CHAPTER 6 : Life Processes

Key Points and Concepts

- **Life processes :** These are the basic functions performed by living organisms for their survival and body maintenance.
- Life processes includes Nutrition, Respiration, Transportation, Excretion etc.
- **Nutrition :** There are two modes of nutrition: autotrophic and heterotrophic.
- **Photosynthesis :** It is the process by which green plants make their own food with the help of CO_2 and H_2O in the presence of chlorophyll and sunlight.
- **Raw Materials for Photosynthesis** are carbon dioxide and water.
- **Site of Photosynthesis** is chloroplast in the leaf. Chloroplast contain a green colour pigment called chlorophyll.
- **Main Events of Photosynthesis :**
  - Absorption of light energy by chlorophyll.
  - Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.
  - Reduction of CO_2 to form carbohydrates.
- **Stomata** are tiny pores present on the surface of the leaves. Exchange of gases and transpiration takes place through stomata.
- The opening and closing of stomata is a function of the guard cells.
- **Heterotrophic nutrition is of three types :** Holozoic (*e.g.* *Amoeba*, animals), Saprophytic (*e.g.* fungi) and Parasitic (*e.g.* Cuscuta, ticks and mites).
- **Nutrition in Amoeba :** Amoeba takes in food using temporary finger-like extensions of the cell surface (known as pseudopodia), which fuse over the food particle forming a food-vacuole.
- **Human digestive system :** In humans, digestion begins from the mouth and gets completed in small intestine.
- **Respiration :** It is a process in living organisms involving the production of energy.
- **There are two modes of respiration :** Aerobic (in the presence of oxygen) and anaerobic (in the absence of oxygen).
- **Human Respiratory System :** It involves the passage of air through the respiratory system.
- **Mechanism of Breathing :** It involves two processes : Inhalation and exhalation.
- In human beings, oxygen is transported by haemoglobin. Haemoglobin is a respiratory pigment present in RBCs, which have a very high affinity for oxygen.
- Carbon dioxide is more soluble in water than oxygen and hence is mostly transported as dissolved form in our blood.
- Terrestrial organism uses atmospheric oxygen for respiration.
- Aquatic organisms uses oxygen dissolved in water.
- **Respiration in Plants :** Gaseous exchange occur through stomata in leaves, lenticels in stems, general surface of the roots and transpiration.
- The **circulatory system** in human beings consists of a circulatory medium (blood and lymph), blood vessels (veins, arteries and capillaries) and heart.
- Humans have double circulation. In this, the blood one is oxygenated and one is de-oxygenated travels twice through the heart in one complete cycle of the body.
- **Pulmonary circulation :** Blood moves from the heart to the lungs and back to the heart.
- **Systemic circulation :** Blood moves from the heart to rest of the body and back to the heart.
- **Blood** is a fluid connective tissue. It comprises four components– Plasma, RBCs, WBCs, and platelets.
- **Lymph** is a yellowish fluid that escapes from the blood capillaries into the intercellular spaces. Lymph flows from the tissues to the heart assisting in transportation and destroying germs.
- **Transportation** in plants occurs via xylem and phloem.
- **Xylem** carries water and minerals from roots to other parts of plants while phloem carries food from leaves to other parts of the plants.
- **Transpiration** is the process by which plants lose water in the form of vapours.
- **Translocation** is the transport of food from leaves (food factory) to different part of the plant.

- The process of the removal of the harmful metabolic wastes from the body is called **excretion.**
- Excretory system of human beings includes a pair of kidney, a pair of ureter, a urinary bladder, and a urethra.
- Kidney removes waste product from the blood *i.e.*, urea which is produced in the liver.
- **Nephron** is the structural and functional unit of kidney.
- The urine formation involves three steps : Glomerular filtration, tubular re-absorption and secretion.
- **Hemodialysis** is the process of purifying blood by an artificial kidney. It is meant for kidney failure patient.

Important concepts

- **Function of blood vessels :**

S. No.	Blood vessels	Function
1.	Arteries	They carry blood away from the heart to various organs of the body.
2.	Veins	They collect the blood from different organs and bring it back to the heart.
3.	Capillaries	Exchange of material between the blood and surrounding cells takes place across the thin walls of capillaries.

- **Arteries and Veins :**

S. No.	Arteries	Veins
1.	They are thick walled.	They are thin walled.
2.	Arteries have no valves.	They have valves.
3.	Carry oxygenated blood except pulmonary artery.	Carry deoxygenated blood except pulmonary vein.

- **Glands and their Secretions :**

S. No.	Name of the Gland	Secretion (*s*)
1.	Salivary glands	Saliva contains enzyme named ptyalin also called anylase
2.	Gastric glands	Secretes gastric juice, HCl, mucus and pepsin.
3.	Liver	Bile juice.
4.	Intestinal glands	Intestinal juice.
5.	Pancreas	Pancreatic juice which contains trypsin, lipase and amylase, hormone insulin, glucagon, somatostatin pancreatic polypeptide

- **Aerobic and Anaerobic Respiration :**

S. No.	Aerobic Respiration	Anaerobic Respiration
1.	It takes place in the presence of oxygen.	It takes place in the absence of oxygen.
2.	Products obtained are CO_2 and H_2O.	Products obtained vary.
3.	More energy is produced.	Less energy is produced.

- **In human, air takes the following path :**

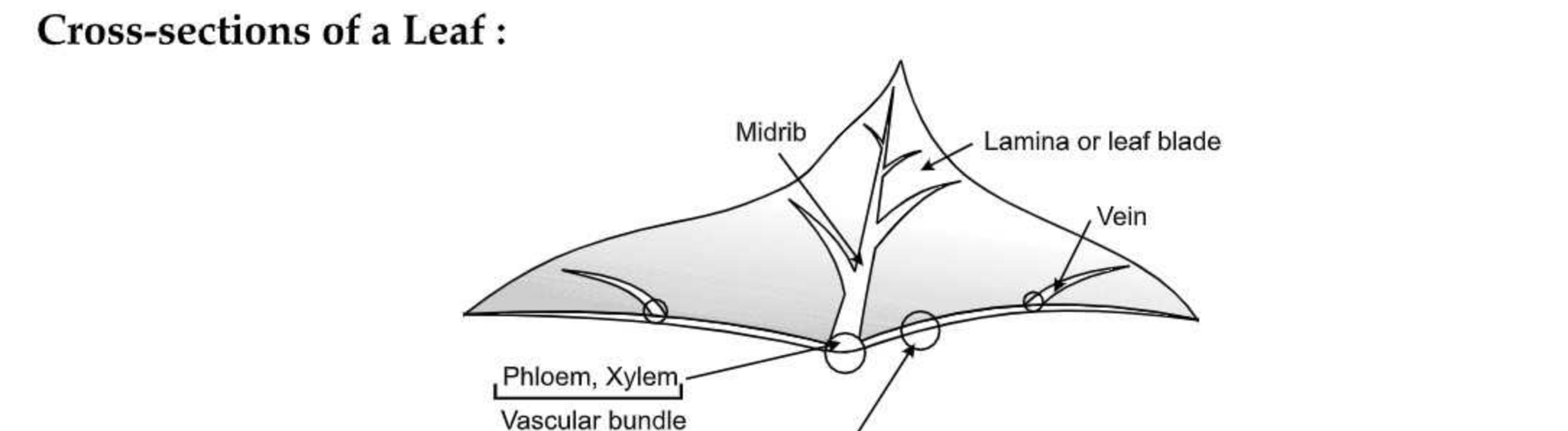
  Nostrils → Nasal passage → Pharynx → Larynx → Trachea → Bronchus → Bronchiole → Alveolus.

- **Important Equations :**

  - **Photosynthesis Process :**

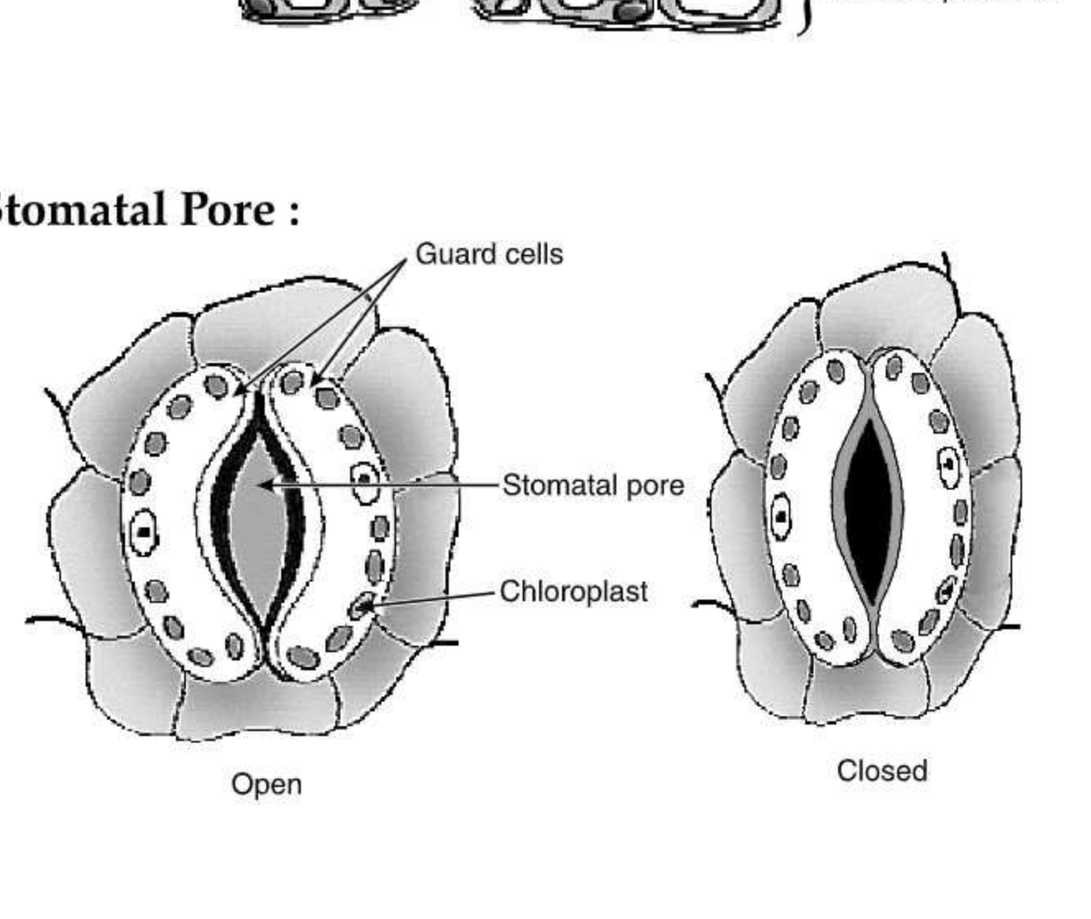
    $$6CO_2 + 6H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6O_2\uparrow$$

  - **Glucose Breakdown**



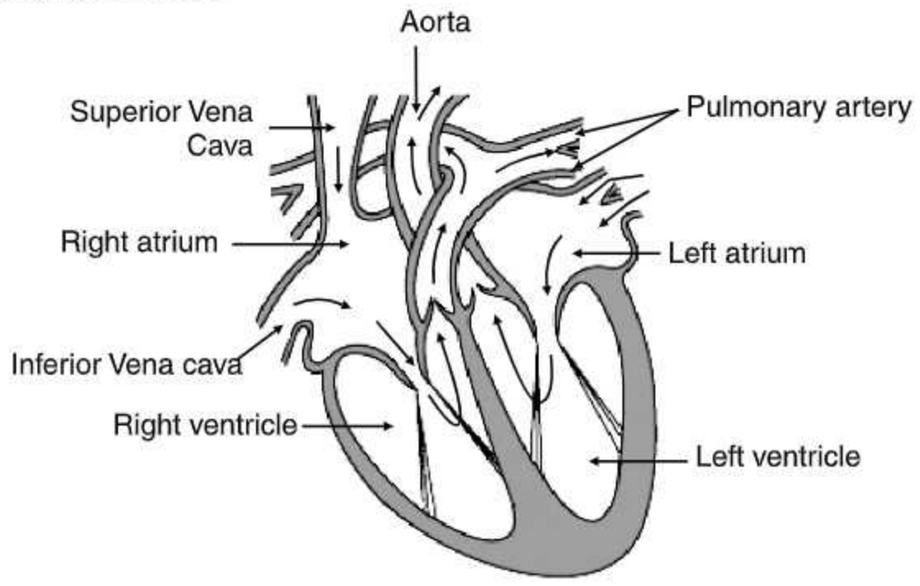
- **Important Diagrams :**

  - **Cross-sections of a Leaf :**

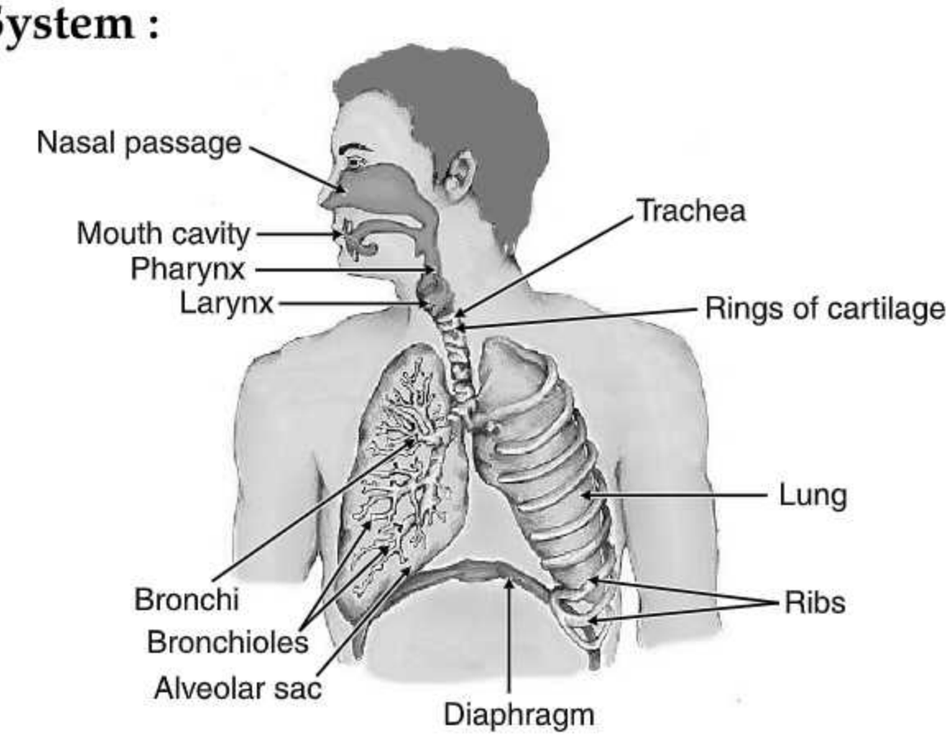


  - **Open and Closed Stomatal Pore :**

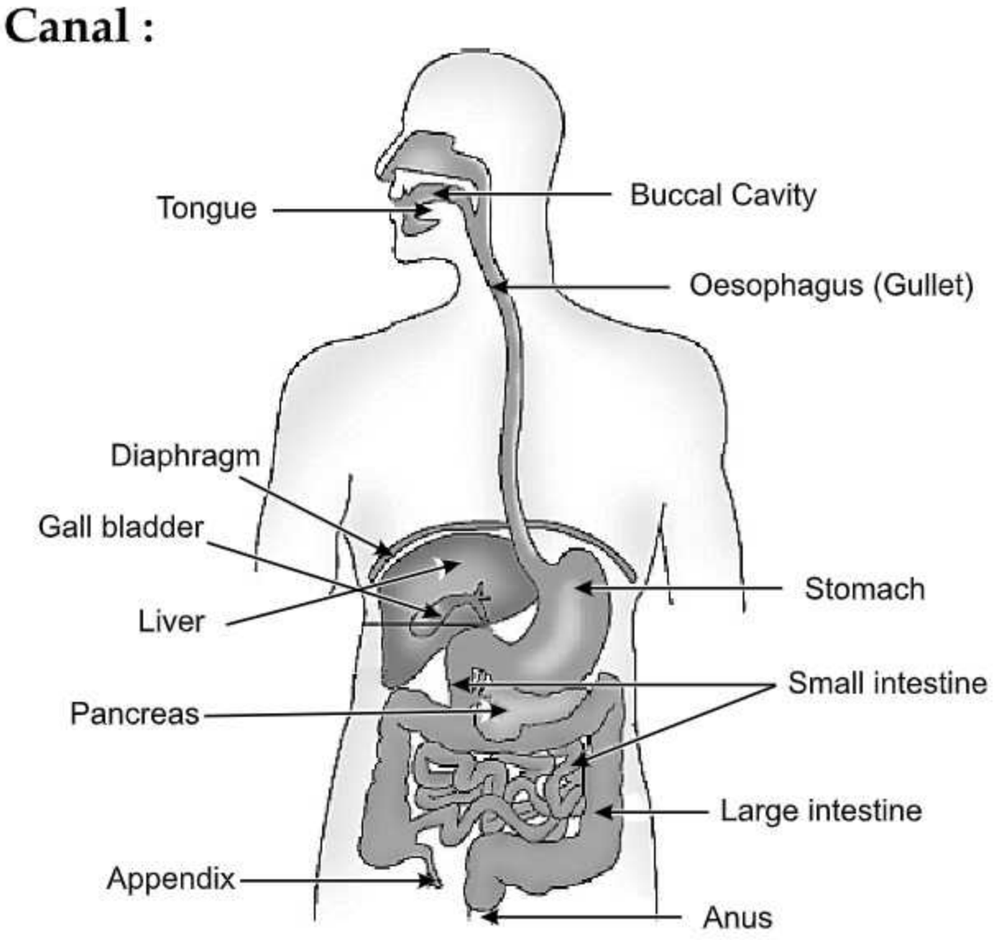
- **(Cross-section) of Human Heart :**



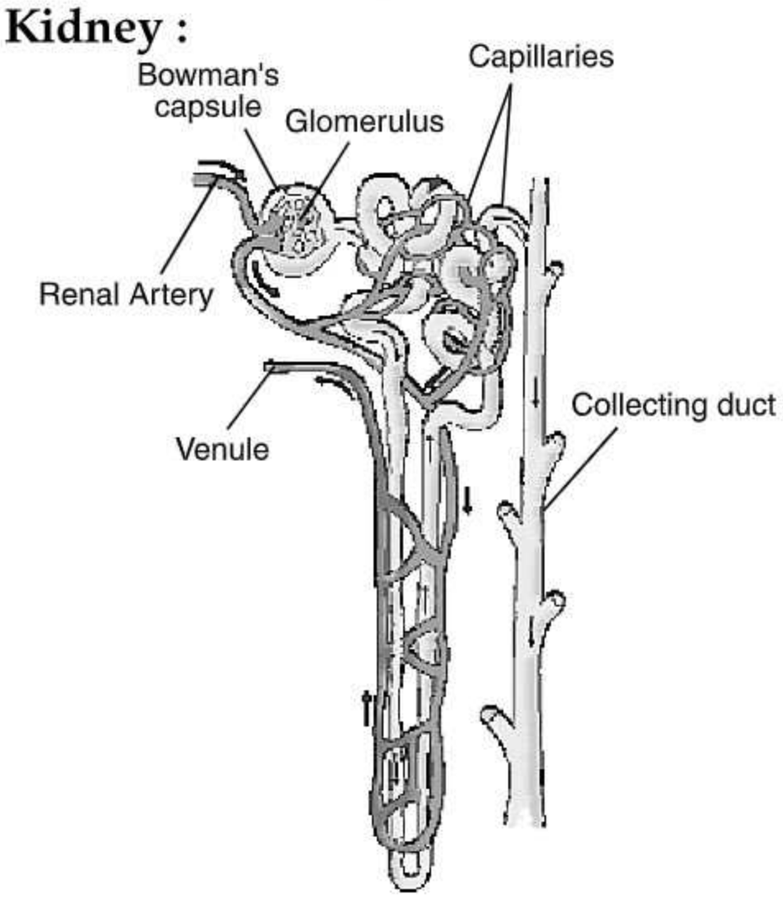
- **Human Respiratory System :**



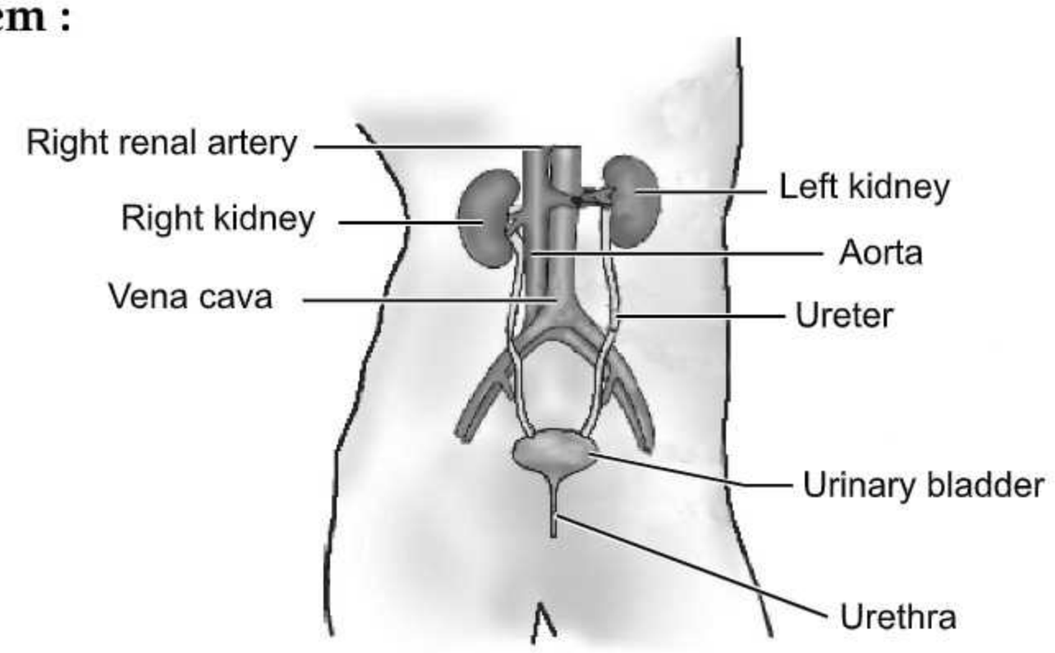
- **Human Alimentary Canal :**



- **Excretory Unit of Human Kidney :**



- **Human Excretory System :**



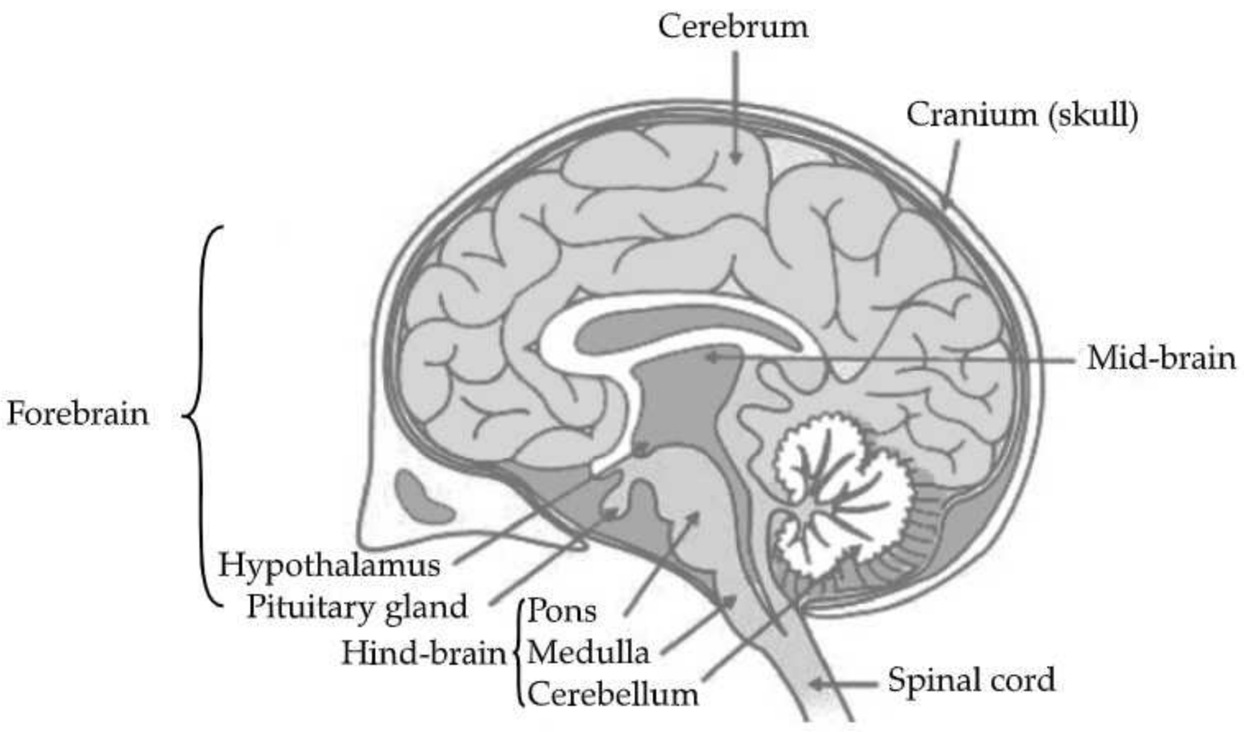
CHAPTER 7 : Control and Co-ordination

Key Points and Concepts

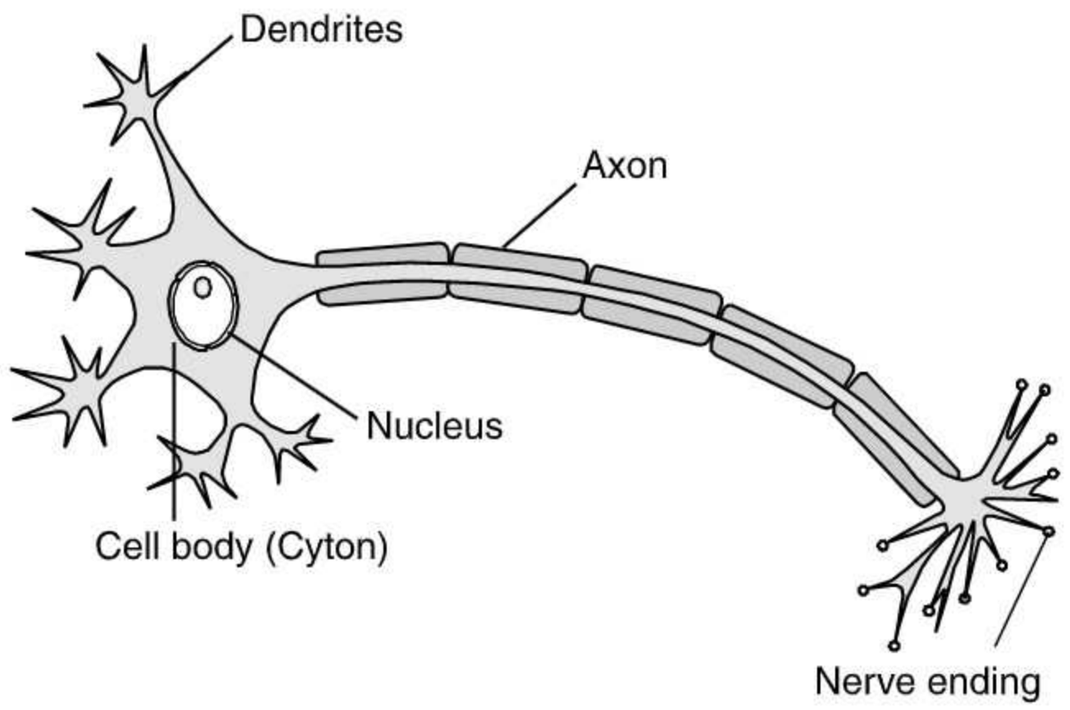
- Control and co-ordination are the functions of the nervous system and hormones in our bodies.
- The structural and functional unit of nervous system is neuron.
- **Structure of a neuron :** It comprises soma (cell body), the axon (a long slender projection that conducts electrical impulses away from the cell body), dendrites (tree-like structures that receive messages from other neurons), and synapses (specialized junctions between neurons).
- The axon (nerve fibre) transmits electrical signals from the cell body. The dendrites are branching fibres that receive electrical signals from other neurons.
- Synapse is the point of contact between the terminal branches of axon of one neuron with the dendrite of another neuron.
- Reflex action is an automatic response of the body to a stimulus. *e.g.* withdrawal of hand, knee jerk etc. on touching a hot plate.
- Reflex arc is the pathway taken by nerve impulses in a reflex action.
- **Stimulus :** Any detectable change in the physical or chemical structure of an organism's internal or external environment to which the organisms respond is called stimulus. *e.g.* Touching a hot plate
- **Response :** The reaction of our body to a stimulus. *e.g.* withdrawal of our hand on touching hot plate.
- The human nervous system is divided into the central nervous system (CNS) and the peripheral nervous system (PNS).
- CNS consists of the brain and the spinal cord. The spinal canal contains the spinal cord, while the cranial cavity contains the brain.
- The human brain is the command center for the human nervous system. It receives input from the sensory organs and sends output to the muscles.
- It is enclosed in cranium (brain box) and is protected by cerebrospinal fluid which acts as a shock absorber. It has several layers called meninges.
- Human brain has three major parts or regions : **(a)** Forebrain **(b)** MidBrain **(c)** HindBrain.
- The most complex and specialized part of the brain is cerebrum or the forebrain.
- Mid brain connects the forebrain with the hindbrain. It is the portion of the central nervous system associated with vision, hearing, motor control, sleep/wake, arousal (alertness), and temperature regulation.
- Hind-brain includes cerebellum, medulla, and pons.
- Spinal Cord is enclosed in the vertebral column.
- **Coordination in plants :** Plants show two different types of movement – one dependent on growth and the other independent of growth.
- Movement dependent on growth are tropic movement. They are directional movement in response to stimulus.
- It includes phototropism (towards light), geotropism (towards gravity), chemotropism (towards chemicals) and hydrotropism (towards water).
- Movement independent growth are immediate response to stimulus. *e.g.* Drooping of leaves of Touch-me-not plants on touching it. This is known as thigmotropism.

- Plant hormones are chemical compounds which help to coordinate growth, development and responses to the environment.
- Main plant hormones are : Auxin, Gibberellin, Cytokinins, and Abscisic acid.
- Hormones in animals are the chemical substances secreted by the endocrine glands. They are transmitted by the blood to the tissues on which it has a specific effect.
- Thyroid gland needs iodine to make thyroxine which helps in regulating the metabolism of carbohydrates, fats and proteins.
- Deficiency of iodine causes a disease called goitre.
- Deficiency of insulin causes diabetes.
- Diabetes can be treated by injecting insulin hormone in the patient's body.
- The excess or deficiency of hormones has a harmful effect on our body. Feedback mechanism makes sure that hormones are secreted in precise quantities and at right time. For example, if the sugar levels in blood rise, they are detected by the cells of the pancreas which respond by producing more insulin. As the blood sugar level falls, insulin secretion is reduced.

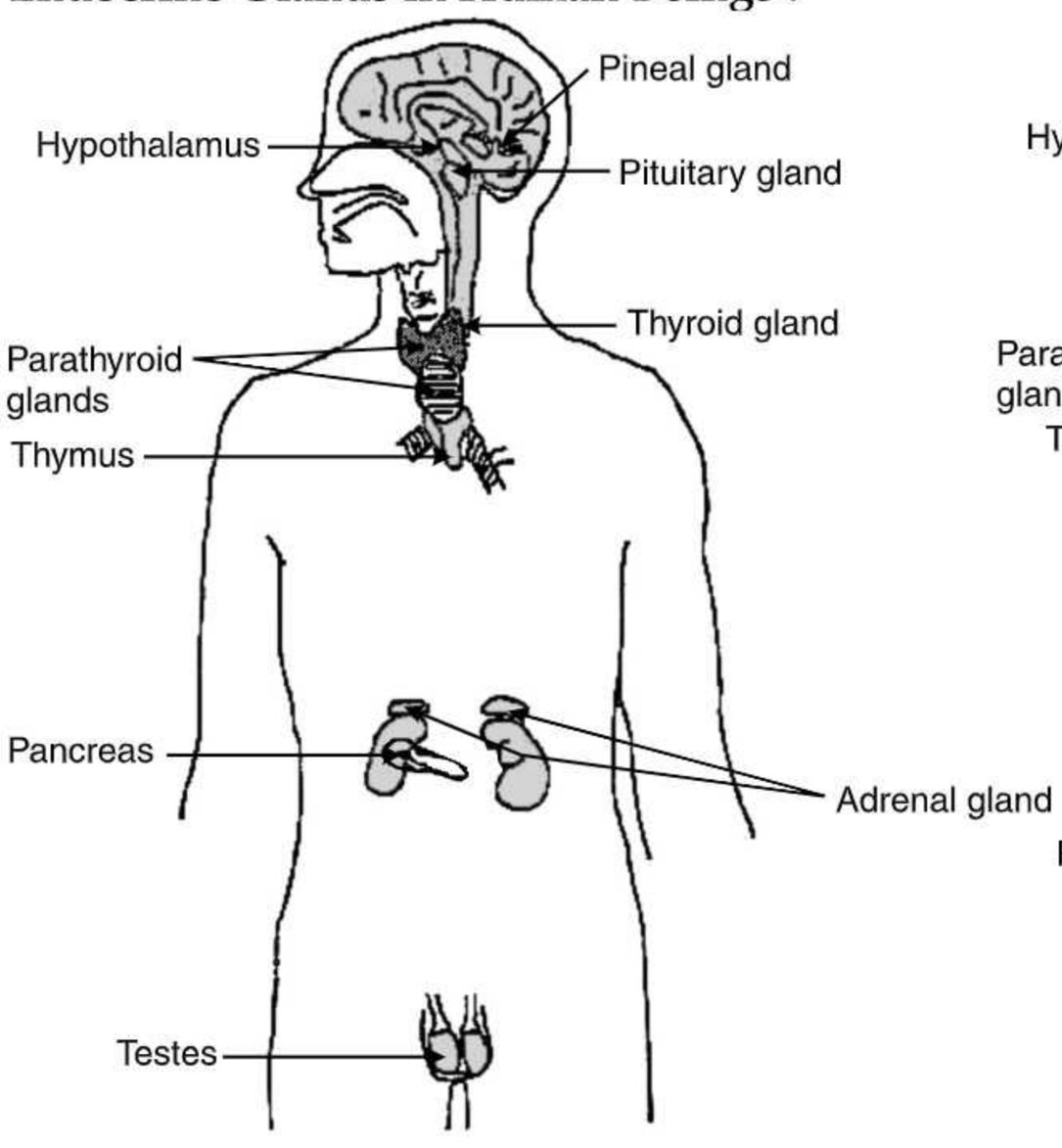
- **Important Diagrams :**
  - **Human Brain**



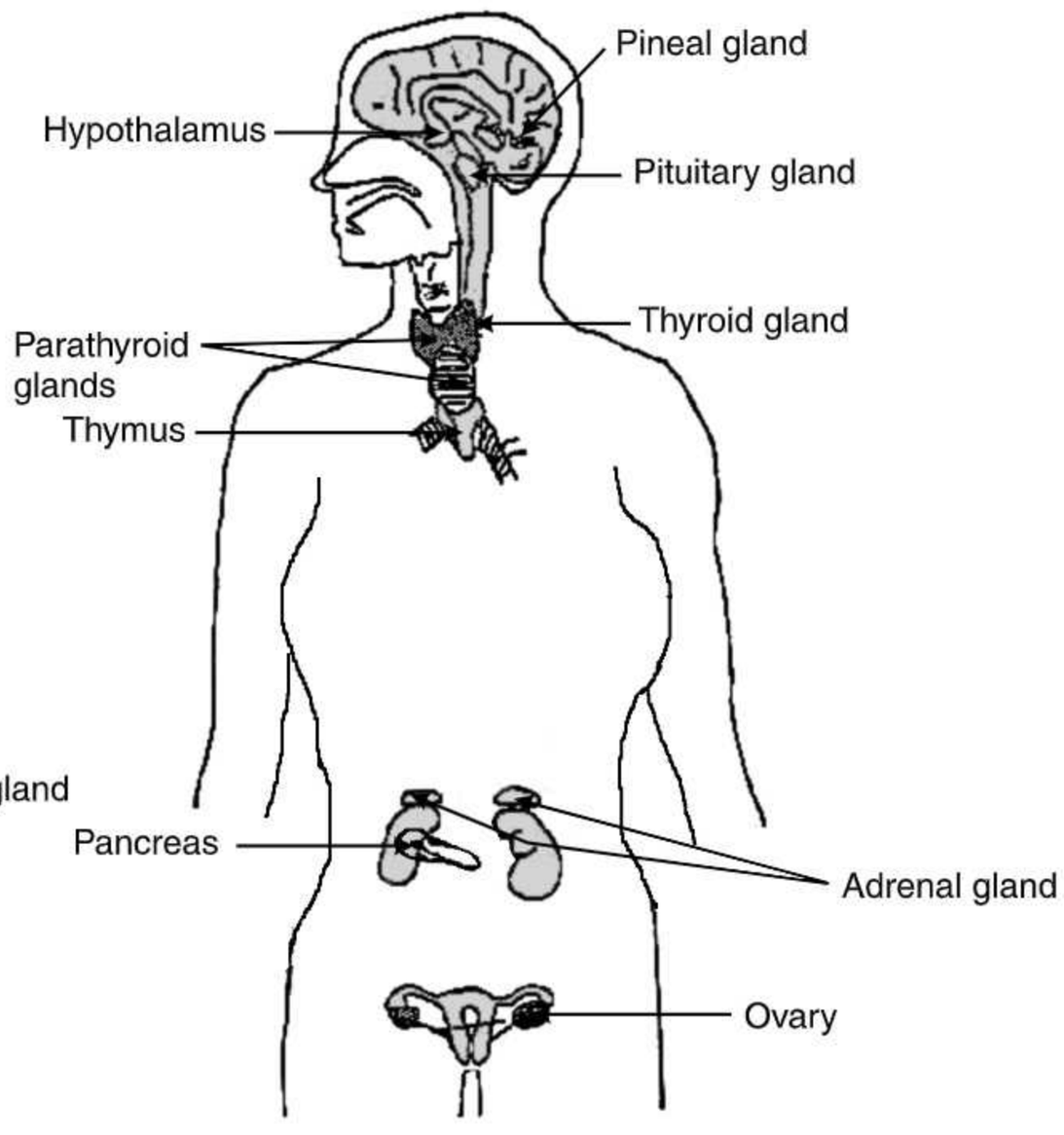
  - **Structure of Neuron :**



- **Endocrine Glands in Human Beings :**



Male



Female

CHAPTER 8 : How Do Organisms Reproduce ?

- **Sexual and Asexual Reproduction :**

S. No.	Sexual Reproduction	Asexual Reproduction
1.	It produces new organism from two parents. *i.e.,* it is biparental.	It produces new organism from a single parent. *i.e.,* it is uniparental.
2.	It involves sex cells or gametes.	It does not involve sex cells or gametes.
3.	Offsprings are not identical to the parents.	Offsprings are identical to the parents.

- Asexual reproduction takes place through fission, fragmentation, budding, vegetative propagation and spore formation.
- **Advantages of Vegetative Propagation :**
  (a) Plants raised by vegetative reproduction can bear flowers and fruits earlier than those produced from seeds.
  (b) This process helps those plants to propagate that have lost the capacity to reproduce.
  (c) It is a quicker method of multiplication.
  (d) It helps to preserve good qualities of a variety or race indefinitely.
- Humans use sexual mode of reproduction.
- The formation of male germ cell (sperms) takes place in the testes. Testes are located outside the abdominal cavity in scrotum.
- Scrotum has a relatively low temperature needed for the production of sperms by testes.
- Testes release a male sex hormone called testosterone. It regulates the production of sperm and bring about changes in appearance seen in boys at the time of puberty.
- The sperms are tiny bodies that consist of mainly genetic material and a long tail that helps them to move towards the female germ cell.
- The female germ cells or eggs are produced in the ovaries.
- One egg is produced every month by one of the ovaries.
- Fertilization occurs in the fallopian tube of female genital tract.
- The fertilized egg also called zygote ($2n$) gets implanted in the lining of the uterus, and starts dividing. Actually uterus is richly supplied with blood to nourish the growing embryo. If zygote is not formed, the inner wall of uterus breaks which causes bleeding through vagina. This process is called menstruation.
- The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta.

- **Functions of placenta :**
  - It provides a large surface area for glucose and oxygen to pass from the mother to the embryo.
  - The wastes from developing embryo are removed to mother's blood through placenta.
- The time period from fertilization upto the birth of the baby is called Gestation Period. In humans, it is about nine months (36 weeks).
- Reproductive health is total well-being in all aspects of physical, emotional, social and behavioural.
- **Contraception :** It is the avoidance of pregnancy.
- **Methods of Contraception :**

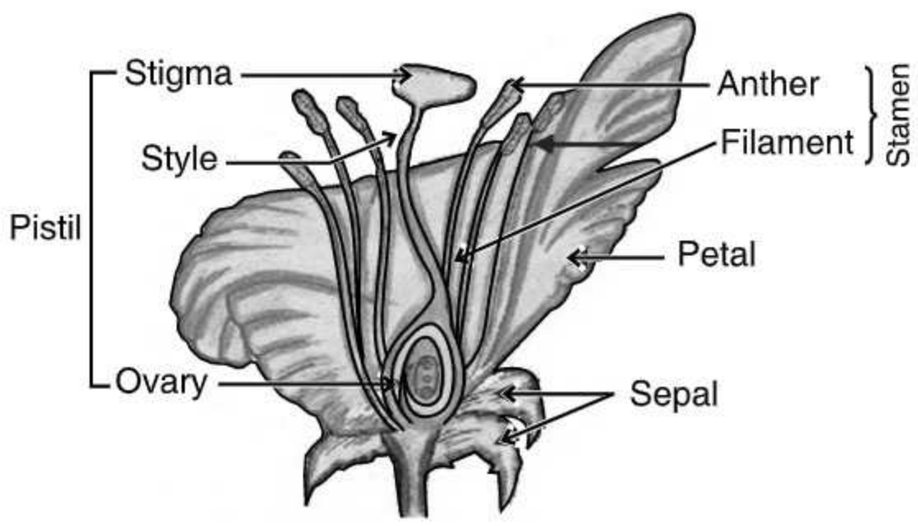
(i) Barrier method : In this method, a mechanical device is used to prevent the entry of sperms in the female genital tract during sexual intercourse.
Example : Condom, diaphragm, cervical cap, vault cap and femidom etc.

(ii) Chemical method : It involves the use of specific drugs by females.
Example : Oral pills, vaginal pills, OC.(Oral Contraceptions)

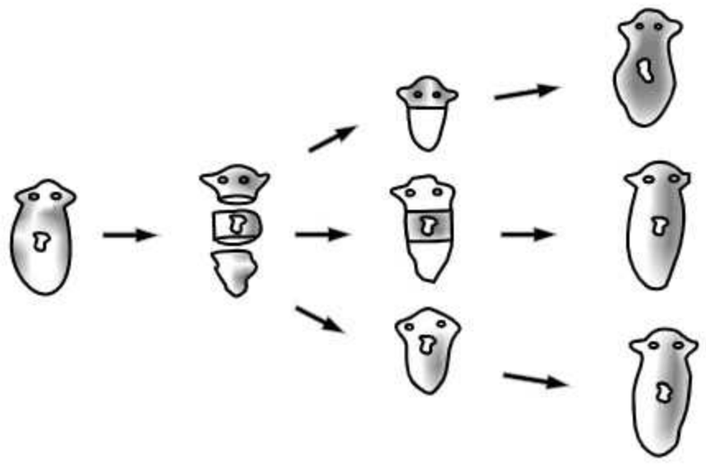
(iii) Surgical method : It involves surgical removal or ligation of vas deferens in males and the fallopian tube in females, thereby preventing passage of male and female gametes through the corresponding genital tract.

- **STD (Sexually Transmitted Diseases) :**
  Disease caused by virus—AIDS, Genital warts and herpes.
  Disease caused by bacteria—Gonorrhea, Syphilis.
- **Prevention of STDs :**
  (a) By using contraceptive devices.
  (b) By educating people and maintaining hygiene.
  (c) By avoiding sex with unknown/multiple partners.
- Sexual Reproduction in plants takes place in flowers. Flower is the reproductive organ of plants.
- A typical flower consists of four main whorls namely Calyx (Sepals), Corolla (Petals), Androecium (Stamens) and Gynoecium (Carpels).
- Flowers can be of two types : Unisexual (*e.g.* papaya) and bisexual (*e.g.* Hibiscus).
- Pollination is the transfer of pollen grain from anther to stigma. It is of two types : self-pollination and cross-pollination.
- The transfer of pollens is achieved by agent like wind, water or animals.
- After pollination, a pollen tube grows out of pollen grains, through which male germ cell reaches the ovary and fuses with the female germ cell.
- Fertilization is the process of fusion of male and female gamete to produce zygote. It occurs inside the ovary.
- **After fertilization :**
  (i) Zygote divides several times to form an embryo within the ovule.
  (ii) The ovule develops a tough coat and is converted into a seed.
  (iii) Ovary ripens to form a fruit.
  (iv) Sepal, petals, stamens, style and stigma may shrivel off.
  (v) The seed contains the future plant or embryo which develops into a seedling under suitable condition. This process is known as Germination.
- **DNA Copying :**
  (i) Cells use chemical reactions to build copies of their DNA. This creates two copies of the DNA in a reproducing cell. DNA copying is accompanied by the creation of an additional cellular apparatus to facilitate the DNA copies to separate with its own cellular apparatus.
  (ii) DNA copying gives rise to variation during reproduction which is the basis for evolution.

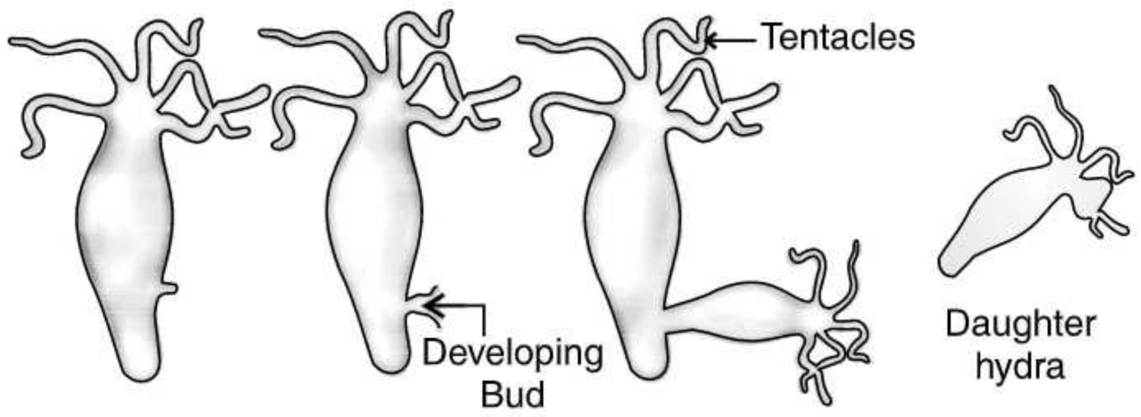
- **Important Diagrams :**
  - **Longitudinal Section of a flower :**



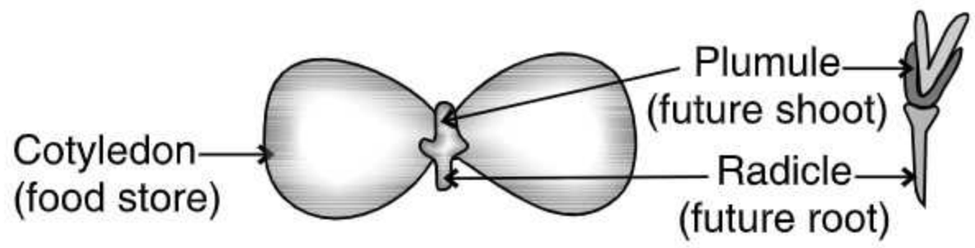
  - **Regeneration in Planaria :**



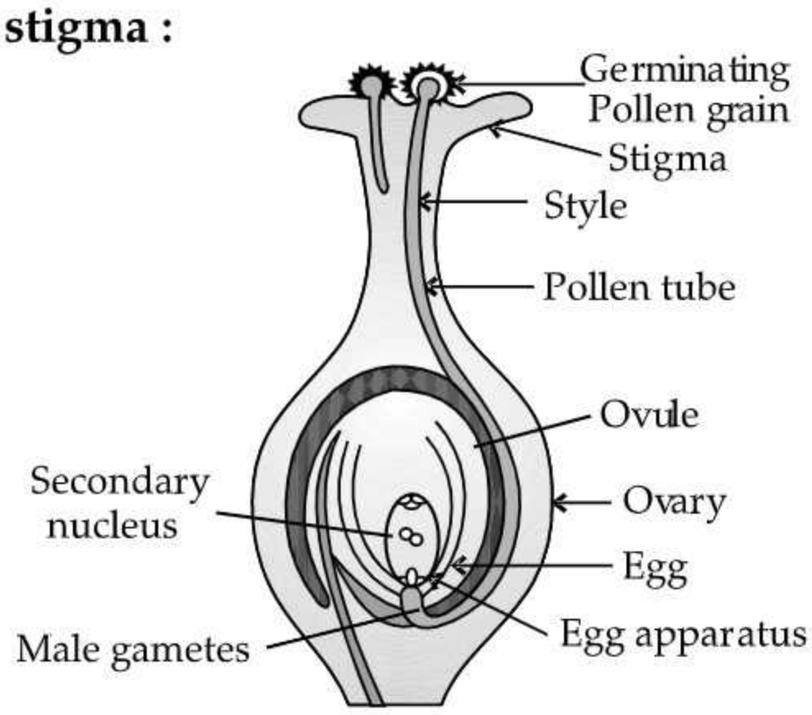
- **Budding in Hydra :**



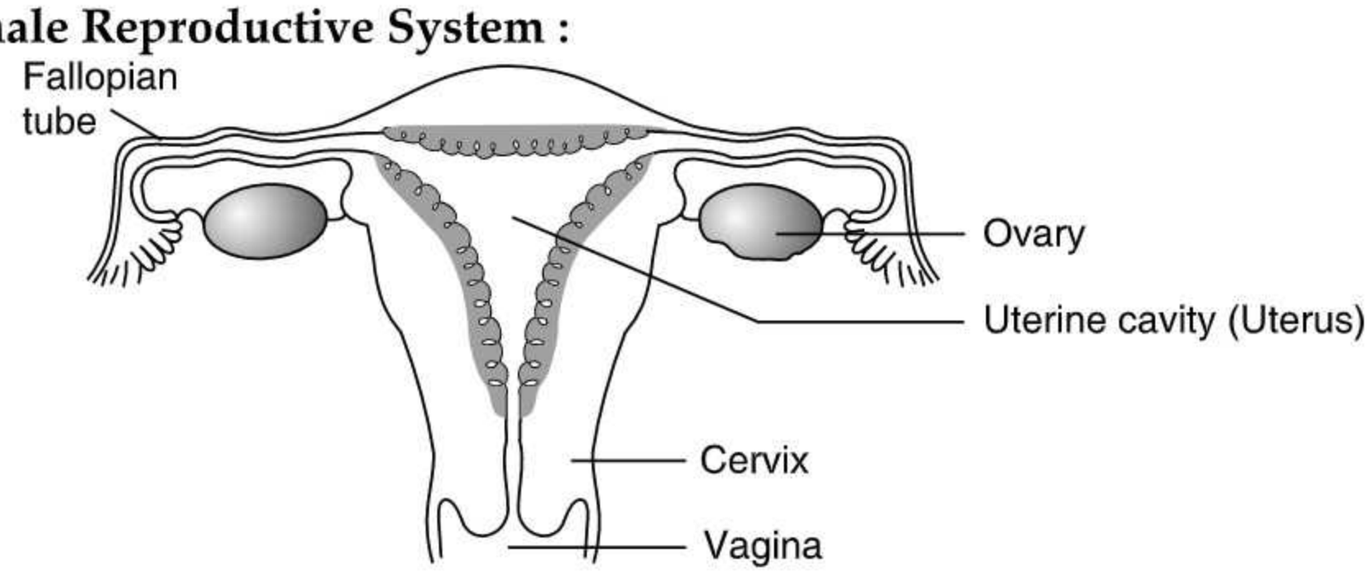
- **Germinated Seed :**



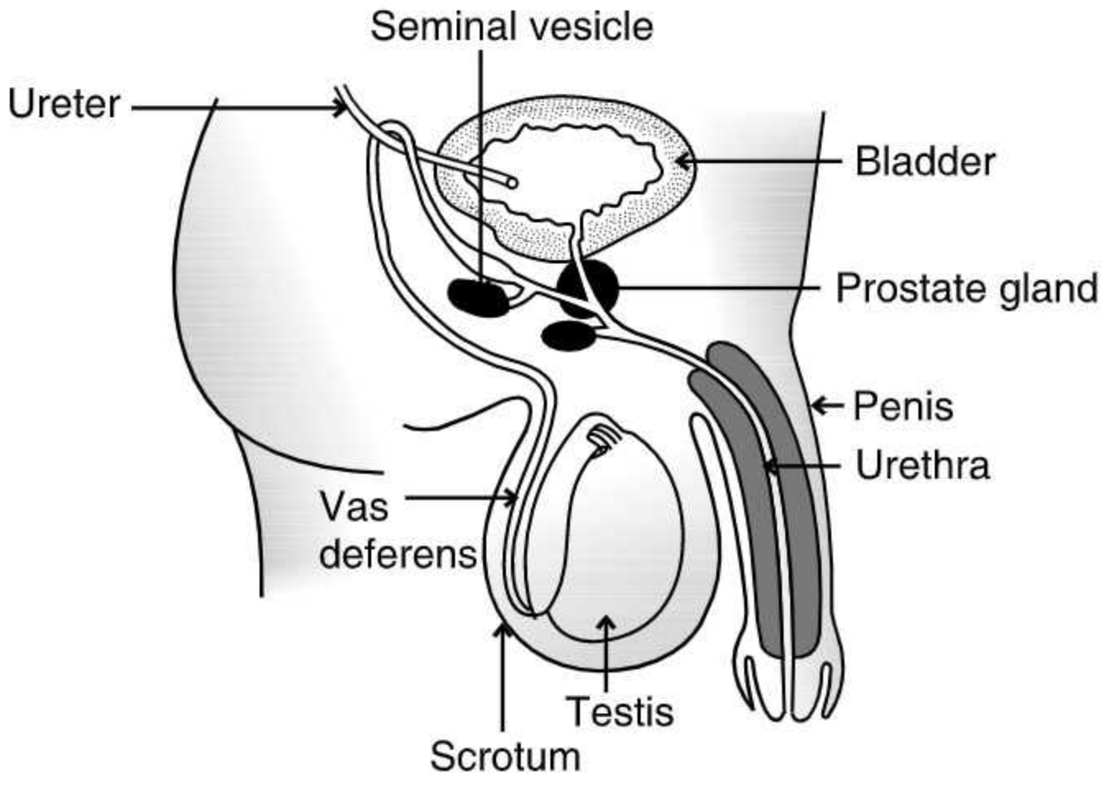
- **Germination of pollen on stigma :**



- **Human Female Reproductive System :**



- **Human Male Reproductive System :**



CHAPTER 9 : Heredity and Evolution

Key Points and Concepts

- The process by which physical or mental qualities pass from parent to child is called heredity.
- The transmission of traits from one generation to the next with the help of genes is the mechanism of heredity.

- **Acquired and Inherited Traits :**

S. No.	Acquired Traits	Inherited Traits
1.	The traits that develop during the lifetime of an individual.	The traits that are obtained from the parents.
2.	They are somatic variations and die with the death of the individual.	They are genetic variations which are transmitted to the next generation.
3.	*e.g.* Muscular body of wrestler.	*e.g.* Fused and free ear lobes.

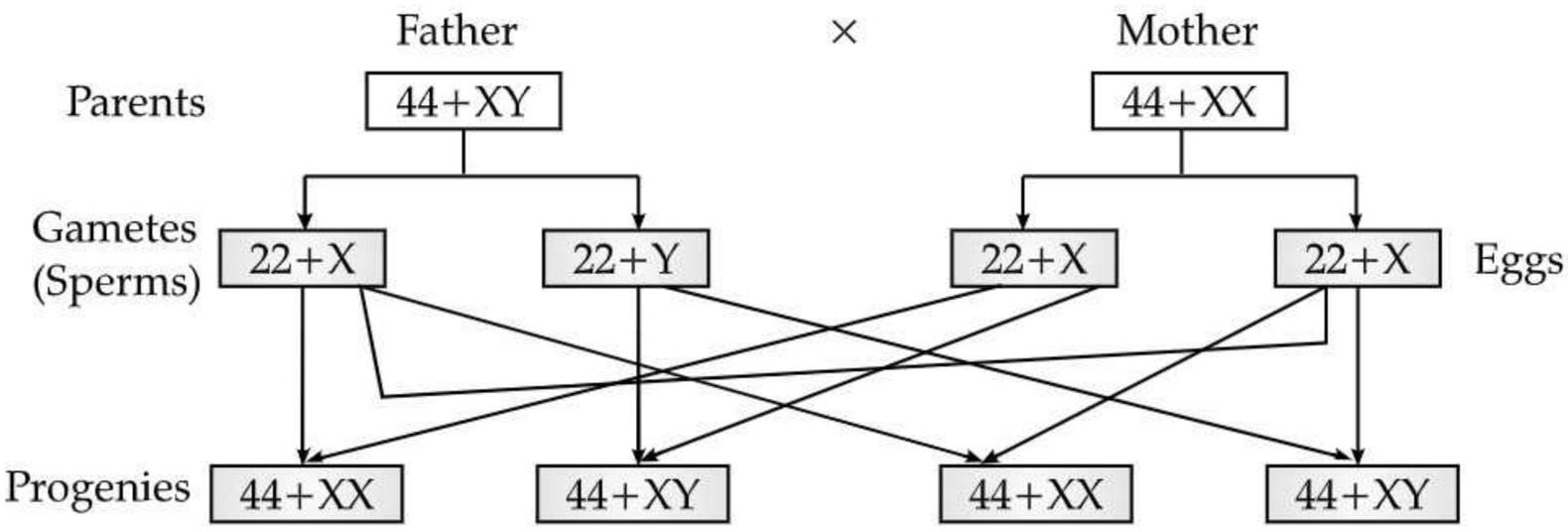
- Genetic drift and natural selection could lead to the rise of new species.
- **Mendel and His Work on Inheritance :**
  - Gregor Johann Mendel started his experiments on plant breeding and hybridization.
  - He proposed the laws of inheritance in living organisms.
  - Mendel was known as Father of Genetics.
  - The plant selected by Mendel was *Pisum sativum* (garden pea).
  - Mendel used seven pairs of contrasting characters in garden pea.
- In case of monohybrid cross with pure variety of plants, the phenotypic ratio obtained in F_2 generation is 3 : 1.
- In case of di-hybrid cross involving two pairs of contrasting characters, the phenotypic ratio obtained in F_2 generation is 9 : 3 : 3 : 1.
- Genes carry information for synthesizing proteins, which in turn control the various body characteristics.
- Humans have 22 pairs of autosomes and one pair of sex chromosomes.
- Females have similar sex chromosomes XX, whereas males have dissimilar sex chromosomes *i.e.*, XY. All eggs carry X chromosome while sperms may have X or Y chromosome.
- The sex of the child depends on the type of sperm that fuses with the egg. If the egg fuses with the sperm carrying X chromosome, it results in a girl and if it fuses with the sperm carrying Y chromosome, it results in a boy.
- Speciation is the process of formation of new species.
- Species are group of similar individuals within a population that can interbreed and produce fertile offspring.
- **Factors which lead to speciation are :**
  - Geographical isolation
  - Genetic drift
  - Variation.

- **Ways by which speciation takes place :**
  - Speciation takes place when variation is combined with geographical isolation.
  - **Gene flow :** It is exchange of genetic material by interbreeding between populations of same species or individuals. It occurs between population that are partly but not completely separated.
  - **Genetic drift :** It is the random change in the frequency of alleles (gene pair) in a population over successive generations.
  - **Natural Selection :** It is the process by which nature selects those organisms which are more suitably adapted and possesses favourable variations.

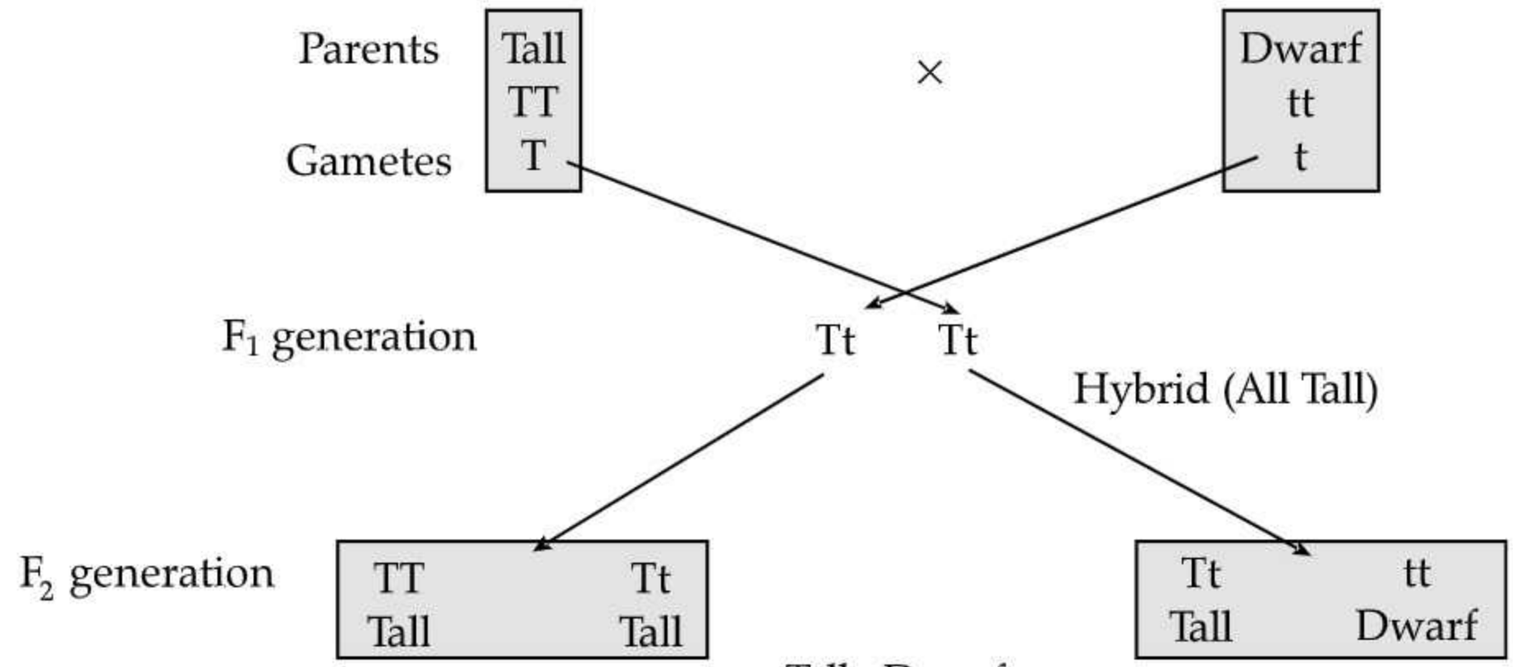
- Evolution is the process by which different kinds of living organism are believed to have developed from earlier forms during the history of the Earth.
- Both evolution and classification are interlinked.
- Jean Baptiste Lamarck gave the first theory of evolution.
- The accepted one is "The Origin of Species" by Charles Darwin.

- **Evidences of Evolution :**
  - **Homologous Organs :** These are the organs that have same basic structural plan and origin but different functions. *e.g.* forelimb of frog, lizard, bird and human being.
  - **Analogous Organs :** These are the organs that have different origin and structural plan but same function. *e.g.* wings of bird and wing of insects.
  - **Fossils (Paleontological evidences) :** Fossils are preserved traces of living organisms. Fossil *Archaeopteryx* possess features of reptiles as well as birds. This suggests that birds have evolved from reptiles.
- Age of fossils can be determined by digging the Earth by dating fossils.
- Evolution cannot be said to 'progress' from 'lower' forms to 'higher' forms. Rather, evolution seems to have given rise to more complex body designs even while the simpler body designs continue to flourish.
- Evolution takes place in stages *i.e.*, bit by bit over generations.

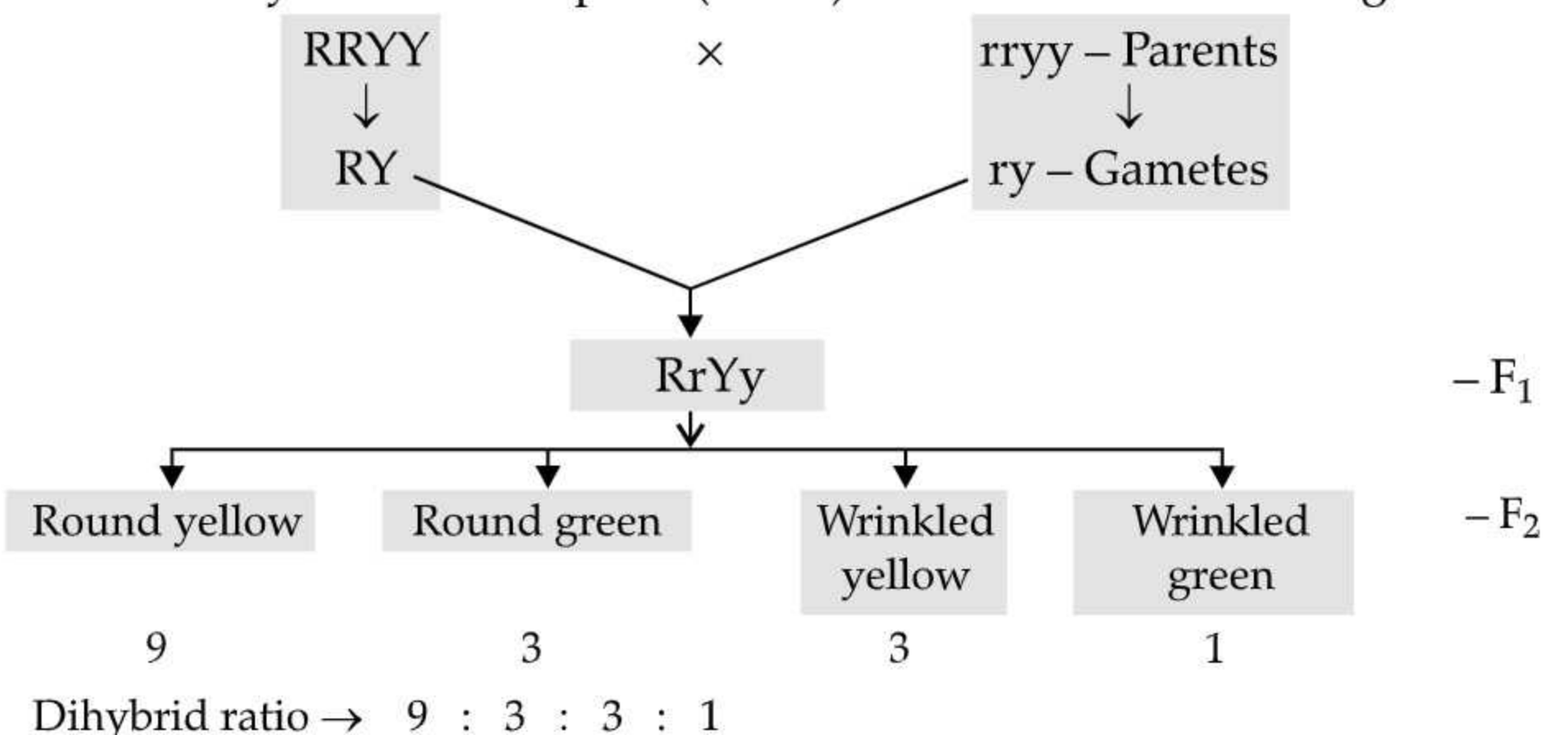
- **Important Graphs and Diagrams :**
  - **Determination of sex of a child :**



  - **Work Done by Mendel :** Ratio of tall to dwarf plants in F_2 generation is 3 : 1 :



- Inheritance of two pairs of contrasted characters over two generations by making a cross between dominant round and yellow seeded plant (RRYY) with recessive wrinkled green seeded plant (rryy).



CHAPTER 15 : Our Environment

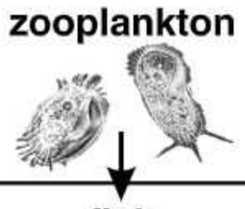
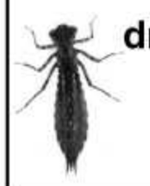
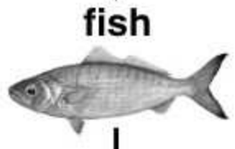
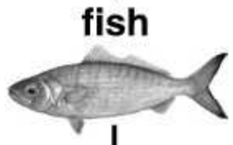
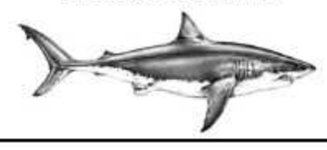
Key Points and Concepts

- All living organisms can be grouped into producers, consumers and decomposers, on the basis of nutrition.
- Producers are organisms which can make organic compound of their need from inorganic substances. These includes all green plants and certain bacteria.
- Consumers are organisms which depend on the producers directly or indirectly for their sustenance.
- Consumers can be classified into herbivores, carnivores, omnivores and parasites.
- Decomposers are microorganisms which can break down the dead remains and waste product of the organisms, such as fungi and bacteria.
- **Food chain :** It is the sequence of living organisms in which one organism consumes another organism for energy. It is unidirectional (single directional).
- Each step or level of the food chain forms a trophic level.
- **Ten percent Law :** There is only 10% flow of energy from one trophic level to the next higher level. Due to this energy loss, only 4 or 5 trophic levels are present in each chain. It is known as Ten Percent law.

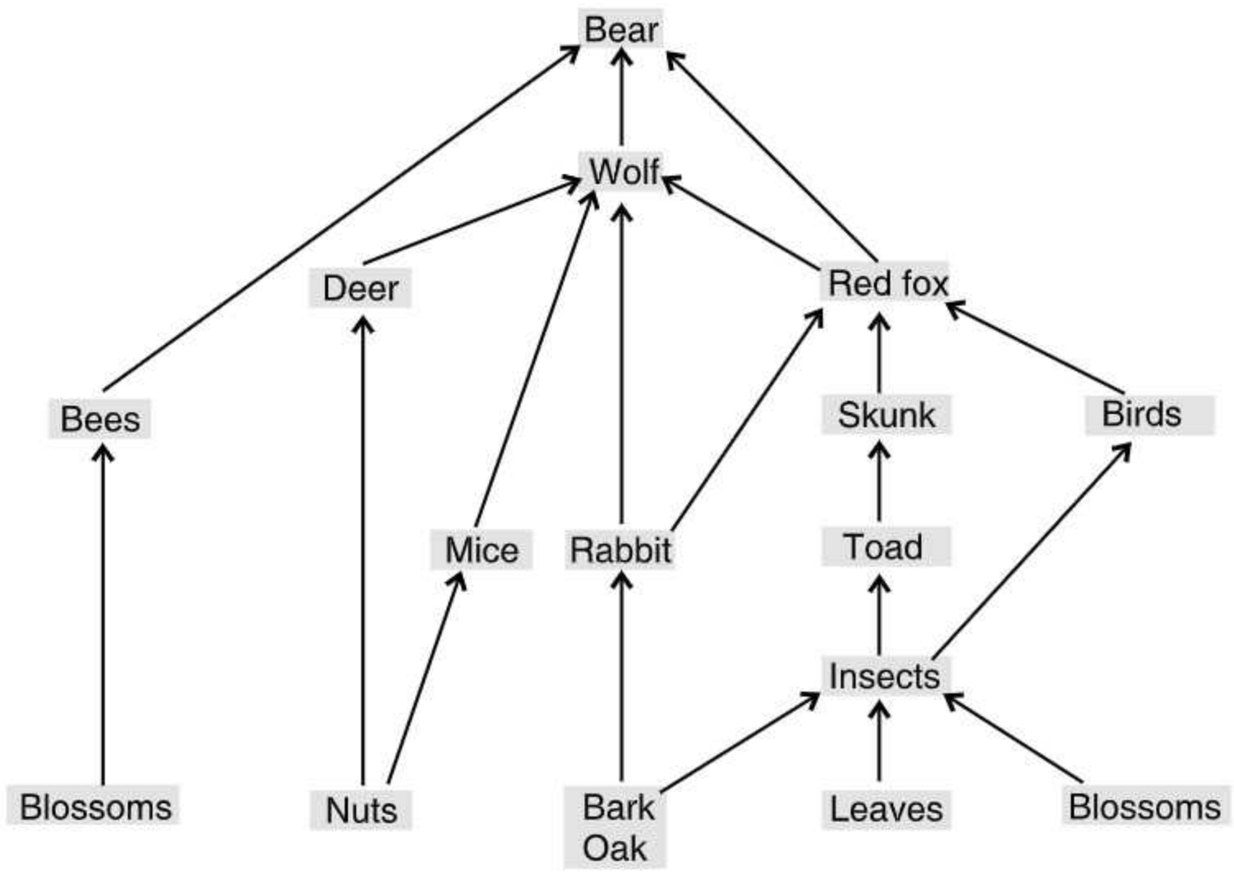
  Example :

Grass	→	Grasshopper	→	Frogs	→	Snakes
(4000 J)		(400 J)		(40 J)		(4 J)

- **Significance of food chain :**
  - It helps in understanding the food relationship and interactions among various organisms in an ecosystem.
  - It helps in following the basic mechanism of transfer of food energy and nutrients through various components of nature.
  - It helps to understand the movement of toxic substances in an ecosystem and the problem of their biological magnification.
- **Sample Food Chains :**

Trophic Level	Grassland Biome	Pond Biome	Ocean Biome
Primary Producer	Grass	algae	phytoplankton
Primary Consumer	grasshopper 	mosquito larva 	zooplankton 
Secondary Consumer	rat 	dragonfly larva 	fish 
Tertiary Consumer	snake 	fish 	seal 
Quaternary Consumer	hawk 	raccoon 	white shark 

➢ **Sample Food Web :**



➢ **Biological magnification:** The concentration of harmful chemical increases with every next trophic level in a food chain. It is called bio-magnification. As human beings occupy the top of any food chain, the maximum concentration of these chemicals get accumulated in human body.

➢ **Ozone (O_3)** is a molecule formed by three atoms of oxygen.

$$NO_2 \xrightarrow{\text{Light}} NO + O, \qquad O_2 \xrightarrow{UV} O + O, \qquad O + O_2 \rightarrow O_3$$

➢ Due to **ozone layer depletion**, the ultraviolet rays reach the Earth and causes certain ill-effects which are harmful to us and crops. Exposure to UV rays can lead to greater incidence of skin cancers, cataracts and damages the eye and cause immune deficiency.

➢ **Four appliances which releases chlorofluorocarbon are :**

(a) Aerosol spray **(b)** Air conditioner **(c)** Refrigerator **(d)** Coolant

➢ **Non-biodegradable substance :**

(i) These are poisonous substances that either do not degrade or degrade very slowly in nature.

(ii) They affect environment. They may enter the food chain and show biological magnification.

(iii) They contaminate water and soil resources as they cannot be decomposed by micro-organisms.

(iv) The non-biodegradable waste have long lasting effect and cause environmental problems that affect much.

➢ **Some eco-friendly activities :**

(i) Gardening and planting trees.

(ii) Use of gunny bags / paper bags in place of polythene bags.

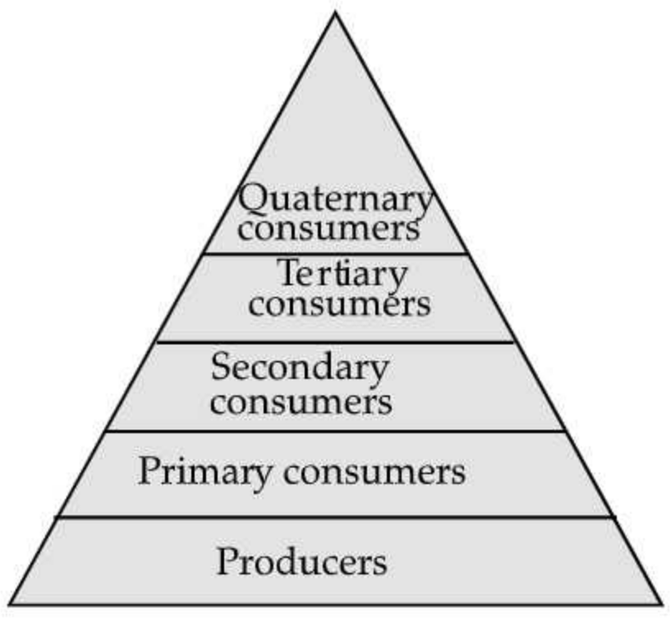
(iii) Use of compost and vermi-compost in place of fertilizers.

(iv) Separation of biodegradable and non-biodegradable substances.

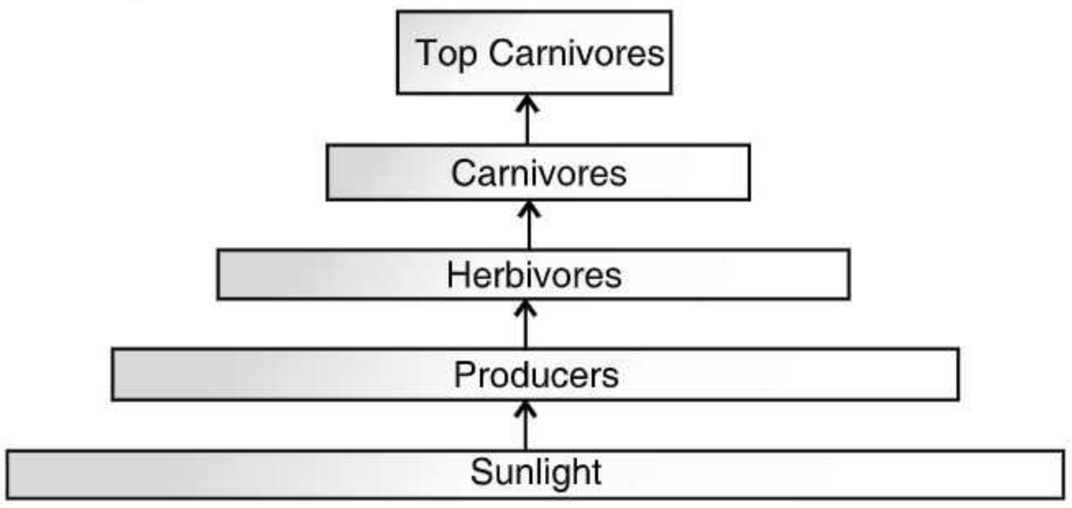
(v) Fostering compassion and respect to all living beings and the environment by educating youth.

➢ **Important Diagrams :**

- **Trophic Levels :**



- **Flow of energy in an ecosystem :**



CHAPTER 16 : Management of Natural Resources

Key Points and Concepts

- Forest, wild life, water, coal and petroleum are natural resources.
- Exploitation of these natural resources causes damage to our environment.
- There are certain international laws and regulations to protect our environment.
- **Ganga action plan :** The Ganga action plan came in 1985 to improve the quality of Ganga.
- Contamination of river water is indicated by the presence of coli-form bacteria and acidic water.
- Coliform is a group of bacteria, found in human intestines, whose presence in water indicates contamination by disease-causing microorganisms.
- **The 3R's to save environment are :** Reduce, Recycle and Reuse.
- **Some examples of 3R's :**
  - By switching off unnecessary lights and fans to save electricity.
  - By repairing leak taps to save water.
  - Recycling, plastic, paper, glass and metal items to make required things.
  - The used envelopes can be reversed and can be used again instead of throwing away.
- **Sustainable development** is the economic development that is conducted without depletion of natural resources.
- **Need of sustainable management :** Our natural resources are limited. With the rapid increase in human population, due to improvement in health care, the demand for all resources is also increasing. Sustainable management is necessary to provide the economic well being to the present and the future generations and to maintain a healthy environment and life support system.

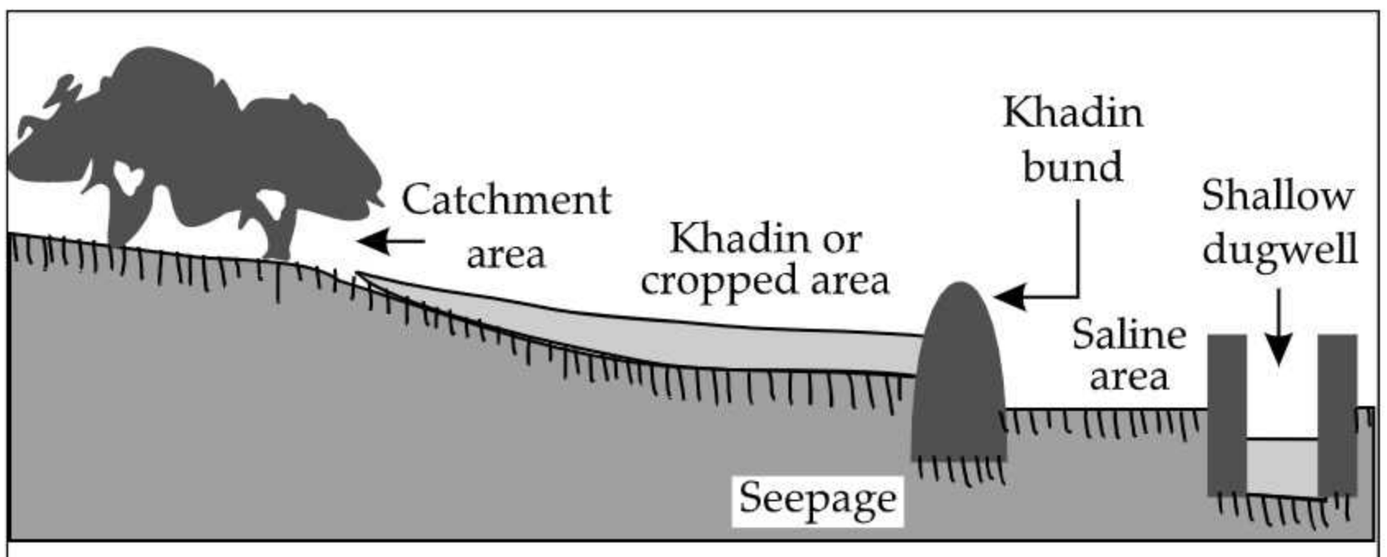
- **Components of fossil fuels :**
  - Carbon,
  - Nitrogen,
  - Hydrogen,
  - Sulphur
- **Reason to reduce use of fossil fuel :**
  - These are non-renewable (exhaustible) *i.e.,* once used, they can not be easily replaced.
  - They contribute to global warming.
  - They causes pollution.
- Water is a basic necessity for all terrestrial forms of life. However, human intervention pollute water bodies. Also, they change the availability of underground water.

- **Advantages of water stored in ground :**
  - Water spreads to recharge wells.
  - Provides moisture to vegetation over a wide area.
  - Does not provide breeding ground to mosquitoes.
  - Protected from contamination.
- Large dams ensure the storage of adequate water for irrigation and for generating electricity

- **Advantages of Dams :** For Irrigation and for producing electricity.
- **Disadvantages of building dams :**
  - Displace large number of peasants and tribals without adequate compensation or rehabilitation.
  - They swallow up huge amounts of public money.

- **Water Harvesting** is the collection of rain water and its utilization for various purposes.
- **Advantages of Water Harvesting :**
  - It ensures water availability in non-rainy season.
  - Water becomes available for drinking as well as irrigation.
- Khadin system is based on the principle of water harvesting of rain water on farmland.
- Forests are biodiversity hotspots. Many different life forms are found in the forests.
- **Forest Stakeholders :**
  - Forest stakeholders include all those people who either live in forest or nearby forest and are dependent on them to meet their each and every requirement.
  - The people living in or around the forests who are directly dependent on forest product for their livelihood.
  - The Forest Department of the government which owns the land and controls the resources from forests.
  - The industrialists who use the forest products, but are not dependent on the forest of a particular area.
  - The wildlife and nature enthusiasts, who want to conserve nature in its present form.

- **Important Diagrams :**
  - **Khadin System of Water Harvesting :**



Khadin system of water harvesting