OFFICE OF THE DDPI, KOLAR DISTRICT, KOLAR

STD : 10 GLANCE ME ONCE SUB: SCIENCE 2020-21

RESOURCE CREATION TEAM

MENTOR

Smt. Shashivadana K.S.
Science Subject Inspector
DDPI Office, Kolar District.

MEMBERS

C.K. GOPALA RAO Assistant Master GHS (RMSA), Thoralakki Malur Taluk	**CHANNABASAVARAJA D.S.** Assistant Master GHS, Bangaruthirupathi, Bangarpet Taluk
NAGESH T.S. Assistant Master GHS, Alangur Cross Mulbagal Taluk	**AMARESH BABU R** Assistant Master B.R.M.V. High School, Narasapura Kolar Taluk
C.R. BHAGYALAKSHMI Assistant Mistress GHS, Harati Kolar Taluk	**SWARNALATHA P** Assistant Mistress Boys GPUC, Malur Malur Taluk
K NARAYANA REDDY Assistant Master Girls GPUC, Kolar Kolar Taluk	**HARISH R** Assistant Master GHS, Angondahalli Mulbagal Taluk
NAVEEN BABU N Assistant Master GHS, Imarakunte Srinivasapur Taluk	**SHIVASHANKAR B.S.** Assistant Master Dr. Ambedkar High School, K.G.F. K.G.F. Taluk
T.V. RAJANNA Assistant Master Girls GPUC, Srinivasapur Srinivasapur Taluk	**MANJULA RAMANI P** Assistant Mistress St. Teresa Girls High School, Robertsonpet K.G.F. Taluk
JAYASUDHA K.V. Assistant Mistress GHS, Hudukula, Bangarpet Taluk	

I N D E X

GLANCE ME ONCE : Science 2020-21

CHAPTER 2 : ACIDS, BASES AND SALTS

I. Answer the following Questions :

1. Which element present in the acids can be displaced ?
   Ans: Hydrogen

2. Name two metals which react with conc. NaOH solution to liberate hydrogen gas.
   Ans: Zinc and Aluminium

3. Write the general word equation for reaction between acids and bases.
   Ans: Acid + Base → Salt + Water

4. What is the pH of a neutral solution ?
   Ans: 7

5. What is dilution of an acid or base ?
   Ans: The process of mixing an acid or base with water results in, decrease in the concentration of ions (H3O+ / OH-) per unit volume.

6. Name the acid produced in our stomach.
   Ans: Hydrochloric acid.

7. Name of the gas released when zinc granules react with dilute HCl.
   Ans: Hydrogen

8. Acids do not show acidic behavior in the absence of water. Why ?
   Ans: The separation of H^+ ion from acid molecules cannot occur in the absence of water.

9. What types of drugs are used to treat indigestion?
   Ans: Antacids [Ex: Milk of magnesia]

10. Give two different forms of calcium carbonate.
    Ans: Limestone, chalk and marble.

11. Why do metal oxides are called basic oxides ?
    Ans: Metallic oxides are basic in nature because they react with dilute acids to form salt and water.

12. The pH of fresh milk is 6.0. How does the pH change as it becomes curd ?
    Ans: The pH value of milk is 6 since it is acidic in nature. When the milk is converted into curd due to the action of bacteria, lactic acid is formed which is more acidic in nature. Therefore the pH value of the milk is reduced as it turns to curd

13. What is neutralization reaction ?
    Ans: The reaction between an acid and a base to give salt and water is known as a neutralization reaction.

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

Ans : Both the Curd and sour substances contain acids. Acids react with metals to produce salt and hydrogen gas. So, if such substances are kept in a copper container, the acid will react and the container will be corroded. Thereby it may spoil the food.

15. Why does an aqueous solution of an acid conduct electricity?
Ans : Acids undergo dissociation in aqueous solution to form $H^{+}_{(aq)}$ / H_3O^{+} ions and other ionic species and the movement of these ions helps for the flow of electrical current through the solution.

16. The pH of a sample of vegetable soup was found to be 6. How is this soup likely to taste?
Ans : The vegetable soup is slightly acidic. Therefore it is sour to taste.

17. Name the acid present in ant sting.
Ans : Methanoic acid

18. What would be the colour of litmus in a solution of sodium hydrogen carbonate?
Ans : Sodium hydrogen carbonate is basic in nature. Therefore the colour of litmus will be BLUE.

19. Which one of these has a higher concentration of H^{+} ions? 1M HCl or 1M CH3COOH
Ans : 1M HCl (strong acid)

20. How does the pH of the solution change when a solution of a base is diluted?
Ans : When a solution of base is diluted, its pH value will be decreased (towards 7), because the concentration of OH^{-} ions per unit volume will be decreased.

21. What effect does an increase in concentration of $H^{+}_{(aq)}$ in a solution have on the pH of the solution ?
Ans : An increase in concentration of $H^{+}_{(aq)}$ in a solution, the solution becomes more acidic which results in a decrease in the pH value of the solution.

22. How will you test for a gas which is liberated when hydrochloric acid reacts with an active Metal?
Ans : H_2 gas will be liberated when HCl reacts with an active metal. Pass the gas evolved through the soap solution. Gas filled bubbles will be formed. Take a burning candle near a gas filled bubble. On doing so, hydrogen gas burns with a squeaky pop sound. Hydrogen gas is recognized by the 'pop' when it burns.

23. On adding dilute hydrochloric acid to copper oxide powder, the solution formed is blue-green. Predict the new compound formed which imparts blue-green colour to the solution.

Ans : The blue-green colour of the solution is due to the formation of **Copper (II) chloride** in the reaction.

24. How does the flow of acid rain into a river make the survival of aquatic life in the river difficult?
Ans : When acid rain flows into the rivers, it lowers the pH of the river water below 7. But the living body works normally within a pH range of 7.0 to 7.8. Therefore, the survival of aquatic life in such rivers becomes difficult.

25. How does the pH of a solution of an acid influence when it is diluted ?

Ans : When a solution of an acid is diluted, its pH value will be increased (towards 7), because the concentration of $H^+_{(aq)}$ ions per unit volume will be decreased.

26. How does the pH of a solution of a base influence when it is diluted ?
Ans : When a solution of base is diluted, its pH value will be decreased (towards 7), because the concentration of OH^- ions per unit volume will be decreased.

27. Write the name and the chemical formula of the organic acid present in vinegar.
Ans : Acetic Acid CH_3COOH

28. Which will be more acidic and why ? A solution with pH value of 6.0 or a solution with pH value of 5.0
Ans : A solution with pH value 5.0 is more acidic than a solution with pH value 6.0. Because higher the hydronium ion concentration, lower is the pH value.

29. An element 'X' on reacting with oxygen forms an oxide XO. The oxide dissolves in water and turns red litmus blue. Predict the nature of the element whether metal or nonmetal?
Ans : The element 'X' is a metal. Because metallic oxides are basic oxides and bases turn red litmus blue.

30. The pH of rainwater collected from two cities A and B was found to be 6 and 5 respectively. The water of which city is more acidic ?
Ans : The rainwater collected from city B is more acidic (pH is less)

31. What is the difference between strong acid and concentrated acid ?
Ans : The acid which dissociates into ions completely is called strong acid, whereas the concentrated acid is the one which has less water content.

32. Why do solutions of compounds like alcohol and glucose do not show acidic character ?
Ans : Although aqueous solutions of alcohol and glucose contain hydrogen, these cannot dissociate in water to form hydrogen ions. Hence they do not show acidic.

33. What is the role of acid in our stomach ?
Ans: It helps in the digestion of food.

34. Which bases are called alkalis? Give an example of an alkali.
Ans: The bases which dissolve in water are called alkalis. Ex: KOH, NaOH

35. Why does tooth decay start when the pH of the mouth is lower than 5.5?
Ans: Tooth enamel is made up of Calcium Hydroxyapatite. It corrodes when the pH of the mouth is below 5.5. The bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth after eating.

36. How does the flow of acid rain into a river make the survival of aquatic life in the river difficult?
Ans: When acid rain flows into the rivers, it lowers the pH of the river water. Therefore, the survival of aquatic life in such rivers becomes difficult.

37. Name the gas usually liberated when a dilute acid reacts with a metal. What happens when a burning candle is brought near this gas?
Ans : Hydrogen gas.
Hydrogen gas burns with a pop sound.

38. Name the acid present in ant sting and give its chemical formula. Also give the common method to get relief from the discomfort caused by the ant sting.
Ans : Methanoic Acid HCOOH
Use of a mild base like baking soda on the stung area gives relief.

39. Do basic solutions also have $H^+_{(aq)}$ ions ? If yes, then why are these basic ?
Yes. They are basic because the concentration of OH^- is higher than the H^+ ions.

40. Arrange the following solutions in order of decreasing $H^+_{(aq)}$ ions concentration.
(i) ammonium hydroxide (ii) gastric juice (iii) vinegar (iv) sodium hydroxide
Gastric juice > vinegar > ammonium hydroxide > sodium hydroxide

41. Two solutions P and Q are tested with universal indicator. The solution P turns red, whereas solution Q turns orange. Which solution : (i) is more acidic; (ii) has more pH
i) Solution P is more acidic
ii) Solution Q has more pH value

42. A knife, which is used to cut a fruit, was immediately dipped into water containing drops of blue litmus solution. If the colour of the solution is changed to red, what inference can be drawn about the nature of the fruit and why?
Ans : The fruit is acidic in nature. Acids turn blue litmus into red.

43. A person is suffering from indigestion due to the intake of hot spicy food. What remedy will you prescribe to the patient? Give the name of a chemical that can give relief to him.
Ans : The person is advised to use bases called antacids.
Ex: Baking soda solution, Magnesium hydroxide (Milk of magnesia)

44. When a drop of orange juice is added to pure water, how does the pH value vary for water? If a drop of lemon juice is also added, will there be any more change in the pH value?
The pH of pure water decreases when orange juice is added. When to this lemon juice is also added, the pH value further decreases. (both fruits are acidic in nature)

45. Fresh milk has a pH of 6. How do you think the pH will change as it turns into curd ? Explain.
The pH of milk decreases below 6 due to the formation of lactic acid in curd.

46. HCl and HNO3 show acidic characters in aqueous solution while alcohol and glucose solution do not. Give reasons.
Solutions like HCl, HNO_3 etc. get ionized in aqueous solutions and due to the presence of H^+ ions they show acidic characters. While solutions of compounds like alcohol and glucose do not form any such ions so they do not show acidic characters.

47. (i) An aqueous solution has a pH value of 7.0. Is this solution acidic, basic or neutral?
(ii) Which has a higher pH value, 1 M HCl or 1 M NaOH solution?
i) Neutral in nature
ii) 1M NaOH solution has higher pH value. (base)

48. Given below are the pH values of four different liquids: 7.0, 14.0, 4.0, 2.0. Which of these could be that of
(i) lemon juice (ii) distilled water
(iii) 1 m sodium hydroxide solution (iv) tomato juice
Ans : (i) lemon juice - Liquid with the pH value 2.0
(ii) distilled water - Liquid with the pH value 7.0

(iii) 1 m sodium hydroxide solution - Liquid with the pH value 14.0
(iv) tomato juice - Liquid with the pH value 4.0

49. What is meant by the term 'pH of a solution'? The pH of gastric juices extracted from the stomach of two persons A and B were found to be 1 and 3 respectively. The stomach juice of which person is more acidic ?
Ans : pH of a solution is a scale for measuring hydrogen ion concentration in the solution. The stomach juice of person A is more acidic. Because lower the pH value, higher is the hydronium ion concentration.

50. You have been provided with three test tubes. One of them contains distilled water and the other two contain an acidic solution and a basic solution respectively. If you are given only red litmus paper, how will you identify the contents of each test tube?
Ans: Dip the red litmus paper individually in all three test tubes. It will turn blue in a basic solution. Dip this blue litmus into the other two. In acid it turns red. The colour of the litmus does not change in the other. It will be water.

51. While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid?
If water is added to a concentrated acid, the heat generated may cause the mixture to splash out and cause burns. The glass container may also break due to excessive local heating.

52. You have two solutions, A and B. the pH of solution A is 6 and pH of Solution B is 8. Which solution has more hydrogen ion concentration? Which of this is acidic and which is basic?
Ans : Solution A has more hydrogen ion concentration (pH is less).
Solution A is acidic (pH is < 7) and solution B is basic (pH is >7).

53. Under what soil condition do you think a farmer would treat the soil of his fields with quick lime (Calcium oxide) or slaked lime (calcium hydroxide) or chalk (Calcium carbonate) ?
Ans: If the soil is acidic and improper for cultivation, then to increase the basicity of soil, the farmer would treat the soil with quicklime or slaked lime or chalk.

54. Name the acid present in the following
a) Tomato b) Vinegar c) Tamarind d) lemon
a) Tomato : Oxalic acid
b) Vinegar : Acetic acid
c) Tamarind : Tartaric acid
d) lemon : Citric acid

55. Mention the pH of the following substances
a) Gastric juice b) Pure water c) Milk of Magnesia d) NaOH solution
a) Gastric juice : 1.2
b) Pure water : 7
c) Milk of Magnesia : 10
d) sodium hydroxide solution :14

56. Tooth decay starts when the pH of the mouth is lower than 5.5. Give your reasons
Tooth enamel is made up of Calcium Hydroxyapatite. It corrodes when the pH of the mouth is below 5.5. The bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth after eating.

57. Equal lengths of Mg ribbons are taken in test tubes A and B. Hydrochloric acid (HCl) is added to test tube A, while acetic acid (CH_3COOH) is added to test tube B. In which test tube will the fizzing occur more vigorously and why?
Ans: The fizzing will occur strongly in test tube A, in which HCl is added. This is because HCl is a stronger acid than CH_3COOH and therefore produces hydrogen gas at a faster speed due to which fizzing occurs.

III. Answer the following: (3 Marks)

58. A sodium salt is placed in a dry test tube. To this salt is added 5 ml of hydrochloric acid. Then a lot of effervescence takes place with the liberations of a colourless gas. The gas on passing through a colourless solution, turns it milky. Answer the following questions.
(i) Which gas is produced during the chemical reaction?
(ii) What is the colourless solution and why does it turn milky?

(i) Carbon dioxide
(ii) Lime water / Calcium hydroxide [$Ca(OH)_2$]. It turns milky due to the formation of a white precipitate $CaCO_3$.

59. Describe your observations and explain by writing chemical equations, when carbon dioxide gas is passed through limewater : (a) for a minute (b) for more than 5 minutes.
a) On passing the carbon dioxide gas through lime water, it turns milky.

$$Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$$

b) On passing CO2 for more than 5 minutes again the solution turns colourless due to formation of calcium hydrogen carbonate.

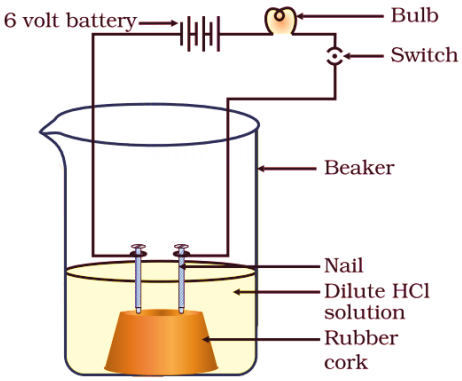
$$CaCO_3 + H_2O + CO_2 \rightarrow Ca(HCO_3)_2$$

60. You are given two solutions A & B. The pH of solution A is 6 and pH of solution B is 8.
(a) Which solution is acidic and which is basic?
(b) Which solution has more H^+ ion concentration?
(c) Why is HCl a stronger acid than acetic acid?

Ans : (a) Solution A is acidic (pH < 7) and solution B is basic (pH > 7).
(b) Solution A has more H^+ ion concentration. Lower the pH value, higher is the H^+ ion concentration.
(c) Because HCl produces more H^+ ions

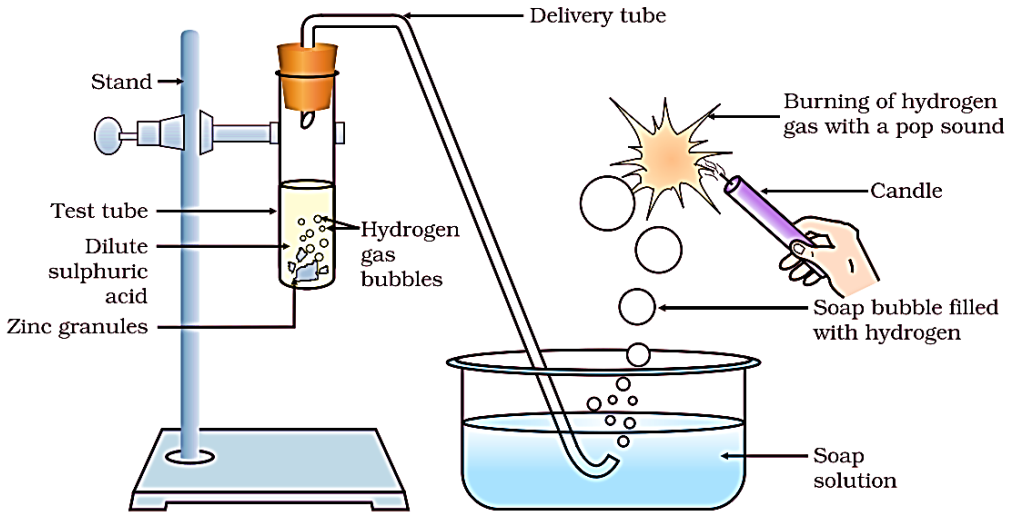
61. (a) Why does an aqueous solution of an acid conduct electricity?
(b) How does the concentration of hydronium ions (H_3O^+) change when a solution of an acid is diluted?
(c) Which has a higher pH value, a concentrated or dilute solution of hydrochloric acid?
Ans : (a) Acids dissociate in aqueous solutions to form ions. These ions are responsible for the conduction of electricity.
(b) Mixing an acid with water results in decrease in the concentration of H_3O^+ ions per unit volume.
(c) A dilute solution of HCl has a higher pH value. Lower the $H^+_{(aq)}$ ion concentration, higher is the pH value.

62. Draw a neat diagram showing Acid solution in water conducts electricity



IV. Answer the following: (4 Marks)

63. In the following schematic diagram for the preparation of hydrogen gas as shown, what would happen if the following changes are made?



(a) In place of zinc granules, the same amount of zinc dust is taken in the test tube.

(b) Instead of dilute sulphuric acid, dilute hydrochloric acid is taken.

(c) In place of zinc, copper turnings are taken.

(d) Sodium hydroxide is taken in place of dilute sulphuric acid and the tube is heated.

Ans : (a) Hydrogen gas will evolve with greater speed.

(b) Almost the same amount of gas is evolved.

(c) Reaction does not take place. -OR- Hydrogen gas is not evolved.

(d) If NaOH is taken, Sodium zincate will be formed and hydrogen gas will be evolved.

$$Zn + 2\ NaOH \rightarrow Na_2ZnO_2 + H_2$$

CHAPTER : 3 Metals and Non-metals

1. Name the soft metal which can be easily cut with a knife.

Ans. Lithium, Sodium, Potassium

2. Name the most malleable metals?

Ans. Gold and silver.

3. Name the most ductility metal?

Ans. Gold.

4. Metals can be given different shapes according to our needs. why?

Ans. Because they have a property of malleability and ductility.

5. Metals are used for making cooking vessels. why?

- Metals are good conductors of heat
- Have high melting points

6. **Give the examples of best conductor of heat?**

Ans. Silver and copper.

7. Give the examples of poor conductor of heat?

Ans. Lead and mercury.

8. Metal wires are used in electric circuit why?

Ans. Because metal wires are good conductors of electricity.

9. Aluminium or copper wire required for electric circuits are coated with rubber or PVC like material why?

Ans. Rubber or PVC materials are bad conductors of electricity.

10. Name the metal which can melt with heat of your palm?

Ans. Gallium and Cesium

11. Name the metal which is a liquid at room temperature?

Ans. Mercury

12. Give the example for liquid nonmetal?

Ans. Bromine

13. Name the nonmetal which is lustrous?

Ans. Iodine and diamond

14. Name the hardest natural substances?

Ans. Diamond.

15. Name the nonmetal which conduct electricity?

Ans. Graphite.

16. What type of oxides are formed when non-metals combine with oxygen ?

Ans. Acidic oxides (SO_2, CO_2) or neutral oxides (CO, N_2O, H_2O).

17. What are amphoteric oxides? Give example.

Ans. Metal oxides which react with both acids as well as bases to produce salt and water are called amphoteric oxides.

Ex. Aluminium oxide, Zinc oxide

$Al_2O_3 + 6HCl \rightarrow 2AlCl_3 + 3H_2O$

$Al_2O_3 + 2NaOH \rightarrow 2NaAlO_2 + H_2O$

18. Why potassium and sodium metal are kept immersed in kerosene oil?

Ans. Potassium and sodium reacts so vigorously that they catch fire if kept in the open.

19. Name the metals which do not react with oxygen?

Ans. Gold and silver.

20. Name the metals which do not react with water?

Ans. Lead, copper, silver, and gold.

21. List the properties of ionic compound?

Ans. Ionic compounds are solids and somewhat hard because of the strong force of attraction between the positive and negative ions

- Compounds are **generally brittle** and break into pieces when pressure is applied
- Ionic compounds having **high melting and boiling point** because a considerable amount of energy is required to break the strong inter ionic attraction
- Ionic compounds are **soluble in water** because they form ions in aqueous solution
- Ionic compounds **conduct electricity in molten state and in aqueous solution** because I am scary current the moment of Ions takes place towards opposite charged electrode in electric field

22. What are minerals?

Ans. Elements and compounds which occur naturally in the earth crust.

23. What are ores?

Ans. Minerals containing a very high percentage of a particular metal and the metal can be profitably extracted from it.

24. Name the metals which are found in nature in a free state.

Ans. Gold, silver, platinum and copper

25. What is gangue?

Ans. Large amounts of impurities such as soil, sand, etc., present in the ores are called gangue.

26. Write the difference between roasting and calcination?

Ans.

Roasting	Calcination
Ore is heated in excess of air	Ore is heated in the absence or limited supply of air
This is used for sulphide ores	This is used for carbonate ores
SO2 is produced along with metal oxide	CO2 is produced along with metal oxide

27. Highly reactive metals such as sodium, calcium, aluminum are used as reducing agents why?

Ans. Because they can displace less reactive metals from their compounds.

28. What is thermite reaction. Give example?

Ans. The highly reactive metals such as sodium, calcium, aluminium etc., can displace metals of lower reactivity from their compounds. These displacement reactions are highly exothermic. The amount of heat evolved is so large that the metals are produced in the molten state. Such reactions are known as thermite reaction.

Ex: The reaction of Fe_2O_3 with Al is used to join railway tracks or cracked machine parts.

$$Fe_2O_{3(s)} + 2\ Al_{(s)} \rightarrow 2Fe_{(l)} + Al_2O_{3(s)} + Heat$$

29. Metals high up in the reactivity series cannot be obtained from their compounds by heating with carbon. Why?

Ans. Because these metals have more affinity for oxygen than carbon.

29. Name the metals used in the electrolytic refining?

Copper, Zinc, Tin, Nickel, Silver, Gold

30. Why silver articles become black after sometime when exposed to air?

Ans. Because it reacts with Sulphur in the air to form a coating of silver sulphide.

31. Copper reacts with air to form a green coating why?

Ans. Copper reacts with moist carbon dioxide in the air and slowly lose its shiny brown surface and gains a green coat.

32. Why iron will get rusted?

Ans. Iron is a medium reactivity metal. When it is exposed to moist air for a long time, it reacts with oxygen and moisture and acquires a coating of brown flaky substance called rust.

33. What are the methods to prevent corrosion of metals?

Ans. Painting, oiling, greasing, galvanizing, Chrome plating, anodizing and making alloys.

34. What is galvanization?

Ans. Galvanization is a method of protecting steel and iron from rusting by coating them with a thin layer of zinc.

35. What are alloys?

Ans. It is a homogenous mixture of two or more metals or a metal and nonmetal.

36. Iron does not used in pure state why?

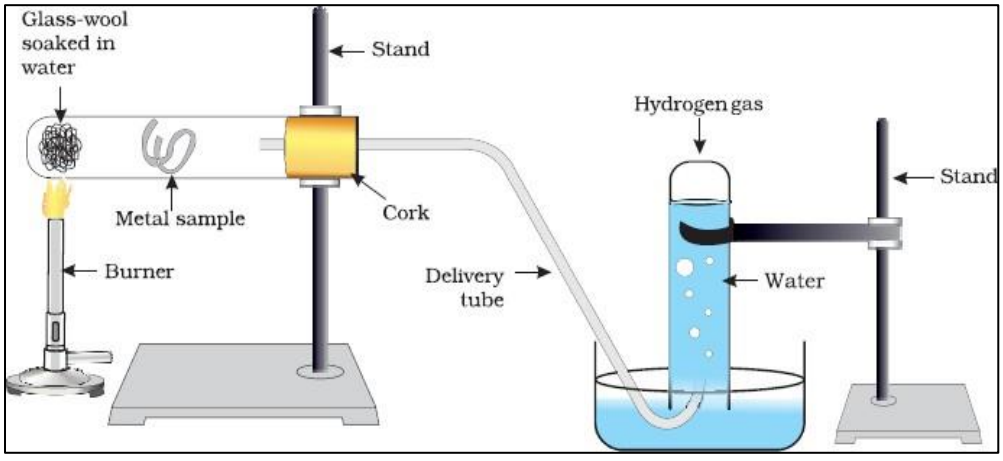
Ans. Because pure iron is very soft and stretches easily when hot.

37. What are the constituents of solder. Why it is used in welding electrical wires together?

Ans. Lead and Tin

Because it has a low melting point.

38. Draw a neat labelled diagram of action of steam on a metal?

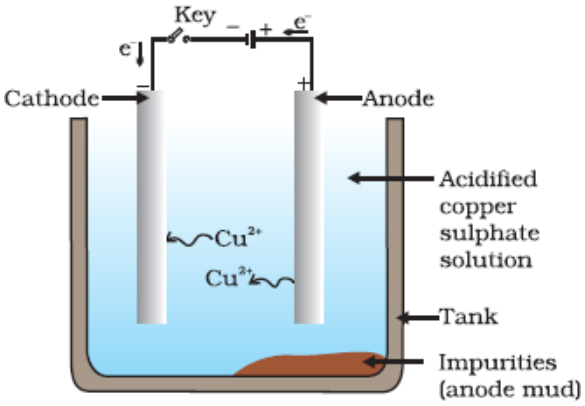


39. Name the alloys of the copper and its constituents.

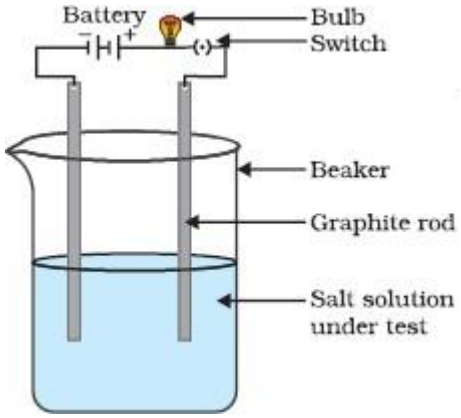
Ans. Brass- Copper and zinc

Bronze- Copper and tin

40. Draw a neat labelled diagram of electrolytic refining of copper?



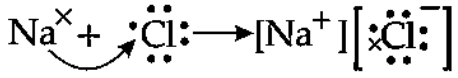
38. Draw a neat labelled diagram of testing the conductivity of a salt solution?



40. Illustrate the formation of bond in sodium chloride.

$$Na \longrightarrow Na^+ + e^-$$
2, 8, 1 2, 8

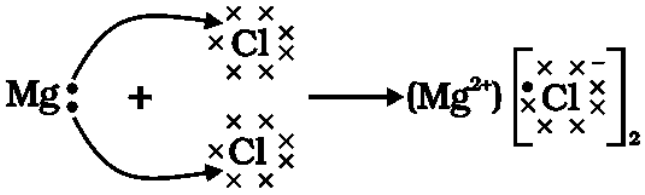
$$Cl + e^- \longrightarrow Cl^-$$
2, 8, 7 2, 8, 8



42. Illustrate the formation of bond in Magnesium chloride ?

$$Mg \longrightarrow Mg^{2+} + 2e^-$$
2,8,2 2,8
(Magnesium cation)

$$Cl + e^- \longrightarrow Cl^-$$
2,8,7 2,8,8
(Chloride anion)



43. Aluminium oxide is amphoteric oxide. Give Reason

Ans. Aluminium oxide reacts with HCl to form Aluminium Chloride and water

. Aluminium oxide reacts with Sodium Hydroxide to form Sodium aluminate and water.

Aluminium oxide reacts with both acids and bases to produce salt and water

$Al_2O_3 + 6HCl \rightarrow 2AlCl_3 + 3H_2O$

$Al_2O_3 + 2NaOH \rightarrow 2NaAlO_2 + H_2O$

44. What are alkalis give example?

Ans. Bases which are soluble in water called alkalis.

$Na_2O(s) + H_2O(l) \rightarrow 2NaOH(aq)$

$K_2O(s) + H_2O(l) \rightarrow 2KOH(aq)$

45. Why calcium floats on water?

Ans. Because the bubbles of hydrogen gas formed stick to the surface of the metal.

46. Write the chemical equation when aluminium and iron react with steam?

Ans. $2Al(s) + 3H_2O(g) \rightarrow Al_2O_{3(s)} + 3H_{2(g)}$

$3Fe(s) + 4H_2O(g) \rightarrow Fe_3O_{4(s)} + 4H_{2(g)}$

47. Write the chemical equation when Magnesium aluminium zinc iron react with HCL acids.

$Mg + 2HCl \rightarrow MgCl_2 + H_2$

$2Al + 6HCl \rightarrow 2AlCl_3 + 3H_2$

$Zn + 2HCl \rightarrow ZnCl_2 + H_2$

$2Fe + 6HCl \rightarrow 2\ FeCl_3 + 3H_2$

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

Ans. Because nitric acid is a strong oxidizing agent. It oxidizes the hydrogen produced to water and itself get reduced to any of the nitrogen oxides.

49. Describe briefly the method to obtain Mercury from cinnabar write the chemical equation for the reaction involved in this process?

When Mercuric oxide is heated in air, it is first converted into mercuric oxide (HgO). Mercuric oxide is then reduced to mercury on further heating.

$$2HgS(s) + 3O_2(g) \xrightarrow{Heat} 2HgO(s) + 2SO_2(g)$$

$$2HgO(s) \xrightarrow{Heat} 2Hg(l) + O_2(g)$$

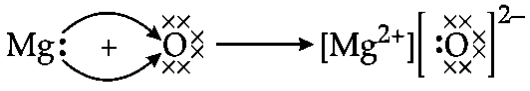
50.Show the formation of MgO by the transfer of electrons

$Mg \longrightarrow Mg^{2+} + 2e^-$

(2, 8, 2) (2, 8)

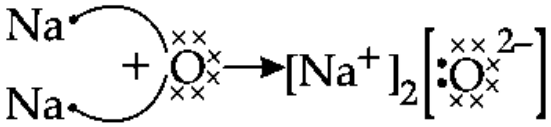
$O + 2e^- \longrightarrow O^{2-}$

(2, 6) (2, 8)



51.Show the formation of Na_2O by the transfer of electrons

$$Na \longrightarrow Na^+ + e^-$$
$$2, 8, 1 \qquad\qquad 2, 8$$
$$O + 2e^- \longrightarrow O^{2-}$$
$$2, 6 \qquad\qquad 2, 8$$



52. What is malleability?

Ans. Metals can be beaten into thin sheets

53. What is ductility?

Ans. The ability of metals to be drawn into thin wires.

CHAPTER 4 : Carbon and its Compounds

One mark Questions:

1. Define reactivity elements?
   Ans: The tendency of, atom of an element to attain octet configuration either by losing or gaining electrons is called reactivity of elements.
2. What is covalent bond?
   Ans: The bond formed between two atoms by sharing of electrons is called covalent bond.
3. Give an example for the molecule which has triple bond.
   Ans: Ethyne ($C_2 H_2$)
4. What is catenation?
   Ans: The property of carbon atoms to form covalent bonds with other carbon atoms to give rise to a large molecule is called catenation.
5. What are structural isomers?
   Ans: The carbon compounds having same molecular formula but different structural arrangements are called structural isomers.
6. How many structural isomers can be drawn for pentane?
   Ans: Three
   n-pentane, iso-pentane and neo-pentane
7. Which is the functional group present in alcohols?
   Ans: -OH
8. How many electrons must be shared between two atoms to form a double bond?
   Ans: Two pairs or four electrons.
9. Name the oxidizing agents which can be used to convert alcohols into carboxylic acid?
   Ans: Alkaline potassium permanganate ($KMnO_4$) or acidic potassium dichromate ($K_2Cr_2O_7$)
10. Name the catalyst used in the hydrogenation of oils?
    Ans: Nickle or palladium

Two marks Questions:

11. Define homologous series? Explain with an example.

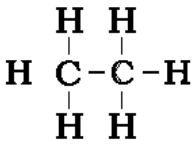
Ans: The group of carbon compounds with same general formula, similar chemical properties and each successive member differ by CH_2 are said to belong to a homologous series.
Ex: Methane and Ethane belongs to alkane group, their molecular formulas are CH_4 and C_2H_6 respectively. They both differ by CH_2.
They have same general formula, C_nH_{2n+2}.
They both have similar chemical properties.

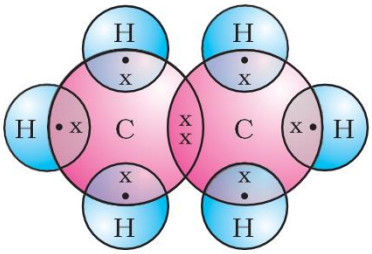
12. Differentiate between saturated and unsaturated carbon compounds.

Ans:

saturated carbon compounds.	unsaturated carbon compounds.
The carbon compounds having single bond between carbon atoms.	The carbon compounds having double or triple bonds between carbon atoms.
They are generally less reactive.	They are generally more reactive.
Eg: alkanes	Eg: alkenes and alkynes

13. Write the structural formula and electron dot structure of ethane.



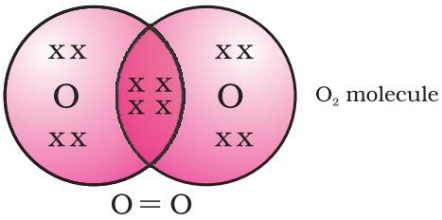


Ans: Molecular formula of ethane C_2H_6.
Structural formula -
Electron dot structure -

14. Explain the formation of oxygen molecule with electron dot structure.

Ans: The atomic number of oxygen is 8.
Its electron distribution is 2, 6
Oxygen atom needs two electrons to obtain Octet configuration.
Oxygen atom shares two electrons with another oxygen atom to form double bond and attains octet configuration, thus becomes stable molecule.

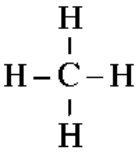
Oxygen atoms 

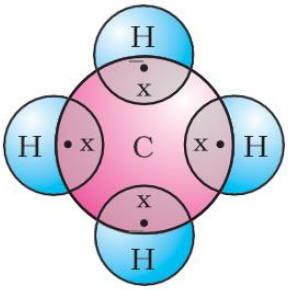


O_2 molecule

15. Write the electron dot structure for methane.

Ans: Molecular formula of methane is CH_4
Structural formula of methane is



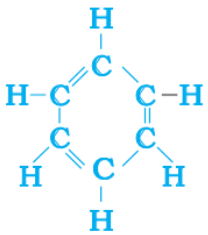
Electron dot structure is 

16. Give example for molecules having double and triple bonds.

Ans: Molecule having double bond between carbon atoms is Ethene.(C_2H_4)
Molecule having triple bond between carbon atoms is Ethyne.(C_2H_2)

17. Write the molecular and structural formula of benzene.

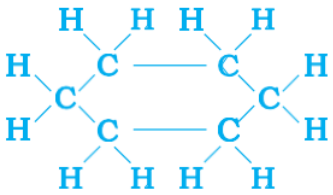
Ans: Molecular formula of benzene is C_6H_6.
Structural formula of benzene is



18. Write the molecular and structural formula of cyclohexane.

Ans: Molecular formula of Cyclohexane is C_6H_{12}.

Structural formula of Cyclohexane -



19. Why carbon cannot form ionic compounds?

Ans: Carbon cannot form ionic compounds because

i) It could gain four electrons forming C^{4-} anion. But it would be difficult for the nucleus with six protons to hold on to ten electrons.

ii) It could lose four electrons forming C^{4+} cation. But it would require a large amount of energy to remove four electrons.

20. List out the properties of covalent compounds (carbon compounds).

Ans: i) Covalent compounds are poor conductors of electricity.

ii) They have low boiling and melting points.

iii) They are generally insoluble in water.

iv) They have covalent bonds between atoms.

21. Explain the two versatile nature of carbon.

Ans: **i) Catenation:**

- Carbon has the unique ability to form bonds with other carbon atoms, giving rise to large molecules. This property is called catenation.
- The carbon compounds may have straight chains, branched chains or closed chains.

ii) Tetravalency :

- Carbon has four valence electrons.
- Its valency is four.
- It is capable of bonding with four other atoms of carbon or atoms of some other mono valent element.

22. Name the functional group present in ketone? Mention the name and molecular formula of first member of ketone group.

Ans: Functional group present in ketone is 

The first member of ketone family is Propanone.

The molecular formula of propanone is C_2H_6CO

23. Write the properties of homologous series.

Ans: i) The members of the series will have same general formula.

ii) The members of the series will have same functional group.

iii) The members of the series will have similar chemical properties.

iv) The successive members differ by – CH_2

v) They have gradually varying physical properties.

Three marks questions :

24. Explain oxidation reaction of carbon compounds with suitable chemical equation. Name the oxidizing agents used in the above reaction.

Ans: Oxidation reaction :

The process of converting the alcohols into carboxylic acids is called oxidation of carbon compounds.

$$C_2H_5OH \xrightarrow[\text{or acidified } K_2Cr_2O_7 + \text{heat}]{\text{Alkaline } KMnO_4 + \text{heat}} CH_3COOH$$

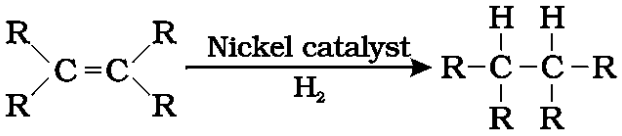
The oxidizing agents used in the above reaction is Alkaline $KMnO_4$ or acidified $K_2Cr_2O_7$

25. Write the suitable chemical equations of the following properties of carbon compounds.
a) Oxidation reaction b) Addition reaction c) Substitution reaction

Ans: a)

$$C_2H_5OH \xrightarrow[\text{or acidified } K_2Cr_2O_7 + \text{heat}]{\text{Alkaline } KMnO_4 + \text{heat}} CH_3COOH$$

b)



c) $CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$ (in the presence of sunlight)

26. Explain the cleaning action of soap?

Ans: Soaps are the sodium or potassium salts of long chain carboxylic acids.

- Each soap molecule has two ends, ionic end (hydrophilic end) and hydrocarbon end (hydrophobic end).
- When soap is dissolved in water its hydrophobic end attaches themselves to the dirt and forms structure called micelles around the dirt while the hydrophobic end faces towards water.
- The soap micelles thus helps in pulling out the dirt in water and we can wash our clothes clean

Four marks questions :

27. Define the following chemical properties of carbon compounds and write suitable chemical equations for each.
a) Combustion reaction b) Oxidation reaction
c) Addition reaction d) Substitution reaction.

Ans: a) Burning of carbon compounds in presence of oxygen to give carbon dioxide and water vapor.

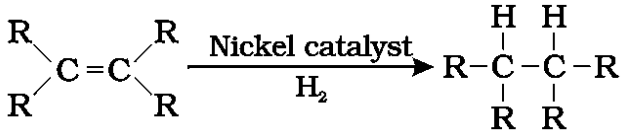
Ex: $CH_4 + O_2 \longrightarrow CO_2 + H_2O$ + heat and light

b) The reactions in which alcohols are converted into carboxylic acids are called oxidation reaction of carbon compounds.

$$C_2H_5OH \xrightarrow[\text{or acidified } K_2Cr_2O_7 + \text{heat}]{\text{Alkaline } KMnO_4 + \text{heat}} CH_3COOH$$

c) The reaction in which unsaturated hydrocarbons are converted into saturated hydrocarbons by passing hydrogen gas in presence of nickel or palladium as catalyst.

Ex:



d) The reaction in which one or more hydrogen atoms present in hydrocarbon are replaced by atoms of other elements.

Ex: $CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$ (in the presence of sunlight)

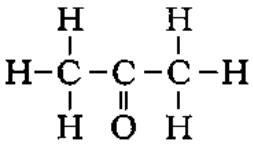
Five marks Questions :

28. Which is the functional group present in aldehydes?
Write the molecular and structural formula of first member of ketone group and write its electron dot structure.

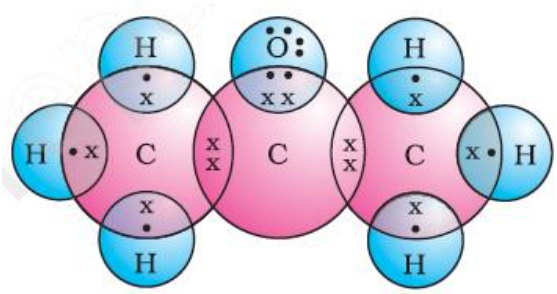
Ans: i) Functional group present in aldehydes is – CHO

ii) The molecular formula of first member of ketone family is C_2H_6CO.

iii) structural formula of Propanone is -



iv) Electron dot structure of propanone is -



CHAPTER 5 : PERIODIC CLASSIFICATION OF ELEMENTS

One Mark Questions

1. Electronic configuration of X and Y elements are 2,8,8,1 and 2,8,7 respectively. Which type of bond formed in between them?
   Ans: Ionic Bond
2. The metallic property ____ as it moves from left to right in the periodic table.
   Ans: Decreases
3. The atomic number of the X element is 7. To which period the element X belongs in the Modern periodic table?
   Ans: 2nd row/ 2nd period.
4. Which element is having large atomic size in Na, Mg. K & Ca?
   Ans: K
5. State the Henry Moseley's Modern periodic table?
   Ans: The Modern periodic law states that "The chemical and physical properties of elements are a periodic function of their atomic numbers"
6. The atomic numbers of nitrogen and phosphorus are 7 & 15 respectively. Which of these is most electronegative and why?
   Ans: Nitrogen. Tendency of gaining electrons decreases down the group.
7. How does the metallic property of a metal depend on the size of the atom?
   Ans: As the atomic size increases, metallic property (losing electrons) increases and vice versa.
8. Why hydrogen placed in 1st group?
   Ans: It is having $1s^1$ electronic configuration and shows the property of alkali metals.
9. Lithium, Sodium and Potassium elements are Dobereiner triads. If atomic masses of Lithium and potassium atoms are 7&39, find out the atomic mass of Sodium?
   Ans: Atomic mass of Na = Li+K/2, =7+39/2, Na=23. Atomic mass of Sodium is 23.
10. What are electro positive atoms?
    Ans: The atoms which gain net positive charge by losing of electrons are called electro positive atoms.
11. In the Mendeleev's Periodic Table Hydrogen could not be placed in a permanent position, Why?
    Ans: According to Mendeleev's theory, isotopes of hydrogen cannot be placed in a periodic table because they have different atomic masses.

2-Marks questions.

12. What are electro negative atoms? How does electro-negativity changes in a modern periodic table?
    Ans: The electro negative atoms are atoms which gain net negative charge by gaining of electrons.
    Across the period it increases and down the group it decreases.
13. The position of the elements A, B, C, D in the modern periodic table is given in the table below. Look at the table and answer the questions below.

	Group-1	Group-2
Period-3	A	B
Period-4	C	D

i. Which element is having maximum atomic size and why?
Ans: Element C. Across the period atomic size decreases and down the group increases.

ii. Which element is having minimum metallic property? Why?
Ans: Element B. Metallic property decreases across the period and increases down the group.

14. What are electro positive atoms? How this property varies across a period ?
Ans: By losing of electrons the atom will get the net positive charge. This property decreases along the period in modern periodic table.

15. Atomic numbers of A, B, C, D & E elements are given below. Answer the following questions based on this table.

Elements	A	B	C	D	E
Atomic number	7	10	12	4	19

i. Which two elements are similar in chemical property?
Ans: C & D (4&12)

ii. Which are noble gases?
Ans: B (10)

iii. Which element belongs to 3^{rd} period of modern periodic table?
Ans: C (12)

iv. Which elements are nonmetals?
Ans: A & B (7&10)

16. The elements X, Y & Z are in the 2,3 & 4 periods respectively. Which element is having large atomic size in X &Y elements? Which element is having more electro positivity in X, Y &Z elements?
Ans: Y element is having more atomic size in X & Y elements.
Z element is having more electro positivity in X, Y &Z elements.

17. Arrange Mg, Cl, P& Ar elements are in decreasing order based on their atomic size. Justify your answer.
Ans: Mg=12 :: $1s^2, 2s^2, 2p^6, 3s^2$ :: 3^{rd} period, 2^{nd} group
Cl = 17 :: $1s^2, 2s^2, 2p^6, 3s^2, 3p^5$ :: 3^{rd} period, 17^{th} group
P= 15 :: $1s^2, 2s^2, 2p^6, 3s^2, 3p^3$ :: 3^{rd} period, 15^{th} group
Ar= 18 :: $1s^2, 2s^2, 2p^6, 3s^2, 3p^6$ :: 3^{rd} period, 18^{th} group.
Mg<P<Cl<Ar
Across the period increases the number of electrons, the greater the affinity between the nucleus and electrons leads to reduction of atomic size.

18. Atomic number of X & Y elements are 12& 16 respectively. To which period these X & Y elements belongs? Which type of bond is formed in between them and why?
Ans: X=12 :: $1s^2, 2s^2, 2p^6, 3s^2$ :: 3^{rd} Period
Y=16 :: $1s^2, 2s^2, 2p^6, 3s^2, 3p^4$ :: 3^{rd} period

- Valency of X element is +2. It becomes X^{2+} by losing two electrons.
- Valency of Y element is -2, it becomes Y^{2-} by gaining the electrons.
- By electrostatic force of attraction in between the ions, the ionic bond is formed.

19. Electronic configuration of an a element is 2,8,6 . Explain the position of this element in modern periodic table and compare the atomic size of sodium with hydrogen and justify the answer with reason.

Ans: 16= $1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p^4$ :: It belong to 3rd period (3 shells), 16th group (6 valence electrons).

Hydrogen present in 1st period, Sodium present in 3rd period. Atomic size increases down the group due to addition of shells. Therefore, atomic size of Sodium is larger than Hydrogen.

20. How does the electronic configuration depend on the position of the element in a periodic table? Explain with an example.

Ans: Mg=12 :: $1s^2$, $2s^2$, $2p^6$, $3s^2$

- In electronic configuration highest shell number indicates period.
- In electronic configuration ended sub shell number shows that the group which element belong.

$$\frac{s^1}{1}, \frac{s^2}{2}, \frac{d^1}{3}, \frac{d^2}{4}, \frac{d^3}{5}, \frac{d^5}{6}, \frac{d^5}{7}, \frac{d^6}{8}, \frac{d^7}{9}, \frac{d^8}{10}, \frac{d^{10}}{11}, \frac{d^{10}}{12}, \frac{p^1}{13}, \frac{p^2}{14}, \frac{p^3}{15}, \frac{p^4}{16}, \frac{p^5}{17}, \frac{p^6}{18}$$

21. Write the electronic configuration of Mg & Al, mention their periods in periodic table. Justify your answer.

Ans: Mg=12:: $1s^2$, $2s^2$, $2p^6$, $3s^2$

Al=13:: $1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p^1$

Both the elements highest shell number is 3, therefore both the elements belong to the 3rd period in modern periodic table.

22. X, Y, Z elements position has been given in the table. Which type of ion formed with X element? In Y &Z elements which element is having relatively greater in atomic size?

Group-1	Group-2
-	Z
X	-
Y	-

Ans: X element is form cation by losing electrons.

Y element is having relatively large atomic size in Y&Z elements.

23. Write the no. of valence electrons in P, Q & R elements? Write the chemical formula of the compound when P & Q elements react. Which element is having larger atomic size?

Elements	Atomic Numbers
P	3
Q	17
R	13
S	11

Ans: P=3 :: $1s^2$, $2s^1$ :: Valence Electrons =1

Q=17 :: $1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p^5$ :: Valence Electrons =7

R=13 :: $1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p^1$ :: Valence Electrons =3

- Molecular Formula = PQ
- S is having large atomic radius. (atomic size decreases across the period)

3 Mark Questions

24. Atomic numbers of A & B elements are 11 & 12 respectively. Which shows highest metallic property? Why? Write the molecular formulas of compound when A & B elements reacts with the element C which is having the atomic number 8.
    - Element A is having higher metallic property because when we move along the period, metallic property decreases.
    - A_2C & BC
25. Atomic numbers of A, B, C, D & E elements are 6, 8, 3, 7 & 9 respectively. Which element shows less metallic property and why? What is your conclusion on the relationship between metallicity and electro positivity?
    - C element is having highest electro positivity, because it is having the tendency to lose more electrons.
    - Metallic property of E element is more because it is having tendency to gain electrons.
    - Electro positivity and metallic property are directly proportional.
26. Atomic number of calcium is 20. Answer the following questions with reasons.
    i. Is calcium a metal or non-metal?
    Calcium is having a tendency to lose electrons and shows metallic property. It is a metal.
    ii. Compare with potassium which is having the atomic number 20.
    Potassium is having one valence electron. Therefore it's metallic property is more when compared to Calcium which is having 2 valence electrons.
    iii. Write the formula of, oxide of calcium.
    CaO

Additional notes :

Dobereiner's Triads : When elements were arranged in the order of increasing atomic masses, groups of three elements having similar chemical properties are obtained. These are known as Triads.
Ex : i) Li, Na, K ii) Ca, Sr, Ba iii) Cl, Br, I

Law of Triads : The atomic mass of the middle element of the triad was roughly the average of the atomic masses of the other two elements.

Limitations : Only three triads were recognized from the elements known at that time.

Newland's Law of Octaves: When elements are arranged in the increasing order of their atomic masses, every eighth element has similar properties to the first.

Merits of Newlands Classification :

- This system worked quite well for the lighter elements. For example, lithium, sodium and potassium were brought together.
- It relates the properties of the elements to their atomic masses.
- For the first time, it was shown that there is a distinct periodicity in the properties of elements.

Limitations:

- It was applicable up to calcium (for lighter elements only).
- Properties of newly discovered elements did not fit into the law of octaves.

- To fit elements into his table, he put even two elements together in one slot and that too in the column of unlike elements having very different properties.
- He also put some **unlike elements under the same note**. Cobalt and nickel are placed in the same column as fluorine, chlorine and bromine which have very different properties than these elements.
- Iron, which resembles cobalt and nickel in properties, has been **placed far away** from these elements.

Mendeleev's Periodic Law:

The properties of elements are the periodic function of their atomic masses.

Merits of Mendeleev's Periodic Table :

i) Some gaps were left for the undiscovered elements like Gallium (Ga), Scandium (Sc) and Germanium (Ge).
ii) Predict properties of elements on the basis of their positions in the periodic table.
iii) Accommodate noble gases when they were discovered without disturbing the original arrangement.
iv) This arrangement helped to **calculate the correct atomic masses** of elements. For Ex: Atomic mass of Beryllium was corrected from 13.5 to 9. Similarly, with the help of this table, atomic masses of Indium, Gold, Platinum, Uranium etc. were corrected.

Limitations of Mendeleev's Classification:

i) Position of isotopes could not be explained.
ii) Position of Hydrogen in the periodic table is uncertain.
iii) Increase in atomic mass was not regular while moving from one element to another. Hence, the number of elements yet to be discovered was not predictable

Modern Periodic Law

Properties of elements are a periodic function of their atomic **number.**

Modern Periodic Table remove various anomalies of Mendeleev's Periodic Table.

a) In Mendeleev's periodic table, position of hydrogen is uncertain. In Modern periodic table, Hydrogen is placed in 1^{st} group since it is having $1s^1$ electronic configuration.
b) In Mendeleev's periodic table, the position of isotopes could not be explained.
In Modern periodic table, the isotopes were assigned same position as they have same atomic number.
c) In Mendeleev's periodic table, elements with larger atomic weights were placed before elements with smaller atomic weight without any justified reason.
In modern periodic table, all were arranged systematically with increasing atomic number.

Trends in the Modern Periodic Table :

a) **Valency** :

i) On moving from left to right in each period, the valency of elements increases from 1 to 4 and then decreases to 0.
ii) Valency remains the same down in a group.

b) **Atomic Size** :

i) Atomic size or radius of an atom **decreases** as we move from left to right in a period. This is due to an **increase in nuclear charge** which tends to **pull the electrons closer** to the nucleus and reduces the size of the atom.

ii) Atomic size **increases as we move down the group.** Because new shells are being added and this increases the distance between nucleus and outermost electron.

c) **Metallic Character :** (the tendency of an atom to lose electron)

i) On moving left to right in a period, the metallic character of an element decreases because the effective nuclear charge increases. It means tendency to lose electron decreases.

ii) Metallic character increases as we go down a group as the effective nuclear charge is decreasing.

iii) Metals are electropositive as they tend to lose electrons while forming bonds.

iv) Metals occupy the left side of the periodic table.

v) Oxides of metals are basic in nature.

d) **Non-Metallic Character** :

i) Non-metallic character increases across a period because due to increase in effective nuclear charge that means tendency to gain electron increase.

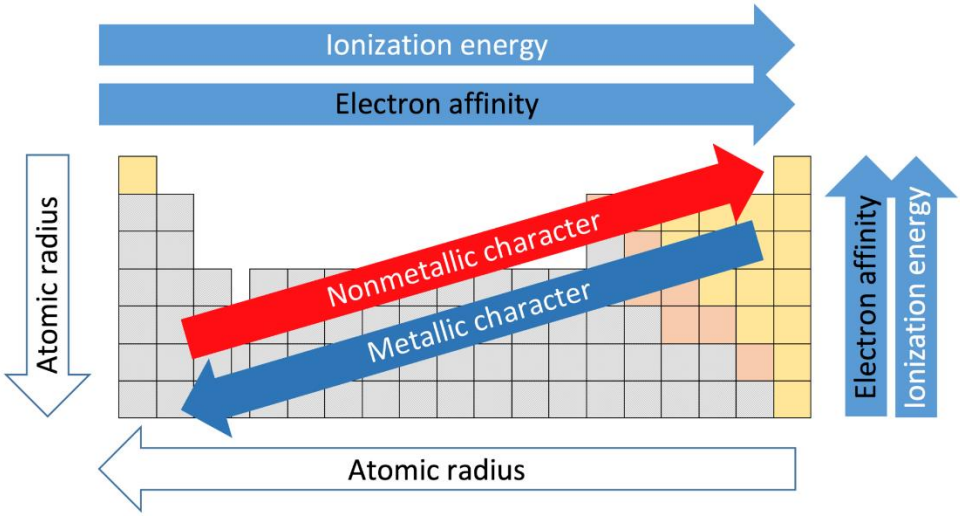
ii) Non-metallic character decreases as we move down a group due to decrease in effective nuclear charge experienced by the valence electron thus the tendency to gain electron decreases.

iii) Non-metals are electronegative as they tend to form bonds by gaining electrons.

iv) Non-metals occupies the right side of the periodic table.

v) Oxides of non-metals are acidic in nature.

In the middle of periodic table, we have semi-metals or **metalloid** because they exhibit some properties of metals and non-metals. Ex : Boron, Silicon, Germanium, Arsenic, Antimony, Tellurium, Polonium.



CHAPTER 6 : Life Processes

Multiple choice Questions :

1. Birds remove nitrogenous waste in the form of
   a) Carbon dioxide b) urea c) ammonia **d) uric acid**
2. Exchange of material between the blood and surrounding cells, takes place across this
   a. Arteries b. Veins **c. capillaries** d. Valves
3. The unit of blood which transport food carbon dioxide and nitrogenous wastes is
   a. Plasma b. RBC c. WBC d. Platelets
4. Valves present in heart helps in
   a. Backward movement of blood **b. Prevent backward movement of blood**
   c. Flow of blood to the lungs d. Flow of blood to all parts of body
5. The blood vessel carry oxygenated to the different parts of the body is
   a. Aorta b. Pulmonary veins
   c. Vena cava from upper body d. Vena cava from lower body
6. Number of chambers present in the heart of birds and mammals
   a. Two b. Three **c. Four** d. Five
7. This drains excess fluid from extracellular space back into the blood
   a. Red blood cells **b. Lymph** c. Platelets d. All the above.
8. The tissue which contains less protein is
   a. Enzyme **b. Lymph** c. Platelets d. Red blood cells
   Answer: b) lymph
9. Identify the false statement about arteries is :
   a. arteries carry blood away from the heart to various organs of the body
   b. Arteries have thick elastic walls.
   c. They have valves
   d. Transport oxygenated blood
10. Blood pressure of healthy person is
    a. 80/120 mm of Hg b. 130/90 mm of Hg
    c. 120/80 mm of Hg d. 140/80 mm of Hg

One mark questions

11. Define transpiration.
    Ans: The loss of water in the form of vapour from the aerial parts of the plant is known as transpiration.
12. Define lymph.
    Ans: It is similar to the plasma of blood but colorless (no RBC) and contains less protein.
13. Write the function of lymph?
    Ans: Carries digested and absorbed fat from intestine and drains excess fluid from extracellular space back into the blood.
14. Why arteries have thick elastic walls?
    Ans: The blood emerges from the heart under high pressure. To withhold this pressure, arteries have thick elastic walls.

15. Write the function of valves present in veins.
    Ans: Valves ensure that the blood flows only in one direction.
    OR
    Valves prevent the backflow of the blood.
16. Write the function of platelets.
    Ans: Helps to clot the blood
17. Define excretion. How unicellular organisms remove waste?
    Ans: The removal of harmful metabolic wastes from the body is called excretion.
    Unicellular organisms remove waste by simple diffusion
18. Name the nitrogenous waste present in urine.
    Ans: Urea and uric acid
19. Name the factors on which re-absorption of water in nephron depends.
    Ans: i) How much excess water there in the body.
    ii) How much of dissolved waste there is to be extracted
20. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?
    Ans: i) Highly efficient supply of oxygen to the body.
    ii) This is used in animals to maintain constant body temperature.

2 marks questions

21. Write any four techniques used by plants to get rid of waste material?
    - They can get rid of excess water by transpiration.
    - They can store wastes in tissues consists of dead cells.
    - Waste products may be stored in leaves that fall off.
    - Many plant waste products are stored in cellular vacuoles.
    - Waste products are stored as resins and gums especially in old xylem.
    - Plants also excrete some waste substances into the soil in around them.
22. Write any two main functions of kidney.
    - Remove nitrogenous waste from the body.
    - Maintain pH of our body.
    - Maintain water level of our body.
23. Define translocation? Name the tissue helps in the process.
    - The transport of soluble products of photosynthesis is called translocation.
    - Phloem tissue helps in this process.
24. Define transpiration pull ? Name the tissue helps in this process.
    - It is major driving force in the movement of water.
    - Xylem tissue helps in this process.
25. Define double circulation? Why ventricles are thick walled compared to atria.
    Blood moves twice in to heart during each cycle. This is known as double circulation.
    Since ventricles have to pump blood into various organs they have thicker muscles walls than the atria.

3 Marks questions

26. a. What are blood capillaries?

b. Blood moves only once in heart of fishes. Why?

c. Diffusion is not enough in multi-cellular organisms to remove wastes from body. Why ?

a) Capillaries are tiny blood vessels connecting arteries to veins.

b) In fishes, blood is pumped through gills is oxygenated their and passes directly to the rest of the body they do not maintain constant body temperature.

c) Since all the body cells are not in direct contact with the surrounding environment.

27. Explain structure and function of nephron.

i) Each kidney has large number of filtration units called nephrons.

ii) Nephron shows cup shaped end of a coiled tube called bowman's capsule.

iii) It initially filters glucose, amino acids, salts, urea, uric acid, water etc,

iv) Urine flows along the tube it reabsorbed glucose amino acids salt and water,

v) The amount of water reabsorbed depends on how much excess water there is to be excreted.

vi) The urine farmed enters into collecting duct.

4 marks questions

28. Write the function of blood vessels which are involved in circulatory system in man.
Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

Arteries: Arteries are the vessels which carry blood away from the heart to various organs of the body.

Veins: veins collect the blood from different organs of the body.

Capillaries: smaller blood vessels which bring the blood in contact with all the individual cells.

- Highly efficient supply of oxygen to the body.
- Animals maintain constant body temperature.

5 marks questions:

29. Write the uses of transpiration in plants. What are the differences between the transport of materials in xylem and phloem? Why plants have slow transport systems?

Uses of transpiration:

- Transpiration creates a suction which pulls water from the xylem cells of roots.
- Helps in upward movement of water and minerals.
- Helps in temperature regulation.

Xylem:

- It is water conducting tissue.
- At the roots, cells in contact with the soil actively take up ions.
- Steady movement of water into xylem creating column of water that it steadily pushed upwards.
- Evaporation of water molecules from the cells of a leaf creates a suction which pulls water from the xylem cells of root.
- It works on physical force.

Phloem;

- It is food conducting tissue.
- Transport of soluble products of photosynthesis is called translocation.
- The translocation in phloem is achieved by utilizing energy.
- Material like sucrose is transferred into phloem tissue using energy from ATP.
- Plant bodies have a large proportion of dead cells in many tissues. So, plants have low energy needs.

30. a) What are the functions of the fluids blood and lymph in humans?
    b) What are the different waste materials added to the urine from the blood?
    c) How are waste materials excreted in plants?

a) Functions of **Blood:**

- Plasma of blood transports food carbon dioxide and nitrogenous waste.

Functions of **Lymph**

- Lymph carries digested and absorbed fat from intestine and
- drains excess freed from extracellular space back into the blood.

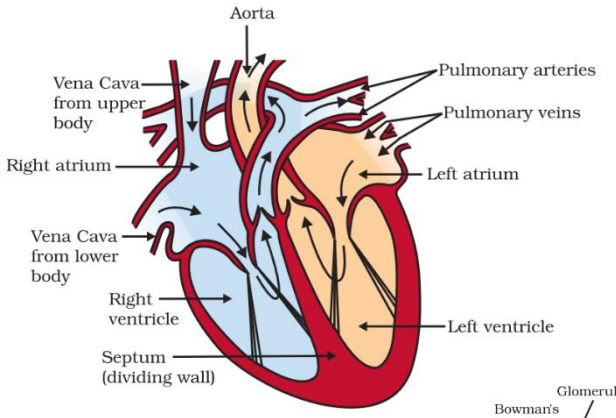
b) Nitrogenous wastes like urea and uric acid are removed from the blood in the kidneys.

c) Excretion in plants :

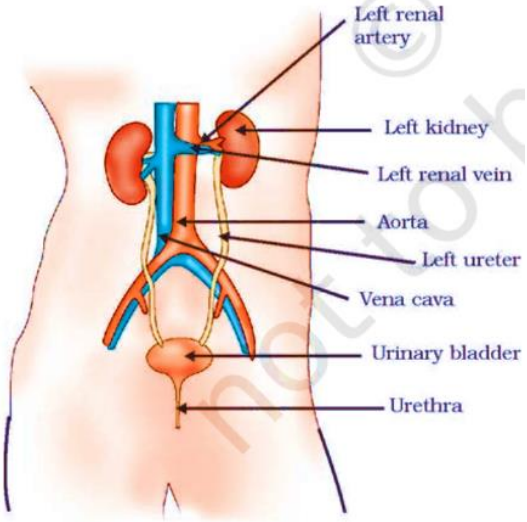
- Excess of water is get rid by transpiration.
- Many plants waste products or stored in cellular vacuoles.
- Waste products may be stored in leaves that fall off.
- Waste products are stored as resins and gums especially in older xylem.
- Plants also excrete some waste substances into the soil around them.

Diagrams :

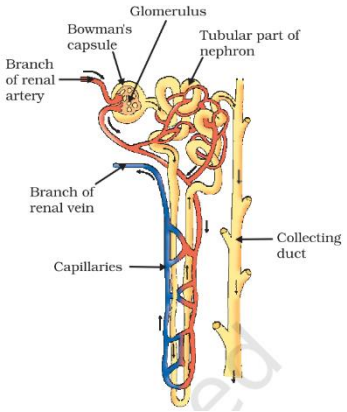
1. Schematic sectional view of the human heart



2. Excretory system in Human beings



3. Structure of a nephron



CHAPTER 7 : CONTROL AND COORDINATION

I. Multiple choice questions:

1.Which part if a nerve cell contains a nucleus?
a. Axon b. Dendrite **c. Cyton** d. Nerve endings.

2. The gap between two nerve cell s is said to be
a. Dendrites b. Axon **c. Synapse** d. Impulse

3. Plant hormone among the following is
a. Gibberellin b. Adrenaline c. Pituitary d. Thyroxine

4. The main function of forebrain is
a. Body balancing b. Facial expression **c. Thinking** d. Controls calcium

5.The hormone which retards the growth of plant is
a. Auxins b. Gibberellin **c. Ethylene** d. Cytokinin

6. The biggest part in the human brain
a. Pons b. Cerebellum **c. Cerebrum** d. Medulla oblongata

7.Identify the plant hormone
a. Insulin b. Thyroxin c. Estrogen **d. Cytokinin**

8. Touch me not plant is sensitive to which of the below actions
a. Light b. Smell **c. Touch** d. Heat

9. The part of the brain that controls the involuntary actions
a. Forebrain b. Mid brain **c. Hind brain** d. Spinal cord

10. The disease caused by the deficiency of parathormone is
a. Myxedema b. Cretinism c. Acromegaly **d. Muscle cramps**

11. The element needed for the synthesis of thyroxin is
a. Carbon **b. Iodine** c. Sodium d. Potassium

12. The trophic movement of plant moving towards light is
a. Phototropism b. Geotropism c. Hydrotropism d. Chemotropism

13. Identify the correct statement among the following with respect to plant hormones.
a. cytokinin promotes withering of leaves. b. auxin inhibits stem elongation.
c. abscisic acid inhibits the growth of plants. d. gibberellin promotes falling of leaves.

II. One mark questions:

1.Which are the two components of central nervous system in humans?
A. Brain and spinal cord.

2. What is reflex action?
A. Any sudden, involuntary response to a stimulus is known as reflex action.

3. If a potted plant is made to lie horizontally on the ground, which part of the plant will show a positive geotropism and negative geotropism?
A. Roots of the plant show positive geotropism and shoots of the plant show negative geotropism.

4. A young green plant receive sunlight unidirectionally. What will happen to the roots and shoots?
A. The root shows negative phototropism and it grows away from the sunlight. The shoot shows positive phototropism and it grows towards the sunlight.

5. Name the plant hormone which help to promote a. cell division b. growth of stem

A. a. cytokinin b. gibberellin

6. Among these which are the promoters?

a. phototropism b. geotropism c. chemotropism

A. a. phototropism - light
b. geotropism - gravity
c. chemotropism - chemicals.

7.Give an example of a plant hormone that promotes its growth and where is it synthesized?

A. Auxins promotes the growth in plants and it is synthesized at the tip of the plant body.

8. State the functions of gustatory receptors and olfactory receptors.

A. Gustatory receptors: helps in sensing the taste of the food.
Olfactory receptors: helps in sensing the smell.

9. Where are gustatory and olfactory receptors located?

A. Gustatory receptors are located in tongue and olfactory receptors are located in nose.

10. Mention the function of hind brain in humans.

A. Hind brain maintains the balance of the body, regulates the facial expression, mastication and in involuntary actions of the body.

11. Name the part of the human body where large number of neurons are found.

A. Brain.

12. Name the hormone that regulates blood sugar level. Name the gland associated in the secretion of this hormone?

A. Insulin is the hormone that regulates blood sugar level.
The gland associated in its secretion is pancreas.

13. Adrenalin hormone is called emergency hormone. Why?

A. Adrenalin is secreted only at the time of emergency situation like fear, anxiety, and extreme happiness.

14. Name the important hormone secreted by thyroid gland and mention its function.

A. The hormone secreted by thyroid gland is Thyroxin.
Thyroxin helps in the metabolism of carbohydrates, proteins, calcium and phosphorus.

15. Name the hormone which is associated with the metabolism of carbohydrates, proteins, calcium and phosphorus.

A. Thyroxin.

16. Why is pituitary gland is called the “Master gland”?

A. Pituitary gland control the activities of all the other glands in the body. So, it is called the “Master gland”.

17. Why hormones are called chemical messengers?

A. Hormones carry information to perform definite functions to the target organs. Hence, they are called chemical messengers.

18. Why are endocrine glands called ductless glands?

A. Endocrine glands directly secrete the hormone into the blood stream to reach the target organs instead of proper ducts. Hence, they are called as ductless glands.

19. Why is it advised to use iodized salt in our diet?

A. Iodine helps in balancing the secretion of thyroxin hormone which is very essential for the physical and mental development of the body.

20. Which part of our brain is responsible for maintaining posture and balance of our body?

A. Cerebellum is responsible for maintaining posture and balance of our body.

21.If we step on something sharp, immediately we remove /lift our foot away at once. What type of response is it?

A. Reflex Action.

22. When a boy is met with an accident, he loses his memory. Which part of the brain is affected?

A. Cerebrum.

IIII. Two marks questions:

1. How do auxins promote the growth of tendril around a support?

A. Auxin is plant hormone which is synthesized at the tip of the shoot. It helps the cell to grow longer. When a stem comes in contact with a support, auxin stimulates faster growth of the cells on the opposite side. That is why tendril forms a coil around a support.

2. How the nervous system is contrast from endocrine system in forming control and coordination in animals?

Nervous system	endocrine system
Electrical impulses are the messengers in the nervous system.	chemical messengers.
composed of brain, spinal cord and nerves.	composed of glands.

3. Which is the control center of reflex action?
What is the route taken by the reflex action called? And write its pathway.

A. Spinal cord is the control center of the reflex action.

The route taken by the reflex action is called Reflex arc.

Receptors------ sensory neurons------- spinal cord------- motor neurons ------- effector.

4. Which is the largest part of the brain? Write its function.

A. Cerebrum is the largest part of the brain. It is the seat of memory power. All the impulses from the sense organs are interpreted in different centers of cerebrum.

5. The given experimental set up establishes the response of different plant parts towards gravity.

i) Give the scientific term used for such response /movement.

ii) How is shoot response different from the root ?

A. i) Geotropism.

ii) Shoot - negative geotropism

Root - positive geotropism.

6. Classify the following movements as tropic or nastic :

a. Opening of flower b. roots moving downwards

c. shoots moving towards light. d. twirling of a tendril.

A. Tropic movement: roots moving downwards, shoots moving towards light.

Nastic movement: Opening of flower, twirling of a tendril.

7. Mention the name of pituitary hormone and its function secreted in humans.

A. Growth hormone

Function - controls the growth and development of body.

8. List out the functions of testosterone and estrogen.

Testosterone helps to develop secondary sexual character in male and controls the secretion of male gametes.

Estrogen helps to develop secondary sexual character in female and controls the secretion of female gametes.

9. How do you support the statement that "Pancreas is the overall controller of blood sugar level"?

A. Because they secrete insulin and glucagon hormones which are essential for balancing both high and low sugar level in blood.

10. Justify that the pancreas and the gonads perform dual function.

A. Pancreas act as both exocrine and endocrine gland and
gonads secrete hormones and also release gametes.

11. a. Which are the plant hormones present in the parts of the plant where rapid cell division takes place?

b. Give examples for the plant growth promoters and plant growth inhibitors?

A. a. Cytokinins are the plant hormones which promotes cell division.

b. Plant growth promoters are Auxins, Gibberellins, Cytokinins,
Plant growth inhibitors are abscisic acid.

IV. Three mark questions:

1.a. Draw the structure of neuron and label the parts.

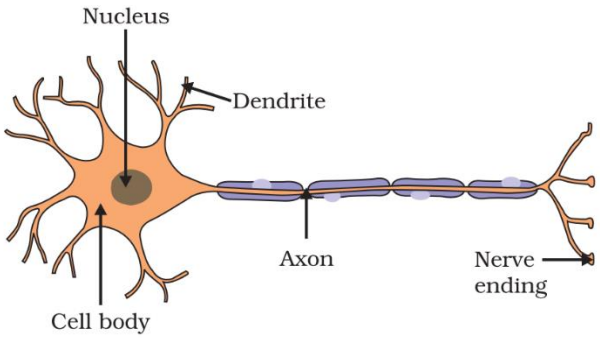
b. Name the below parts of neuron.

i) Which part acquires the information in neuron?

Dendrites

ii) Through which part does the information travel?

Dendrite →Cell body→Axon→ Nerve ending.



2. Mention the functions of phytohormones.

A. Phyto hormones are of two types:

a. growth promoters: auxin, gibberellin, ethylene, cytokinin

b. growth inhibitors: abscisic acid.

Functions:

i) Auxins: cell elongation of stem and root.

ii) Gibberellins: helps in growth of stem.

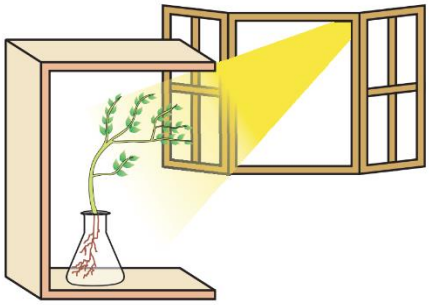
iii) Cytokinin: promotes lateral growth, stimulates the formation of chloroplast in leaves.

4. What is synapse? How are electric impulses created in nerve cell?

A. The tiny gap between successive neuron is called synapse. During the transmission of nerve impulse, the information acquired at the end of the dendrite's tip of a neuron, sets off a chemical reaction which creates an electrical impulse. This impulse travels from the dendrite to the cyton along the axon to its end. At the end of the axon the electrical impulses sets off the release of some chemicals which across the synapse and start a similar electrical impulse in a dendrite of the next neuron. In this way nerve impulses travel in the body. Synapse helps in transmitting impulses from one neuron to another.

5. Explain how auxins are helpful for the plant shoot to bend towards light?

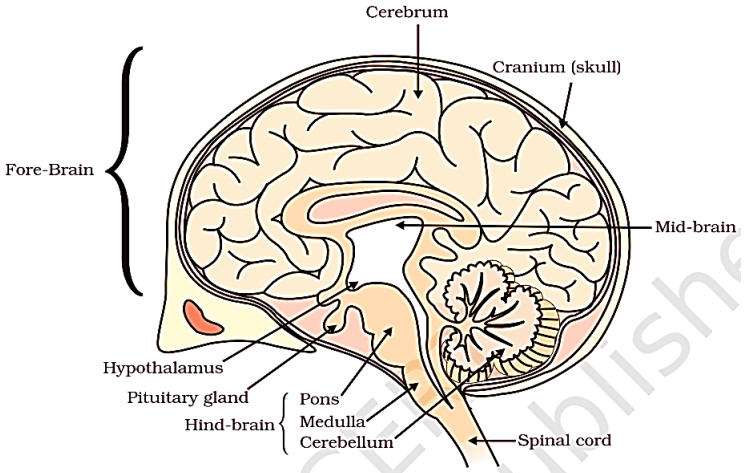
a) When light is coming from one direction of plant, auxins synthesized at the shoot diffuses towards shady side. This concentration of auxins stimulates the cells to grow longer on the side of the shoot which is away from light. Thus, plant appears to bend towards light.



b) Response of the plant to the direction of light. Shoot gives positive phototropism and root gives negative phototropism.

V. Four marks questions:

1. Draw the diagram of longitudinal section of human brain and label the parts.



i) Name the part which controls involuntary actions in hind brain: Medulla

ii) Name the area receiving sensory impulses: fore brain cerebral hemisphere.

2. Mention the functions of plant hormones. Name four types of plant hormones.

A. i) Auxins: helps in growth of plant tissue.

ii) Gibberellins: promote cell division, delays ageing of cells.

iii) Abscisic acid: inhibits growth and cause withering of leaves.

iv) Ethylene: causes ripening of fruits.

VI. Five marks questions:

1.a. Distinguish between cerebellum and spinal cord.

CEREBRUM	SPINAL CORD
It is protected by a bony box called cranium.	It is protected by vertebral column.
Largest part of brain	Longest part of CNS.
Centre of perception, imagination, thoughts, judgement and decision making	Controls reflex action.
Surface is composed of grey matter over white matter.	White matter covers the grey matter.
Contains cell bodies of neuron outside and axons of the neuron inside.	It contains axons outside and cell bodies inside.

b. Give technical terms for the following events:

i) The movement of plant in the direction of light- Phototropism

ii) The movement of plant parts in response to water- Hydrotropism.

iii) The movement of plant parts towards chemical substance – chemotropism.

iv) The downward movement of roots in response to gravitational force- Positive geotropism.

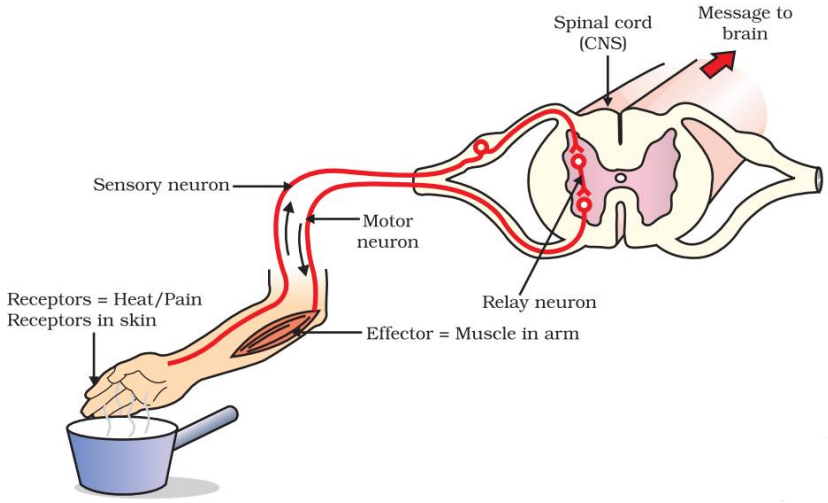
2. Define reflex action. What is reflex arc? Draw a neat labeled diagram of the components in a reflex arc. Why do impulse flow only in one direction in reflex arc?

A. Reflex action is a sudden involuntary reaction of the body in response to stimuli.

Reflex Arc- is the path followed by electrical impulse during reflex action.

The impulse travel from the receptor organ to the spinal cord/ brain. It is processed there and the information is brought back to the concerned muscle to carry out the action.

Thus, receptor organ, sensory/afferent neuron, inter neuron, motor/efferent neuron and effector organs are the components of reflex arc.



CHAPTER -8 HOW DO ORGANISMS REPRODUCE

M.C (1 Mark)

1. The flower may be unisexual in
   a) Papaya b) Hibiscus c) Mustard d) Toor dal
2. Which of the following part is considered in female reproductive system in human beings?
   a) uterus b) testis c) vas deferens d) scrutum
3. The ovule develops a tough coat and is gradually converted into
   a) ovule b) ovary **c) seed** d) fruit
4. The ovary grows rapidly and ripens to form a
   a) Seed b) ovary c) ovule **d) fruit**
5. A pollen tube, grows out of the pollen grain and travels through the style to reach the :
   a) ovule **b) seed** c) ovary d) fruit
6. The male reproductive system consists of
   a) ovaries b) uterus **c) testis** d) cervix
7. The female germ cells or egg are made in the
   a) vagina b) cervix **c) ovaries** d) uterus
8. The fertilized egg is called
   a) embryo **b) zygote** c) egg d) placenta
9. The embryo gets nutrition from the mother's blood with the help of a special tissue called
   a) blood b) mucus **c) placenta** d) embryo
10. Bacterial infections such as gonorrhea and syphilis are :
    a)STD b) virus c) corona d) fever
11. The common passage for sperms and urine in the male reproductive system is
    a) vas deferens **b) urethra** c) seminal vesicle d) ureter
12. In sperms, mitochondria occurs in :
    a) head b) tail **c) middle piece** d) acrosome
13. A fruit is
    a) An enlarged ovule **b) a mature ovary** c) an anther d) a thin style
14. What makes the beginning of the reproductive life of a women?
    a) Fertilization b) menopause c) ovulation **d) menarche**
15. What is formed immediately after fertilization?
    a) A gamete b) An Ovum **c) A Zygote** d) An embryo

Short Answers :

1. **Zygote :** Fusion of the male (sperm) and the female (egg) gametes.
2. **Seed :** The ovule develops a tough coat and is gradually converted into a seed.
3. **Puberty :** The rate of general body growth begins to slow down reproduction tissues begin to mature.
4. **Placenta :** The embryo gets nutrition from the mother's blood.
5. **Menstruation :** The process of bleeding in women in case fertilization does not occurs in about 28 to 30 days.

6. **Pollination :** The transfer of pollen grains from anther to stigma.
7. **Self-Pollination :** Transfer of pollen occurs in the same flower / different flower in the same plant.
8. **Cross Pollination :** If the pollen is transferred from one flower to another.
9. **Germination :** development of embryo into a seedling under appropriate conditions.
10. **Fetus :** A fetus is formed by the growth and development of an embryo.
11. **Menopause :** Is the stoppage of menstruation at about 45-50 years of age.
12. **Menarche :** Is the onset of menstruation.
13. **Fertilization :** Fusion of male gamete with female gamete
14. **Gestation period :** Starts from fertilization till delivery.

2 marks :

1. How is the process of pollination different from fertilization?

Pollination is defined as the process of transfer of pollens from anther to stigma. The process takes place with the help of pollinators like air, water and some insects.

Fertilization is defined as the fusion of male and female gametes. It takes place in the ovule and leads to the formation of zygote.

2. What is the role of the seminal vesicles and the prostate gland?

Lubrication of sperms and providing of a fluid medium for the easy transportation of sperms takes place with the help of secretions from the seminal vesicles and the prostate gland. These secretions also provide nutrients in the form of fructose, calcium and some enzymes.

3. If a woman is using a Copper-T, will it help in protecting her from sexually transmitted diseases?

No, because usage of copper-T cannot stop the contact of body fluids. Hence, it cannot protect her from getting sexually transmitted diseases.

4.What are the functions performed by the testis in human beings?

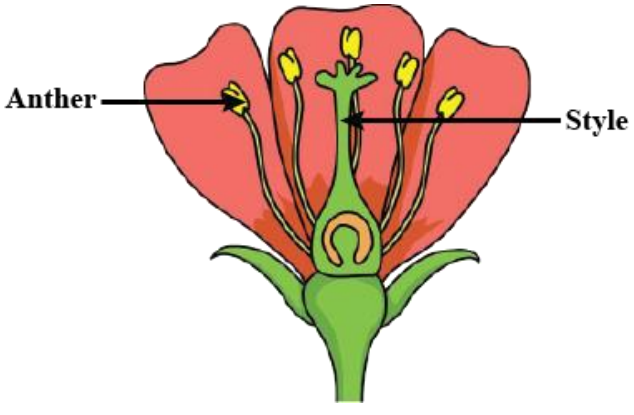
Following are the functions performed by the testis in human beings:

- Apart from the production of sperms, it also produces the male hormone known as androgens.
- They also produce hormone called testosterone, which is responsible for secondary sexual characters in boys.

5. Give example of two bacterial and two viral diseases which are transmitted through sexual contact?

Bacterial diseases;- gonorrhea and syphilis . Viral diseases;- AIDS and genital warts

6. Draw the diagram of the longitudinal section of a flower and label the parts.



3 marks

1. Why is the variation beneficial to the species but not necessarily for the individual?

The reason why the variation is beneficial to the species than individuals is because sometimes the climatic changes have a drastic effect on the species, which makes their survival difficult. For examples, if the temperature of the water body increases, then there might be certain species of microorganisms which might die. This may result in disturbance in the environment. So, variation is beneficial to species and not for the individuals.

2. Why is DNA copying an essential part of the process of reproduction?

DNA copying is an essential part of the process of reproduction because it carries the genetic information from the parents to offspring. A copy of DNA is produced through some chemical reactions resulting in two copies of DNA. Along with the additional cellular structure, DNA copying also takes place which is then followed by cell division into two cells.

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

Following are the changes seen in girls at the time of puberty:

- In genital area, hair growth appears.
- Hair growth in other areas like underarms, face, hands and legs.
- The size of uterus and ovary increases.
- The size of the breast increases followed by darkening of the nipple skin that is present at the tip of the breast.
- Beginning of menstrual cycle.
- Appearance of pimples, as the oil secretion is more from the skin.

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

The lining of the uterus thickens after fertilization. The blood flow is good so as to nourish the growing embryo. Placenta is a special tissue which is embedded in the uterine wall and helps the embryo get the nourishment from the mother's tissue. Placenta has villi on the embryo side and blood space on the mother's side. This spacing provides a large area between the mother and the embryo and also for waste removal.

5. Why does menstruation occurs?

Menstruation is the normal bleeding of the vaginal line which starts between puberty and lasts till menopause. During this period, the body prepares itself for pregnancy. Every month an egg is released from one of the ovaries at the same time where the uterus prepares itself for fertilized egg. The inner lining of the uterus gets thickened and is supplied with sufficient amount of blood for the embryo. Since there is no interaction between the egg and the sperms, the fertilization of egg doesn't take place. So, when the egg doesn't get fertilized, the uterus lining breaks down slowly resulting in menstruation.

6.How does reproduction help in providing stability to populations of species?

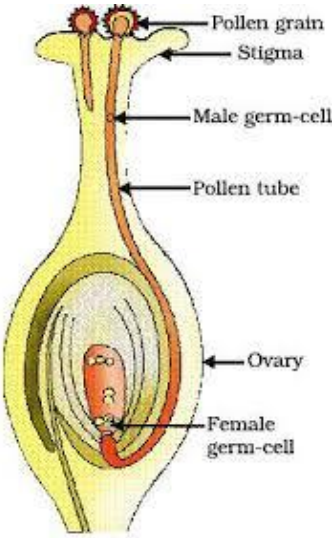
Reproduction is the process of producing the same kind of species by the existing species. This is done so as to maintain the population of that species and also to take forward their species to next generations. Stability is maintained by keep a check of rate of births and rate of deaths.

7. What could be the reason for adopting contraceptive methods?

Following are the reasons for adopting contraceptive methods:

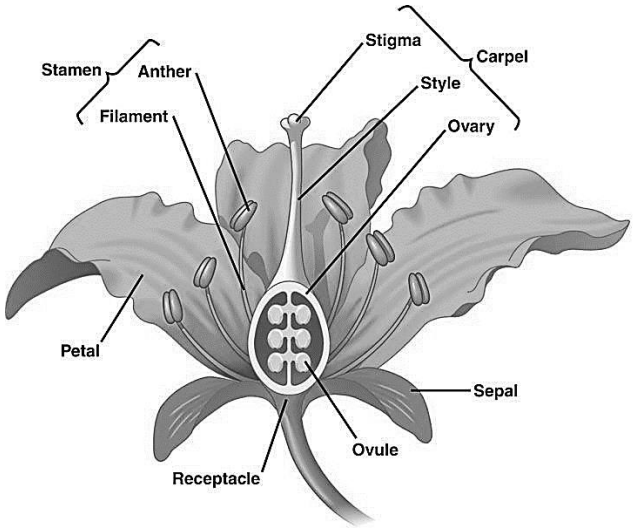
- To control population
- To avoid unplanned pregnancy
- To avoid transfer of sexually transmitted diseases

8. Draw a labeled diagram of Pollen on Stigma.



4 marks

1. Draw a labelled diagram of the longitudinal section of a flower.



2. What are the different methods of contraception?

Following are the different methods of contraception:

- **Natural method**: In this method, the main focus is to avoid the meeting of sperms and ovum. This can be achieved by avoiding the mating from 10th to 17th day of the menstrual cycle. During this period, there are high chances of fertilization as ovulation is expected.
- **Barrier method**: In this method, the meeting of sperms and ovum is avoided by using a barrier. These barriers are available for males as well as for females. Condoms for both male and female, diaphragms for female, cervical cap and contraceptive sponge for females.
- **Oral contraceptives**: In this method, pills are taken orally. These pills contain small portion of hormones that block the eggs so that fertilization doesn't takes place.
- **Implants and surgical method**: In this method, contraceptive devices like copper-T or a loop can be used to block the meeting of sperms and ovum. In surgical method, the fallopian tubes are blocked in females to stop flow of eggs and vas deference is blocked in men to stop the flow of sperms.

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CHAPTER 9 : HEREDITY AND EVOLUTION

I. Choose the correct answer from the given options :

1. An example of homologous organs are
   a. Our arm and a dog's foreleg b. Our teeth and an elephant tusk
   c. Potato and runners of grass d. **All the above**
2. An example of analogous organs are
   a. **Wing of bat and wing of bird** b. wings of birds and forelimb of lizard
   c. wings of birds and Arm of human d. All the above
3. A mendelian experiment consisted of breeding tall plants bearing violet flowers with short pea plants bearing white flowers. The progeny all bore violet flowers. but almost half of them were short. This suggests that the genetic makeup of the tall parents Can be depicted as
   a. TTVV b. TTvv c. **TtVV** **d.** TtVv
4. The earliest members of the human species homo sapiens traced their genetic footprints at
   a. Asia b. Eurasia c. Australia d. **Africa**
5. The fossil found few years ago in the Narmada valley is
   a. Fish b. Invertebrate c. **The dinosaur skull** d. Tree trunk
6. The ratio of di-hybridization progeny is
   a. 3:1 b. **9:3:3:1** c. 1:2 d. Answer the following 2:4
7. The type of chromosome hereditarily carried from parents to male baby is
   a. XX b. **XY** c**.** YY d. All of these
8. The notion which provides diversity without any adaptations is
   a. **Genetic drift** b. Natural selection c. Dominance d. Fossils
9. The vegetable developed from wild cabbage is
   a. Cabbage b. Cauliflower c. Kale d. **All the above**
10. The plants selected by Mendel for hereditary experiments are
    a. Chenna plants b. Bengal gram plants c. **Pea plants** d. Groundnut plants

II Answer the following :

1. What is a gene?
   A section of the DNA that provides information for one protein Synthesis is called the gene for that protein .
2. What is the basic concept of evolution in beetle illustration?
   As the characters are controlled by genes the repetition of these are controlled by them from generation to generation.
3. Who is the father of heredity ?
   Gregor Johann Mendel.
4. Who is the father of evolution?
   Charles Darwin
6. What are fossils?
   Preserved traces of living organisms are called as fossils.
7. Who is the first ancestor of humans?
   Homo sapiens
8. To which continent does our genetic footprints traced back?
   Africa

9. How many sex chromosomes are seen in humans and which are they?
   One pair of chromosomes i.e., XX in females and XY in male.
10. How many chromosomes are seen in human?
   23 pairs or 46 chromosomes

III Answer the following questions

01. On which characters does the experiments of Mendel were carried?
   Round and wrinkled seeds, smooth and rough seed coat, tall and dwarf plants, White and purple flowers, yellow and green seeds.
02. What are analogous organs ?
   The organs which are similar in function and not common in their origin are called as analogous organs. Ex : Wings of bat and wings of bird.
03. Write the methods of calculating the age of fossils?
   1. Relative method 2. Fossil dating method
   1) Relative method : When we dig into the earth the fossils we find closer to the surface are more recent than the fossils we find in deeper layers .
   2) Fossil dating method : Detecting the ratio of different isotopes of the elements in the fossil material.
04. List out the methods of evolutionary relationships study.
   1. Study of analogous organs
   2. Study of homologous organs
   3. Study of fossils
   4. Comparison of similarities and variations
   5. Direct estimation of DNA changes
   6. Age of fossils
   7. Genetic drift
   8. Natural selection
05. Formation of New species will not make disappearance of the old species. How?
   It depends on the environment. The natural selection and gene flow totally form the populations of species which do not Reproduce each other.
06. Give an illustration to show that old and simple patterns are still existing on earth?
   Bacteria is the simple organisms which is seen in hot water springs, deep oceans hot pots and Antarctica's snow areas.

IV. 3-mark questions:

1. Explain the analogous and homologous organs with examples
   Homologous organs are those organs which have the same basic structural designs and origin, but have different functions.
   Example: Forelimbs of humans and the wings of birds look different externally but their skeletal structures are similar.
   Analogous organs are those Organs which have the different basic structural design and origin but have similar functions.
   Example: The wings of birds and insects.
2. Cells cannot get two sets of genes from the normal two copies of cells. Justify the statement.
   Organisms get one set of gene from the parental organisms. No two characters can appear at a time
   R and Y would be linked to each other and cannot be independently inherited. This is explained by the fact that each gene set is present not as a single long thread of DNA. But as separate independent piece each called a chromosome. Thus, each cell will have two Copies of each

chromosome one each from the male and female parents. Every germ cell Will take one chromosome from each pair and these may be of either maternal or parental origin.

03. Explained how genetic drift and natural selection shapes new species.
The selection of nature is one of the most common qualities that make organisms survive.
- Life clusters dictates the evolution of life by natural selection
- These causes adaptations to be better for the environment
- It is the genetic quality that provides diversity without any compromises is the genetic drift.
- Each sub group combines several changes in the face of several statements of inheritance.
- The natural selection works differently in different geographical areas
- Gene flow and natural selection jointly get differentiated together which cannot reproduce each other
- Variations carry occasionally by natural selection
- New variations undergo powerful natural selection.
- Old speeches do not disappear with the emergence of a new species
- Natural selection and gene flow together creates a non-reproductive life group with the original species.
- The two evolving species may have taken the form of the majority on their own separate paths.

04. a) How anatomical studies are helpful in detecting biochemical relationships?
Anatomical analysis of fossils helps to determine biological relationships with age
- It reveals that complex structures arise from simple structures.
- The relationship between species is known.
- It reveals the formation of new and old species.

b) How can we determine that reptiles are very close relatives to birds?
Feathers began to protect the bird's body from the cold but were later useful to the birds in flying and body temperature maintenance.
- Dinosaurs have an inability to fly but lately birds used the wings to fly
- Dinosaurs are the reptiles which are close relatives of birds.

CHAPTER 10 : Light, Reflection and Refraction

1. What is refraction of light?
   When light travel obliquely from one medium to another the direction of propagation of light in the second medium changes this phenomenon is known as refraction of light.
2. State Snell's law of refraction?
   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
3. What is refractive index ?
   The extent of the change in direction that takes place in a given pair of media is expressed as refractive index
4. Refractive index of water is 1.33, what does it mean ?
   This means the ratio of the speed of light in air and the speed of light in water is equal to 1.33
5. What is aperture of a lens?
   The effective diameter of the circular outline of a spherical lens is called its aperture.
6. What is double convex lens?
   Lens having two spiracle surfaces bulging outwards is called a double convex lens
7. What is by double concave lens?
   Lens having two spherical surfaces curved inwards is called double concave lens
8. Why convex lens is called converging lens?
   Convex lens is the middle as compared to the edges and it can work and it converges the light rays.
9. Why concave lenses are called diverging lenses?
   Concave lenses or thicker at the edge than at the middle so that diverge the light rays.
10. The light passing through which point of the lens do not deviate?
    Optical center
11. What is the SI unit of power of a lens?
    Diopter
12. What is the meaning of 1 diopter.
    1 diopter is the power of a lens whose focal length is 1 meter
13. Lens having power +2D, which type of lens it is?
    Convex lens
14. A lens is having power - 25 D, which type of lens it is?
    Concave lens
15. Focal length of a lens is - 0.40m, what is its power?
    f= -0.40m,
    P=1/f. 1/-0.40 = -2.5D
16. A lens is having a power + 2.0 D, calculate its focal length?
    P= +2.0 D, f= ?
    P=1/f
    2.0= 1/f
    f = 1/ 2.0

= 0.5m

17. When object is placed between F1 and 2F1 of a convex lens, what is the characteristics of its image?
    - Image is formed beyond 2F2
    - Enlarge image
    - real and inverted
18. How can we get virtual and erect image in convex lens?
    By placing object between focus and optical center.
19. What is principal axis?
    An imaginary straight line passing through the center of curvature of a lens is called principal axis.
20. What is focal length of a lens?
    The distance of the principal focus from the optical center of a lens is called its focal length.
21. The distance between the principal focus and optical center of a lens is 10 cm. What is its focal length?
    10cm
22. What is principal focus of a lens?
    Rays of light after refraction from the lens meet at a point on principal axis, it is called principal focus.
23. State the laws of refraction of light
    First 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
    Second law: 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
24. How real image is different from virtual image?
    - Real images can be obtained on a screen but
      virtual images cannot be obtained on screen.
    - Real images are inverted whereas
      virtual images are erect.
25. Name the factors that influence the refractive index.
    - Nature of a medium
    - Density of a medium
    - Colour of light (wavelength)
26. What is the difference between convex lens and concave lens?

Convex lens	Concave lens
Thicker at the middle	Thinner at the middle
Thinner at the edge.	Thicker at the edge
Converging lens.	Diverging lens
Bulged surface.	Curved inwards

27. Magnification of a 1-meter height object is 2. What is the magnification of image.?
    h =1m. m= h'/h
    2=h'/1. = 2

28. Focal length of a convex lens is 20 cm, at 15 cm image is formed. Find out the distance of a object?

f = -20cm v = -15cm u= ?

1/f. = 1/v -1/u

1/-20 = 1/-15 - 1/u

1/u =1/-15 -1/20

1/u =. -1/60

U =-60cm

Formula ;

Lens formula :1/f. = 1/v -1/u

Magnification :m =h'/h =v/u

Power of a lens : P= 1/f

CHAPTER-12 : ELECTRICITY

1.Define the unit of current?

One ampere is constituted by the flow of one coulomb of charge per second.

2. Define ohms law?

The potential difference, V across the ends of a given metallic conductor in a electric circuit is directly proportional to the current flowing through it. Provided its temperature remains same.

V=IR

3.Define power?

The rate of consumption of energy.

P=VI

4.Define joules law of heating?

The heat produced in a conductor due to the flow of current is directly proportional to the time duration of current flow when the electrical resistance and the magnitude of current are constant.

H= V I t

$H=I^2 R t$

5.What is resistance?

The property that resists the flow of electrons in a conductor.

6.What is the SI unit of resistivity of a conductor?

Ohm meter (Ωm)

7. define resistivity?

It is characteristic property of the material to resist the flow of charges.

8. list any two advantages of fuse in domestic electric circuits.

- Prevents damage to the appliances and the circuit due to overloading.
- Avoids short circuit

9.What is meant by saying that the potential difference between two points is 1V?

One volt is the potential difference between two points in a current carrying conductor when 1 joule of work is done to move a charge of 1 coulomb from one point to the other.

10.A current of 2A is drawn by a filament of electrical bulb for 5 minutes, find the amount of electric charge flows through the circuit.

Q=It

Q=2x300

Q=600C

11.The resistivity of materials A and B are $2.63x10^{-8}$and$1.84x10^{-6}$which one is good conductor of electricity.

A is good conductor of electricity

12.List any two applications of joules law of heating.

1) The electric iron, electric oven, electric toaster, electric heater etc.. are based on Joule's heating effect.
2) The fuse works on the principle of Joule's heating effect.
3) The electric bulb works on the principle of Joule's heating effect.

13.An electrical gadget is connected to a 220V source battery. The current is 2A. Calculate its power.

P=VI P=220x2 P=440W

14.Why are copper and aluminum wires are usually employed for electricity transmission.

Copper and aluminum wires are usually employed for electricity transmission because they are good conductors of electricity.

15.How much energy is given to each coulomb of change passing through 6v Battery.

W=VQ
W=6 x 1
W=6J

15.Define electric potential.

Work done from bringing charge from infinity to electric field is called electric potential

16.An electric Iron of resistance 20Ω takes a current of 5A calculate the heat developed in 30S.

$H=I^2Rt$

$H=5^2 \times 20 \times 30$
H=25 x600
H=15000 j

17.A current of 0.5A is drawn by a filament of an electric bulb for 10 minutes. Find the amount of electric charge that flows through the circuit.

I=0.5A
t=10min=10 x 60=600sec
Q=It
Q=0.5 x 600
Q=300c

18.What potential difference must be applied across a 10Ω wire in order that a current of 2.5A flows through it.

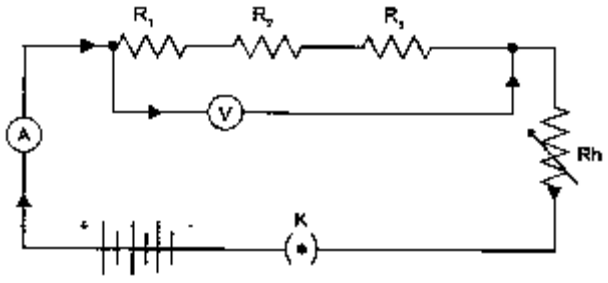
R=10Ω I=2.5 A V= ?
V=IR
V=2.5 x 10
V=25 v

19.Calculate the amount of charge that flows through a conductor when a current of 5A flows through it for 2 minutes.

Q= ? I=5A t=2 min =2x60=120 sec
Q= It
Q=5x120
Q=600C

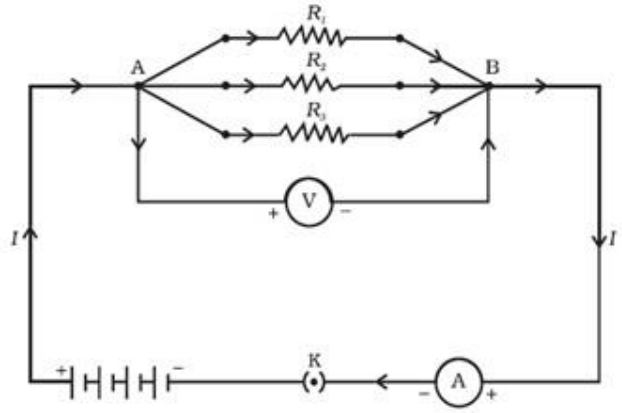
II marks

1. Draw the circuit diagram showing the combination of resistors R_1,R_2,R_3 in series, including voltmeter, plug key and battery.



Circuit diagram for resistors in series

2. Draw the circuit diagram showing the combination of resistors R_1,R_2,R_3 in parallel including , voltmeter, plug key and battery.



3. Compute the heat generated while transferring 96000 C of charge in two hours through a potential difference of 40V.

$$I = \frac{Q}{t}$$

$I = \frac{96000}{2x3600}$=13.33 A

H=VIt

H=40 x 13.33 x 7200

H=3.84 x 10^6 J

4. An electric iron of resistance 20Ω takes a current 5A. Calculate the heat developed in 30s.

V=IR

V=5 X 20

V=100 V

H=VIt

H=100 x 5 x 30

H=1.5 X 10^4 J

5.Why series arrangement is not used for domestic circuits.

- The current is constant throughout the electric circuit
- Different gadgets need currents of widely different values to operate properly
- When one component fails, the entire circuit is broken and none of the components work.

6. What are the advantages of connecting electrical devices in parallel with a battery .

- Parallel circuit divides the current through the electrical gadgets.
- The total resistance in a parallel circuit decreases and helps each gadget having different resistance and requires different current to operate properly.

7.Why tungsten is used as filament in electrical bulbs.

Tungsten is used for filament of electric bulbs because,

- Tungsten retains as much of the heat generated as possible, so that it gets very hot and emits light.
- It has high melting point.

8.How does the resistance of a wire vary with it's length and area of cross section?.

The resistance of the wire increases as its length increases and decreases as its area of cross section increases

9.Which uses more energy a 250W TV set or a 1200Wheater is 10minutes.

Energy consumed by TV

H=P x t

H=250 x

10. A bulb is marked 220 V and 40 W. Calculate the current flowing through the bulb and its resistance.

V=220V P=40W I=? R= ?

P=VI

40 = 220 x I

I =0.1818

R=V/I

R=220/0.1818

R= 1210 ohm

11. An electric iron draws a current 0.5A when voltage 200V. Calculate the amount of charges flowing through it in 1 hour?

I=0.5A V=200V t=1h=1x60x60=3600sec

Q=It

Q=0.5 x 3600

Q=1800C

12. The resistivity of two conductors, 'A' and 'B' are 1.62 x 10−8 Ω m and 5.20 x 10−8 Ω m respectively. Which of them is used in: (i) Transportation of electricity (ii) The making of heating coils? Why?

i) Conductor A is used in transportation of electricity, because it's resistance is low.

ii) Conductor B is used in making of heating coils, because it's resistance is high.

13. Observe the following table. Complete the table using Ohm's law

Sl No	Electric Current I	Potential Difference V	Resistance R
1	2A	120V	**---Ω**
2	1.5A	---	60**Ω**
3	----	60V	60**Ω**

Sl No	Electric Current I	Potential Difference V	Resistance R
1	2A	120V	60**Ω**
2	1.5A	90V	60**Ω**
3	1A	60V	60**Ω**

14. How much work is done in moving a charge of 2C across two points having a potential difference 12V?

W= ? Q= 2C V= 12v

W=VQ

W=12 x 2

W= 24 J

III marks

1.Compare the power used in 2Ω resistor in each of the following circuits.

i) 6V battery in series with 1Ω and 2Ω resistors

ii) a 4V battery in parallel with 12Ω and 2Ω resistors.

i) 6V battery in series with 1Ω and 2Ω resistors

V=6V

$R= R_1 + R_2=1Ω +2Ω =3Ω$

I=V/R=6/3=2A

$P=I^2R= 2^2x2= 4x2 = 8W$

ii) a 4V battery in parallel with 12Ω and 2Ω resistors.

$P=V^2/R=4^2/2 = 16/2 =8W$

2. Define 1 watt. Name the commercial unit of electric energy.

Express it in terms of SI unit of energy.

One Watt : The power consumed by a device that carries 1ampere of current when operated at a potential of 1V

The commercial unit of electric energy is kWh (kilo watt hour) commonly known as unit.

1kWh = 1000W x 3600sec

$=3.6 \times 10^6$wattsec

$=3.6 \times 10^6$joules.

3.i) Define one ohm.

If the potential difference across the two ends of a conductor is 1 volt and current through it is 1A, then the resistance R, of the conductor is 1Ohm

ii) On what factors does the resistance of a conductor depends.

The factors on which the resistance of a conductor depends are

i) on its length
ii) on its area of cross section
iii) temperature
iv) nature of the material

4.How fuse is helpful in domestic electric circuits. On what principle fuse works.

- Fuse stops the excess current through the circuit avoids short circuit.
- Prevents damage to the appliances and the circuit due to overloading.
- Fuse works on the principle of joules law of heating

5. i) Define electric circuit.

ii) how can we bring potential difference in an electrical circuit.

iii) Define the SI unit of potential difference.

i) A continuous and closed path of electric current is called electric circuit
ii) We can bring potential difference in an electrical circuit by the battery.
iii) One volt is the potential difference between two points in a current carrying conductor when 1 joule of work is done to move a charge of 1 coulomb from one point to the other.

6. i) How much current will an electric bulb draw from a 220V source, if the resistance of the bulb filament is 1200Ω.

ii) The current drawn by an electric heater coil is 2A from 220V source. Calculate its resistance. If it draws 1A current find the potential difference of the circuit.

i) V=220V R=1200**Ω** I=?

V = I R
I = V/R =220/1200
I = 0.1833A

ii) I = 2A
V = 220V
R = V/I=220/2
=110 **Ω**
If it draws 1A current then V=?
V=IR
V=1x 110
V=110V

7. An electric lamp where resistance is 20Ω and a conductor of 4Ω resistance are connected in series to a 6V battery calculate.

a) The total resistance of the circuit b) The current through the circuit and
c) The potential difference across the electric lamp and conductor.

a) The total resistance of the circuit : Rt = $R_1 + R_2$
=20+4
=24 Ω

b) The current through the circuit : I =V/R
=6/24
=0.25 A

c) The potential difference across the electric lamp and conductor
V = I R
V = 0.25 x 20
V = 5v

8. Compare the power used in the 2Ω resistor in each of the following circuits

i) A 6V battery in series with 1Ω and 2Ω ii) A 4V battery in parallel with 12Ω and 2Ω

i) A 6V battery in series with 1Ω and 2Ω
$R=R_1+R_2$
R=1+2
R=3 **Ω**
I=V/R
I=6/3
I=2A
$P=I^2xR$
$P=2^2$ x 2
P=8 W

ii) A 4V battery in parallel with 12Ω and 2Ω
I=V/R
I=4/2
I=2A
$P=v^2/R$
$P=4^2/2$
P=16/2
P=8W

9. Several electric bulbs designed to be used on a 220V electric supply line, are rated 10W. How many lamps can be connected in parallel with each other's across the two wires of 220V line if the maximum available current is 5A?

V=220v P= 10W Number of lamps = x

R=V/I

R=220/5

R=44 Ω

$P=v^2/R$

$R= v^2/P$

$R=(220)^2/10$

R=220 x 22

R= 4840 Ω

$1/R=1/R_1 +1/R_2 +1/R_3 + ...+1/R_n$

1/44 =x/4840

x=110

10. A copper wire has diameter 0.5 mm and resistivity of 1.6 x 10−8 Ω m. What should be the length of this wire to make its resistance 10 Ω.

$d=0.5mm =0.5 \times 10^{--3}m$

$A = \pi r^2$

$= 3.14 \times (0.25 \times 10^{-3})^2$

$= 0.19625 \times 10^{-6}m^2$

$\rho = 1.6 \times 10^{-6}\Omega m$

R=10Ω

l= ?

$$R = \frac{\rho l}{A}$$

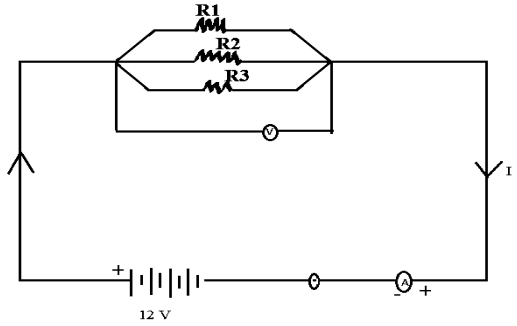
$$10 = \frac{1.6x10 - 6x\,l}{0.19625x10 - 8}$$

$1.6 \times 10^{-6} x\, l = 10 \times 0.19625 \times 10^{-8}$

$$l = \frac{1.9625}{1.6} x 10^2$$

l= 122.7 m

11. In the circuit diagram given below suppose the resistors R_1, R_2 and R_3 have values 5Ω 10Ω and 30Ω respectively, which are connected to a battery of 12V. Calculate the current through each resistor and also the total current in the circuit.



The current through each resistor

R_1= 5Ω , R_2 = 10Ω , R_3 =30Ω, V=12V,

I_1= V/ R_1

=12/5=2.4 A

I_2= V/ R_2

12/10=1.2A

I_3= V/ R_3

12/30=0.4A

I =I1+I2+I3

I=2.4+1.2+0.3

I=3.9 A

12. Four Resistors 5Ω, 6Ω, 4Ω and 8Ω are connected in parallel. Find the resistance of the circuit.

$1/R=1/R_1+1/R_2+1/R3$

$=1/5 + 1/6 + 1/4 + 1/8$

$\frac{24+20+30+15}{120}$

$\frac{89}{120}$

$R = 120/89$

IV marks

1.On what factors resistance of substance depends. Observe the following table which of the material is used for transmission of electricity, heating material and insulator why?

Material	Specific resistance(Ωm)
A	**$1.62x10^{-8}$**
B	**$100x10^{-6}$**
C	**$1x10^{10}$**

The factors on which the resistance of a conductor depends are

a) on its length
b) on its area of cross section
c) temperature
d) nature of the material

The material is used for transmission of electricity is A, because its resistance is low.
The material is used for heating is B because it has high resistance and high melting point.
The material is used for insulator is C because they do not conduct electricity.

2. i) Calculate the monthly bill for a heater of resistance 30Ω. Used on 220V mains when it is used daily for 1 hour, at the cost of Rs.5.00per kWh?

R=30Ω. V=220V I=? P=?

I=V/R=220/30

I=7.33A

P=VI

P=220 x 7.33

P=1612.6 W

Monthly bill = 1612.6 x 1 x 30

= 48378Wh

= 48.378kWh

@Rs5 per unit

=48.378 x 5

=Rs 241.89

ii)Define electric circuit?

A continuous and closed path of an electric current is called an electric circuit.

3) i) Define electric current?

The rate of flow of charges is called electric current. $I = \frac{Q}{t}$

4) i) Find the number of electrons in 1C of charge.

$1C=1/1.6 \times 10^{-19}$

$1C= 10^{19}/1.6$

$1C=6.25 \times 10^{18}$ electrons.

ii) Why heating elements made of alloys rather than metals-Give reason.

Alloys are used in the electrical heating devices because,

1. The resistivity alloys are generally higher than that of its constituent metals.
2. Alloys do not oxidize readily at high temperatures.

5) Three bulbs of 50W each are connected in series is an electrical circuit

i) Will the bulbs glow the same brightness. Justify your answer.

ii) When one bulb gets fused what happens to the circuit? Will other bulbs glow.

iii) To overcome this problem how should the bulbs are to be connected.

iv) How electrical gadgets are connected in domestic circuits.

i)The bulbs will glow with the same brightness because the current is same in all the currents.

ii) When one bulb gets fused the circuit will broke. Other bulbs do not glow.

iii)To overcome this problem the bulbs are to be connected in parallel.

iv) electrical gadgets are connected in parallel in domestic circuits.

6) i) How is ammeter connected in an electric circuit? Why.

ii) How is voltmeter connected in an electric circuit? Why.

iii) Explain the application of heating effect of electric current in an electric bulb and the fuse used in an electric circuit.

i) Ammeter is connected in series in an electric circuit, to measure the current in the circuit.

ii) Voltmeter is connected in parallel in an electric circuit, to measure the potential difference across the ends of conductor.

(iii) Tungsten retains as much of the heat generated as possible, so that it gets very hot and emits light.

When the current larger than the specified value flows through the circuit the fuse wire melts and breaks the circuit.

CHAPTER 13 : Magnetic effects of electric current

1. What is magnetic field?
   The region surrounding a magnet in which the force of the magnet can be experienced is called magnetic field.
2. Mention the properties of magnetic lines of force.
   - Magnetic lions originate from North pole and end at its south pole
   - Magnetic lines of force are closed and continuous curve
   - Magnetic lines never intersect each other
   - Magnetic lines of force are denser near the poles of a magnet
3. Why two magnetic lines of force never intersect each other?
   If two magnetic lines of force intersect then there will be two tangents and hence two directions of the magnetic field at the point of intersection, this is not possible
4. Why the needle of compass deflects when it is brought near a bar magnet?
   Compass is a bar magnet. Magnetic lines of force interact with a bar magnet hence the middle of a compass deflects.
5. Find the magnetic field around straight conductor carrying current?
   Right hand thumb rule
6. Write the pattern of magnetic field lines in the following.
   a) Straight conductor carrying current - concentric circles
   b) Current carrying circular loop- straight lines
   c) Current carrying circular coil-two concentric circles
   d) Solenoid- parallel straight lines
7. What is solenoid?
   A coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder is called a solenoid
8. What is an electromagnet?
   Soft iron placed inside a current carrying solenoid it magnetizes. This is called an electromagnet.
9. How a magnitude of magnetic field is related to current carrying conductor?
   Magnitude of the magnetic field is directly proportional to the current passing through the wire.
10. State right hand the rule?
    Imagine that you are holding a current carrying straight conductor in your right hand such that thumb points towards the direction of the current. Then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field.
11. Define electric motor?
    The device which converts electrical energy into mechanical energy is called electric motor.
12. Name devices in which the electric motor is used.
    Electric fan, refrigerator, mixer, washing machines
13. State Fleming's left-hand rule.
    Stretch the thumb, forefinger and middle finger of your left hand such that they are mutually perpendicular. Middle finger shows the direction of current, fore finger shows the direction of the magnetic field then the thumb point in the direction of motion of conductor.

14. What is commutator?

A device that reverses the direction of flow of current through a circuit is called a commutator.

15. India motor which part acts as a commutator?

Split rings

16. Define armature.

The soft iron core on which the coil is wound, plus the coils is called an armature

17. What is the principle of electric motor?

A conductor carrying current is placed in magnetic field experiences a mechanical force.

18. Name the instrument it used to detect the presence of electric current in a circuit.

Galvanometer

19. Mention the sources of direct current?

Dry cell, solar cell, acid battery

20.when does a conductor carrying current experiences maximum force in magnetic field ?

When direction of current it is perpendicular to magnetic field

21. What is electromagnetic induction?

The process by which a changing magnetic field in a conductor induces a current in another conductor is called electromagnetic induction.

22. State Fleming's right-hand rule

Stretch the thumb, forefinger and middle finger of right hand so that they are perpendicular to each other. If the forefinger indicates the direction of the magnetic field and the thumb shows the direction of motion of conductor then the middle finger will show the direction of induced current

23. Define electric generator

Device used to convert mechanical energy into electrical energy is called electric generator.

24. Name the principal on which electric generator works

Electromagnetic induction

25. What is alternating current?

If the current changes its direction after equal intervals of time is called alternating current.

26.what is the difference between electric motor and generator

Electric motor	**Electric generator**
Converts electrical energy to mechanical energy	Converts mechanical energy to electrical energy
Works on the principle, A conductor carrying current is placed in magnetic field experiences a mechanical force.	Works on the principle of Electromagnetic induction

27. What is direct current?

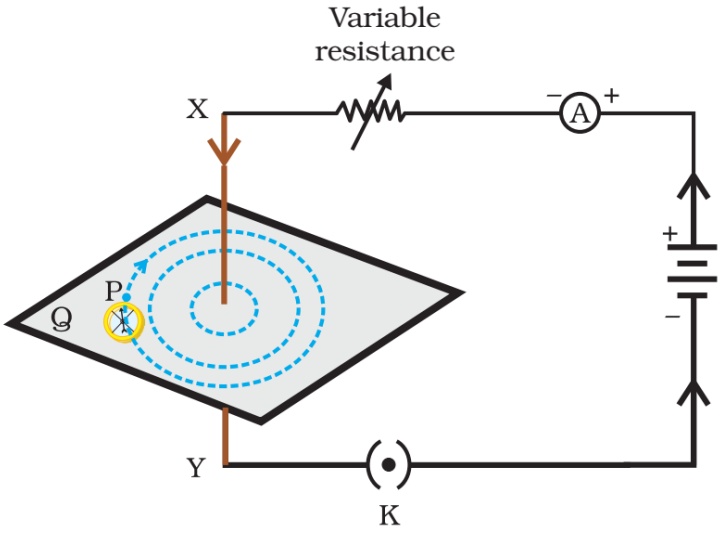
A current in which the magnitude and the direction do not change with time is called direct current.

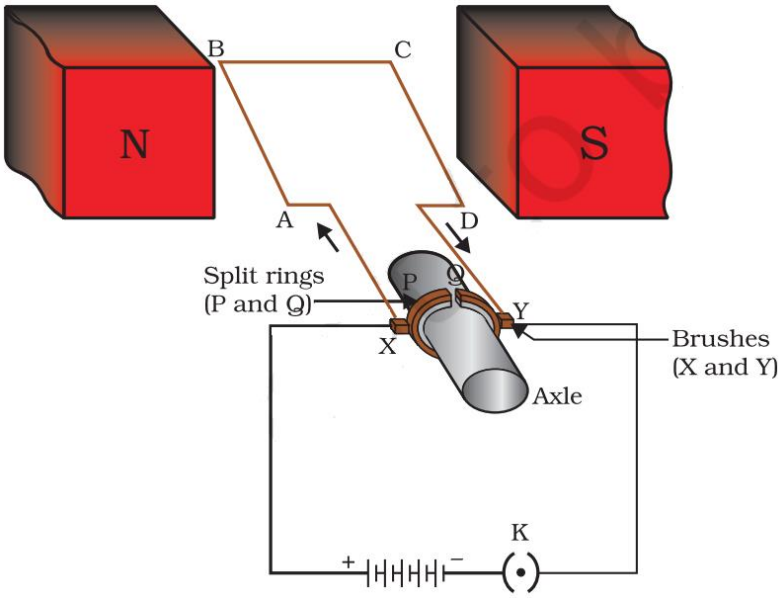
28. Why alternating current is more preferred over direct current?

- The generation of alternating current is more economical than direct current.
- Alternating current voltage can be easily step up or step down by using a transformer.
- Alternating current can be transmitted to distant places with minimum loss.

29. Which type of electric current is supplied to our homes?
    What is the voltage and frequency of that current?
    Alternating current
    Voltage is 220 V and Frequency is 50 Hertz
30. What is earthing?
    Earthing is a wire usually connected to a metal plate deep into the earth near the house.
31. What is the significance of earthing?
    Earthing ensures that any leakage of current to the metallic body of the appliance keeps its potential to that of the earth and the user may not get severe electric shocks.
32. What is the frequency of AC if it changes direction after every 1/100 second?
    50 Hertz.
33. What is the difference between direct current and alternating current?
    Direct current flows in one direction whereas the Alternating current reverses its direction periodically.
34. Which type of circuit used for geysers and air coolers?
    15A
35. Which type of circuit is used for lighting and fans?
    5A
36. What is the colour of insulation in the following
    Live wire- Red
    Neutral wire- black
    Earth wire-green
37. When does overloading occur?
    Overloading occurs
    - When live wire and neutral wire come into direct contact.
    - Due to an accidental hike in the supply of voltage
    - Connecting to many appliances to a single socket
38. What is short circuiting?
    Due to overloading the current in the circuit abruptly increases. This is called short-circuiting.
39. What is the role of fuse in Electric circuit?
    A fuse in a circuit prevents damage to the appliances and the circuit due to overloading
40. what precautions have to be taken to avoid overloading in domestic electric circuits?
    - Too many appliances should not be connected to a single socket
    - Too many appliances should not be used at the same time
    - Fuse should be connected in the circuit
    - Using separate circuits for high power and low power appliances
41. Mention any two safety measures taken in and domestic electric circuit
    - Using fuse of appropriate rating
    - Proper earthing
    - Separate circuits for high power and low power appliances

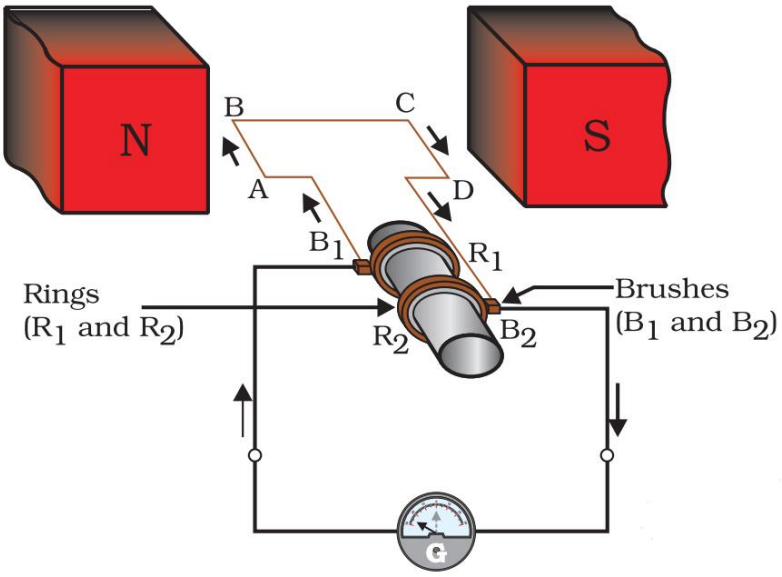
A pattern of concentric circles indicating **the field lines of a magnetic field around a straight conducting wire**. The arrows in the circles show the direction of the field lines.





A simple electric motor

Illustration of the principle of
Electric generator



CHAPTER 14 - SOURCES OF ENERGY

Answer the following questions 1mark

1. What is a good fuel?

a. It has a high calorific value.

b. Produces less smoke on burning.

2. Why main thermal power plants are set up near coal or oil fields ?

Because transmission of electricity is more efficient than transporting coal and petroleum.

3. Define Biomass?

The material contained in the bodies of plants and animals

4. Name two combustible components of biogas?

Methane and hydrogen

5. Name the elements used in the solar cell?

Silicon and silver

6. Name the two major components present in the left-over slurry of a biogas plant?

Nitrogen and phosphorus.

7. List any two advantages of using wind energy?

- Environmental friendly
- Efficient sources of renewable energy

8.What is geothermal energy?

Heat energy stored in the hot spot of the earth's crust.

9. Define nuclear fission?

The heavy nucleus splits into two or more smaller nucleus with the evolution of large amount of energy when it is bombarded with slow moving neutron.

10. What is nuclear fusion reaction?

A reaction in which two or more lighter nuclei fuse to form a heavy nucleus and large amount of energy

11. Why is solar cooker painted black from outside?

A black surface absorbs more heat when compared to White.

12. What are the advantages of nuclear energy?

- It does not release harmful gases
- Small amount of nuclear fuel produces a large amount of energy

13. Mention the two limitations in harness in wind energy?

- Wind energy farm can be established only at those places where wind blow greater part.
- The wind speed should maintain 15 kilometer per hour.

14. Write any two advantages of bio energy?

- It maintains an unpolluted environment.
- Reduces the carbon dioxide in the atmosphere.

2 marks questions

15. What is good source of energy?

- Easily accessible
- Easy to store and transport
- Is economical
- It would be a large amount of work per unit volume

16. Mention the limitations of the hydropower plants?

- Construction of a big dams have certain problems associated with it
- Dams can be constructed only in the Limited number of places preferably in hilly terrains

17. Mention the four gases generated in biogas plant?

- Methane
- Carbon dioxide
- Hydrogen
- Hydrogen sulphide

18. What are the limitations of establishment of wind energy farms?

- No electricity is produced when the wind is not blowing.
- 1Mv generator the farm needs about 2 hectares of land
- Cost of establishment is very high
- The towers and blades are exposed to rain, sun and storms
- They need high level of maintenance.

19. List any two limitations of the usage of solar cell for harnessing for domestic use?

- Availability of this special grade silicon for making solar cell is limited.
- Silver used for interconnection of the cells in the panel further adds to the cost.

20. Can any source of energy be pollution free?

No, because the uses of any source of energy will disturb environment in one or other way.

Example: Solar cell. It is free of pollution but installation may cause some damage to environment

21.state any two major hazards associated with a nuclear power plant?

- Storage and disposal of spent are used fuels the uranium still leaking into a powerful subatomic particle.
- Improper nuclear waste storage and disposal result in Environmental contamination.

22. Which reaction takes place in the biogas plant?

The reaction takes place in the biogas plant is an aerobic fermentation.

Biomass _digester anaerobic digestion_ biogas _energy.

23. What kind of mirror would be best suited for use in a solar cooker. why?

Concave mirror would be suited for use in a solar cooker

Concave mirror concentrate sunlight to produce the heat in solar furnace.

24. Compare and contrast Biomass and energy hydroelectricity as sources of energy?

Biomass	**Hydroelectricity**
Causes pollution	Do not cause pollution
It is renewable sources of energy	It is nonrenewable sources of energy

3 marks questions

25.Explain the principle and working of a biogas plant?

- The waste of living organisms like cow dung
- Various plant materials like the Residue vegetable waste sewage etc.
- During the decay of Biomass in the absence of oxygen biogas is produced in biogas plant
- A slurry of cow dung and water is made into the mixing tank from while it is fed into the digester
- In the digester tank anaerobic micro-organisms, decomposers, Complex molecules of cow dung slurry and produces biogas

26. List two ways in which animal dung can be utilized as a fuel. Out of these two which one do you think is better? Justify your answer.

a. As cow dung cake b. as biogas

Biogas is better than cow dung cake. Because it has high heating capacity and are nonpolluting as it burns without smoke and leaves no residue like ash. Slurry left in the biogas plant is a good manure for fields.

27. What is solar cell? List out the application of the solar cell and limitation of the solar cell?

Solar cell is a device that converts solar energy into electrical energy.

Application of solar cell

- Artificial satellites
- Traffic light
- Calculator
- Radio and wireless transmission
- TV relay stations

Limitations

- Highly expensive
- Low efficiency

28. What are the limitations of can be shown in single main energy form

A. Wind B. Waves C. Tides

Wind. The windmills require a wind speed more than 15 km/h to generate electricity.

Waves. Wave energy would be commercially viable only at place where waves are strong. The energy produced from waves as to transmitted through long distance

Tides. The Rise and fall of water during Tides is not very large-scale generation of electricity is not possible

29. On what basis would you classify energy source as

a. Renewable and nonrenewable

b. Exhaustible and inexhaustible

Are the option in a and b the same?

a) **Renewable and non-renewable**:

Renewable energy sources are those which replenish on their own and are easily available in nature. Like solar energy, tidal energy, wind energy, bio-mass.

Non-renewable energy sources are those which do not replenish on their own and have limited availability in nature. Like fossil fuels which includes petroleum, coal and natural gas.

b) **Exhaustible and inexhaustible**:

Exhaustible source of energy are those which deplete after few hundred years. Like coal and petroleum.

Inexhaustible source of energy are those which do not deplete and are available in abundant quantity. Like solar and wind energy.

30. What are the advantages and disadvantages of using solar cooker? Are there places where solar cookers would have limited utility?

Advantages of solar cooker

- Solar cooker does not cause pollution

- Solar cooker save fuel like wood LPG

Disadvantages of solar cooker

- It doesn't work on a cloudy day and at night
- Large amount of food cannot be cooked using solar cooker
- Solar cooker will be limited utility where Sun shines for a shorter period of time.

31. What are the environmental consequences of the increasing demand for energy. What steps would you suggest to reduce energy consumption?

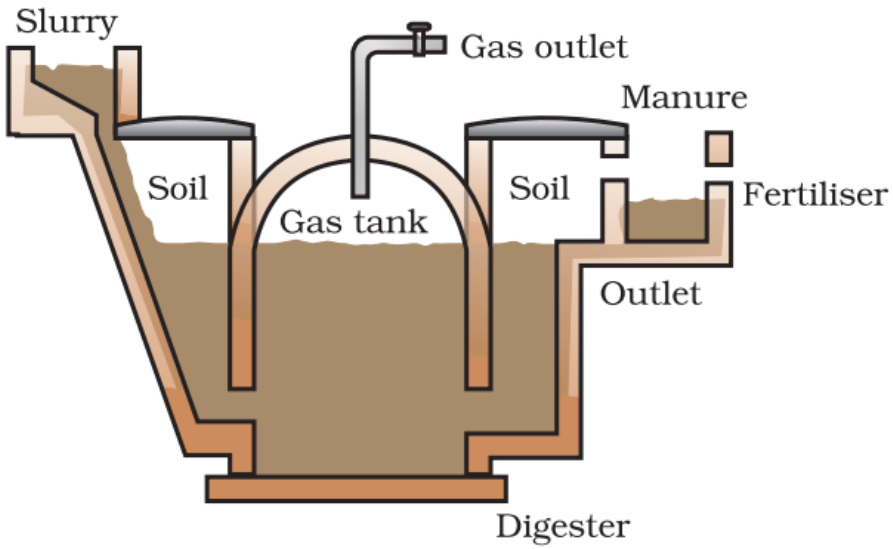
Industrialization demands for more energy and to fulfil these demands fossil fuels are used as they are readily available. Due to their harsh usage, it has an impact on the environment. Too much exploitation of fossil fuels has led to greenhouse effect resulting in global warming.

Steps to reduce energy consumption

- Reducing the usage of fossil fuels and opting for alternate sources of energy.
- Reduce the unnecessary usage of electricity and water.
- Opt for public transportation and lessen using own vehicles.

These are a few small steps that can be implemented to reduce energy consumption.

32.Draw a diagram of a biogas plant and label the parts?



CHAPTER 15 : OUR ENVIRONMENT

ONE MARK QUESTION:

1. How many oxygens form ozone?

   Ozone is formed by three oxygens.

2. Expand UNEP.

   United Nation Environment Program.

3. In which year UNEP established?

   1987

4. Expand CFC.

   Chlorofluorocarbon.

5. What is the main reason for the depletion of ozone?

   CFCs used in industries and household devices are the main cause for the depletion of ozone.

6. Which disease is caused by the depletion of ozone in human beings?

   Skin Cancer.

7. List any two non-biodegradable objects.

   Plastic and glasses.

8. Give example for biodegradable things.

   Organic matter, green leafy vegetables etc.,

9. Why the Government has ordered the factories to manufacture the refrigerators free from CFC's?

   To avoid the damage caused to ozone by the CFC's, the government has issued an order to manufacture refrigerators free of CFC's.

TWO MARKS QUESTIONS:

1.What are the steps taken to limit the ozone layer depletion?

- The Government has made it mandatory for the manufacturing countries to produce refrigerators free of CFC's.
- CO emission is tested by the authorities to avoid air pollution which in turn leads to ozone depletion.

2. How is the ozone formed?

   UV radiation split apart some molecular oxygen (O_2) into free oxygen (O) atoms. These atoms then combine with the molecular oxygen to form ozone.

$$O_2 \rightarrow O + O$$

$$O + O_2 \rightarrow O_3$$

3. The government has banned the use of plastic. Why?

Plastics are non-biodegradable and they are not broken by the action of bacteria. Plastic remains in the environment for a long time thus polluting the environment and making it danger for animals and human beings.

4. What are saprophytes?

The organisms which derive food from dead and decaying organic matter are called saprophytes.

5. What are bio-degradable and non-biodegradable materials?

The materials which are broken by the bacteria are called bio-degradable and the things which are not broken by the bacteria are called non-biodegradable.

6. The presence of DDT is detected in mother's breast milk. Why?

Chemical fertilizers used to grow plants are non-biodegradable. DDT is a pesticide and it is non-biodegradable. It enters our body through the consumption of food. Hence DDT is detected in the breast milk of mother.

7. How can we help in the disposal of the waste products?

We can separate biodegradable and non-biodegradable materials while disposing garbage. Thus, helping in keeping our environment clean and pollution free.

CHAPTER-16. SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

1. In which year the Ganga Action Plan was established?

   1985

2. Which type of bacteria is the cause for the pollution of Ganga river?

   Coliform bacteria.

3. What are the 5R's to save the environment?

   The 5R's are Refuse, Reduce, Reuse, Repurpose, Recycle.

4. Why do we need to use our resources carefully?

   Resources are limited and with tremendous increase in population makes the resources exhaust.

5. Give example for renewable resources.

   Sun, water.

6. Give example for nonrenewable resources.

   Coal, petroleum, natural gas etc.,

7. List the problems arising while constructing dams.

   Social problems, Economical problems and environmental problems.

8. List two causes for the pollution of river Ganga.

   i) Releasing industrial wastes to the river by the factories located on the bank of river Ganga.

   ii) Throwing of dead bodies, garbage by pilgrims and residents.

9. Name some traditional water harvesting system in India.

   Khadins, Tanks and Nadis in Rajasthan,

   Bandharas and Tals in Maharashtra,

   Bundhis in Madhya Pradesh and Uttar Pradesh,

   Ahars and pines in Bihar,

   Kulhs in Himachal Pradesh,

   Ponds in the Kandi belt of Jammu region, and

   Eris (tanks) in Tamil Nadu

Two marks questions:

1.List the advantages of building dams.

- Large dams can ensure the storage of adequate water for irrigation purposes.
- Large water storage in dams is utilized for generating electricity.

2. List the advantages of conservation of water.

- Increase in the biomass production
- To develop primary resources of land and water.
- To improve the underground water level and irrigation.

3. How can we save our environment by 2R's in schools?

Reduce: We can save resources such as electricity by switching off the fans and lights when not in use. We can save water by limited use and repairing leaky taps.

Re use: We can recycle the papers and water bottles used by students. Also we can use old students child profile for the next classes.

4. What are the main advantages of water harvesting system?

Water harvesting has many advantages like:

- It increases water at primary sources and also underground water level.
- It reduces water scarcity.

5. What are coliform bacteria?

Coli form bacteria are the bacteria present in the small intestine of human beings. The presence of coli form in water indicates the pollution water by microorganisms.

6. What is Chipko Movement?

The movement started in the village Garhwal, at the roots of Himalayas where all the women hugged the trees to save them from the tree cutters. This movement is called Chipko Movement.