

Govt PU College, High School Section, Megaravalli

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**EXAM EMPOWERER**



Hai everyone. This is a small effort from my side to help 10<sup>th</sup> standard students those who are not doing well in science. This is a series under the name “Exam empowerer” with 8 question answers and diagram for a day. There are separate tests for Chemistry(25 Marks), Biology(27 Marks) and Physics(28 Marks) after the completion of respective parts to reinforce the learning. And these papers are prepared according to the board model paper. If the students practice this everyday they will definitely score good marks in the upcoming SSLC examination.

I welcome your advice and suggestions regarding this.

### Day 1

**1. Why should a magnesium ribbon be cleaned before burning in air?**

**Ans:** To remove the stable layer of magnesium oxide.

**2. What is a balanced chemical equation? Why should chemical equations be balanced?**

**Ans :** Chemical reaction in which the number of atoms of each element is same in reactants and products is called balanced chemical equation.

Chemical equations should be balanced to obey the law of conservation of mass.

**3. Differentiate between chemical combination and chemical decompositions**

chemical combination	chemical decomposition
Two or more reactants combine to form a single product.	Single reactant breaks down to give two or more simpler products.
$\text{CaO(s)} + \text{H}_2\text{O(l)} \rightarrow \text{Ca(OH)}_2\text{(aq)} + \text{Heat}$	$\text{CaCO}_3\text{(s)} \xrightarrow{\text{Heat}} \text{CaO(s)} + \text{CO}_2\text{(g)}$

**4. Differentiate between endothermic and exothermic reaction.**

Exothermic reaction	Endothermic
Reaction in which heat is released along with the products.	Reaction in which energy is absorbed
$\text{CaO(s)} + \text{H}_2\text{O(l)} \rightarrow \text{Ca(OH)}_2\text{(aq)} + \text{Heat}$	$\text{CaCO}_3\text{(s)} \xrightarrow{\text{Heat}} \text{CaO(s)} + \text{CO}_2\text{(g)}$

**5. Differentiate between displacement and double displacement reactions.**

Displacement reaction	Double displacement reaction
more reactive element displaces less reactive element from its compound.	Reactions in which there is an exchange of ions between the reactants
Ex, $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$	Ex, $\text{BaCl}_2 + \text{Na}_2\text{SO}_4 \rightarrow 2\text{NaCl} + \text{BaSO}_4$

## 6. Differentiate between oxidation and reduction.

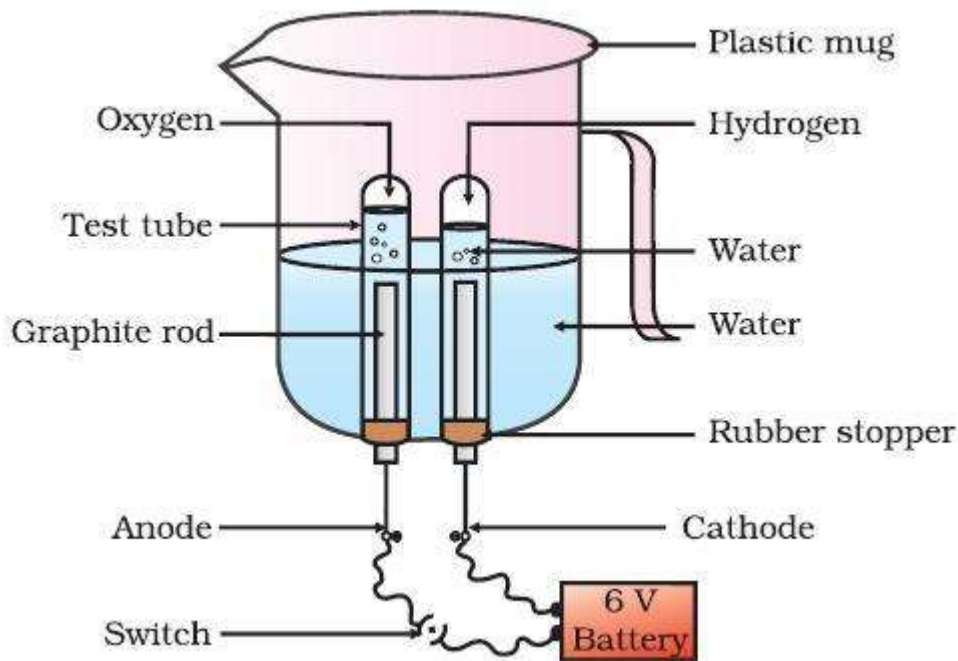
Oxidation	Reduction
1. Gain of oxygen 2. loss of hydrogen	1. Loss of oxygen 2. gain of hydrogen
Ex, $2\text{Cu} + \text{O}_2 \rightarrow 2\text{CuO}$	$\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$

## 7. What are Redox reactions ?

Ans: If one reactant gets oxidized while the other gets reduced during a reaction.

## 8. Why is respiration/decomposition of vegetable/combustion - are considered as exothermic reactions.

Ans: Heat energy is released in the process.



**Electrolysis of water**

Day 2

## 9. Mention three types of decomposition reactions with an example for each.

Ans: **Thermal decomposition** : decomposition reaction carried out by heating

Ex ;  $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$  (CaO- Calcium oxide is called lime or quick lime. It is used in the manufacture of cement. )

**Photochemical decomposition reaction :**

Silver chloride and Silver bromide decomposes when exposed to sunlight.



**Electrical decomposition :** Decomposition of water into Oxygen and Hydrogen upon electrolysis. Ex,  $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$

## 10. Define precipitation reaction.

Ans : Reaction that produces a precipitate

## 11. Define Corrosion. Give example.

Ans: The process in which a metal is attacked by substances around it such as air, moisture, acids, etc. Ex, Rusting of iron (reddish brown powder), Black coating on silver (silver sulphide), green coating on copper (Copper carbonate [formed when copper reacts with moist  $\text{CO}_2$ ])

**12. Define rancidity. State two measures to prevent it.**

Ans: Change in the smell and taste of food materials containing oils and fats due to oxidation. Preventive measures :1. Keeping food in air tight containers.2.Adding antioxidants. 3.Flushing bags of chips with nitrogen.

**13. Oil and fat containing food items are flushed with nitrogen. Why?**

Ans : To prevent the rancidity.

**14. Name the brown fumes liberated when lead nitrate is heated. Write the balanced chemical equation for this reaction.**

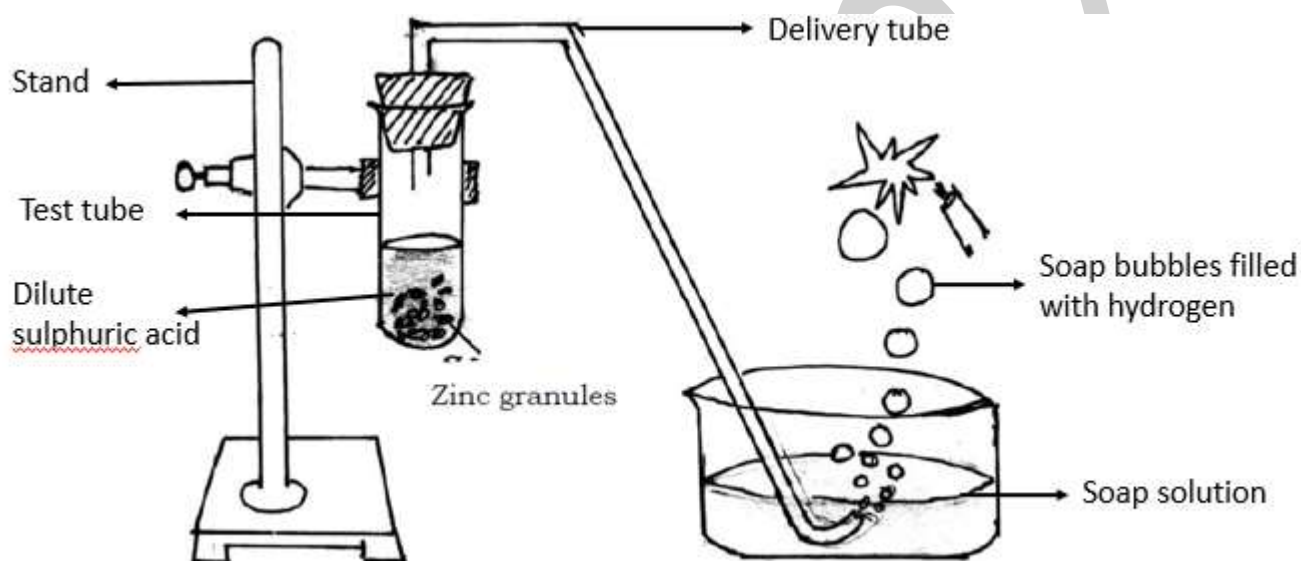
Ans:Nitrogen dioxide.  $2\text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{PbO} + 4\text{NO}_2 + \text{O}_2$

**15.Why should curd and sour substances not be kept in brass and copper vessels?**

Ans: Metal reacts with the acid in the curd to liberate hydrogen gas and harmful substances, there by spoiling the food.

**16.Which gas is usually liberated when an acid reacts with a metal? How will you test for the presence of this gas?**

Ans: Hydrogen gas. It burns with a 'pop' sound on bringing a burning candle near.



**Reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning**

**Day 3**

**17.Which gas is usually liberated when an acid reacts with a metal carbonate or metal hydrogen carbonate? How will you test for the presence of this gas?**

Ans:  $\text{CO}_2$ . It turns lime water milky.

**18. What is neutralization reaction? Give example.**

Ans: The reaction between an acid and a base to give a salt and water.



**19. While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?**

Ans: The process of dissolving an acid or a base in water is a highly exothermic.

1.the heat generated may cause the mixture to splash out and cause burns.

2.The glass container may also break due to excess heat produced.

**20. Why does dry HCl gas not change the colour of the dry litmus paper?**

Ans:Acid dissociates in to ions only in the aqueous solution.

## 21. List Some naturally occurring acids and their sources.

Natural source	Acid	Natural source	Acid
Vinegar	Acetic acid	Sour milk (Curd)	Lactic acid
Orange & Lemon	Citric acid	Ant sting & Nettle sting	Methanoic acid
Tamarind	Tartaric acid	Tomato	Oxalic acid

## 22. Explain how tooth decay is caused. How can it be prevented ?

Bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth after eating. So the pH in the mouth decreases and the tooth enamel gets corroded.

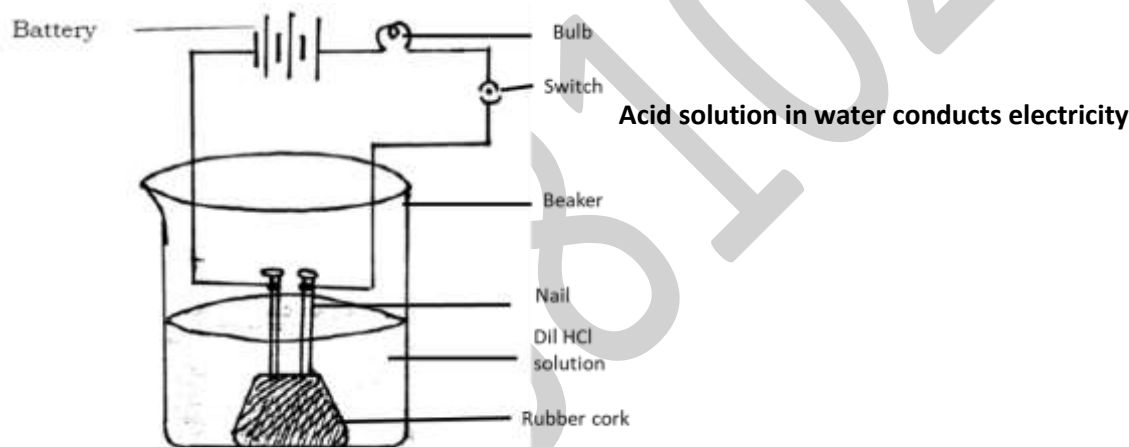
\* Using toothpastes which are generally basic, for cleaning the teeth.

## 23. Plaster of Paris should be stored in a moisture-proof container. why?

Ans: Plaster of Paris absorbs moisture to form a hard solid known as gypsum.

## 24. Write chemical name, formula and uses of washing soda.

Ans: Sodium carbonate-  $\text{Na}_2\text{CO}_3$ . It is used in (i) glass, (ii) soap, (iii) paper industries. (iv) remove permanent hardness of water.



## Day 4

## 25. Write chemical name, formula and uses of baking soda.

Ans: Sodium hydrogen carbonate-  $\text{NaHCO}_3$ . It is used (i) as an antacid. (ii) in soda-acid fire extinguishers. (iii) manufacture of baking powder.

## 26. What is chloro-alkali process?

Ans: Electrolytic decomposition of sodium chloride solution

## 27. Name the products of chloro-alkali process and write two uses of each.

Ans: Hydrogen (Gas) (Cathode)- Ammonia, fuel, margarine.

Chlorine (Gas) (Anode)- purification of water, manufacture of PVC, CFC, insecticide.

Sodium hydroxide (Alkali)- Degreasing metals, Soaps, Detergents, paper, artificial fibre.

## 28. What is meant by water of crystallization? Give example.

Ans: Fixed no of water molecules present in one formula unit of a salt. Ex-  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

## 29. What is the difference between strong acid and concentrated acid?

Ans: Acid which dissociates into ions completely is called strong acid whereas the concentrated acid is the one which has less water content.

**30. How plaster of Paris is manufactured? Explain with chemical reaction.**

**Ans:** Plaster of Paris is obtained by heating gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) to 373 K temperature.

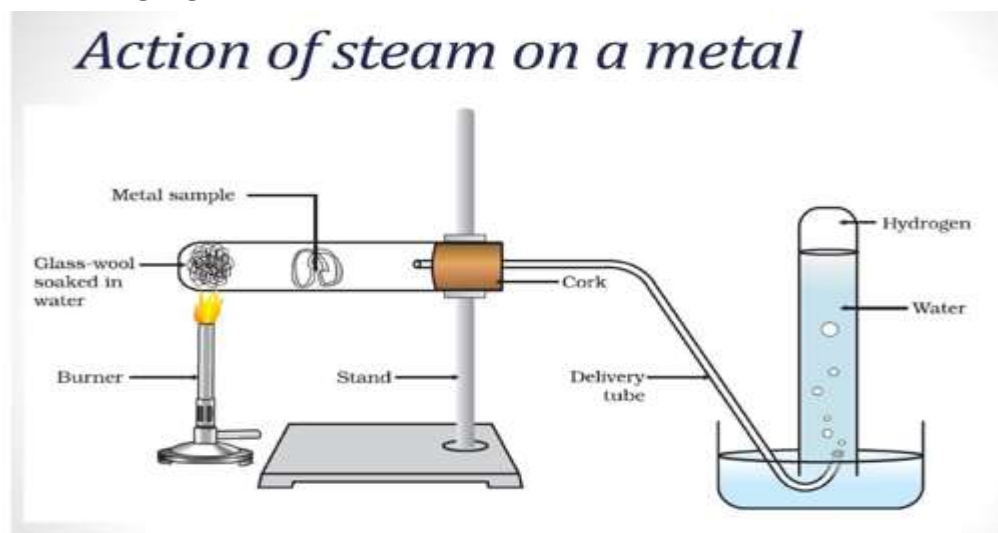


**31. Why do acids not show acidic behavior in the absence of water?**

**Ans:** Dissociation of hydrogen ions from an acid occurs only in the presence of water.

**32. Write chemical name, formula and uses of bleaching powder.**

**Ans:** Calcium oxy chloride-  $\text{CaOCl}_2$ - disinfect water, to bleach clothes in laundry, oxidising agent in industries, bleach the wood pulp, bleaching agent for cotton.



**Day 5**

**33. What is meant by acid rain? How it is harmful to aquatic organisms?**

**Ans:** When the pH of rain water is less than 5.6 we call it as acid rain. It destroys eggs of the aquatic organisms.

**34. Write chemical name, formula and uses of plaster of Paris.**

**Ans:** Calcium sulphate hemihydrate ( $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ )

Uses- 1. for supporting fractured bones, 2. making smooth surfaces, 3. making toys.

**35. Sodium, potassium and lithium are stored under oil.**

**Ans:** They are highly reactive metals and react with air and water very rapidly.

**36. Food cans are coated with tin and not with zinc. Why?**

**Ans:** Zinc is more reactive than tin.

**37. Distinguishing between metals and non-metals on the basis of their physical properties**

Metals	Non -metals
1. malleable	1. non-malleable (brittle)
2. good conductors of electricity	2. poor or non conductors of electricity.
3. sonorous	3. non-sonorous

**38. Differentiate between metal and non-metal on the basis of their chemical properties.**

Metals	Non-metals
1. electron donors, i.e. they are electropositive	1. electron acceptors i.e they are electronegative
2. react with oxygen to form basic oxides	2. react with oxygen to form acidic oxides.
3. are reducing agents	3. are oxidizing agents.

39. What are amphoteric oxides? Give two examples of amphoteric oxides.

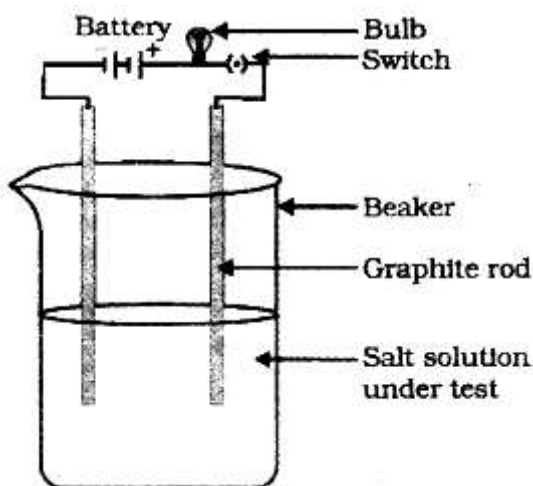
Ans: Metal oxides which react with both acids as well as bases to produce salts and water.

Ex: aluminium oxide ( $\text{Al}_2\text{O}_3$ ), zinc oxide ( $\text{ZnO}$ ).

40. Does the chemical reaction take place when zinc is added to ferrous sulphate solution?

Justify your answer.

Ans: Yes the reaction takes place, because zinc is more reactive than the iron.



Testing the conductivity of a salt solution

Day 6

41. Name:- (i) Metal which is liquid at room temperature.- Mercury (ii) Metal that can be easily cut with a knife.- Sodium (iii) Metal which is the best conductor of electricity- Silver. (iv) Shiny non metal- Iodine (v) Smooth alkali metals- Sodium, Potassium, Lithium

42. Why hydrogen gas is not evolved when a metal reacts with nitric acid ?

Ans:  $\text{HNO}_3$  (nitric acid) is a strong oxidising agent. It oxidises the  $\text{H}_2$  produced to water.

43. Name any two metals that react with cold water very quickly. Write the products formed when these Metals react with cold water.

Ans: Sodium, potassium, lithium.

\* Products formed- Metal hydroxide and hydrogen gas.



44. What are ionic compounds?

Ans: The compounds formed by the transfer of electrons from a metal to a non-metal.

45. Write the four properties of ionic compounds.

Ans: 1. solids and are some what hard. 2. have high melting and boiling points. (strong attractive force between ions) 3. generally soluble in water. 4. conduct electricity only in the molten state. (movement of ions)

46. Show the formation of  $\text{NaCl}$  with the help of electron dot structure.

Ans:

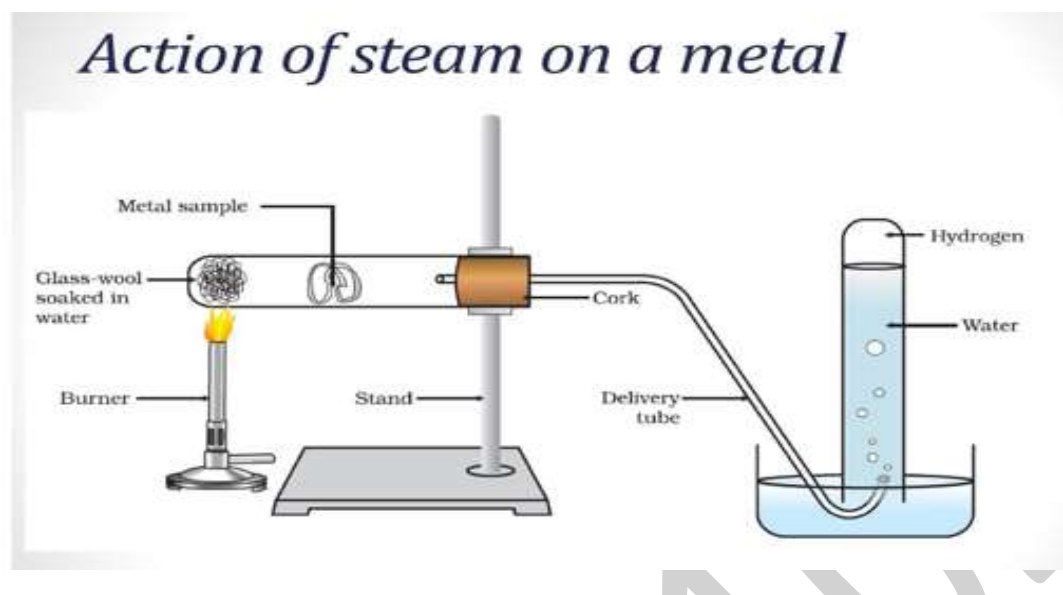


#### 47. Define Covalent bond.

Ans :Chemical bond formed by the mutual sharing of one or more electron pairs.

#### 48.List the properties of covalent compounds.

Ans: (i) have low melting points and boiling points.(ii) generally gaseous or liquids or soft solids. (iii) are generally insoluble in water, but soluble in organic solvents like alcohol, acetone. (iv) They are bad conductors of electricity.



Day 7

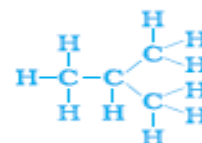
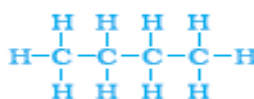
#### 49. What is a homologous series? Give example.

Ans.A group of members of the same class of organic compounds, where successive members differ by a  $-\text{CH}_2$  group.

Ex : a)  $\text{CH}_3\text{OH}, \text{C}_2\text{H}_5\text{OH}, \text{C}_3\text{H}_7\text{OH}, \text{C}_4\text{H}_9\text{OH}$ , b)  $\text{CH}_4, \text{C}_2\text{H}_6, \text{C}_3\text{H}_8, \text{C}_4\text{H}_{10}$

#### 50. What are isomers? Draw the structures of two isomers of butane ( $\text{C}_4\text{H}_{10}$ ).

Ans. Organic compounds having the same molecular formula but different structural formulae, and hence, different physical and chemical



properties are called isomers. *n* - butane and *iso*-butane

#### 51.What are the two properties of carbon which lead to a huge number of carbon compounds we see around us?

Ans. 1. Catenation 2. Tetravalency.

#### 52. What is catenation?

Ans;The ability of carbon to form covalent bonds with other carbon atoms.

#### 53.What are functional groups? Give example.

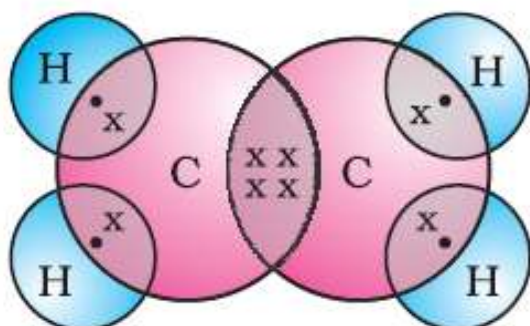
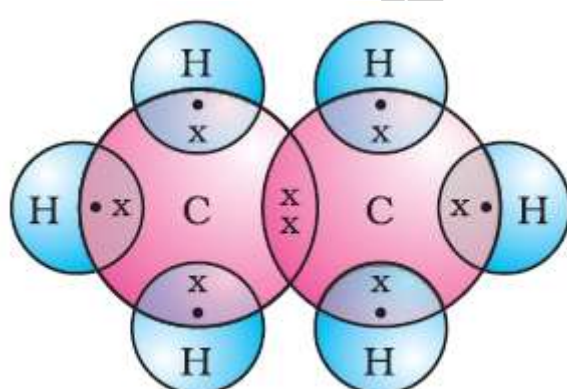
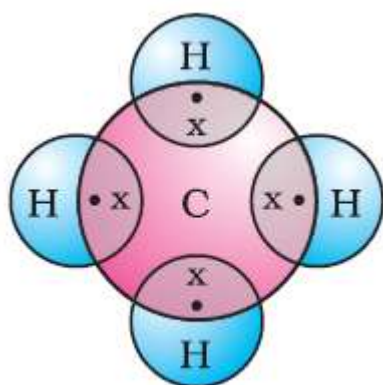
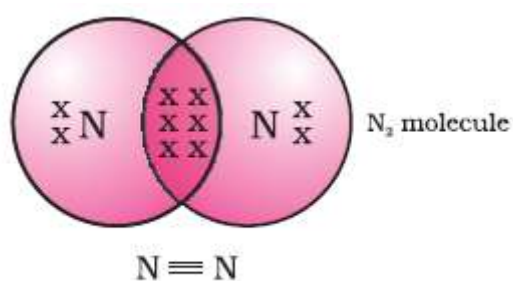
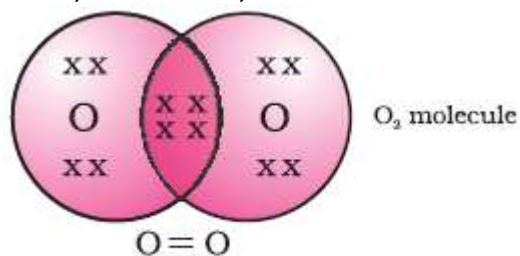
Atoms which decide the properties of the carbon compounds, are known as Functional Groups.

Ex: Cl, Br, -OH, Aldehyde, Ketone, Carboxylic Acid.

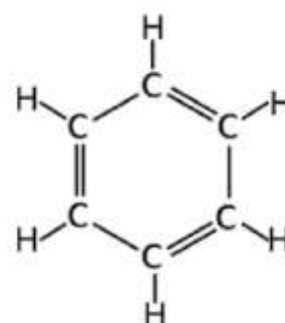
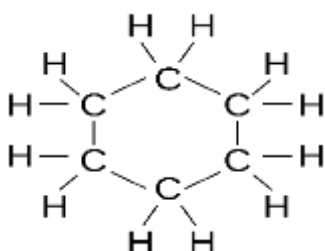
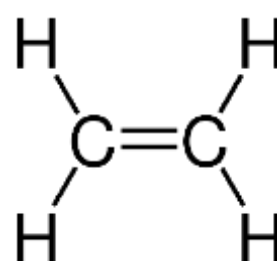
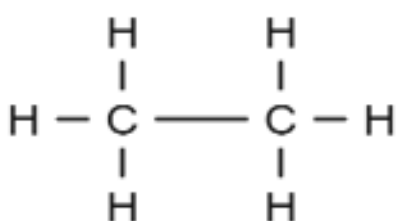
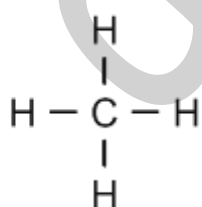
#### 54.Write the differences between saturated and unsaturated hydrocarbons.

Saturated hydrocarbons	Unsaturated hydrocarbons
i. carbon atoms are satisfied by a single bond between them	i. carbon atoms have double or triple bonds between them
ii. not very reactive	ii. more reactive
Ex, Alkanes,	alkenes , alkynes,

55. Write the electron dot structures of a) oxygen b) Nitrogen c) methane d) ethane e) ethene.



56. Write the structural formulae of a) methane b) ethane c) ethane d) Ethyne e) cyclohexane f) benzene.





## Day 8

**57. What were the limitations of Dobereiner's classification?**

**Ans:** i. He could identify only three triads from the elements known at that time.  
ii. All known elements could not be classified into triads.

**58. What were the limitations of Newland's law of octaves?**

**Ans:** (i) It was applicable up to calcium only. (ii) Elements that were discovered after did not find a place. (iii) He placed some unlike elements under the same note.

**59. State Mendeleev's periodic law.**

**Ans:** "properties of element are the periodic function of their atomic mass".

**60. What are the advantages of Mendeleev Periodic Table**

- He left gap for some undiscovered elements.
- **Ex:** Eka Boron etc.
- This table also accommodate the noble gases

**61. State the merits of Mendeleev's classification of elements.**

**Ans:** 1) He left blank spaces for the elements yet to be discovered.

- 2) When noble gases were discovered, they could be placed in a new group without disturbing the existing order.

**62. State modern periodic law.**

**Ans:** "properties of element are the periodic function of their atomic number".

**63. Why do you think the noble gases are placed in separate group?**

**Ans:** i. Noble gases are inert elements.

ii. They are having octet electronic configuration.

**64. Define Atomic radii. How it varies across the period and down the group? Why?**

**Ans:** The distance between the centre nuclei and the outermost electron shell of the atom.

- Atomic size increases down the group.
- Because new shells are being added as we go down the group
- The atomic size decreases along a period.
- Because an increase in nuclear charge tends to pull the electrons closer to the nucleus.

**Day -9**  
**Chemistry - Test :**

**I. Choose the correct alternative**

**2 x 1 = 2**

1. The name of carbon compound  $\begin{array}{c} \text{H} \\ | \\ \text{H}-\text{C}=\text{O} \end{array}$  is :
- A. Methanal  
B. Methanone  
C. Ethanal  
D. Methanoic acid
2.  $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$

The type of above chemical reaction is

- A) combination reaction                      B) double displacement reaction  
C) decomposition reaction                    D) displacement reaction.

**II. Answer the following questions.**

**4 x 1 = 4**

3. What is a strong acid?  
4. State modern periodic law.  
5. The metallic property of elements increases down the group in the modern periodic table. Why?  
6. Define catenation.

**III. Answer the following questions.**

**3 x 2 = 6**

7. The compounds  $\text{C}_2\text{H}_4$ ,  $\text{C}_3\text{H}_6$ ,  $\text{C}_4\text{H}_8$ ,  $\text{C}_5\text{H}_{10}$  are in homologous series. Why? Write the general name and general formula for these carbon compounds.  
8. Mention the advantages and limitations of Mendeleev's periodic classification.  
9. Why acid must be added to water always while diluting the acid?

OR

Write the chemical name, molecular formula and uses of plaster of Paris.

**IV. Answer the following questions.**

**3 x 3 = 9**

10. Draw the diagram of the arrangement of the apparatus showing the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts :  
(i) Zinc granules                      (ii) Delivery tube
11. What is rancidity? Mention the measures to prevent rancidity.

OR

Define endothermic and exothermic reactions with examples.

12. Draw the diagram of the apparatus used in the Electrolysis of water  
Label the following parts.

(i) Cathode                      (ii) graphite rod

**V. Answer the following question.**

**1 x 4 = 4**

13. What are ionic compounds? Write the four properties of ionic compounds.  
b) What are amphoteric oxides ? Give two examples.

## Biology Day - 10

**65. List three events that occur during the process of photosynthesis.**

- Ans:**(i) Absorption of light energy by chlorophyll.  
(ii) Conversion of light energy to chemical energy  
(iii) splitting of water molecules into hydrogen and oxygen.  
(iii) Reduction of carbon dioxide to carbohydrates.

**66. Why is diffusion insufficient to meet the oxygen requirements of multi-cellular organisms?**

**Ans:** All the cells of multicellular organisms are not in direct contact with the outside environment.

**67. What are the differences between autotrophic nutrition and heterotrophic nutrition?**

Autotrophic nutrition	Heterotrophic nutrition
(i) Food is synthesised from simple inorganic raw materials such as CO <sub>2</sub> and water.	(i) Food is obtained directly or indirectly from autotrophs.
(ii) Presence of green pigment (chlorophyll) is necessary.	(ii) No pigment is required
(iii) Digestion is not required	(iii) Digestion is required

**68. What is the role of the acid in our stomach?**

- Ans:**i) creates acidic medium which facilitates the action of the enzyme pepsin.  
ii) Kills microbes entering the stomach along with food.

**69. What advantage over an aquatic organism does a terrestrial organism have with regard to obtaining oxygen for respiration?**

**Ans:** The content of oxygen in air is high as compared to the amount of dissolved oxygen present in water. (Aquatic organisms have to breathe faster to get adequate oxygen)

**70. What are the different ways in which glucose is oxidized to provide energy in various organisms?**

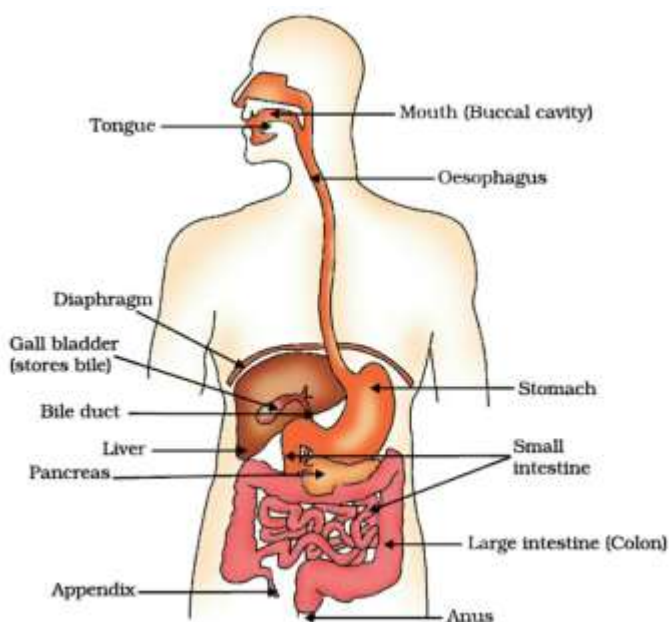
- Ans:**i) In yeast cell glucose is broken down in the absence of oxygen to form ethyl alcohol and carbon dioxide along with energy.  
ii) In muscles of, in the deficiency of oxygen. Glucose is converted into lactic acid  
iii) In the cells of higher organisms, in mitochondria, presence of oxygen glucose is converting into CO<sub>2</sub> and H<sub>2</sub>O.

**71. Name the components of blood and mention their functions.**

- Ans:** i) Plasma - transports food, carbon dioxide and nitrogenous wastes.  
ii) Red blood corpuscles (RBC) : transport oxygen.  
iii) Platelets: helps in blood clotting.

**72. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?**

**Ans: i.)** Helps to maintain body temperature. ii) ensures efficient supply of oxygen.



## Digestive system

### Day 11

#### 73. What is Lymph?

**Ans:** Fluid similar to the plasma of blood but colourless and contains less protein.

#### 74. What are the functions of lymph?

- Ans:** i) carries digested and absorbed fat from intestine  
 ii) drains excess fluid from extra cellular space back into the blood.

#### 75. How are water and minerals transported in plants?

**Ans:** In xylem tissue, vessels and tracheids form a continuous water-conducting channels reaching all parts of the 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, therefore, moves into the root from the soil. Evaporation of water molecules from the cells of a leaf creates a suction. Which pulls water from the xylem cells of roots.

#### 76. How is food transported in plants?

**Ans:** Transport of soluble products of photosynthesis is called **translocation**. Phloem transports food materials from the leaves to different parts of the plant body. The transportation of food in phloem is achieved by utilizing energy from ATP. The translocation of food and other substances takes place in the sieve tubes with the help of adjacent companion cells both in upward and downward directions.

#### 77. What are the methods used by plants to get rid of excretory products?

- Ans:** (i) Plants get rid of excess of water by transpiration.  
 (ii) Waste products are stored in cellular vacuoles.  
 (iii) Waste products may be stored in leaves that fall off.  
 (iv) Resins and gums are stored in old xylem.  
 (v) some waste substances excreted into the soil from roots.

#### 78. What is the role of saliva in the digestion of food?

**Ans:** Salivary amylase in the saliva breaks down starch into sugar.

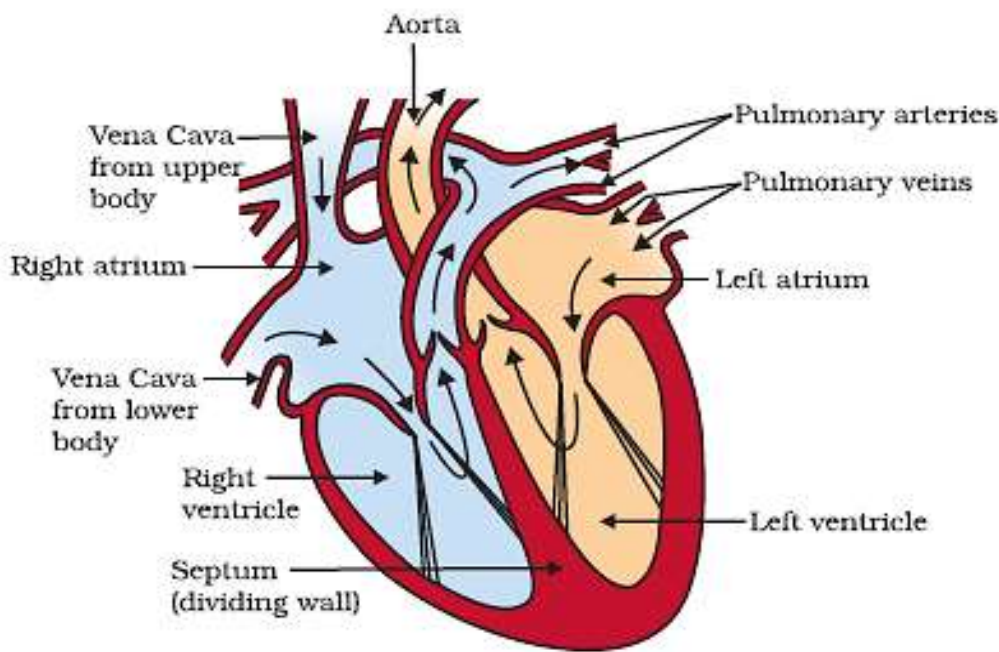
**79.What are the differences between aerobic and anaerobic respiration?**

Aerobic respiration	Anaerobic respiration
1. Occurs in the presence of O <sub>2</sub> .	1. Occurs in the absence of O <sub>2</sub> .
2. Takes place in mitochondria.	2. It occurs only in cytoplasm.
4. The products are carbon dioxide and water.	4. The products are ethyl alcohol and carbon dioxide.
5. Yields more energy.	5. Yields less energy.

**80.What is double circulation? What are its importances ?**

**Ans:** Blood goes through the heart twice during each cycle. **Importance-**

- (i) keeps the oxygenated blood separated from de-oxygenated blood.
- (ii) allows more efficient supply of oxygen to the body cells.



**Figure 6.10**  
Schematic sectional view of the human heart

**Day 12**

**81.What are the differences between the transport of materials in xylem and phloem?**

Transport of materials in xylem	Transport of materials in phloem
(i) it helps in the transport of water and minerals.	(i) it helps in the transport of food.
(ii) Water is transported upwards from roots to all other plant parts.	(ii) Food is transported in both upward and downward directions
(iii) Takes place with the help of simple physical forces.	(iii) Transport of food in phloem requires energy in the form of ATP.

**82.What is 'translocation' in plants?**

**Ans:** Transport of soluble products of photosynthesis.

**83. Define transpiration.**

**Ans;** Loss of water in the form of vapour from the aerial parts of the plant.

**84. Mention the importance of transpiration in plants**

**Ans:** i) helps in the absorption and upward movement of water minerals.  
ii) helps in temperature regulation.

**85. How do guard cells regulate opening and closing of stomatal pores?**

**Ans;** When the water enters in to the guard cells they swell and the stomatal pore opens. When the water moves out the guard cells shrink and stomatal pore closes.

**86. Differentiate between an artery and a vein.**

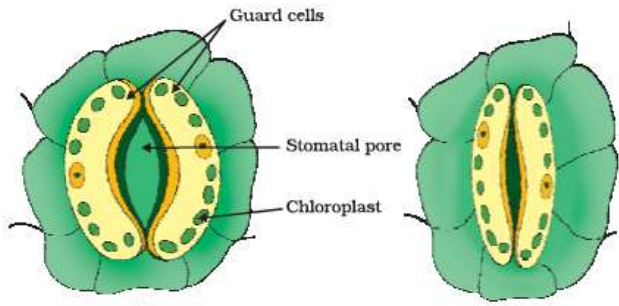
Artery	Vein
Carries blood away from the heart	Carries the blood to the heart
Thick walled	Thin walled
Valves are absent	Valves are present

**87. Why do herbivores have longer small intestine than carnivores ?**

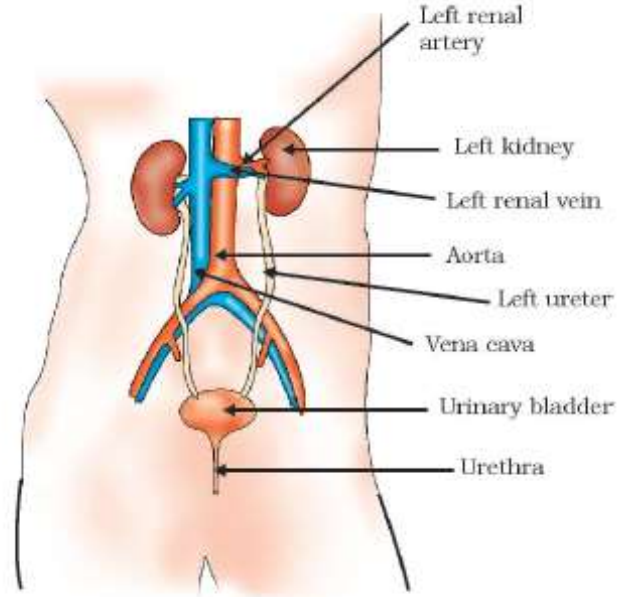
**Ans:** Herbivores eating grass need a longer small intestine to allow the cellulose to be digested. Meat is easier to digest, hence carnivores like tigers have a shorter small intestine.

**88. Name different secretions of digestive system in humans and write their functions**

No	Part of digestive system	Secretion	function
1	Mouth	Salivary amylase	Converts starch into sugar
2	Stomach	HCl	Kills micro organisms & Creates acidic medium
		Mucous	Protects the lining of the stomach from the action of HCl
		Pepsin	Protein digestion
3	Liver	Bile juice	Makes the food alkaline & breaking down the large fat molecules in to smaller globules. (emulsification)
4	Pancrease	Trypsin	Protein digestion
		Lipase	Breaking down the emulsified fat
5	Small intestine	Intestinal juices	<ul style="list-style-type: none"><li>➤ Protein → amino acids</li><li>➤ Carbohydrates → glucose</li><li>➤ Fats → fatty acids and glycerol</li></ul>



(a) Open and (b) closed stomatal pore



**Figure 6.13**  
Excretory system in human beings

### Day 13

89. What is reflex action? Which part of brain is responsible for this?

**Ans:** Sudden action in response to something in the environment. - **Spinal cord.**

90. How are involuntary actions and reflex actions different from each other?

Involuntary actions	Reflex actions
i. cannot be consciously controlled.	i. are sudden, unconscious automatic response to some change in an environment.
ii. directly under the control of the brain.	ii. controlled by spinal cord.
iii. Takes place slowly.	iii. Takes place very rapidly

91. Name different type of tropisms exhibited by the plants and write their meaning.

**Ans:** A tropism is a growth toward or away from a stimulus.

**Phototropism** - the directional growth in response to light (controlled by auxin)

**Thigmotropism** - plant growth in response to touch or contact with a solid object.

**Geotropism** - growth in response to gravity.

**Hydrotropism** - directional growth in response to water.

**chemotropism** - growth in response to chemicals.

92. Write the functions of **Forebrain**      **b) Cerebellum**      **c) Mid brain**      **d) Medulla**

**Ans:** 1. Control the voluntary actions.

2. Stores information collected from sense organs (**Memory**)

3. Receives sensory impulses from various body parts and integrates it.

4. Sensation of hunger.

93. Write the functions of **cerebellum**

**Ans:** 1. Controls posture and balance      2. Control precision of voluntary actions

94. Write the functions of **mid brain**

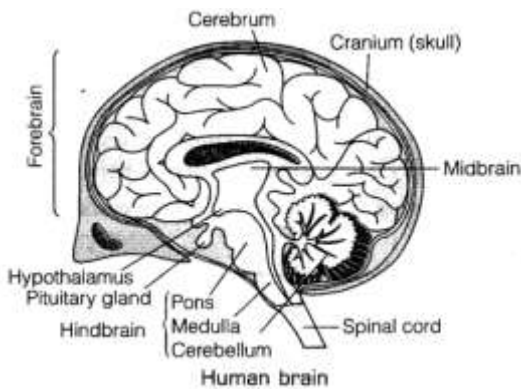
**Ans:** Controls involuntary activities. - Ex: Movement of head and neck as reflex for music.

**95. Write the functions of medulla**

**Ans:** Controls involuntary actions eg. blood pressure, salivation, vomiting.

**96. How does nervous system differ from the endocrine system in forming control and co-ordination in animals?**

Nervous system	Endocrine system
Transmission of information takes place through neurons	Transmission of information takes place through blood in the form of hormones.
Information is transmitted mainly in the form of electric impulse.	Information is transmitted in the form of chemical message.
Electrical impulses will reach only those cells that are connected by nervous tissue	Chemical messages reach every cell in the body.
Response is faster.	Response is slower.



**Day 14**

**97. List the important plant hormones and write their functions.**

plant hormones	Functions
Auxin	helps the cells to grow longer
Gibberellin	help in the growth of the stem
Cytokinins	promote cell division
Abscisic acid	inhibits growth. (Ex-wilting of leaves)

**98. List the important Endocrine glands, the hormone they secrete & their function**

Gland	Hormone	Function
Pituitary Gland	Growth hormone	-Controls growth- (dwarfism & gigantism.)
Thyroid Gland	Thyroxin	regulates carbohydrate, protein and fat metabolism (Goitre- Iodised salt)
Adrenal Gland	Adrenaline	-Increase heart beat, blood pressure, breathing rate, to face the situation.
Pancreas	Insulin	-regulates the blood sugar level. (Diabetes)
Testis	Testosterone	changes associated with puberty in males
Ovary	Oestrogen	changes associated with puberty in females



**99. How does our body respond when adrenaline is secreted into the blood?**

Ans: It speeds up the heartbeat and hence supplies more oxygen to the muscles. The breathing rate also increases due to contractions of diaphragm and rib muscles.

**100. How is the process of pollination different from fertilisation?**

Pollination	Fertilisation
transfer of pollen grains from anther to the stigma of a flower	fusion of male gamete with the female gamete

**101. Explain the significant function of each structure in human male reproductive system.**

Ans. : i) **Testis** : Produce sperms and testosterone hormone.

ii) **Urethra and vas deferens** : Transport sperm from testis.

iii) **Prostate gland and seminal vesicle** : Their secretion

1) Makes the transport of the sperms easier, 2) Provides nutrition to the sperms

iv) **Penis** : Delivers the sperms to the site of fertilization.

**102. Why do testes located in scrotum outside the abdominal cavity?**

Ans. Sperm formation requires lower temperature than the body temperature.

**103. Explain the significant function of each structure in human female reproductive system.**

Ans: (i) **Ovaries** : Produce eggs( female gametes)

(ii) **Fallopian tube/Oviducts**: Carries the egg from ovary to the womb and is the site of fertilization.

(iii) **Uterus**: Structure where the foetus grow.

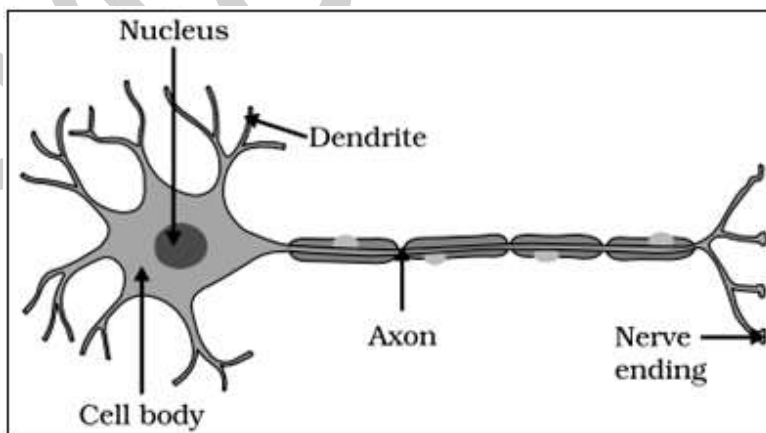
(iv) **Vagina**: The sperms enter through the vaginal passage during sexual intercourse.

**104. What are the changes seen in girls at the time of puberty?**

Ans: (i) Skin becomes oily. Pimples often develop.

(ii) Breast size begins to increase, with darkening of the skin of the nipples at the tips of the breasts. (iii) Beginning of menstruation cycle.

(iv) Growth of thick hairs in armpit and genital area between the thighs.



**Structure of neuron**

## Day 15

**105. What happens if egg is not fertilized in female? Or How does menstruation occur?**

**Ans:** The 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. (menstruation)

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

**Ans:** (i) **Creation of mechanical Barrier** : Condoms on the penis or similar coverings worn in the Vagina. Using loop or the copper-T inside vagina.

(ii) **Changing the hormonal balance** - by using drugs or pills.

(iii) **Surgical methods** : Blocking the vas deferens in male or the fallopian tube in female.

**107. Differentiate between plumule and radicle**

Plumule	Radicle
i) Plumule is future shoot.	i) Radicle is future root.
ii) It grows towards the sun	ii) It grows towards the soil.

**108. What is placenta? Write two functions of placenta.**

**Ans:** Embryo attaches to the mother's blood with the help of a special tissue called placenta. Functions

i) It provides nutrients to the embryo.

ii) Helps to remove the waste generated by the embryo.

**109. Differentiate between self pollination and cross pollination.**

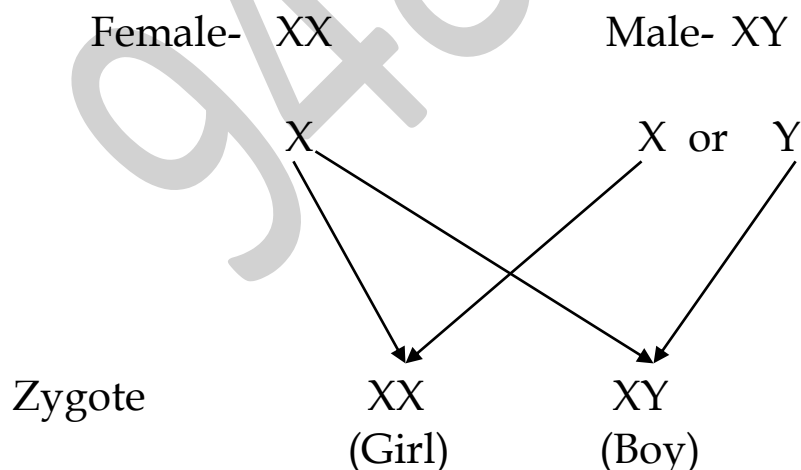
self pollination	cross pollination
i) transfer of pollen grains within the same flower	i) transfer of pollen grains from one flower to another.
ii) Does not require external agency	ii) Requires external agency.

**110. Why are traits acquired during the life-time of an individual not inherited?**

**Ans:** Acquired traits cannot be passed on to DNA of germ cells.

**111. How is the sex of the child determined in human beings?**

**Ans :** Woman has a perfect pair of sex chromosomes, both called X. Man has a normal sized chromosome X and another short sized chromosome Y. All children will inherit an X chromosome from mother. Child who inherits an X chromosome from father will be a girl. Child who inherits a Y chromosome from father will be a boy.

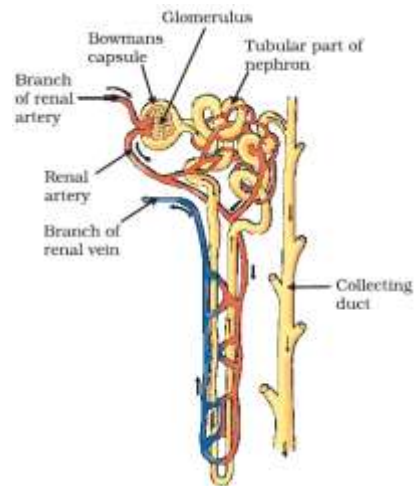


**112. What is speciation? What factors could lead to the speciation?**

**Ans :** Formation of new and distinct species in the course of evolution from the existing species. The factors that could lead to the rise of a new species are :-

1. Natural selection, 2. Genetic drift, 3. Geographical isolation

## Structure of a nephron



## Day 16

### 113. What are fossils?

**Answer :** Fossils are the Remains and relics of dead organisms of the past.

### 114. Differentiate between acquired traits and inherited traits.

Sl.No	Acquired traits	Inherited traits
1	developed during the lifetime of an individual.	Characteristics transmitted from parent to offspring's.
2	Cannot be passed on to progeny	Can be passed on to progeny
3	Doesn't bring change in DNA of germ cells.	Bring changes in DNA of germ cells.
	Ex, Dancing ability in man	Skin color in man

### 115. Differentiate between homologous organs and analogous organs.

homologous organs	analogous organs
Organs that have same basic structural plan and origin but different functions.	Organs that have different origin and structural plan but same function.
Ex: hands of humans and the wings of birds	wings of bird and insects

### 116. Explain the two methods to estimate the age of fossils.

**Ans.: Relative method** – If we dig into the earth, the fossils we find closer to the earth's surface are more recent than the fossils we find in deeper layers.

By detecting the ratios of different isotopes of the same element in the fossil material.

### 117. What is biomagnification or biological magnification? Which organism is affected more by this ?

**Ans:** The concentration of pollutants or toxic chemicals increases in successive trophic levels in a food chain is called biological magnification. The organisms which are on the higher trophic level are affected more.

### 118. Write the cause for depletion of ozone layer .Write its effect and measure to save it.

**Ans.** Depletion of ozone layer is caused by CFC (chlorofluro carbon) Effects :- Cancer in human beings, Loss of immunity in humans, Destruction of aquatic life and vegetation.

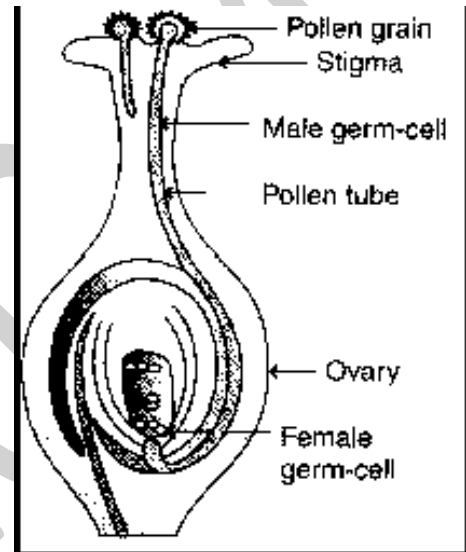
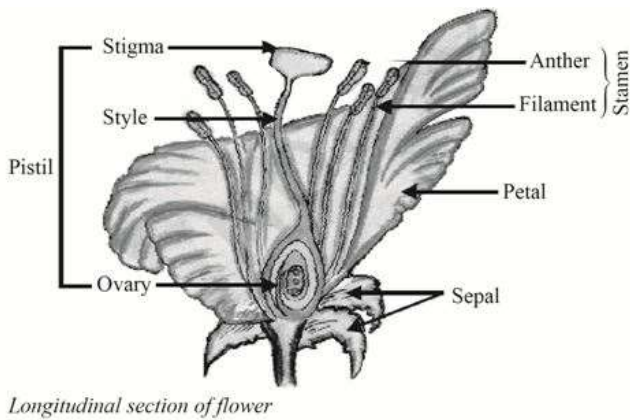
Step taken to limit the damage to the ozone layer :-reducing the use of CFCs

**119. Distinguish between biodegradable and non-biodegradable substances.**

Biodegradable substances	Non-biodegradable substances
1. Decomposed by micro organisms	1. Not decomposed by micro organisms.
2. Do not cause bio magnification	2. Cause bio magnification.
Ex: Kitchen wastes, paper, sewage.	Ex: Plastic, metal cans, glass, polymers

**120. Give reason : Protecting of ozone layer is necessary. (Sept 2020)**

**Ans:** Ozone layer shields the surface of the earth from ultraviolet radiation from the sun. This radiation is highly damaging to organisms



Day 17

**EXAM EMPOWERER -BIOLOGY TEST**

**I Choose the correct alternative**

4x1=4

- The plant hormone that promote cell division is  
A) cytokinin                      B) auxin      C) abscisic acid                      D) gibberellin
- Part of the flower that develops into fruit and part of the seed that develops into root respectively are  
(A) ovary and plumule                      (B) plumule and radicle  
(C) ovary and radicle                      (D) ovary and ovule
- The site of complete digestion of carbohydrates, proteins and fats is  
A) large intestine      B) stomach                      C) liver                      D) small intestine
- In female reproductive system fertilization occurs at  
A) Ovary                      B) Uterus  
C) Vegina                      D) Fallopian tube

**II. Answer the following questions.**

4x1=4

- How does our body respond when adrenaline is secreted into the blood?
- What speciation?
- What is the role of decomposer in an ecosystem ?
- Why are traits acquired during its lifetime of an individual not inherited?

**III. Answer the following questions.**

3x2=6

- Draw the diagram of human excretory system and label urinary bladder.
- Write any two differences between biodegradable and non biodegradable substances

OR

Write a grassland food chain and name the different tropic levels in it.

- Protecting of ozone layer is necessary. Why? Explain

**IV Answer the following questions.**

3x3=9

- Write the flowchart to show the breakdown of glucose by various pathways in the cytoplasm of living organisms.

OR

Explain the function of stomach in the human digestive system.

- Explain the function of each part in human male reproductive system.
- The tall pea plant bearing red colour flowers (TTRR) is crossed with dwarf pea plant bearing white flowers (ttrr). Represents the result obtained in F<sub>2</sub> generation of dihybrid cross with the help of checker board. Mention the ratio of different plants obtained in F<sub>2</sub> generation.

OR

- Differentiate between homologous organs and analogous organs.
- How is the sex of the child determined in human beings?

**V. Answer the following question.**

1x4=4

- Draw the diagram showing structure of human brain. Label the following parts.  
i) cerebrum ii) spinal cord

## - Physics - Day -18

121. Define Principal Focus of concave mirror .

Ans: The rays of light parallel to the principal axis of a mirror after reflection meet at a point on the principal axis and this point is called the principal focus of concave mirror.

122. Define Principal Focus of convex mirror .

Ans: The rays of light parallel to the principal axis of a mirror after reflection appear to come from a point on the principal axis and this point is called the principal focus of convex mirror.

123. Define Focal Length of the spherical mirror. How its related with radius of curvature?

Ans: Distance between the pole and the principal focus of a spherical mirror.  $f = \frac{R}{2}$

124. State Laws of Refraction

1st law: 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.

2nd law (Snell's law) : Or  $\frac{\sin i}{\sin r} = \text{constant}$

Ratio of the sine of the angle of incidence to the sine of the angle of refraction is a constant.

125. Define absolute Refractive index .

Ans: The ratio of the velocity of light in a vacuum to its velocity in a specified medium.

126. What is the meaning of "the refractive index of crown glass is 1.52"?

Ans: The ratio of the speed of light in air and the crown glass is equal to 1.52.

127. Define Principal Focus of concave lens .

Ans: Parallel rays of light pass through the concave lens the refracted rays appear to come from one point called the principal focus of concave lens.

128. Define Principal Focus of convex lens

Ans: Parallel rays of light pass through convex lens the refracted rays converge at one point called the principal focus of convex lens.

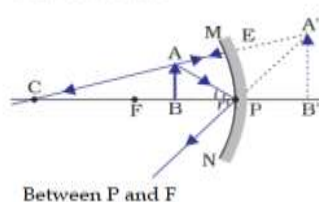
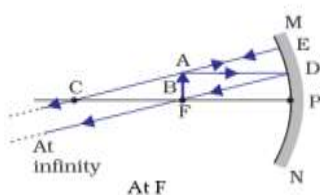
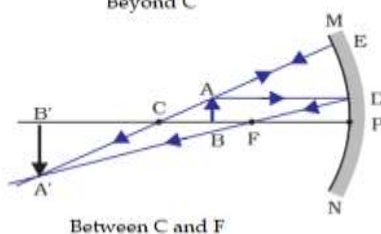
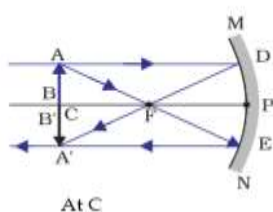
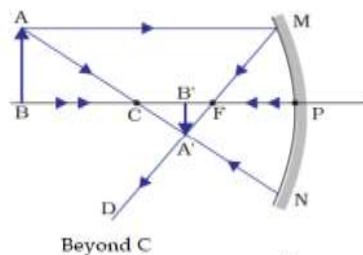
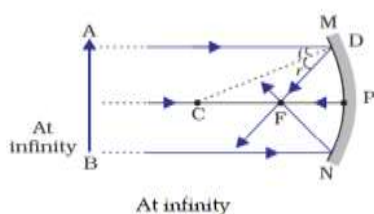


Image formed by the Concave mirror

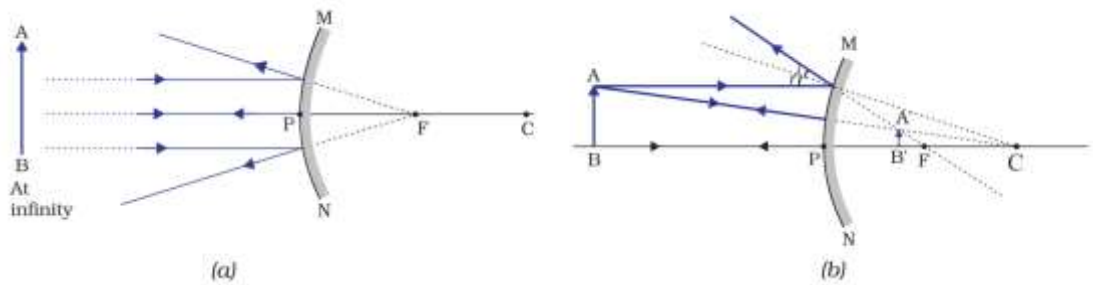


Image formed by the Convex mirror

### Day - 19

129. Why do we prefer a convex mirror as a rear-view mirror in vehicles?

Ans :1.It always gives virtual, erect, and diminished image  
2.Gives a wider field of view.

130. Define 1 dioptre(D) of power of a lens.

Ans: 1 dioptre is defined as the power of a lens of focal length 1 metre.  $[ D = \frac{1}{f} ]$

131.List the uses of concave mirrors.

Ans:1.in torches, 2.In Search lights, 3.In vehicle headlights,4.In shaving mirrors,  
5.used by the dentist, 6. In solar furnace(To concentrate sunlight )

132.Write the mirror and lens formula.

Mirror formula  $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$  lens formula  $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$

133.Write the magnification formula for mirror and lens.

for mirror:  $(m) = \frac{h'}{h} = -\frac{v}{u}$  , for lens:  $(m) \frac{h'}{h} = \frac{v}{u}$

134.An object is kept on the principal axis of a concave mirror of focal length 12 cm. If the object is at a distance of 18 cm from the mirror, calculate the image distance.

Determine the nature of the image formed by calculating the magnification produced by the mirror.

Ans: Data:-  $u = -18$  cm ,  $f = -12$  cm,  $v=?$ ,  $m=?$

Applying the lens formula:  $\frac{1}{f} = \frac{1}{v} + \frac{1}{u} \Rightarrow \frac{1}{v} = \frac{1}{f} - \frac{1}{u}$   
 $= \frac{1}{-12} - \frac{1}{-18} = \frac{-3+2}{-36} \Rightarrow \frac{1}{v} = \frac{-1}{36} \Rightarrow v = -36$  cm

Magnification ,  $= -\frac{v}{u} \Rightarrow -\frac{-36}{-18} = -2$  cm

The image formed is inverted real and enlarged.

135.An object is placed at a distance of 10 cm from a convex mirror of focal length 15 cm. Find the position and nature of the image.

Ans :  $f = +15$  cm ,  $u = -10$  cm

According to the mirror formula,

$\frac{1}{f} = \frac{1}{v} + \frac{1}{u} \Rightarrow \frac{1}{v} = \frac{1}{f} - \frac{1}{u} \Rightarrow \frac{1}{v} = \frac{1}{15} - \frac{1}{-10}$   
 $\frac{1}{v} = \frac{1}{15} + \frac{1}{10} \Rightarrow \frac{1}{v} = \frac{2+3}{30} = \frac{5}{30} \Rightarrow v = \frac{30}{5} = 6$  cm

Magnification,  $m = -\frac{v}{u} = -\frac{6}{-10} = +0.6$

The image is formed 6 cm behind the mirror and the image is virtual and erect and diminished.

136. An object 5 cm in length is held 25 cm away from a converging lens of focal length 10 cm. Find the position, size and the nature of the image formed.

Ans: Data:-  $u = -25$  cm,  $f = +10$  cm,  $h' = 5$  cm

Applying the lens formula:

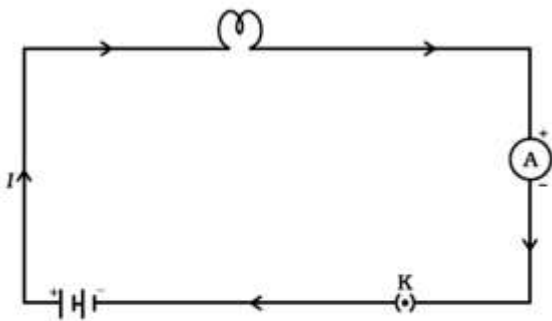
$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \quad \text{i.e.} \quad \frac{1}{v} = \frac{1}{u} + \frac{1}{f}$$

$$\frac{1}{v} = \frac{1}{-25} + \frac{1}{10}$$

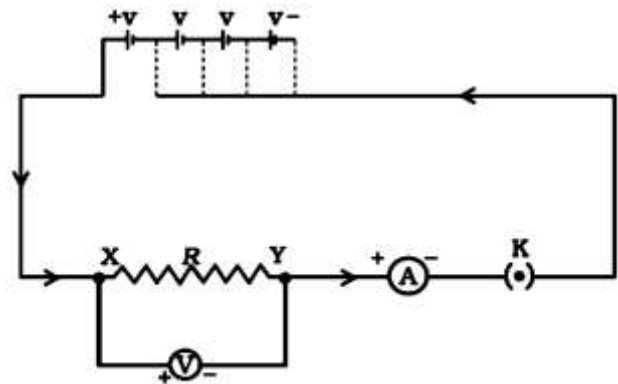
$$\frac{1}{v} = \frac{5-2}{50} = \frac{3}{50} \quad \text{So,} \quad v = \frac{50}{3} = 16.67 \text{ cm}$$

Size of the image,  $\frac{h'}{h} = \frac{v}{u} \rightarrow h' = \frac{16.67 \times 5}{-25} = -3.33$  cm.

The image is real and inverted.



**Figure 12.1**  
A schematic diagram of an electric circuit comprising - cell, electric bulb, ammeter and plug key



**Figure 12.2** Electric circuit for studying Ohm's law

### Day -20

137. A concave lens has focal length 30 cm. At what distance should the object be placed from the lens so that it forms an image at 20 cm from the lens? Also, find the magnification produced by the lens. (June 2019)

Ans:  $f = -30$  cm,  $v = 20$  cm,  $u = ?$ ,  $m = ?$

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

$$= \frac{1}{-20} - \frac{1}{-30} = \frac{-3+2}{60}$$

$$\frac{1}{u} = \frac{-1}{60} \quad \text{Object distance - } u = -60 \text{ cm.}$$

$$\text{magnification (m)} = \frac{v}{u} = \frac{-20}{-60} = \frac{1}{3}$$

$$m = +0.33$$



**138. What is electric current? Which is the device used to measure electric current in the circuit? How this device should be connected in electric circuit ?**

**Ans:** \* Amount of charge flowing through a particular area in unit time.

\* Ammeter. \* It should be connected in series.

**139 Define 1 Ampere**

**Ans:** Flow of one coulomb of charge per second.

**140. Define resistance.**

**Ans:** The property of a conductor to resist the flow of charges through it.

**141. Mention the factors on which resistance of a conductor depend?**

**Ans:** (a) Length of the conductor (b) Cross-sectional area of the conductor

(c) Material of the conductor (d) Temperature of the conductor.

**142. Define electric potential difference. Which is the device used to measure potential difference in the circuit? How this device should be connected in electric circuit ?**

**Ans :** The work done to move a unit charge from one point to the other. \* Voltmeter

\* It should be connected in parallel

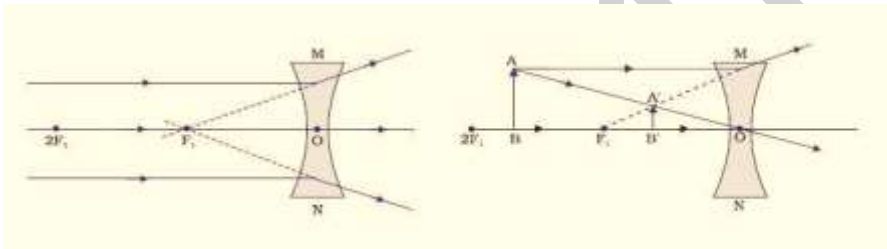
**143. What are the advantages of connecting electrical devices in parallel?**

**Ans:** 1. the total resistance decreases.

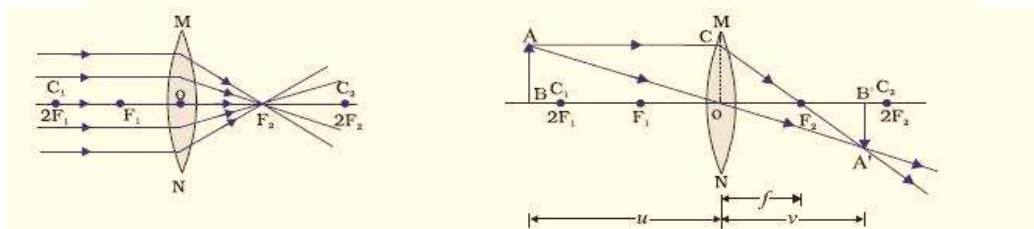
2. When one component fails in the circuit other components are not effected.

**144. State Ohm's law.**

**Ans:** At constant temperature, the potential difference, V, across the ends of a given metallic wire in an electric circuit is directly proportional to the current flowing through it.

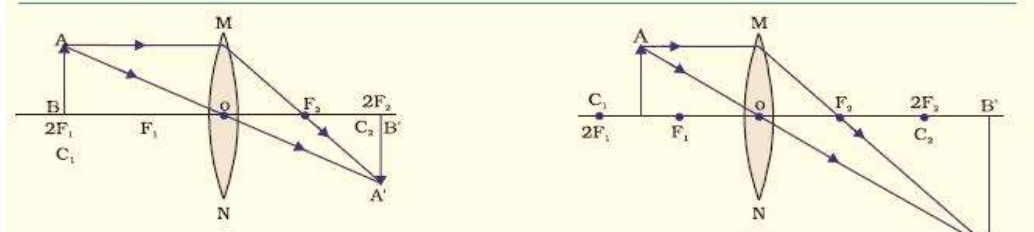


**Image formed by the Concave Lens**



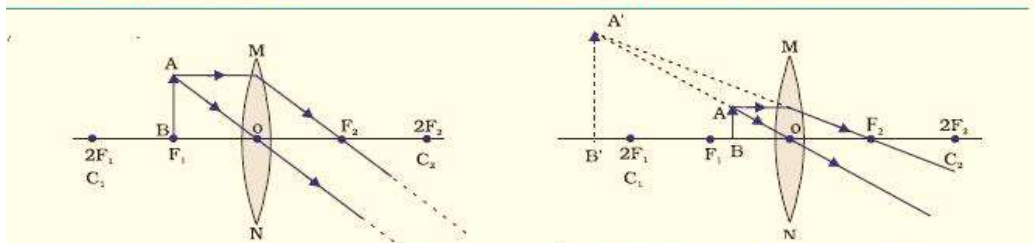
**Case (i) Object at infinity**

**Case (ii) Object at beyond 2f**



**Case (iii) Object at 2f**

**Case (iv) Object in between f and 2f**



**Case (v) Object at f**

**Case (vi) Object distance < f**

**Image formed by the Convex Lens**

## Day -21

145. Observe the given circuit :

Calculate the total resistance in the circuit and the total current flowing in the circuit.

Ans: Given- $R_1 = 2\Omega$ ,  $R_2 = 4\Omega$ ,  $R_3 = 4\Omega$ ,  $R_4 = 5\Omega$ ,  
 $V = 6V$ ,  $R_T = ?$ ,  $I = ?$

In parallel connection

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{2} + \frac{1}{4} + \frac{1}{4} = \frac{2 + 1 + 1}{4} = \frac{4}{4}, \quad R_p = 1\Omega$$

Total resistance of the circuit  $R_T = R_p + R_4 = 1 + 5 = 6\Omega$

$$\text{Electric current } I = \frac{V}{R} = \frac{6}{6} = 1 \text{ A}$$

146. An electric lamp whose resistance is  $20\Omega$  and a conductor of  $4\Omega$  resistance are connected in series to a  $6V$  battery. Find the current through the circuit and the potential difference across the electrical lamp and conductor.

Given :  $R_1 = 20\Omega$ ,  $R_2 = 4\Omega$ ,  $V = 6V$

Total resistance  $R_s = R_1 + R_2$

$$R_s = 20 + 4 = 24\Omega$$

current through the circuit  $I = \frac{V}{R} \rightarrow \frac{6}{24} = 0.25A$

i) potential difference across the electrical lamp

$$V = IR \Rightarrow V = 0.25 \times 20 = 5V$$

ii) potential difference across the electrical conductor

$$V = IR \Rightarrow V = 0.25 \times 4 = 1V$$

147. State Joules law of heating.

Ans : Joule's law of heating  $H = I^2 R t$

Heat produced in a resistor is (i) directly proportional to the square of current for a given resistance, (ii) directly proportional to resistance for a given current, and (iii) directly proportional to the time for which the current flows through the resistor.

148. Name the devices working based on Joule's heating –

Ans: Electric laundry iron, electric toaster, electric oven, electric kettle and electric heater, electric bulb, electric fuse (made up of alloy with high resistance and low melting point)

149. Explain the working of fuse.

Ans: 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.

150. What is electric power? Mention any three formulae to calculate electric power.

Ans: Rate of consumption of electric energy is electric power. [ SI unit is watt (W)]

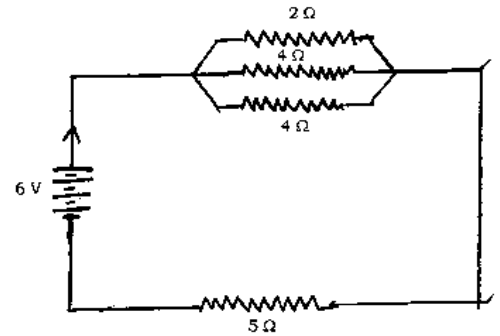
$$P = VI \quad \text{or} \quad P = I^2 R \quad \text{or} \quad P = \frac{V^2}{R}$$

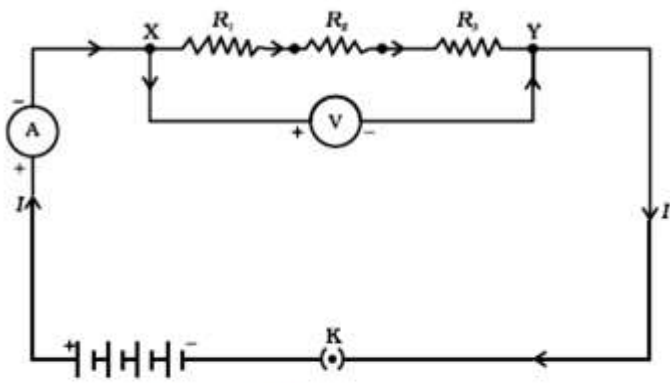
151. Why are coils of electric toasters and electric irons made of an alloy?

Ans : i. Alloys have higher resistivity, and ii. have high melting point.

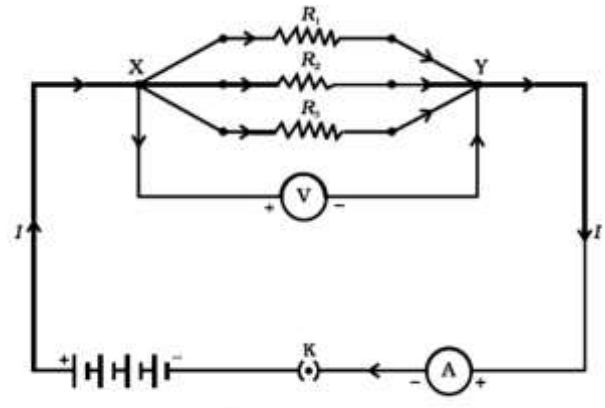
152. Define magnetic field. State the characteristics of Field Lines

Ans: The area around a magnetic in which its magnetic force can be experienced.

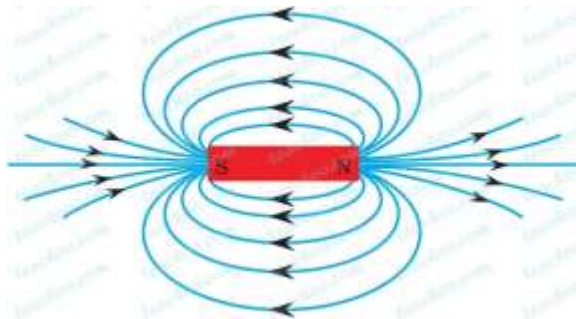




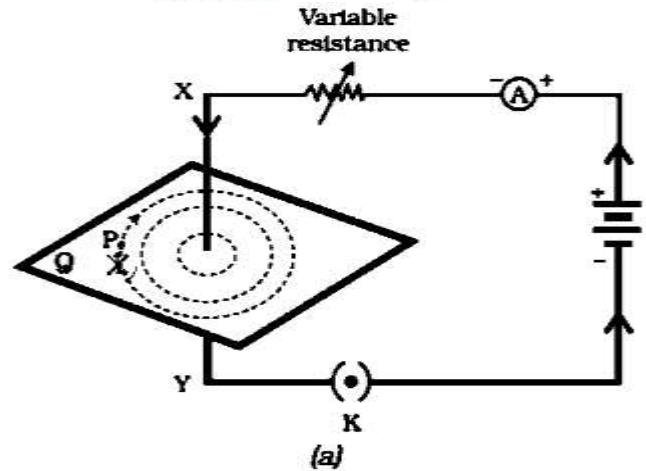
**Figure 12.6** Resistors in series



**Figure 12.7** Resistors in parallel



**Field lines around a bar magnet**



**Figure 13.6**

*(a) A pattern of concentric circles indicating the field lines of a magnetic field around a straight conducting wire. The arrows in the circles show the direction of the field lines.*

### Day-22

#### 153. State the characteristics of Field Lines

- Ans: (i) Field lines arise from North pole and end into South pole of the magnet.  
 (ii) Field lines never intersect each other.  
 (iii) Field lines are closer in stronger magnetic field.  
 (iv) Field lines are closed curves.

#### 154. State Right-hand thumb rule .

Ans: "Imagine you are holding a current carrying straight conductor in your right hand such that the thumb is pointing towards the direction of current. Then the fingers wrapped around the conductor give the direction of magnetic field."

#### 155. What is a solenoid?

Ans: Coil of many circular turns of insulated copper wire wrapped closely in cylindrical form.

#### 156. Define electromagnetic induction.

Ans; The process by which a changing magnetic field in a conductor induces a current in another conductor.

#### 157. What is the advantage of alternate current.

Ans: It can be transmitted over long distance without much loss of energy.

158. State Fleming's right-hand rule and Fleming's left hand rule.

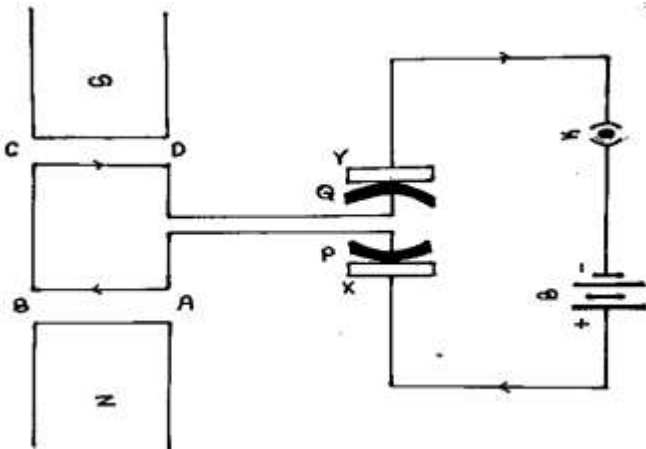
Fleming's right-hand rule	Fleming's left hand rule
<p>When thumb, forefinger and middle finger of right hand are held perpendicular to each other</p> <p>Forefinger -the direction of magnetic field Middle finger-the direction of induced current Thumb -direction of motion of the conductor.</p>	<p>When thumb, forefinger and middle finger of left hand are held perpendicular to each other</p> <p>Forefinger - the direction of magnetic field Middle finger- the direction of current Thumb - direction of motion or the force acting on the conductor.</p>

159. What precaution should be taken to avoid the overloading of domestic electric circuits?

- Ans: i. Too many appliances should not be connected to a single socket.  
ii. Too many appliances should not be used at the same time.  
iii. Fuse should be connected in the circuit.

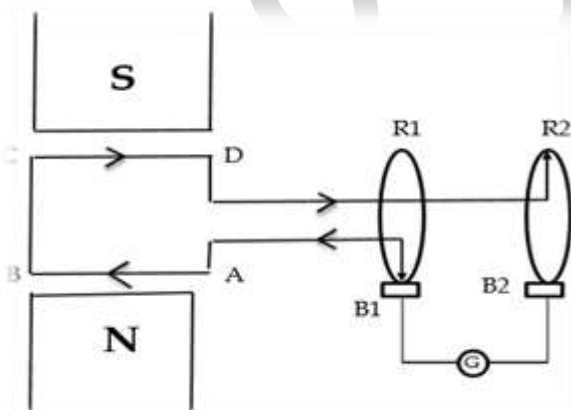
160. Mention the frequency and potential difference of the electric current produced in India.

Ans: The frequency is 50 Hz and potential difference is 220 V



Motor

- N & S -Magnets
- P & Q- Split rings
- X & Y – Brushes
- ABCD - Rectangular coil
- B- Battery
- K - Switch



Generator

- N & S - Magnets
- R1 & R2- Rings
- B1 & B2 – Brushes
- ABCD - Rectangular coil
- G - Galvanometer

**Day 23**

161. Differentiate between dynamo and motor

Dynamo	Motor
Converts mechanical energy into electrical energy	Converts electrical energy into mechanical energy.
Principle: Electromagnetic induction	Magnetic effect of electric current

**162. Differentiate between simple motors and commercial motors.**

Simple motor	Commercial motor
Permanent magnets are used	Electromagnets are used
Small number of turns of the conducting wire in the current carrying coil	Large number of turns of the conducting wire in the current carrying coil
The coil is not wounded on a soft iron core.	Have a soft iron core on which the coil is wound

**163. List the characteristics of a good fuel:**

Ans: i) High calorific value, ii) Less smoke, iii) Easy availability  
 (iv) less expensive, v) Easy to store and transport, vi) Less polluting

**164. What is the major component of bio gas. What are the advantages of using bio gas.**

Ans: Methane( $CH_4$ )

i) Its renewable source of energy, ii) It burns without smoke / eco friendly.  
 iii) Leaves no residue. iv) heating capacity is high.

**165. List the disadvantages of Nuclear energy:**

Ans: (i) Risk of nuclear waste leakage, (ii) High cost of setting up of nuclear plant  
 (iii) Pollution of environment.

**166. List the disadvantages of wind energy, :**

i) min wind speed of 15km/sec required, ii) setting up wind mills is very expensive.

**167. What are the disadvantages of fossil fuels?**

Ans: i) Are non renewable sources of energy, ii) Cause pollution.

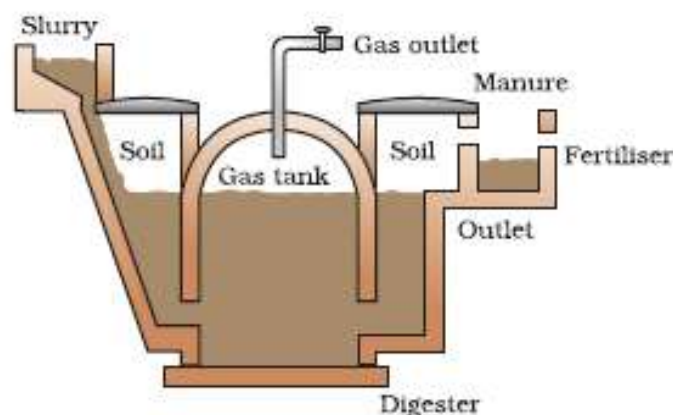
**168. Mention the advantages and disadvantages associated with solar cells.**

**Ans: Advantages:**

i) have no moving parts  
 ii) require little maintenance  
 iii) They can be set up in remote areas

**Disadvantages**

i) Availability of special grade silicon is limited.  
 ii) The process of manufacture of solar cells is very expensive.  
 iii) Silver used for interconnection of the cells in the panel is very costly.  
 iv) Their efficiency is low.



**Figure 14.4**  
 Schematic diagram of a bio-gas plant

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Exam empowerer- Physics Test (06-02-2022)



2x1=2

**I Choose the correct alternative.**

1. The focal length of a spherical lens is

- (A) the distance between optical centre and principal focus of the lens
- (B) the distance between centre of curvature and optical centre of the lens
- (C) the diameter of the outline of spherical lens
- (D) the radius of the outline of spherical lens.

2. An electric bulb is connected to a 220 volt generator, if the current drawn by the bulb is 0.5A then the power of the bulb is.

- A) 110W
- B) 11W
- C) 220W
- D) 440W

**II Answer the following questions.**

3x1=3

- 3. The radius of curvature of a spherical mirror is 20 cm. What is its focal length?
- 4. Mention any two disadvantages of fossil fuels.
- 5. State Ohm's law.

**III Answer the following questions.**

3x2=6

- 6. How does overloading and short-circuit occur in an electric circuit? Explain. What is the function of a fuse during this situation ?
- 7. Draw the schematic diagram of a biogas plant.
- 8 An electric lamp whose resistance is  $20\Omega$  and conductor of  $4\Omega$  resistance are connected in series to 12V battery in an electric circuit. Calculate the total resistance of the circuit and the current flowing through the circuit.

**IV Answer the following questions.**

3x3=9

- 9. Draw the ray diagram of image formed when the object is kept between  $2F_1$  and  $F_1$  of the convex lens. With the help of the diagram, mention the position and nature of the image formed. ( $F_1$  : principal focus of the lens)

OR

Draw the ray diagram when of image formed the object is kept between C and F of the concave mirror. With the help of the diagram mention the position and nature of the image formed. (C : Centre of curvature of mirror).

- 10. What is the SI unit of potential difference? Name the device used to measure the potential difference. How this device should be connected in electric circuit ?
- 11. An object is kept at a distance of 20cm from a diverging lens of focal length 10cm. At what distance the image is formed from the lens? Find the magnification of the image.

**V Answer the following questions**

2x4=8

- 12. What is a solenoid? What precaution should be taken to avoid the overloading of domestic electric circuits?

OR

- a) State the characteristics of Field Lines
- b) Write any two differences between electric generator and electric motor?
- 13. a) List the uses of Convex mirror and Concave mirror.
- b) State the two laws of refraction of light.

I hope my honest effort to serve the children who want to score good marks but facing some difficulties in doing so is useful. 24 days, 168 questions answered shortly but accurately + 30 diagrams, and more importantly 3 test according to board model paper really empowered the students to face the upcoming exams with more confidence. I am really very glad to all those who used and shared my work with needy students. Your words of appreciation are the motivating source and energy behind my works.

**All the best.**

Keep working hard.



Love Science.....Live Science.

**-Yours :Raghavendra Bhat.**

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