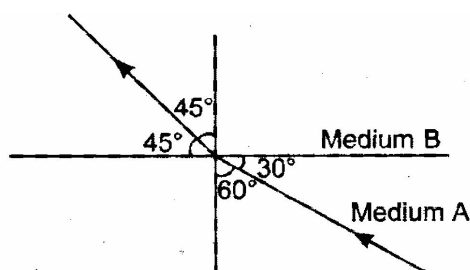



**Ls.No.10 - Light : Reflection and Refraction**

- 1) If a man's face is 25 cm in front of concave shaving mirror producing erect image 1.5 times the size of face, focal length of the mirror would be  
 a) 75 cm                      b) 25 cm                      c) 15 cm                      d) 60 cm                      (1)
- 2) Figure show a ray of light as it travels from medium A to medium B. Refractive index of the medium B relative to medium A is                      (1)



- a)  $\frac{\sqrt{3}}{\sqrt{2}}$                       b)  $\frac{\sqrt{2}}{\sqrt{3}}$                       c)  $\frac{1}{\sqrt{2}}$                       d)  $\sqrt{2}$
- 3) **Assertion** : Cannot see the distant object clearly.                      (1)  
**Reason** : The far point of an eye suffering from myopia is less than infinity.
- 4) a) A real image,  $\frac{1}{5}$  the size of object is formed at a distance of 18 cm from a mirror. What is the nature of mirror? Calculate its focal length.                      (3)  
 b) Name the kind of lens that can form  
 i) Real, inverted and diminished image                      ii) Real, inverted and enlarge image
- 5) The image of an object formed by a mirror is real, inverted and is of magnification -1. If the image is at a distance of 40 cm from the mirror, where is the object placed? Where would the image be if the object is moved 20 cm towards the mirror? State reason and also draw ray diagram for the new position of the object to justify your answer.                      (3)
- 6) For the given data showing the focal lengths of three concave mirrors A, B and C, and the respective distances of different objects from these mirrors.                      (3)

S. No	Object distance (cm)	Focal length (cm)
A	45	20
B	30	15
C	20	30

Answer the following questions :

- i) In the given position of object from the mirrors, which mirror will form a diminished image of the object. Draw a ray diagram for image formation by this mirror.  
 ii) Which mirror can be conveniently used as a make-up mirror? Draw a ray diagram to illustrate this function.
- 7) a) For the following two cases, state whether the obliquely incident ray light on interface of medium 1 and medium 2 will bend towards or away from the normal after refraction, in medium 2.  
 b) Prove that refraction will not take place at the boundary that separates two media of equal refractive indices. Draw ray diagram to justify this statement.

- c) In an experiment with a rectangular glass slab, a student observed that a ray of light incident at an angle of  $55^\circ$  with the normal on one face of the slab, after refraction strikes the opposite face of the slab before emerging out into air making an angle of  $40^\circ$  with the normal. Draw a labelled diagram to show the path of this ray. What value would you assign to the angle of refraction and angle of emergence ? (5)
- 8) A student has focussed the image of candle flame on a white screen using a concave mirror. (5)  
The situation is as given below :  
Length of the flame 1.5 cm  
Focal length of the mirror 12 cm  
Distance of flame from the mirror 18 cm  
If the flame is perpendicular to the principal axis of the mirror, then calculate the following :  
a) Distance of the image from the mirror                      b) Length of the image.  
If the distance between the mirror and the flame is reduced to 10 cm, then what would be observed on the screen?  
Draw ray diagram to justify your answer for this situation.

### LS.No.11 - Human Eye & Colourful World

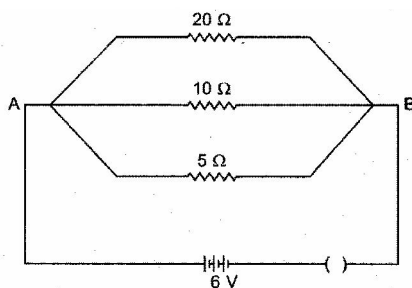
- 1) **Assertion** : The near-point of a hypermetropic eye is more than 25 cm away. (1)  
**Reason** : Hypermetropia is corrected using spectacles containing concave lenses.
- 2) a) The near point of a hypermetropic eye is 50 cm. What is the nature and power of the lens required to enable him to read a book placed at 25 cm from the eye ? (3)  
b) Name the cells on the retina sensitive to  
i) bright light,            ii) dim light ?
- 3) a) What are the values of (i) near point and (ii) far point of vision of a normal adult person ? (3)  
b) A student has difficulty in reading the blackboard while sitting in the last row. What could be his defect of vision ? Draw a ray diagram to illustrate this defect of vision.
- 4) What is myopia ? List two causes for the development of this defect. How can this defect be corrected using a lens ? Draw ray diagrams to show the image formation in case of (i) defective eye and (ii) corrected eye. (5)
- Or**
- A student is unable to see clearly the words written on the blackboard placed at distance of approximately 4m from him. Name the defect of vision the boy is suffering from. Explain the method of correcting this defect. Draw ray diagram for the : i) defect of vision and also            ii) for its correction
- Or**
- What is myopia ? State the two cause of myopia. With the help of a labelled ray diagram show  
(a) eye defect                      (b) correction of myopia.
- 5) What is hypermetropia ? List two causes for the development of this defect. Explain the method of correcting this defect with the help of ray diagrams. (5)
- Or**
- What is hypermetropia ? State two cause. With the help of ray diagram show (a) eye defect (b) correction of hypermetropia.
- Or**
- A person is unable to see distinctly the words printed on a newspaper. Name the defect of vision he is suffering from. Draw ray diagram to illustrate this defect. List its two possible causes. Draw a ray diagram to show this defect may be corrected using lens of appropriate focal length.
- Or**
- An old person finds it difficult to see nearby objects comfortably and distinctly without corrective eye glasses.  
a) What defect of vision is he suffering from ? What is it ?  
b) List two causes for the development of this defect.  
c) What kind of lens will be required to see clearly the nearby as well as distant objects ? Give reasons.
- 6) a) What is dispersion of white light ? State its cause. (5)  
b) "Rainbow is an example of dispersion of sunlight." Justify this statement by explaining, with the help of a labelled diagram, the formation of a rainbow in the sky. List two essential conditions for observing a rainbow.

[3]

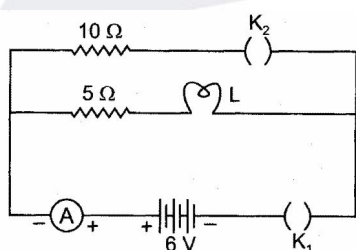
- 7) What is atmospheric refraction ? Use this phenomenon to explain the following natural events. (5)  
 a) Twinkling of stars    b) Advanced sunrise and delayed sunset.  
 Draw diagrams to illustrate your answers.
- 8) a) What is presbyopia ? State its cause. How is it corrected ? (5)  
 b) Why does the sun appear reddish early in the morning ? Explain with the help of a labelled diagram.

### LS.No. 12 - Electricity

- 1) Two wires of same length and area, made of two materials of resistivity  $\rho_1$  and  $\rho_2$  are connected in parallel to a source of potential. The equivalent resistivity for the same length and area is (1)  
 a)  $\rho_1 + \rho_2$                       b)  $\frac{\rho_1 \rho_2}{\rho_1 + \rho_2}$                       c)  $\frac{(\rho_1 + \rho_2)}{\rho_1 \rho_2}$                       d)  $|\rho_1 - \rho_2|$
- 2) Calculate the current flows through the  $10\ \Omega$  resistor in the following circuit. (1)



- a) 1.2 A                      b) 0.6 A                      c) 0.2 A                      d) 2.0 A
- 3) If the current  $I$  through a resistor is increased by 100% (assume that temperature remains unchanged), the increase in power dissipated will be (1)  
 a) 100%                      b) 200%                      c) 300%                      d) 400%
- 4) Study the circuit shown : (3)

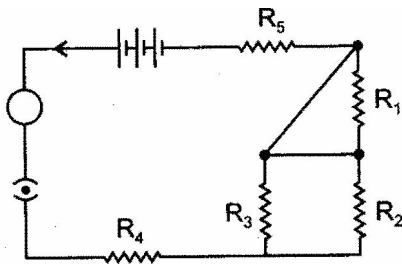


A current of 0.6 A is shown by ammeter in the circuit when the key  $K_1$  is closed. Find the resistance of the lamp  $L$ . What change in current flowing through the  $5\ \Omega$  resistor and potential difference across the lamp will take place, if the key  $K_2$  is also closed. Give reason for your answer.

- 5) Name the physical quantity which is (i) same (ii) different in all the bulbs when three bulbs of : (3)  
 a) same wattage are connected in series.  
 b) same wattage are connected in parallel.  
 c) different wattage are connected in series.  
 d) different wattage are connected in parallel.
- 6) Calculate the total cost of running the following electrical devices in the month of September, if the rate of 1 unit of electricity is ` 6.00. (3)  
 i) Electric heater of 1000 W for 5 hours daily.    ii) Electric refrigerator of 400 W for 10 hours daily.

[4]

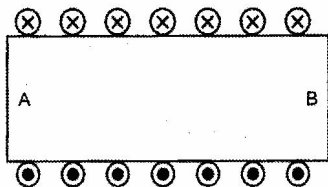
- 7) Two lamps, one rated 100 W at 220 V and other 200 W at 220 V are connected (i) in series and (ii) in parallel to electric main supply of 220 V. Find the current drawn in each case. (3)
- 8) Three bulbs each having power P are connected in series in an electric circuit. In another circuit, another set of three bulbs of same power are connected in parallel to the same source. (5)
- Will the bulbs in both the circuits glow with the same brightness ? Justify your answer.
  - Now let one bulb in each circuit get fused. Will the rest of the bulbs continue to glow in each circuit ? Give reason.
  - Representing each bulb by a resistor, draw circuit diagram for each case.
- 9) Deduce the expression for the equivalent resistance of the parallel combination of three resistors  $R_1$ ,  $R_2$  and  $R_3$ . Consider the following electric circuit : (5)



- Which two resistors are connected in series ?
  - Which two resistors are connected in parallel ?
  - If every resistor of the circuit is of  $2\Omega$ , what current will flow in the circuit ?
- 10) a) Apply Ohm's law to obtain the relation for combined resistance when three resistors  $R_1$ ,  $R_2$  and  $R_3$  are connected in series. (5)
- Write any three differences between the series and parallel combination of resistance.
  - A set of 'n' identical resistors each resistance R are connected in series and the effective resistance is found to be 'X'. When these are connected in parallel, the effective resistance is found to be 'Y'. Find the ratio of X and Y.

### Ls.No. 13 - Magnetic Effect of Electric Current

- 1) Diagram shows the lengthwise section of a current carrying solenoid.  $\otimes$  indicates current entering into the page,  $\odot$  indicates current emerging out of the page, Decide which end of the solenoid A or B, will behave as north pole. Give reason for your answer. Also draw field lines inside the solenoid. (3)



- 2) State the consequences that can lead to a short circuit. (3)
- Or**
- One of the major cause of fire in office building is short circuiting. List three factors which may lead to the short circuit.
- What is overloading ? State the causes of overloading. (3)
  - Draw the pattern of magnetic field lines through and around a current carrying loop of wire. Mark the direction of (5)
    - electric current in the loop
    - magnetic field lines. How would the strength of magnetic field due to current, carrying loop be affected if-
      - radius of the loop is reduced to half its original value ?
      - strength of current through the loop is doubled ?



[5]

- 5) a) Explain why there are two separate circuits one for high power rating appliances and other for low power rating appliances. (5)  
b) A domestic circuit has 5 A fuse. How many bulbs of rating 100 W, 220 V can be safely used in this circuit ? Justify your answer.
- 6) a) State Fleming's left hand rule. (5)  
b) Write the principle of working of an electric motor.  
c) Explain the function of the following parts of an electric motor.  
i) Armature            ii) Brushes            iii) Split ring
- 7) Explain the underlying principle and working of an electric generator by drawing a labelled diagram. What is the function of brushes ? (5)

**Or**

Name a device which converts mechanical energy into electrical energy. Explain the underlying principle and working of this device with the help of a labelled diagram.

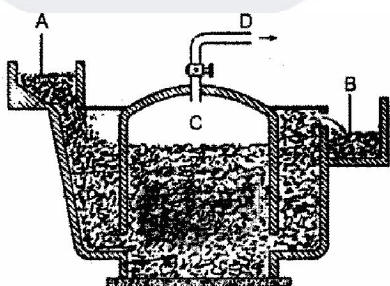
### LS.No. 14 - Sources of Energy

- 1) What is a good source of energy ? (3)

**OR**

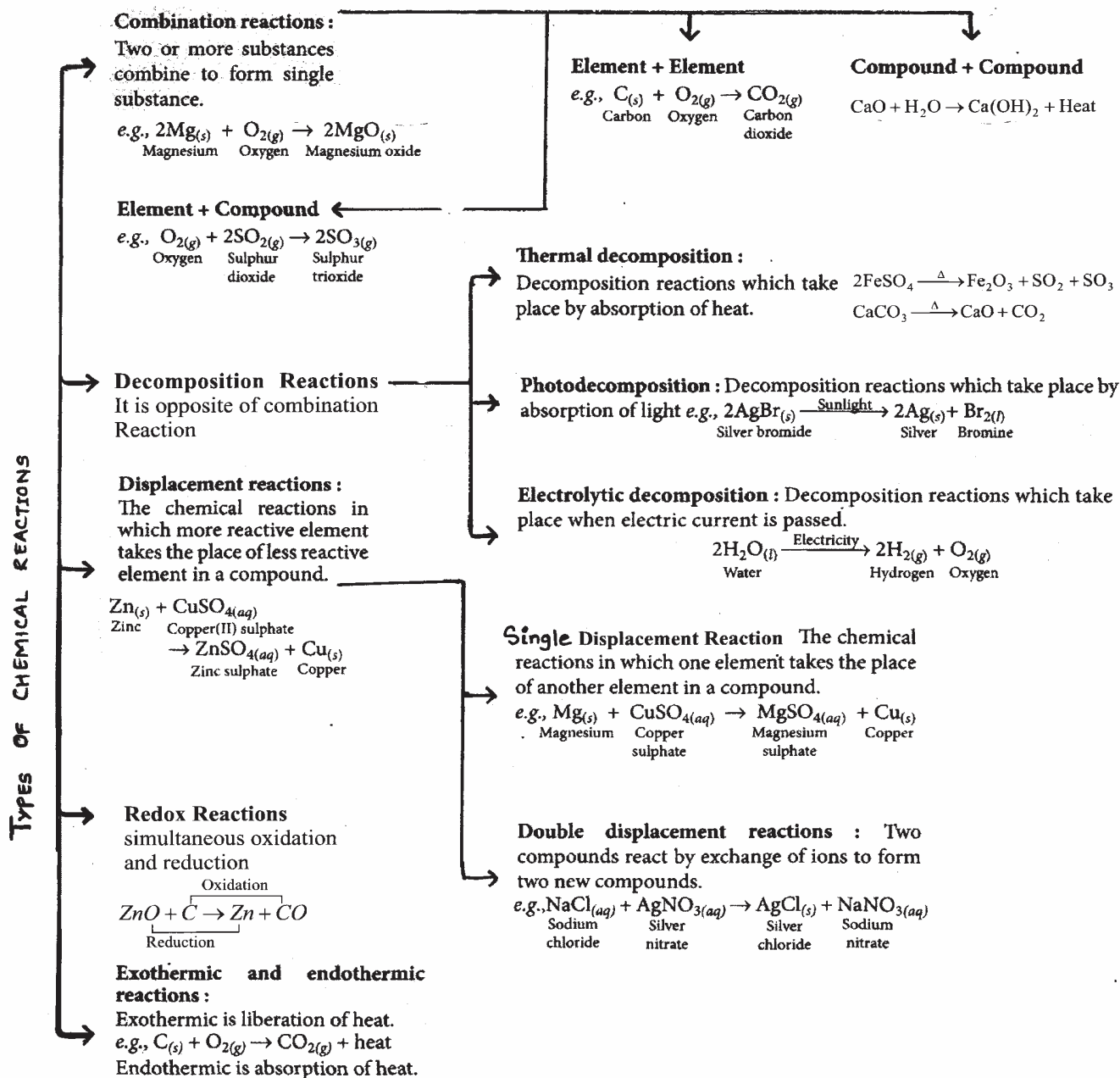
List any three parameters on the basis of which a source of energy can be categorised as a good source of energy.

- 2) a) Name the parts labelled A, B, C and D in the diagram of a biogas plant given below : (3)

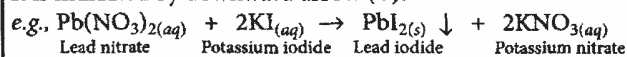


- b) Out of two solar cookers, one was covered with a plane glass slab and the other was left open. Which of the two solar cookers will be more efficient and why ?
- 3) List three advantages of producing hydroelectricity by building dams on rivers. (3)
- 4) List three factors responsible for the wind. State three advantages in harnessing wind energy. (3)
- 5) State the principle of working of ocean thermal energy conversion plant. Explain how the plant works ? Write one essential conditions for it to operate properly. (3)
- 6) What are the merits and limitations of the energy that can be obtained from the deep inside the earth ? (3)

~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~


**LS no 1 : Chemical Reactions and Equation**


**Precipitation reactions :** The reactions in which one of the products formed is an insoluble substance and is separated out of the solution as solid (precipitate) is called precipitation reaction. It is indicated by downward arrow ( $\downarrow$ ).



Double displacement reactions in which one of the products formed is a precipitate, are also called precipitation reactions.

**3 Mark Questions**

1. Write the chemical equation of the reaction in which the following changes have taken place with an example of each:
- a) Change in colour                      b) change in temperature                      c) formation of precipitate

**OR**

Write any three observations in an activity which may suggest that a chemical reaction has taken place. Give an example in support of your answer.

2. 2g of ferrous sulphate crystals are heated in a dry boiling tube.
- a) List any two observations (or state the colour of ferrous sulphate crystals before and after heating)
- b) Name the type of chemical reaction taking place
- c) Write the chemical equation for the reaction.
3. When a copper wire was left in  $\text{AgNO}_3$  solution for some time, it was observed that the solution turned bluish green.
- a) Explain the observation.
- b) Write the balanced chemical equation to represent the change taking place.

**OR**

In refining of silver, the recovery of silver from silver Nitrate solution involved displacement by Cu metal. Write down the reaction involved in it.

4. A solution of substance 'X' is used for white washing. What is the substance 'X'? State the chemical reaction of 'X' with water.

**OR**

A small amount of CaO is taken in a beaker and water is added slowly to it.

- i) Will there be any change in temperature of contents? Explain. (ii) Name and define the type of reaction taking place (iii) Write chemical equation.

**OR**

A housewife wanted her house to be white washed. She bought 10 Kg of quicklime from market and dissolved in 30L of water. On adding lime to water, she noticed that the water started boiling even when it was not being heated. Draw your own conclusion from the given information and also give the chemical reaction involved.

5. (i) A solution of substance 'X' is used for testing  $\text{CO}_2$ . Write the equation of the reaction of 'X' with  $\text{CO}_2$ .  
(ii) How is 'X' obtained? Write chemical equation.
6. A brown substance 'X' on heating in air forms a substance 'Y'. When hydrogen gas is passed over heated 'Y', it again changes back into X.
- i) Name the chemicals 'X' and 'Y'. (x- Cu; Y- CuO)
- ii) Name the chemical process occurring during both the changes.
- iii) Write the chemical equations involved in both the changes.

**OR**

A reddish brown coloured metal, used in electrical wires, when poured and heated strongly in an open china dish, its colour turns black. When hydrogen gas is passed over this black substance, it regains its original colour. Based on the above information, answer the following questions:

[8]

- a) Name the metal and black coloured substance formed.
- b) Write balanced chemical equations for both the reactions.
7. When you have mixed the solutions of lead (II) nitrate and potassium iodide.
- a) What was the colour of precipitate formed and can you name the precipitate?
- b) Write the balanced chemical equation for this reaction.
- c) Is this also a double displacement reaction?

## Ls no. 2 : Acids, Bases and Salts

### 3 Mark Questions

1. 2ml of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in a test tube. When the contents are warmed, a gas evolves which is bubbled through a soap solution before testing. Write the equation of the chemical reaction involved and test to detect the gas. Name the gas which will be evolved when the same metal reacts with dilute solution of a strong acid. ( $Zn + 2 NaOH \rightarrow Na_2ZnO_2 + H_2$ ); pop sound i.e. hydrogen gas;  $Zn + HCl \rightarrow ZnCl_2 + H_2$ )
2. In one of the industrial processes used for manufacture of NaOH, a gas X is evolved as by-product. The gas X reacts with lime water to give a compound Y which is used as a bleaching agent in chemical industry. Identify X and Y giving the chemical equation of the reaction involved. (X-chlorine gas; Y-  $CaOCl_2$ ) (OR) What happens when Chlorine gas is passed over slaked lime at 313K? write chemical equation of the reaction involved and state two uses of the product obtained. (OR) A gas X reacts with lime water and forms a compound Y which is used as a bleaching agent in chemical industry. Identify X and Y. Give the chemical equation of the reactions involved.
3. A compound which is prepared from gypsum has the property of hardening when mixed with proper quantity of water. (A) Identify the compound (B) Write the chemical equation involved (C) Mention one use of it. (OR) A white coloured powder is used by doctors for supporting fractured bones. (A) Write chemical name and formula of the powder. (B) When this white powder is mixed with water a hard solid mass is obtained. Write balanced chemical equation for the change. (OR) A sulphate salt of group 2 element of Periodic Table is white, soft substance, which can be molded into different shapes by making it dough. When this compound is left in open for some time, it becomes a solid mass and cannot be used for moulding purposes. Identify the sulphate salt. Why does it show such a behavior? Give the reaction involved. (OR) White chemical compound becomes hard on mixing proper quantity of water. It is also used to maintain broken founts in fixed position. Name the chemical compound and write its chemical formula. Write the chemical equation to show what happens when water is added to this compound in proper quantity?
4. On passing excess carbon dioxide gas through lime water, it first turns milky and then becomes colourless. Explain why? Write all the chemical equations of the reactions involved.
5. What is water of crystallization? Name and give formula of two salts which contain water of crystallization. (OR) Crystals of a substance changed their colour on heating closed test tube but regained it after some time when they were allowed to cool down. Name the substance and write its formula and explain the phenomenon involved.
6. Identify the acid and the base whose combination forms the common salt that you use in your food. Write its formula and chemical name of this salt. Name the source from where it is obtained

**5 Mark Questions**

7. A) State the chemical properties on which the following uses of baking soda are based (i) As an antacid (ii) To make bread and cake spongy and soft (iii) As soda-acid fire extinguisher.  
B) How is washing soda obtained from baking soda? Write balanced chemical equation.
8. A) Write the chemical equation involved in preparation of sodium hydroxide. Name the process.  
B) Why does bleaching powder smell strongly of chlorine and does not dissolve completely in water? **(OR)**  
A dry pellet of common base B, when kept in open absorbs moisture and turns sticky. The compound is also a product of chlor-alkali process. Identify B. What type of reaction occurs when B is treated with an acidic oxide? Write a balanced chemical equation for one such solution. (B-NaOH;  $2\text{NaOH} + \text{CO}_2 \rightarrow \text{Na}_2\text{CO}_3 + \text{H}_2\text{O}$ )  
**(OR)** What happens when electricity is passed through brine? Write the chemical equation for it.
9. A metal carbonate X on reacting with an acid gives a gas which when passed through a solution Y gives the carbonate back. On the other hand, a gas G that is obtained at anode during electrolysis of brine is passed on dry Y; it gives a compound Z, used for disinfecting drinking water. Identify X, Y, G and Z.
10. How would you distinguish between baking powder and washing soda by heating? **(OR)** Salt A commonly used in bakery products on heating gets converted into another salt B which itself is used for removal of hardness of water and a gas C is evolved. The gas C when passed through lime water, turns milky. Identify A, B and C. (A- $\text{NaHCO}_3$ , B- $\text{Na}_2\text{CO}_3$ , C- $\text{CO}_2$ )
11. Name a compound whose one formula unit is associated with 10 water molecules. How is it prepared? Give equations of related reactions. Give two uses of the compound.



**LS.No. 3 : Metals and Non-metals**

We are made up of 96% non-metals (mainly oxygen, carbon, nitrogen, hydrogen but we also contain Ca, K, Na, Mg, Ca, Zn, Fe and more ...)

**Physical Properties of Metals**

1. They are strong, hard to cut except Na, K.
2. They are malleable, beaten into sheets
3. They are ductile, can be drawn into wires.
4. They are sonorous, produce sound when strike them.
5. They are lustrous (shiny).
6. They are good conductors of heat and electricity.
7. They have high melting and boiling point except Na, K.
8. They are all solids except mercury.
9. They have high density except Na, K, Li, etc.

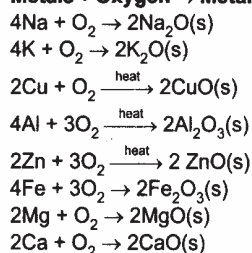
**Exceptional properties**

- Iron is malleable and strong. It easily rusts in moist air. It is magnetic, melts at 1530 °C.
- Sodium is so soft, can be cut by knife. It floats on water, catches fire in presence of water, melts at 98 °C.
- Gold is unreactive highly malleable and ductile and looks attractive. It is used in jewellery, melts at 1064 °C.

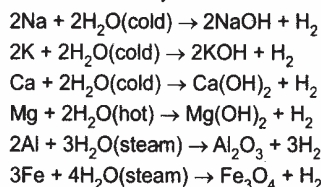
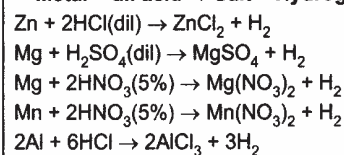
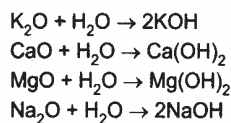
**Chemical Properties of Metals**

1. They react with oxygen to form oxides.
2. Metallic oxides are mostly basic.
3. Metals can lose electrons to form positive ions.
4. Transition metals show variable valency, e.g.  $\text{Cu}^+$ ,  $\text{Cu}^{2+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Fe}^{3+}$
5. Some metals react with cold water, some with hot, some with steam to form oxides or hydroxide and hydrogen gas.
6. Metals react with dil acids to form salt and hydrogen gas except with dil  $\text{HNO}_3$  which is oxidising agent.
7. Metals are good reducing agents.
8. More reactive metals can displace less reactive metals from its salt solution.

**Exceptions:** Mg and Mn react with 5%  $\text{HNO}_3$  to produce  $\text{H}_2$  gas.  
 $\text{Al}_2\text{O}_3$ ,  $\text{BeO}$ ,  $\text{ZnO}$  are amphoteric (acidic as well as basic) oxides.  
 $\text{NO}$ ,  $\text{N}_2\text{O}$ ,  $\text{CO}$  are neutral oxides.

**Metals + Oxygen → Metal oxide****Metal + Water → Metal Oxide + Hydrogen**

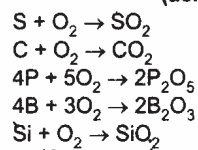
or hydroxide

**Metal + dil acid → Salt + Hydrogen****Metal oxide + Water → Metal hydroxide****Physical Properties of Non-metals**

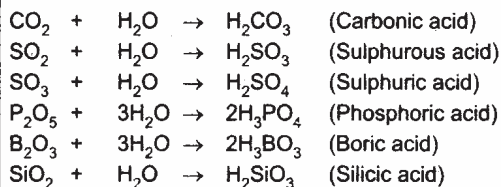
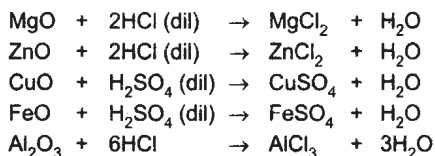
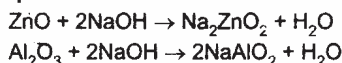
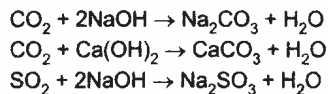
1. They are brittle.
2. They exist as solid, liquid and gas.
3. They are non-lustrous except diamond and iodine.
4. They are not conductors of heat and electricity except graphite.
5. Low melting and boiling point except diamond and graphite.
6. Low density.

**Chemical Properties of Non-metals**

1. They form acidic oxides.
2. They gain electrons to form negative ions.
3. They are good oxidising agents.
4. Their oxides dissolve in water forming acids.
5. They do not react with dilute acids because they cannot lose electrons.
6. More reactive non-metals can displace less reactive non-metals from their salt solution.

**Non-metals + Oxygen → Non-metal oxide (acidic oxide)**

NO, CO, N<sub>2</sub>O are neutral oxides

**Non-metallic oxide + Water → Acids****Metallic oxide + Acids → Salt + Water****Amphoteric oxide + Base → Salt + Water****Acidic oxide + Base → Salt + Water**

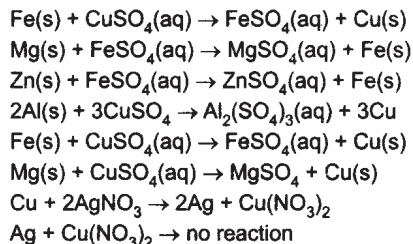
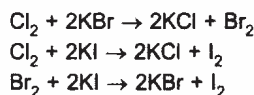
Noble metals like gold and platinum are soluble in aqua regia (royal water) (3HCl conc. + 1 HNO<sub>3</sub> conc.)

**Activity series of Metals**

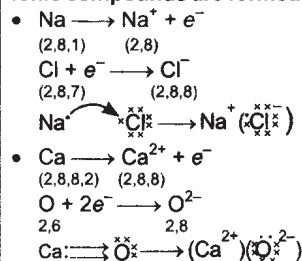
1. More reactive metals can lose electrons most easily.
2. More reactive metals form stable compound.
3. More reactive metals are difficult to extract from its ore and exist as compounds.
4. Least reactive metals are found in nature in free state, e.g. copper, silver, gold.

**Relative Reactivities of Metals**

K	Potassium	→	Most reactive
Na	Sodium		
Ca	Calcium		
Mg	Magnesium		
Al	Aluminium		Reactivity decreases
Zn	Zinc		
Fe	Iron		
Pb	Lead		
H	Hydrogen		
Cu	Copper		
Hg	Mercury		
Ag	Silver		
Au	Gold	→	Least reactive

**More reactive metal + Salt → Salt + Less reactive metal****More reactive non-metal + Salt → Salt + Less reactive non-metal**

Order of reactivity  $\text{Cl}_2 > \text{Br}_2 > \text{I}_2$

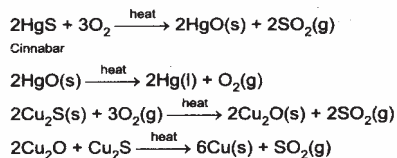
**Ionic compounds are formed by metals and non-metals****Properties of Ionic Compounds**

1. Some metal salts impart characteristic colour to flame. NaCl imparts golden yellow, KCl imparts violet, CaCl<sub>2</sub> bricked, BaCl<sub>2</sub> apple green.
2. Mostly ionic compounds are solids and have high melting points.
3. Most ionic compounds are soluble in water.
4. Ionic compounds do not conduct electricity in solid state but conduct electricity in molten state or in aqueous solution.

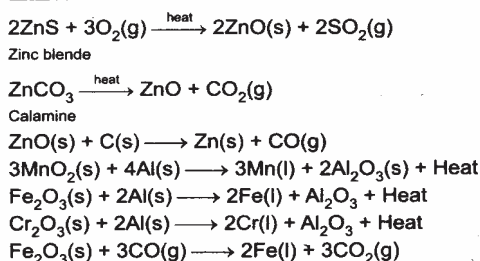
Most of the metals occurs as their compounds except gold, silver, platinum which occur in free state.

Calcination	Roasting
<p>(i) Carbonate, oxides ores.</p> <p>(ii) Heated in limited supply of oxygen</p> $\text{CaCO}_3 \xrightarrow{\Delta} \text{CaO} + \text{CO}_2$ $\text{ZnCO}_3 \xrightarrow{\Delta} \text{ZnO} + \text{CO}_2$ $\text{FeCO}_3 \xrightarrow{\Delta} \text{FeO} + \text{CO}_2$ $\text{CuCO}_3 \xrightarrow{\Delta} \text{CuO} + \text{CO}_2$ $\text{MgCO}_3 \xrightarrow{\Delta} \text{MgO} + \text{CO}_2$	<p>(i) Sulphide ore.</p> <p>(ii) Heated in presence of oxygen.</p> $2\text{ZnS} + 3\text{O}_2 \longrightarrow 2\text{ZnO} + 2\text{SO}_2$ $2\text{Cu}_2\text{S} + 3\text{O}_2 \longrightarrow 2\text{Cu}_2\text{O} + \text{SO}_2$ $2\text{FeS} + 3\text{O}_2 \longrightarrow 2\text{FeO} + 2\text{SO}_2$ $\text{HgS} + \text{O}_2 \longrightarrow \text{Hg} + \text{SO}_2$ $4\text{FeS}_2 + 11\text{O}_2 \longrightarrow 2\text{Fe}_2\text{O}_3 + 8\text{SO}_2$

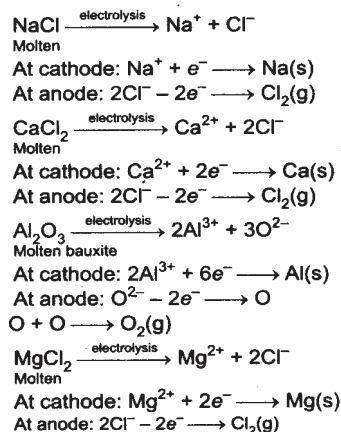
#### Reacting metals low in activity series



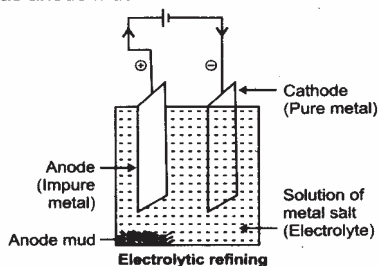
#### Extracting Metals in Middle in Activity series



#### Extracting metals towards top of activity series Electrolytic reduction



**Refining of Metals:** The process of converting impure metal into pure metal is called refining of metals. Many metals such as copper, zinc, tin, nickel, silver, gold are refined by electrolytic refining. Impure metal acts as anode, pure metal as cathode. Soluble salt of metal as electrolyte. When current is passed impure metal changes into metal ions which gain electrons at cathode and change into pure metal. Impurities are left as anode mud.



**Corrosion:** The process in which metals react with substances present in atmosphere to form surface compounds.

Silver turns black due to formation of  $\text{Ag}_2\text{S}$  by exposure to  $\text{H}_2\text{S}$  gas.

Copper turns green due to formation of basic copper carbonate.  $\text{CuCO}_3 \cdot \text{Cu(OH)}_2$

Iron when exposed to moist air for a long time acquires a brown flaky substance is called rust. Rust, chemically is hydrated ferric oxide  $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$

Air and moisture are essential condition for rusting to take place.

[13]

1. I) Name the metal for each case:
  - a) It does not react with cold as well as hot water but reacts with steam.
  - b) It does not react with any physical state of water.ii) What is thermite reaction? Give its equation and state one use of this reaction.
2. In electrolytic refining of copper, a thick block of impure metal is used as anode and thin strip of pure metal is used as cathode. A solution of metal is used as an electrolyte. Draw your conclusion from information given above and describe it stepwise.
3. Explain the following:
  - a) NaCl is an ionic compound which does not conduct electricity in solid state whereas it does conduct electricity in molten in solid state as well as aqueous solution.
  - b) Reactivity of Al decreases if it is dipped in nitric acid.
  - c) Metals like calcium and magnesium are never found in their state in nature.
4. An ore on heating in air produces sulphur dioxide. Which process would you use for its concentration? Describe briefly any two steps involved in conversion of this concentrated ore into related metal.
5. A copper plate was dipped into a solution of silver nitrate. After some time a black layer was observed on the surface of copper plate. State the reason for it and write chemical equation for the reaction involved. When a metal X is treated with cold water, it gives a base Y with molecular formula XOH (Molecular mass=40) and liberates a gas Z which easily catches fire. Identify X, Y and Z.
6. What is meant by 'rusting'? With the labeled diagrams, describe an activity to find out the conditions under which iron rusts.
7. No reaction takes place when granules of a solid 'A' are mixed with a powder of solid 'B'. However when the mixture is heated, a reaction starts with evolution of much heat. Product 'C' of the reaction settles down as a liquid metal and solid product 'D' keeps floating over the liquid 'C'. This reaction is sometimes used for making metals for ready use in odd places. (i) Based on this information, make assumptions about 'A' and 'B' and corresponding deductions about 'C' and 'D' and write a balanced chemical equation for the reaction. Include in the chemical equation about physical states of the reactants and products, (c) need of heating for starting the reaction and the reaction being exothermic. (ii) Name two types of chemical reactions to which this reaction can belong.

Home of innovative education...

Ls. No. 4 : Carbon & Its Compounds

Carbon is a versatile element.

- All living organisms are made up of Carbon (C), Atomic number = 6, Electronic configuration = 2, 4, Valence electrons = 4, valency = 4, Group = 14, Period = 2.
- Carbon can't lose 4 electrons easily, can't gain four electrons easily but can share four electrons to form covalent bonds so as to become stable.

**Covalent Compounds**

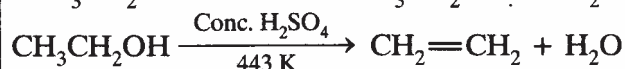
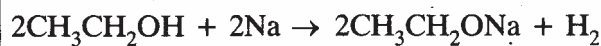
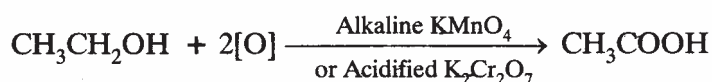
- (i) Solids, liquid or gases.
- (ii) Insoluble in water.
- (iii) Soluble in organic solvents.
- (iv) Do not conduct electricity.
- (v) Low melting and boiling points due to weak intermolecular forces.

**Ionic Compounds**

- (i) Solids
- (ii) Soluble in water.
- (iii) Insoluble in organic solvents.
- (iv) Conduct electricity in aqueous solution or in molten state.
- (v) High melting and boiling points due to strong electrostatic force of attraction.

**Ethanol**

- Melting point 156 K
- Boiling point 351 K
- Soluble in water
- Burning taste

**Oxidation****Combustion****Uses of Ethanol**

1. In preparation of soaps, cosmetics.
2. Alcoholic drinks like wine, whisky, beer.
3. As a laboratory reagent.
4. In medicines, cough syrups and tonics.

Consumption of alcohol causes series health problems and intake of higher amount can be fatal.



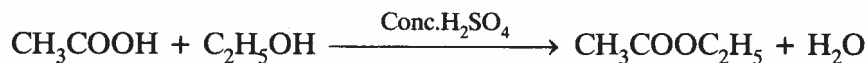
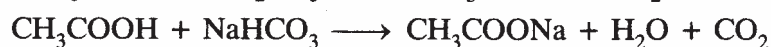
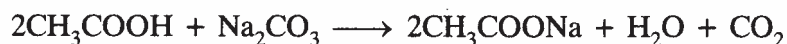
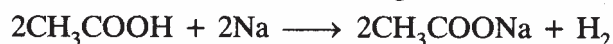
Ethanoic acid

**Physical Properties**

1. Freezes at 290K, boils at 391 K.
2. Pure acetic acid is called glacial acetic acid.
3. Soluble in water.
4. Sour in taste.

**Chemical Properties**

1. Turns blue litmus red
2. pH paper orangish red
3. 5-8% solution in water is vinegar.

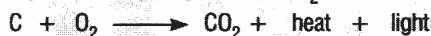


1. What is meant by isomers? Draw the structures of two isomers of butane,  $\text{C}_4\text{H}_{10}$ . Explain. Why we cannot have isomers of first three members of alkane series.
2. a) Give chemical tests to detect the presence of (i) Ethanol (ii) Ethanoic Acid.  
 b) Why Ethanoic acid is called acetic acid? **(OR)** List two tests for experimentally distinguishing between an alcohol and a carboxylic acid and describe how these tests are performed. **(OR)** Name two oxidizing agents that are used for the conversion of alcohols to acids. Distinguish between ethanol and Ethanoic acid. On the basis of a) Litmus test b) Reaction with sodium hydrogen carbonate. **(OR)** You have three unlabelled test tube containing ethanol, Ethanoic acid and soap solution. Explain the method you would use to identify the compounds in different test tubes by chemical tests using litmus paper and sodium metal. **(OR)** List in a tabular form three physical and two chemical properties on the basis of which ethanol and Ethanoic acid can be differentiated. **(OR)** a) In a tabular form, differentiate between ethanol and Ethanoic acid under the following heads: i) physical state ii) Taste iii)  $\text{NaHCO}_3$  iv) Ester test. B) Write a Chemical reaction to show the dehydration of ethanol.
3. Distinguish between esterification and saponification reactions with the help of chemical equation for each. What is the use of (i) Ester and (ii) saponification process?
4. An organic compound 'P' is a constituent of wine. P on reacting with acidified potassium dichromate forms another compound Q. when a piece of sodium is added to Q a gas R evolves which burns with pop sound. Identify P, Q and R and write the chemical equations of the reactions involved.
5. Soaps and detergents are both types of salts. State the difference between the two. Write the mechanism of cleansing action of soaps. Why do soaps not form lather with hard water? Mention any two problems that arise due to use of detergents instead of soaps.
6. What are micelles? Why does it form when soap is added to water? Will a micelle be formed in other solvents such an ethanol also? State briefly how the formation of micelles helps to clean the clothes having oily spots.

## Chemical Properties of Carbon

### Combustion

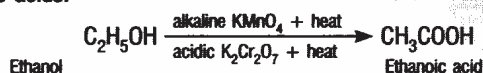
Carbon, in all allotropic forms, burns in presence of oxygen to form carbon dioxide with evolution of heat and light energy. In case of diamond, graphite and fullerene, they burn completely to form  $\text{CO}_2$  because they are purest form of carbon.



Most of the carbon compounds are combustible and burn in presence of oxygen to form  $\text{CO}_2$  and  $\text{H}_2\text{O}$ , e.g.,



Carbon compounds like alcohols are oxidised to carboxylic acids on heating with oxidising agents like alkaline Potassium permanganate  $\text{KMnO}_4$  or oxidised to Carboxylic acids.



### Soaps and Detergents

#### Saponification

It is a process in which an ester reacts with sodium hydroxide to form sodium salt of acid and alcohol is formed.



Saponification is also used for preparation of soap.

#### Soaps

Soaps are sodium or potassium salts of higher fatty acids. Fatty acids are **carboxylic acids** containing 12 or more carbon atoms, e.g., The common fatty acids and their formula are given below :

Table : Some examples of fatty acids

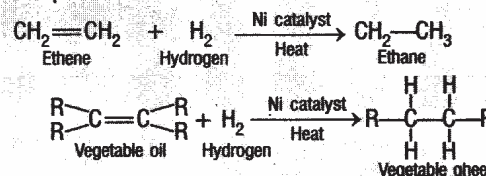
	Name of Fatty acid	Formula	Name of Fatty acid
$\text{C}_{15}\text{H}_{31}\text{COOH}$	Palmitic acid	$\text{C}_{17}\text{H}_{35}\text{COOH}$	Stearic acid
$\text{C}_{17}\text{H}_{33}\text{COOH}$	Oleic acid	$\text{C}_{11}\text{H}_{23}\text{COOH}$	Lauric acid
$\text{C}_{17}\text{H}_{31}\text{COOH}$	Linoleic acid	$\text{C}_{13}\text{H}_{27}\text{COOH}$	Myristic acid

### Oxidation

### Addition

### Substitution

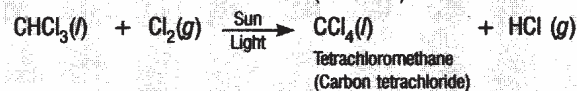
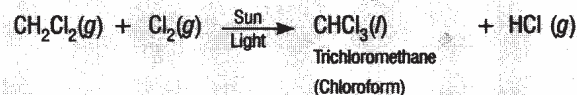
Those reactions in which unsaturated compounds react with a molecule like  $\text{H}_2$ ,  $\text{Cl}_2$ , etc., to form another saturated compounds are called addition reactions.



Those reactions in which an atom or group of atoms of a compound is replaced by other atom or group of atoms are called substitution reaction.

Saturated hydrocarbons are less reactive and do not react with most reagents.

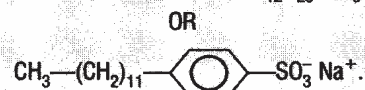
They react with halogens in presence of sunlight and undergo substitution reaction. The reaction is very fast. It is photochemical reaction because it takes place in presence of sunlight.



#### Detergent

Detergents are sodium or potassium salts of sulphonic acids of hydrocarbons of alkene type. They have  $-\text{SO}_3\text{H}$  group, i.e., sulphonic acid group.

Examples.



## Ls. No. 5 : Periodic Classification of Elements

### Modern Periodic Law

Properties of elements are periodic function of atomic number.

### Modern Periodic Table

- There are 18 groups (vertical columns) and 7 periods (horizontal rows).
- Elements in same group have same number of valence electrons and valency.
- Elements in same period have same number of shells.
- Number of shells increases down the group.
- Each period starts with a new shell.
- Number of elements in a period equal to number of electrons in that shell.
- Maximum number of electrons in shell =  $2n^2$  where when  $n = 1$  for K,  $n = 2$  for L,  $n = 3$  for M,  $n = 4$  for N.
- K shell has 2 electrons, 2 elements in first period, L shell has 8 electrons, 8 elements in 2<sup>nd</sup> period. 3<sup>rd</sup> period also has 8 elements, 4<sup>th</sup> period has 18, 5<sup>th</sup> period has 18, 6<sup>th</sup> period has 32, 7<sup>th</sup> period has 32 elements.
- Position of elements in periodic table can predict its valence electrons, valency, size, reactivity.

#### Achievements

1. Isotopes have same position.
2. Increasing order of atomic number is maintained.
3. Elements in same group have similar chemical properties.
4. Elements of different group differ in properties.

#### Limitations

1. Position of hydrogen is not justified.
2. Lanthanoides and Actinoides are placed at the bottom.

### Trends in Modern Periodic Table

	Group	Reason	Period	Reason
<b>1. Valency</b>	Valency remains same in a group.	Valence electron remain the same.	In a period, valency first increases till middle, then decreases.	Valence electrons goes on increasing from left to right. It is easier to lose 1, 2, 3 valence electrons, share 4 electrons, gain 3, 2, 1 electrons.
<b>2. Atomic size</b>	Increases down the group.	Number of shells go on increasing, distance between nucleus and valence shell increases.	Decreases along a period from left to right.	Number of shells remain same, effective nuclear charge increases due to stronger force of attraction.
<b>3. Metallic character</b>	Increases down the group.	Tendency to lose electron increases due to decrease in effective nuclear charge.	Decreases along a period from left to right.	Due to increase in effective nuclear charge, tendency to lose electrons decreases.
<b>4. Non-metallic character</b>	Decreases down the group.	Tendency to gain electron decreases due to decrease in effective nuclear charge as atomic size increases.	Increases along period from left to right.	Tendency to gain electrons increases due to decrease in atomic size and increase in effective nuclear charge.

#### Metalloids (Semi Metals)

- They are at the border of metals and non-metals.
- They resemble with metals as well as non-metals.
- B, Si, Ge, Se, Te are metalloids.

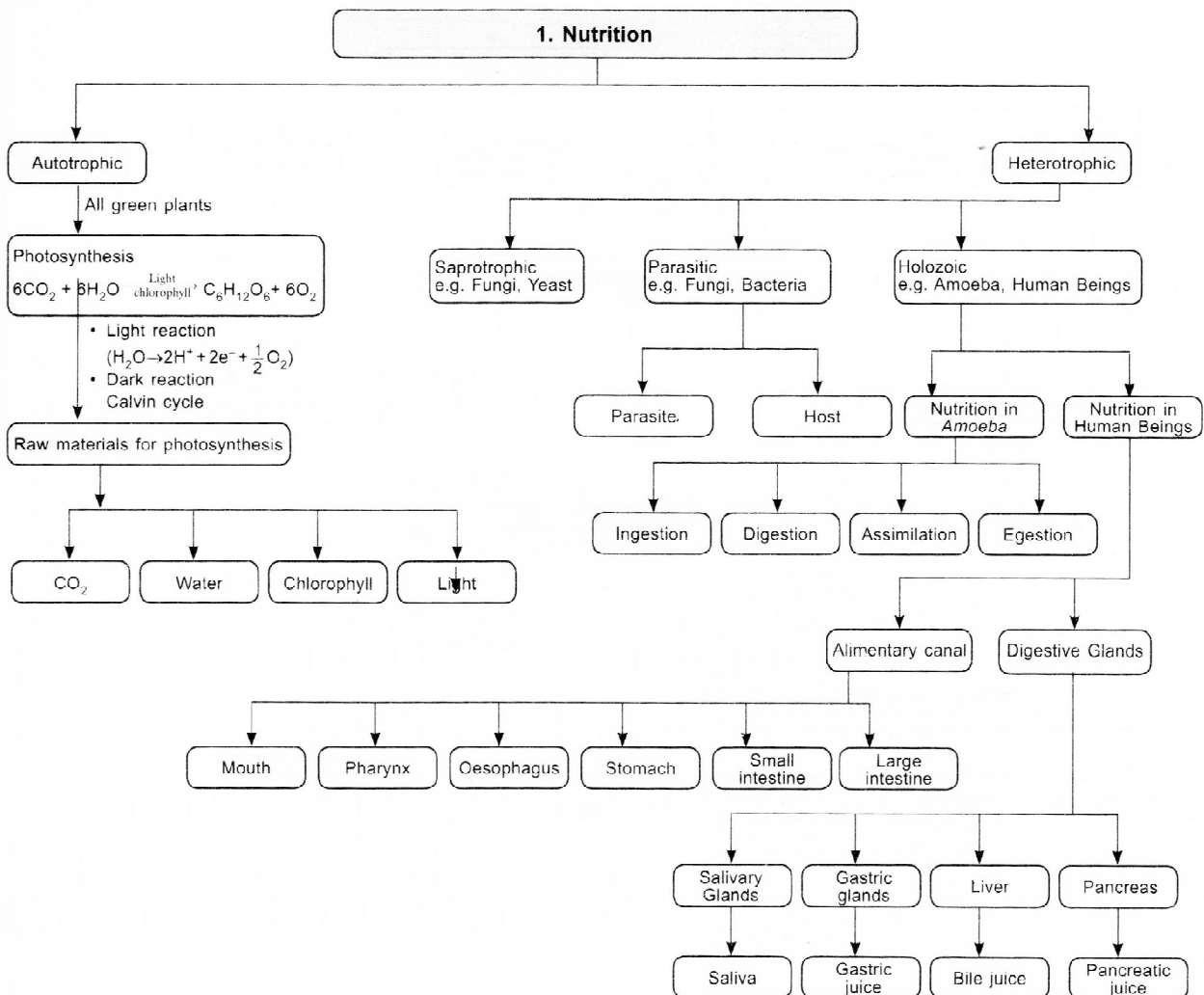
Valence electrons	Group No.	Valence electrons	Group No.
1	1	5	15
2	2	6	16
3	13	7	17
4	14	8	18

- Metals have 1, 2, 3 valence electrons.
- Metals are solids except mercury.
- Metals are electropositive, can lose electrons to form positive ions.
- They form ionic bonds.
- They form basic ( $\text{Na}_2\text{O}$ ,  $\text{MgO}$ ,  $\text{CuO}$ ,  $\text{K}_2\text{O}$ ) and amphoteric (acidic and basic) ( $\text{Al}_2\text{O}_3$ ,  $\text{ZnO}$ ) oxides.
- They are on left side and middle of periodic table.
- Reactivity increases down the group.
- Non-metals are electronegative, can gain electrons to form negative ions.
- Non-metals are solids, liquids as well as gases.
- They form ionic as well as covalent bonds.
- They form acidic oxides like  $\text{NO}_2$ ,  $\text{CO}_2$ ,  $\text{SO}_2$ ,  $\text{SO}_3$  and neutral oxide like  $\text{N}_2\text{O}$ ,  $\text{NO}$ ,  $\text{CO}$ .
- Non-metals are on the left side of periodic table except hydrogen.
- Non-metals have 4, 5, 6, 7, 8 valence electrons except Helium.
- Reactivity and electronegativity decreases down the group.

[18]

1. Two elements P and Q belong to the same period of modern periodic table and are in Group-1 and Group-2 respectively. Compare their following characteristics in tabular form:
  - a) The number of electrons in their atoms
  - b) The sizes of their atoms
  - c) Their metallic characters
  - d) Their tendencies to lose electrons
  - e) The formula of their oxides
  - f) The formula of their chlorides.
2. An element X (atomic number 20) reacts with an element Q (atomic number 17) to form a compound. Write the position of P and Q in the Modern Periodic Table and molecular formula of the compound formed when P reacts with Q.
3. A) Give reasons:
  - i) Elements in a group have similar chemical properties.
  - ii) Elements of Group-1 form ions with charge +1.B) In periodic table, how does the tendency of atoms to lose electrons change on going from
  - i) From left to right across a period
  - ii) Top to bottom in a group?C) How does the size of atoms of elements vary down a group in the periodic table? Why is it so?
4. A) How does the metallic character of elements change along a period of the periodic table from the left to right and why?
  - B) Why is the atomic number of an element more important than its atomic mass?
  - C) Na, Mg, Al, Si, P, Cl and Ar are the elements of third period.
    - i) Which one of them is a noble gas? Why?
    - ii) Which one of them has the valency 4? What kind of bond does it form?
5. How could the Modern Periodic Table remove the anomalies of Mendeleev's Periodic Table?
6. A) Which two criteria did Mendeleev use to classify the elements in his periodic table?
  - B) State Mendeleev's Periodic Law.
  - C) Why is it not possible to give a fixed position to hydrogen in Mendeleev's periodic table?
7. A) State Law of Octaves.
  - B) State any two limitations of Newlands law of Octaves.

\*\*\*\*\*


**Ls. No. 6 : LIFE PROCESSES**
**Nutrition in Plants and Animals**

**(3 Marks Questions :)**

1. Explain the process of nutrition in amoeba. (by extending pseudopodia and forming food vacuole;holozoic)

**OR**

How does paramecium obtain its food? (With the movement of cilia it takes in food through oral groove; holozoic)

2. In human alimentary canal, name the site of complete digestion of various components of food. Explain the process of digestion.
3. A) What is the role of acid in our stomach?



[20]

B) How is small intestine designed to absorb digested food?

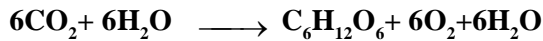
C) Name the first digestive organ that is associated with the breakdown of proteins in humans. What are its three releases?

**(5 Marks Questions) :**

1. A) Name the process and explain the type of nutrition found in green plants. List the raw materials required for this process. Give chemical equation for the mentioned process.

B) Write three events that occur during this process.

**Ans:** A) Photosynthesis, autotrophic nutrition. Raw materials: CO<sub>2</sub>, water and sunlight.



B) Events: a) Absorption of light b) conversion of light to chemical and splitting of water.

c) Reduction of CO<sub>2</sub>.

2. Describe an experiment to show that “sunlight is essential for photosynthesis.”

**Ans :** place healthy potted plant in dark for 1-2 days. Cover and fix 2 black paper strips on leaf and keep in sunlight. Remove the leaf, boil in alcohol and test for starch with iodine. Uncovered portion of leaf gives blue-black colour while covered portion does not as it is not exposed to light.

2. a) State two functions performed by bile juice.

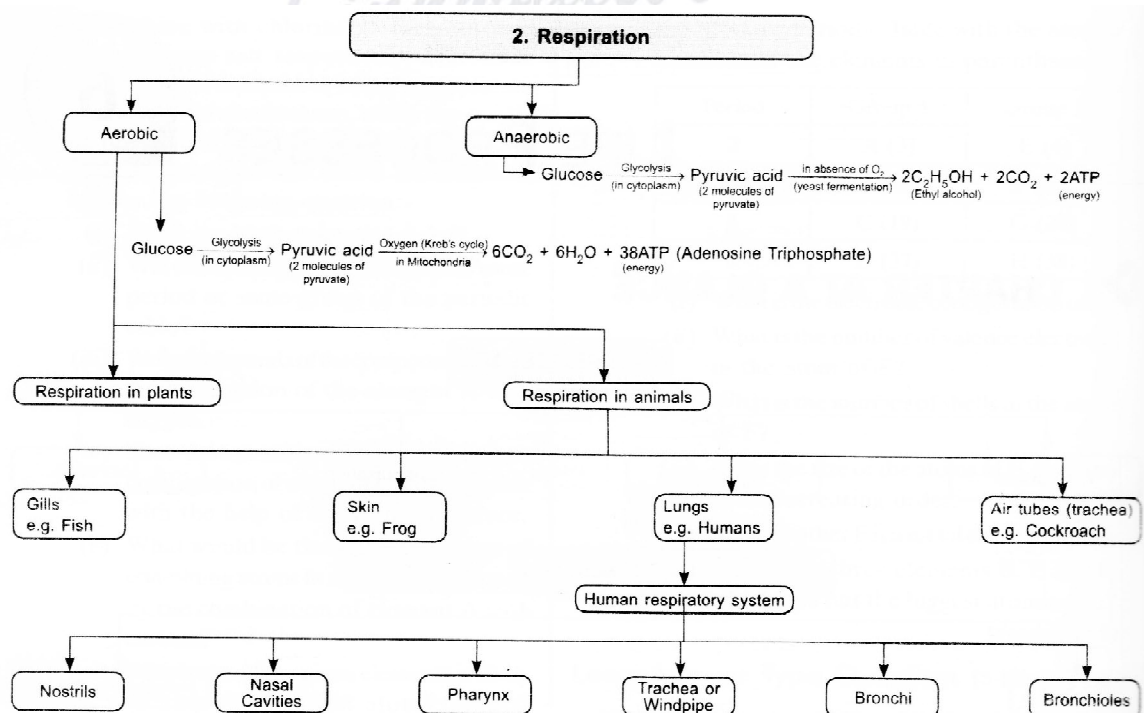
b) Explain the site of complete digestion of various components of food. Name the end products formed on complete digestion of carbohydrates, proteins and fats.

c) What happens to glucose that enters the nephron along with filtrate?

**Ans :** a) neutralizes acidic food from stomach, emulsifies fats.

b) Small intestine; carbohydrate to glucose, proteins to amino acid and fats to fatty acids and glycerol.

c) It gets reabsorbed in blood.



**(3 Marks Questions) :**

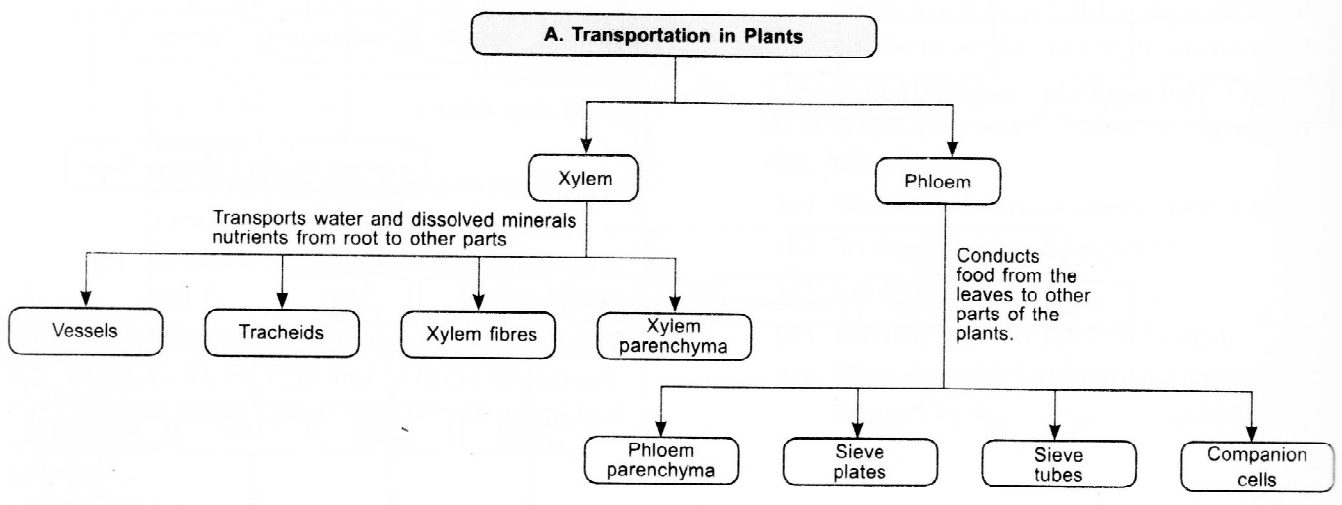
1. What are the differences between aerobic and anaerobic respiration? Name some organisms that use the aerobic mode of respiration.
2. Explain the process of breakdown of glucose in a cell
  - a) In the presence of oxygen
  - b) in absence of oxygen

**(OR)**

With the schematic diagram, explain the overall process of respiration. (Glucose breakdown)

**(5 Marks Questions ) :**

1. A) Write the difference between inhalation and exhalation. **(OR)** Explain the process by which inhalation occurs during breathing in human beings.
- B) Explain the cause of cramps after excessive physical exercise.
- C) 'The breathing cycle is rhythmic whereas exchange of gases is a continuous process'. Justify this statement. (Since lungs always contain residual volume of air so that absorption of oxygen and release of CO<sub>2</sub> becomes continuous)

**(3 Marks Questions) :**

1. What is double circulation? Why it is essential in humans? **(OR)** Describe double circulation in human beings. Why is it necessary ?
2. What are the differences between the transport of materials in xylem and phloem? **(OR)** How is water and food transported in plants ? Write any 3 differences.
3. Name the water and minerals conducting element of non-flowering plants. Mention how conduction takes place in it. ( root pressure, ascent of sap, transpirational pull) **(OR)** How is continuous flow of water maintained in xylem?
4. A) What happens if conducting tubes of circulatory system develops a leak? State in brief, how could this be avoided? ( becomes inefficient for transport and it could be avoided by maintaining normal blood pressure)

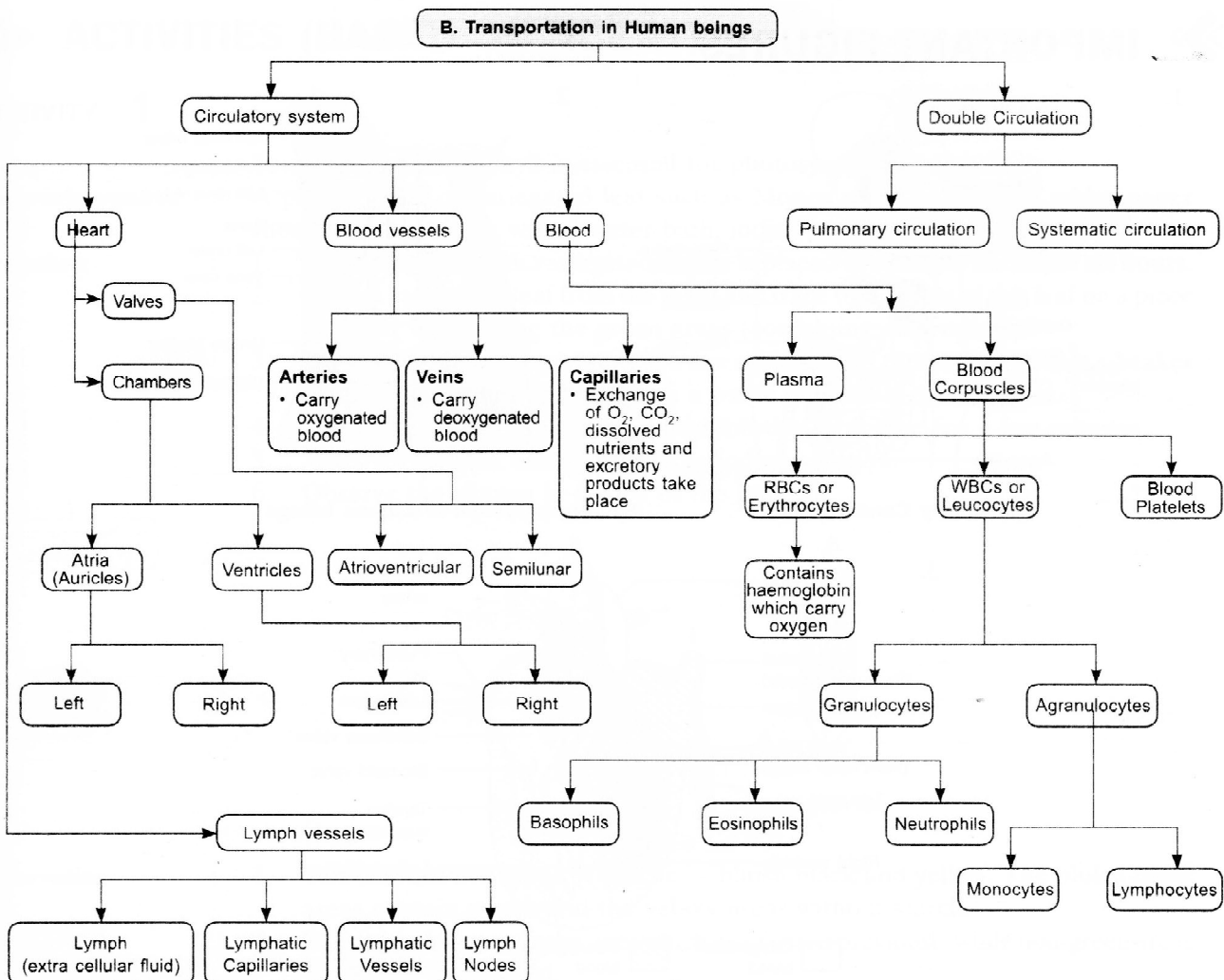
5. What is lymph? What are its functions? **(OR)** Name the colorless fluid which runs parallel with blood vessels. State its two functions. **(OR)** What is lymph? How it is different from blood? State its function.

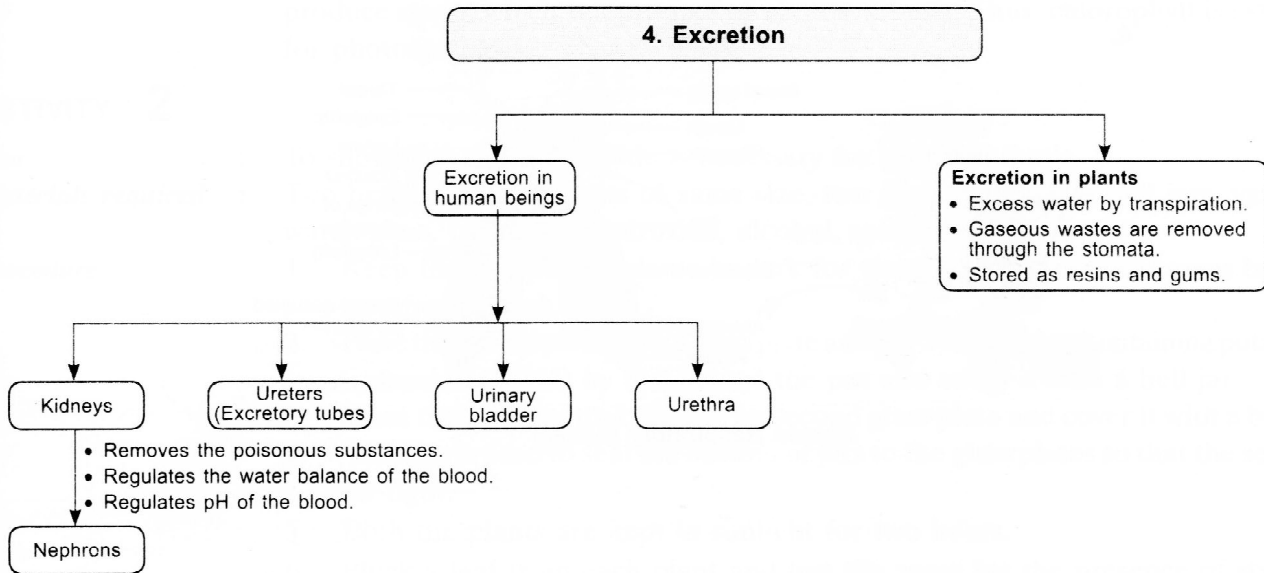
(It is a colorless liquid which does not contain RBC. Helps in transport of digested fats, pour back the extracellular fluid in blood, killing of pathogens)

6. List three kinds of blood vessels of human circulatory system and write their functions in tabular form. **(OR)** Write three types of blood vessels. Give on important feature of each.

**(5 Marks Questions)**

1. A) Draw a schematic representation of transport and exchange of oxygen and carbon dioxide during transportation of blood in human beings and label on it: pulmonary artery to lungs, pulmonary veins from lungs.  
 B) What are the advantage of separate channels in mammals and birds for oxygenated and deoxygenated blood? **(OR)** Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds? **(OR)** what is the advantage of having four chambered heart in mammals and birds?
2. A) ‘Amphibians or many reptiles have three chambered hearts and can tolerate mixing of blood.’ Explain.  
 B) Why are the walls of ventricles thicker than atria?  
 C) State 2 sources from which plants obtain nitrogen for the synthesis of proteins and other compounds.





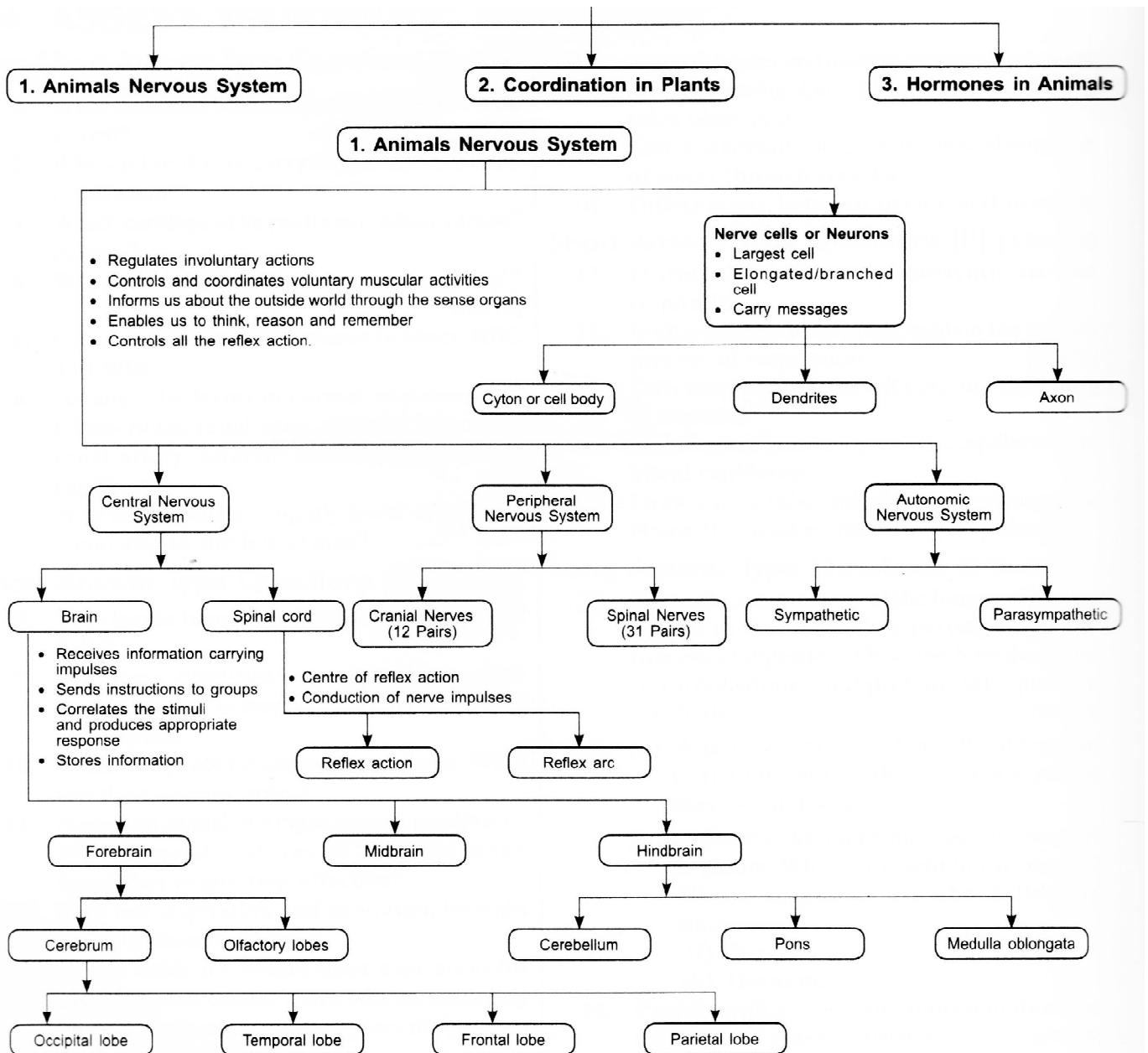
### 3 Marks Questions:

- How is urine produced? **(OR)** How the amount of urine is produced regulated? (By the help of nephron, urea rich blood is filtered in Bowman's capsule with the help of glomerulus i.e. ultra filtration; and then important substance like glucose, amino acids are reabsorbed.)
- How does plant get rid of its excretory products?

### (5 Marks Questions) :

- Define excretion.
  - Name the basic filtration unit present in the kidney.
  - Draw a labeled diagram of excretory system and label the following parts
    - Form urine
    - is a long tube which collects urine from kidney.
    - store urine until it is passed.

## Ls. No. 7 - Control and Co-ordination



### (3 Marks Questions) :

1. A) Which is the control centre of a reflex action? What is the route taken by the reflex action called?  
B) What is Neuromuscular Junction? (A- Spinal cord, reflex arc; B- it is a point where a muscle fibre comes in contact with motor neuron)
2. What is reflex action? Describe the steps involved in a reflex action. **(OR)** What is meant by reflex action? With the help of a labeled diagram trace the sequence of events which occur when we touch a hot object. **(OR)** What is a reflex arc? Draw a neat labeled diagram of the components in a reflex arc. Why do impulses flow only in one direction in a reflex arc? **(OR)** For receiving tennis player, what is the path from stimulus to the response?
3. A) What are cranial nerves? How many cranial nerves does a human being have? ( nerves that arises from brain; 12 pairs are present)  
B) Write the difference between cerebellum and cerebrum?
4. List in tabular form three differences in the movement of leaves of touch-me-not plant when touched and movement of a tendril towards a support. **(OR)** Differentiate between tropic and nastic movement.

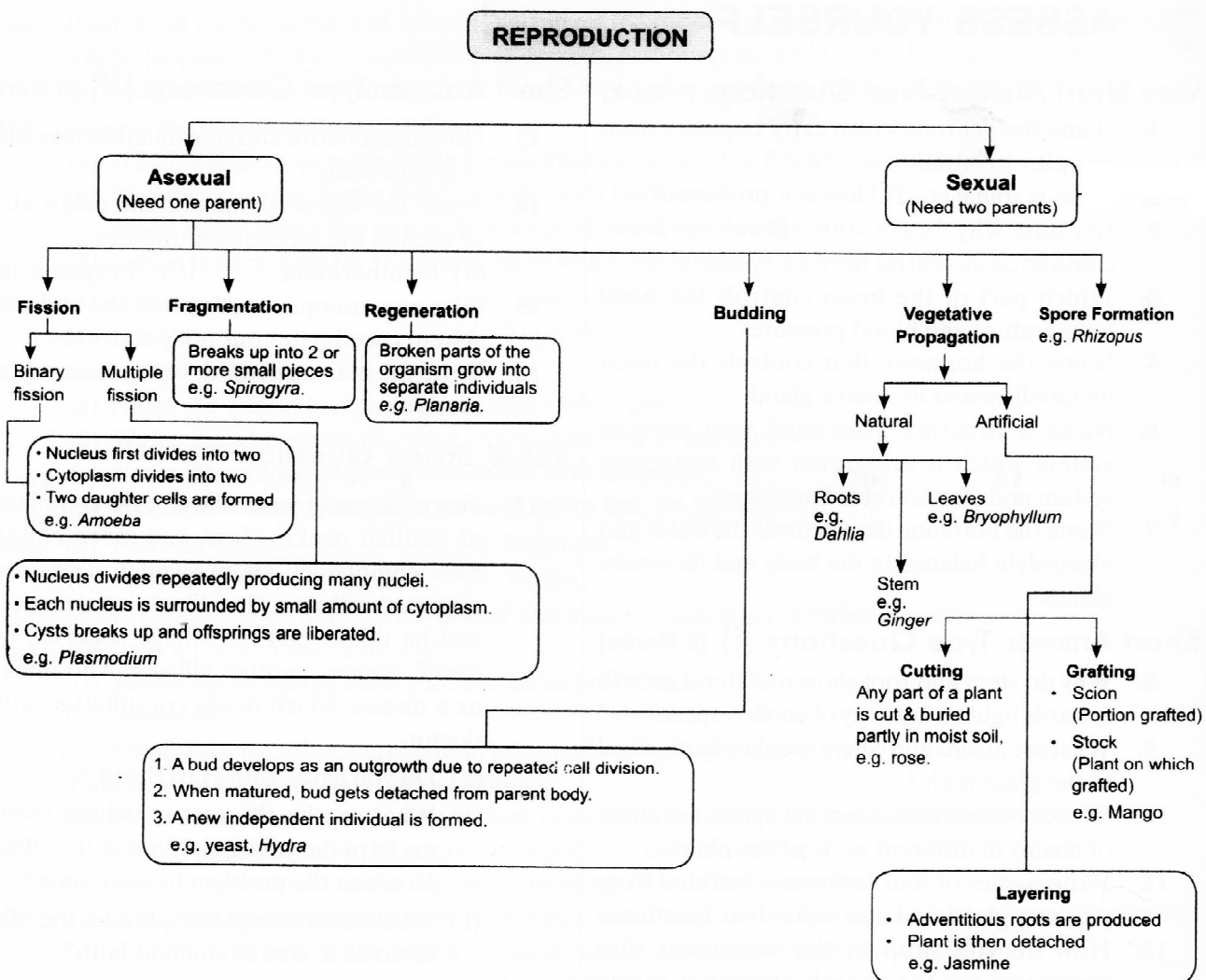


5. Design an experiment to demonstrate hydrotropism.
6. What is phototropism? Describe an activity to show phototropism.
7. What is feedback mechanism? Explain. (OR) Explain feedback mechanism to regulate the action of the hormones with the help of one suitable example.

**(5 Marks Questions ):**

1. What are plant hormones? Give four different types of phytohormones and state their functions briefly. (OR) write the names and function of each of any three plant hormones. In the absence of muscle cells, how do plant cells show movement?
2. A) Draw a neat diagram of the human brain and label the following part: a) mid brain b) pituitary gland c) cerebellum.  
B) How is brain and spinal cord protected?
3. Mention and explain different parts of the human brain. Write any 2 functions of it.
4. A) Which hormone is known as emergency hormone in our body? How it helps in coping during emergency.  
B) Name a hormone secreted by a) pituitary b) thyroid. State one function of each. What happens when each one is secreted in low amount?

**Ls. No. 8 : How do organisms reproduce ?**



**(3 Marks Questions) :**

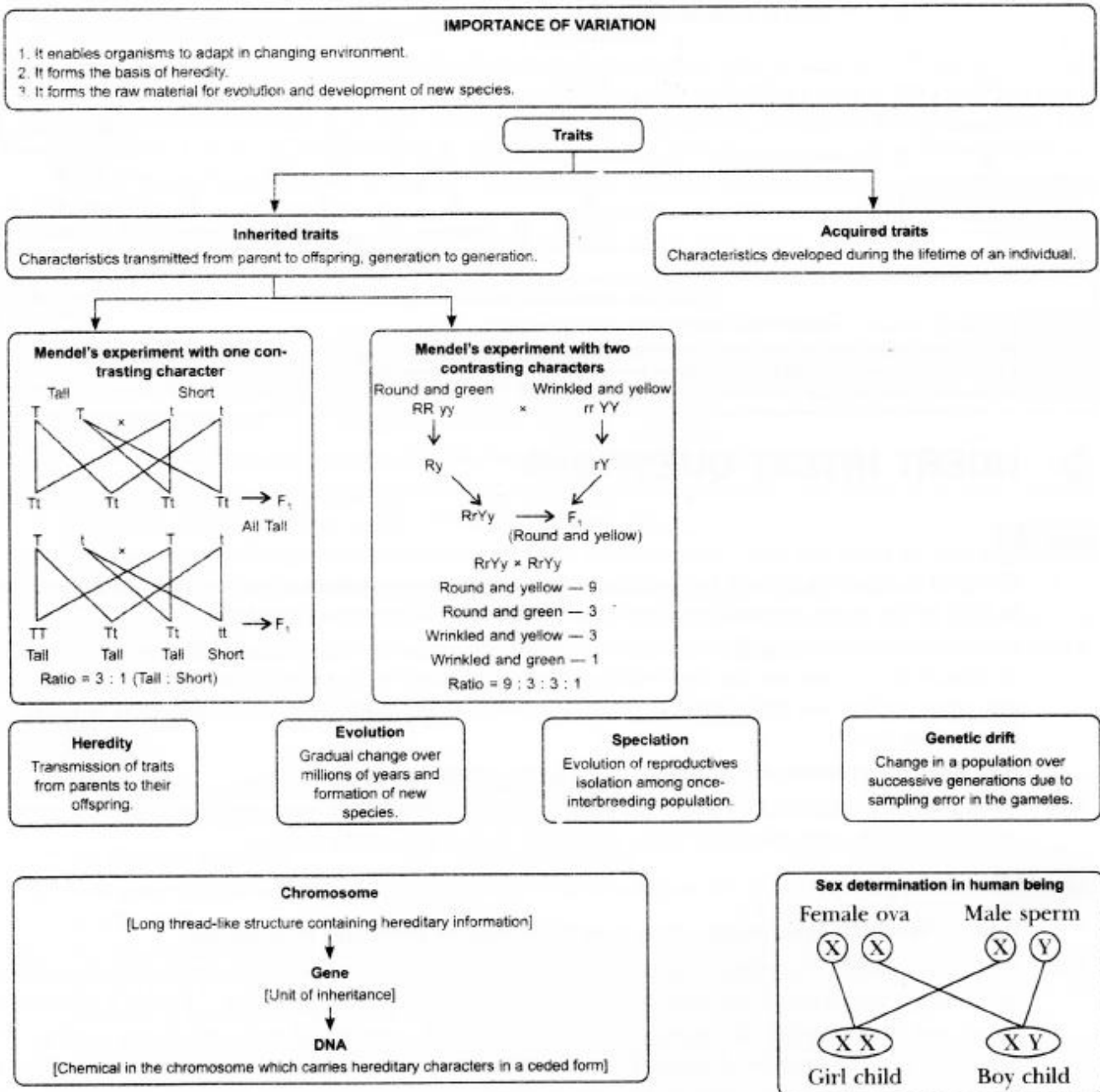
1. Reproduction is one of the most important characteristics of living beings. Give three reasons in support of the statement. (continuity of species, stabilization of population, produce variation )
2. What are chromosomes ? Explain how in sexually reproducing organisms the number of chromosomes in the progeny is maintained. ( a long thread like structures; by meiosis it is maintained)
3. What happens when
  - a) Planaria gets cut into two pieces.
  - b) A mature spirogyra filament attains considerable length.
  - c) On maturation spirogyra burst?
4. What is the effect of DNA copying, which is not perfectly accurate, on the reproduction process? How does the amount of DNA remain constant though each new generation is a combination of DNA copies of two individuals ?( introduces variation; mitosis)
5. What is vegetative propagation? List its any four advantages.
6. A) Describe why variations are observed in the offspring formed by sexual reproduction.  
B) List two preparations shown every month by the uterus in anticipation of pregnancy in human.  
(a- variation; b- thickening of uterine wall).
7. Differentiate between the following:
  - a) Bud of Hydra and bud of bryophyllum
  - b) Fragmentation and regeneration
  - c) Fertilization and germination.
8. A) What is meant by pollination? Name and differentiate between two modes of pollination in flowering plants.  
B) What is double fertilization?
9. What are STDs? List ant 2 examples of each disease caused due to (i) bacterial infection and (ii) viral infection. Which device or devices may be used to prevent the spread of such diseases?
10. List four categories of contraceptive methods. State in brief two advantages of adopting such preventive methods. **(OR)** list any four contraceptive used by humans. How does their use have a direct effect on the health and prosperity of family?

**(5 Marks Questions) :**

1. A) How does pollination occurs in plants?  
B) How does pollination lead to fertilization? Explain  
C) Draw a diagram showing germination of pollen on stigma of a flower.

2. A) Name the human male reproductive organ that produces sperms and also secretes hormones. Write the functions of hormone secreted.  
 B) Name the parts of the human female reproductive system where (I) fertilization and (ii) implantation occur respectively. Explain how the embryo gets nutrition inside the mother's body.
3. Distinguish between a gamete and zygote. Explain their roles in sexual reproduction.

### Ls. No. 9 : Heredity and Evolution



**(3 Marks Questions) :**

1. 'We cannot pass onto our progeny the experiences and qualifications earned during our lifetime.' Justify the statement giving reason and examples. **(OR)** Why traits such as intelligence and knowledge cannot be passed on to next generation? Explain by giving examples. **(OR)** Explain with the help of suitable examples why certain traits cannot be passed on the next generation. What are such traits called? **(OR)** Distinguish between inherited traits and acquired traits giving examples of each. Give reason why the traits acquired by an individual during lifetime are not inherited.

2. Explain with an example how traits get expressed? **(OR)** How an individual does get a particular character ? Chance whether a couple will have a male
3. 'It is a matter of chance whether a couple will have a male or a female child'. Justify this statement by drawing a flow chart. **(OR)** On the basis of the possibilities of combination of the sex chromosomes, what percentage probability does a couple have of having a son or a daughter? Show the same by making a cross. **(OR)** With the help of a flowchart explain in brief how the sex of a newborn is genetically determined in human beings. Which of the two parents is responsible for the determination of the sex of a child? **(OR)** Do genetic combinations of mother play a significant role in determining the sex of new born? **(OR)** In human beings, the statistical combination of getting either a male or a female child is 50:50. Give suitable explanation.
4. How does variation arise in organisms? "Variation is useful for the survival of species". Justify this statement with the help of an example. **(OR)** Why is variation beneficial for the species but not necessarily for the individual? **(OR)** Explain with an example how variation took place due to inheritance.
5. Explain how evolutionary relationships can be traced by the study of homologous organs. **(OR)** Name two homologous structures in vertebrates. Why are they so called? How do such organs help in understanding an evolutionary relationship? **(OR)** The human hand, cat paw and horse foot, when studied in detail show the same structure of bones and point towards a common origin. (a) What do you conclude from this? (b) What is the term given to such structures? **(OR)** Give an example of body characteristics used to determine how close two species are in terms of evolution and explain it.
6. Explain the following: a) Speciation b) Natural Selection c) Genetic Drift. **(OR)** With the help of suitable examples explain natural selection. **(OR)** Describe Darwin's theory of evolution.

**(5 Marks Questions ) :**

1. a) What is variation? How is variation created in a population? How does the creation of variation in a species promote survival?
- b) Explain how, offspring and parents of organisms reproducing sexually have the same number of chromosomes.
2. How does Mendel's experiment show that traits are inherited independently and traits are dominant and recessive?
3. Explain with the help of an example each, how the following provide evidences in favors of evolution:
  - a) Homologous organs b) Analogous organs c) Fossils. .

**(OR)**

4. State and describe in brief any three main factors responsible for the rise of a new species. **(OR)** What is speciation ? State any two factors which could lead to speciation. **(OR)** What is speciation? List four factors that could lead to speciation. Which of these cannot be major factors in speciation of a self-pollinating plant species? Explain
5. Define evolution. How does it occur? Explain how fossils provide evidences in support of evolution. **(OR)** How are fossils formed? Describe in brief two methods of determining the age of fossils. **(OR)** List three roles of fossils in tracing evolutionary relationships. **(OR)** What does help scientists to reconstruct the pattern and trends that existed in the history of life on the Earth? **(OR)** Define evolution. How does it occur ? Explain how fossils provide evidences in support of evolution.