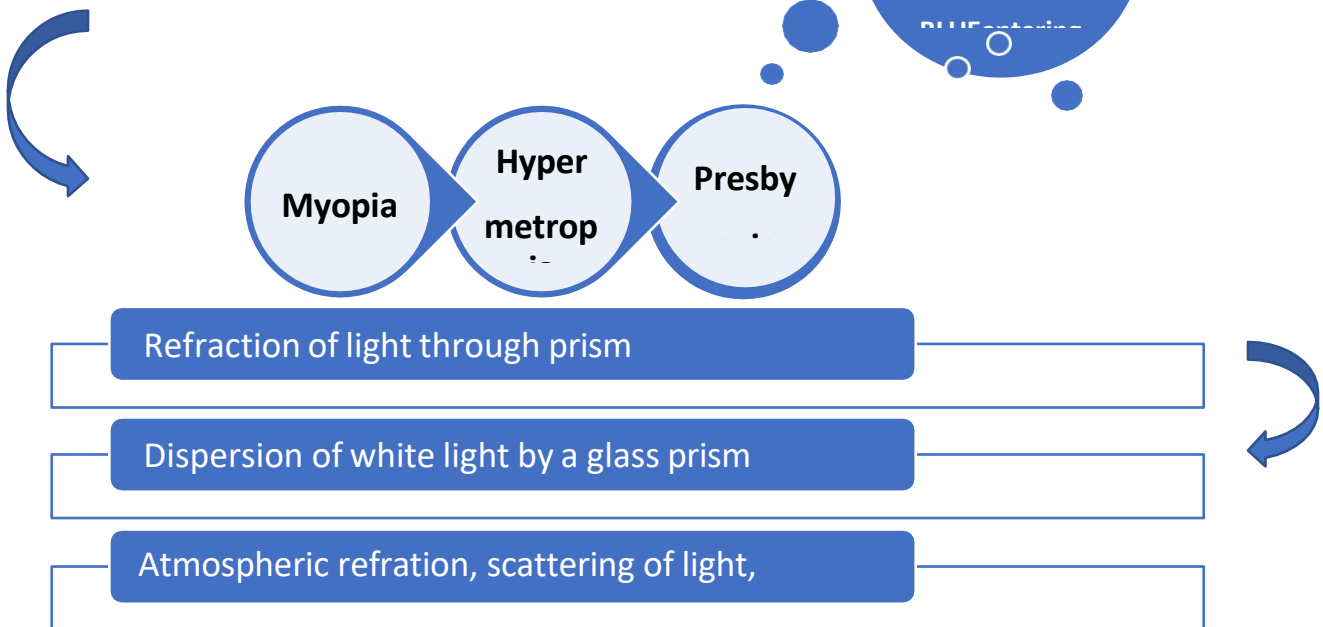
## CHPATER-10-HUMAN EYE AND COLORFUL WORLD.



### THE HUMAN EYE.

#### Power of accommodation

#### Defects of vision and their correction-



**IF FOUR ALTERNATIVES ARE GIVEN FOR EACH QUESTION, CHOOSE THE MOST APPROPRIATE ONE:-**

1) The part of the eye that regulates and controls the amount of light entering the eye

- 1) Iris 2) Cornea 3) Pupil 4) Retina

**Ans: 2) Cornea.**

2) The minimum distance at which objects can be seen most distinctly without strain

- 1) 25cm 2) 20cm 3) 15cm 4) 10cm

**Ans: 1) 25cm**



3) The phenomenon happening here

- 1) Refraction 2) Diffraction 3) Reflection 4) Dispersion

**Ans: 4) Dispersion.**

4)



The effect that is observed when sunlight passes through a canopy of a dense forest.

- 1) Tyndall effect 2) Refraction effect 3) Interference effect 4) Rayleigh effect  
**Ans: 1) Tyndall effect.**

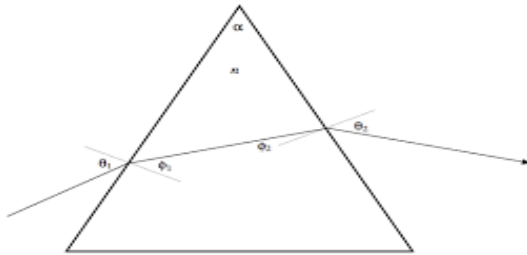
5) A person seeks medical checkup for diminishing flexibility of the eye lens and gradual weakening of the ciliary muscles. The defect he is suffering from

- 1) Myopia 2) Hyper metropia 3) Presbyopia 4) Diabetic retinopathy



**Ans: 3) Presbyopia.**

**6)**



**The ray of light coming out of the prism**

**1) Incident ray 2) Refracted ray 3) Reflected ray 4) Emergent ray**  
**Ans:- 4) Emergent ray.**

**7) The part of the eye in which the images are formed**

**1) Cornea 2) Choroid 3) Retina 4) Optic nerve**

**Ans: 3) Retina.**

**8) The danger signal lights are red in color due to**

**1) Red is most scattered by smoke or fog 2) Red is least scattered smoke or fog**  
**3) Red color is favorite color to signify danger 4) Red cannot be seen .**

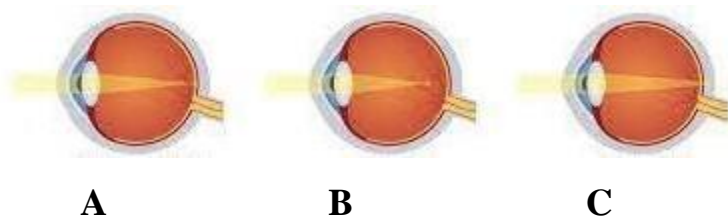
**Ans: 1) Red is most scattered by smoke or fog.**

**II ANSWER THE FOLLOWING QUESTIONS:-**

**1) What is power of accommodation?**

**Ans:-The ability of the eye lens to adjust its focal length is called power of accommodation.**

**2)**



**Identify from the above given diagrams which is myopic, hypermetropic and normal eye .**

**Ans: A is normal, B is myopic eye and C is hypermetropic eye.**

**3) Define dispersion of light.**

**Ans: The splitting of white light into its component colors is called dispersion.**

**4) Define spectrum.**

**Ans: The band of the colored components of a light beam is called spectrum.**

**5) Compare the angle of incidence and angle of refracting surface of the prism and glass slab same or different. If same, why if different why?**

**Ans: The peculiar shape of the prism makes the emergent ray bend at an angle to the direction of the incident ray. This angle is called the angle of deviation. Hence it is different.**

**6) Stars twinkle why?**

**Ans: The twinkling of the stars is due to the atmospheric refraction. The starlight on entering the Earth's atmosphere undergoes refraction continuously before it reaches the earth.**

**7) Why don't the planets twinkle?**

**Ans: The planets are much closer to the earth and are thus seen as extended sources. If we consider a planet as a collection of a large number of point sized sources of light. The total variation in the amount of light entering our eye from all the individual point sources will average out to zero, thereby nullifying the twinkling effect.**

**8) Define Tyndall effect.**

**Ans: The phenomenon of scattering of light by the colloidal particles is called Tyndall effect.**

**9) What causes a rainbow?**

**Ans; A rainbow is a natural spectrum appearing in the sky after a rain shower. A rainbow is always formed opposite to that of Sun. The water droplets act like small prisms. They refract and disperse the incident sunlight**

**And then total internal reflection occurs and finally refracts again when it comes out of the raindrop.**

**10) Why is the color of the clear sky blue?**

**Ans: The blue color has shorter wavelength hence scatter more than the other colors in the spectrum which makes the blue light more visible.**

**11) What causes the advanced and delayed sunrise and sunset?**

**Ans: Advanced sunrise and delayed sunsets are the phenomenon caused due to atmospheric refraction.**

**12) Why does sun appear red during sunrise and sunset?**

**Ans: Near the horizon most of the blue light and shorter wavelengths are scattered whereas the red light having longer wavelengths scatters less and reaches our eyes. This gives the reddish appearance of the sun.**

**13) The sky appears black to an astronaut than blue why? Ans:**

**There is no atmosphere in outer space to scatter the light.**

**14) At noon the sun appears white why?**

**Ans: All the constituent colors of the sunlight come through a shorter distance through the atmosphere in the right proportion to retain its whiteness.**

**15) What is myopia? How is it caused, and how can it be corrected?**

**Ans: Myopia is also known as short sightedness. A person with myopia can see nearby objects clearly but cannot see distant objects clearly.**

**This defect may arise due to**

- **Excessive curvature of the eye lens**
- **Elongation of the eyeball**

**This defect can be corrected by using a concave lens of suitable power.**

**16) What is hypermetropia ? How is it caused, and how can it be corrected?**

**Ans: Hypermetropia is also known as far sightedness. A person with this defect cannot see nearby objects distinctly but can see distant objects clearly.**

This defect may arise due to

- The focal length of the eye lens is too long.
- The eyeball has become too small.

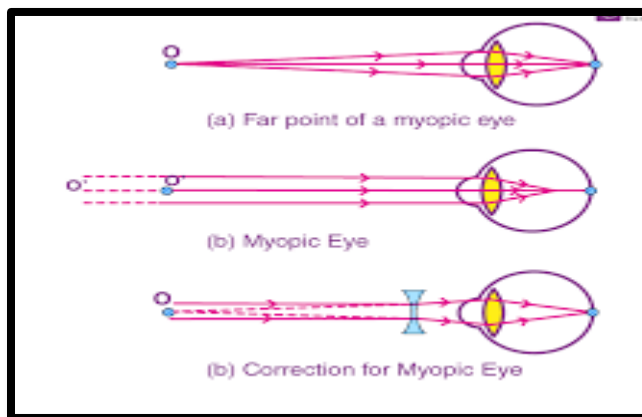
This defect can be corrected by using convex lens of appropriate power.

17) Why does the sun appear yellowish white at noon?

Ans: The sun appears yellowish white at noon because sunlight has to travel a relatively shorter atmospheric distance.

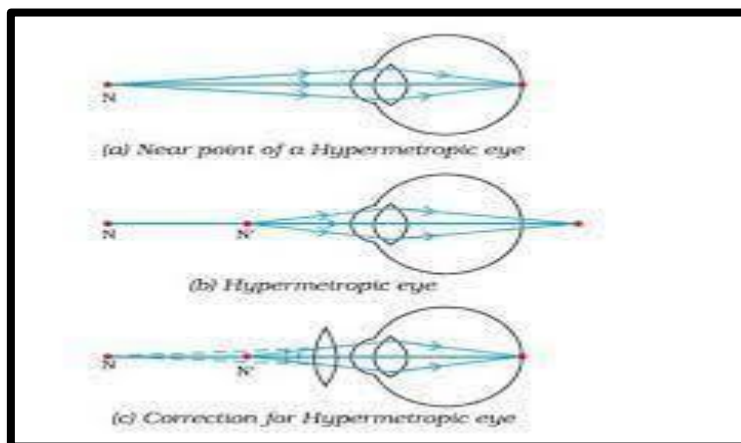
18) Draw a diagram to show myopia and its correction.

Ans:



19) Draw a diagram to show hypermetropia and its correction.

Ans:



## Chapter-13 Our Environment



### MULTIPLE CHOICE QUESTIONS

1. The molecular formula of ozone is

- (a) O<sub>2</sub>                      (b) O<sub>3</sub>                      (c) O<sub>4</sub>                      (d) O<sub>5</sub>

2. The pollutant responsible for the depletion of ozone layer

- (a) CFC    (b) CCF    (c) HDFC    (d) KFC

3. 2 stage equation for formation of ozone layer

- (a) 1) O<sub>2</sub> + O → O<sub>3</sub>    2) O<sub>2</sub> + O → O<sub>3</sub>    (b) 1) O<sub>2</sub> → O + O    2) O<sub>2</sub> + O → O<sub>3</sub>  
(c) 1) O<sub>2</sub> + O<sub>2</sub> → O<sub>3</sub>    2) O<sub>2</sub> + O → O<sub>3</sub>    (d) 1) O + O → O<sub>2</sub>    2) O<sub>2</sub> + O → O<sub>3</sub>

4. We should reduce the use of the plastic bags, bottles etc. because:

- (a) They are not durable                      (b) They are non-biodegradable  
(c) They are made of toxic materials      (d) They react with the atmospheric gases

5. Which atom released when CFCs molecules are broken from UV radiations?

- a) Oxygen    b) Chlorine    (c) Nitrogen    d) Arsenic

**6. Which of these organisms are the most important decomposers in an ecosystem?**

- a) Algae and fungi   b) Fungi and bacteria   (c) Algae and bacteria   d) Bacteria and virus

**7. Element that causes the destruction of the ozone layer**

- (a) Chlorine   (b) Iodine   (c) Carbon   (d) Sodium

**8. In the following groups of materials, which group (s) contains only non-biodegradable items?**

- (a) Wood, paper, leather   (b) Bakelite , detergent, PVC  
(c) Plastic, detergent, grass   (d) Plastic , kitchen wastes, DDT

**9. The correct statement with respect to biodegradable substances among the following is ; these substances**

- (a) remain inert in the environment for a long time  
(b) harm various organisms in the ecosystem  
(c) causes pollution  
(d) undergo recycling naturally in the environment

**10. Dust bin colour used to collect biodegradable waste is**

- (a) Red   (b) Green   (c) Blue   (d) Brown

**Answers**

1	2	3	4	5	6	7	8	9	10
B	A	B	B	B	B	A	B	D	B

**IMPORTANT QUESTIONS AND ANSWERS**

**1. Define Ecosystem? Write the types and give 2 examples?**

**Answer:** An ecosystem is *an area of the environment where* biotic and abiotic components interact with each other .

**2 Types:**

**Natural Ecosystem:** Forest, Grassland, Lakes, Oceans, River

**Artificial Ecosystem:** Zoo, Botanical Garden, Aquarium, Garden.

**2. What is trophic level?**

**Answer:** Each stage of food chain.

**3. How Much Solar Energy will be captured by plants during photosynthesis?**

**Answer:** 1%

**4. What is ozone? How does it protect the organisms on the Earth?**

**Answer:** Ozone is a molecule of three atoms of oxygen (O<sub>3</sub>) It performs a very important function as it shields the atmosphere and protects the earth from UV-radiation. The UV-radiation is very harmful or highly damaging and causes skin cancer in humans.

**5. Name the pollutant responsible for Ozone layer depletion.**

**Answer:** CFC (CHLOROFLUOROCARBON)

**6. Food chains usually not have more than four trophic levels. Why?**

**Answer:**

- Flow of energy in a food chain is unidirectional.

- Only 10% of energy is transferred to the next trophic level. The remaining 90% energy is used in life processes (digestion, growth, reproduction etc.) by present trophic level.
- Due to this gradual decrease in energy, food chains contain 3-4 trophic levels.

**For example-** If energy available at producer level is 1000J then at next level only 10% of 1000J i.e. 100J is available.

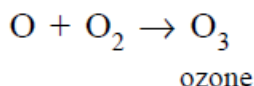
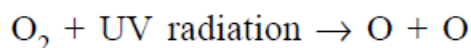
### Define Biomagnification?

**Answer: Biological Magnification:** The concentration of pollutants or toxic chemicals increases in successive trophic levels in a food chain is called **biological magnification**.

**For example:** The non-biodegradable pollutants i.e., DDT once absorbed by an organism cannot be metabolised and broken down or excreted out.

### 8. How is ozone formed in the upper atmosphere? State cause of this damage.

**Answer:** The ozone layer occurs naturally in the stratosphere. The ozone layer is formed when intense UV radiation from the sun causes ordinary molecules of oxygen (O<sub>2</sub>) in the stratosphere to dissociate into single oxygen atoms (O). Single oxygen atoms are very reactive and combine with O<sub>2</sub> to form O<sub>3</sub>.



### 9. Now a days refrigerators are CFC free. Why?

**Answer:** In 1987, the United Nations Environment Programme (UNEP) succeeded in forging an agreement to freeze CFC production at 1986 levels. It is now mandatory for all the manufacturing companies to make CFC-free refrigerators throughout the world.

### 10. Distinguish between biodegradable and non-biodegradable pollutants. Give examples

Biodegradable pollutants:	Non-biodegradable pollutants:
1. Pollutants that can be degraded by biological activity are called biodegradable pollutants. 2. Does not cause pollution Example: Paper, Vegetable and fruit peels, sewage ,	1. Pollutants which cannot be converted into harmless constituents non-biodegradable pollutants. 2. Causes pollution. Example: Lead Vapours, DDT (dichlorodiphenyltrichloroethane)





