Chapter 5: "The Fundamental Unit of Life"

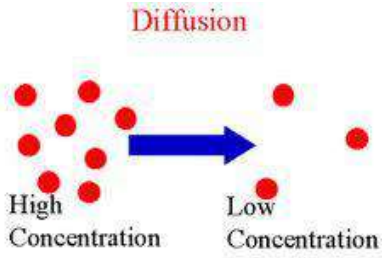
KEY CONCEPTS : *[*rating as per the significance of concept]*

CONCEPTS	**RATING**
Study of historical perceptive related to cell discovery	*****
Study of Microscope	**
Study of Hypotonic/Isotonic/ Hypertonic solutions relation to osmosis.	****
Cell wall	***
Nucleus	*****
Cytoplasm	***
Cell organelles	*****

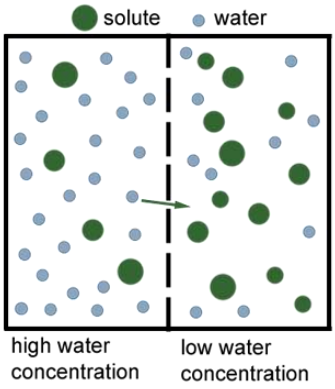
1. All the living organisms are made up of fundamental unit of life called**" cell"**.
2. The cell is a Latin word for "**a little room**".
3. The scientist Robert Hooke saw a little room in the cork (the bark of a tree) resembled the structure of a honeycomb. The use of the word "Cell" to describe these units is used till this day in Biology as**" Cell Biology**".
4. The **Compound Microscope** consist eye piece,objective lens and condenser to observe a cell after putting a drop of **Safranin** (for plant cell) and methylene blue (for animal cell). (Please refer to Fig. 5.1: Compound Microscope NCERT Book Page-57)
5. The scientist **Leeuwenhoek saw free living cells** in the pond water for the first time. (father of microbiology)
6. The scientist **Robert Brown discovered the nucleus** in the cell.
7. The **cell theory** states that all the plants and animals are composed of cells, it was **proposed by Schleiden and Schwann.**
8. The **cell theory** was further expanded by Virchow by suggesting that "**all cells arise from the pre-existing cells".**
9. The cells differ in size, shape, structure (Please refer to Fig. 5.2/5.3: Onion peel/Various cells in Human body, NCERT Book Page-57/58):**Types of cells: Onion cells, Smooth muscle cell, Blood cells, Bone cell, Fat cell, Nerve cell, Ovum, Sperm etc. Each kind of cell performs specific function.**

10. A single cell may constitute a whole organism as in **Amoeba, Chlamydomonas, Paramecium and Bacteria;** these are called as **unicellular organisms**. Whereas in multi-cellular organisms (Human beings) division of labor is seen.
11. **The feature in almost every cell is same**: **Plasma membrane, nucleus and cytoplasm**.
12. **Plasma membrane**: It is the outermost covering of the cell.

- It is called as **selective permeable membrane** (because it prevents movement of some materials).
- It helps in **diffusion** and osmosis
- Diffusion: movement of substance from high concentration to low concentration.
  Eg; exchange of carbon dioxide or oxygen with external environment.



osmosis: it is the passage of water from the region of high water concentration to a region of low water concentration through a selective permeable membrane.



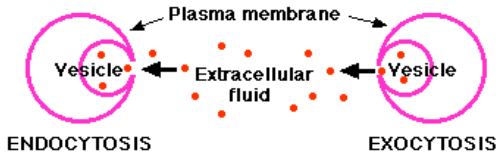
a) The cell gains water, if the medium surrounding the cell has a higher water concentration (**Hypotonic solution**) than the cell.

b) The cell maintains the same water concentration as the cell (**Isotonic solution**), water crosses the cell membrane in both directions.

c)The cell loses water, if the medium has lower water concentration (**Hypertonic solution**) than the cell.

Note - The cell drinking is endosmosis;

- omission of water is called ex-osmosis.



13. The cell engulfs food is called endocytosis and ejects solid is called **exocytosis**. Amoeba acquires food through endocytosis and excretion of solid is called exocytosis.
14. **The cell wall** is a rigid outer covering composed of cellulose. It provides structural strength to plant cells. When a living cell loses water, there is shrinkage of contents of a cell away from the cell wall. This phenomenon is called as **plasmolysis**. The cell walls permit the cells of plants, fungi and bacteria to withstand very dilute (Hypotonic) external media without bursting.
15. **The Nucleus:** It is a dark colored, spherical or oval, dot-like structure near the center of a cell called Nucleus. The nucleus plays a central role in cellular activities/ reproduction. The chromatin material gets organized into chromosomes. The chromosomes contain information for inheritance of features from parents to next generations in the form of **DNA**(Deoxyribo Nucleic Acid) and protein molecules. The functional segments of DNA are called genes.
16. In some organisms like Bacteria nucleus is not covered by nuclear membrane. Hence it is called as **prokaryote.** (Pro= primitive; karyote = karyon = nucleus.) The organisms with cells having a nuclear membrane are called **eukaryotes.**
17. **Differences between prokaryotes and eukaryotes**(Please refer to Fig. 5.4: Prokaryotic cell NCERT Book Page-62)

Prokaryotes	Eukaryotes
Size: generally small (1-10 µm)	Size: generally large. (5-500 µm)

Nuclear region: Not well defined and not surrounded by a nuclear membrane & known as nucleoids.	Nuclear region: Well defined and surrounded by a nuclear membrane
Chromosome: Single	Chromosome: More than one chromosome
Membrane-bound cell organelles absent	Membrane-bound cell organelles present
Eg- bacteria, blue green algae	Eg fungi, plant cell and animal cell.

18. **Cell organelles**: Every cell has fluid matrix (other than nucleus) is called cytoplasm. The nucleus and cytoplasm is together called as protoplasm. The protoplasm term was coined by Purkinje. It has important cell organelles: Endoplasmic Reticulum (ER), Golgi apparatus, Lysosomes, Mitochondria, Plastids, and vacuoles.
19. **Endoplasmic Reticulum (ER):** It is a large network of membrane –bound tubules and vesicles.

    - <u>There are two types of Endoplasmic Reticulum</u>
    - Rough Endoplasmic Reticulum (RER) (It looks rough because Ribosomes are attached to its surface. They are the sites of protein synthesis).
    - Smooth Endoplasmic Reticulum (SER) (It looks smooth because Ribosomes are not attached to its surface. They are the sites of fat molecules synthesis).

        1. SER ; help in the functioning of enzymes and hormones to carryout biochemical activities.
        2. SER detoxifies many poisons and drugs from the cell.

    2. ER serves as channel for the transport of material between various regions of the cytoplasm and the nucleus.
    3. Proteins and fat molecules produced by ER helps in membrane biogenesis.

20. **Golgi apparatus**: It was first described by a scientist Camillo Golgi. It is a system of membrane bound vesicles called cisterns. It functions include the storage,

modification and package of cell products. The complex sugars are made from simple sugars in the Golgi apparatus. It is also involved in the formation of lysosomes.

21. **Lysosomes**: They contain membrane-bound sacs with powerful digestive enzymes (enzymes are made by RER) to digest the worn-out cell organelles. When the cell gets damaged, lysosomes may burst and the enzymes digest their own cell, hence called as "Suicidal bags of a cell". It is a waste disposal system of the cell.
22. **Mitochondria**: It is covered by a double membrane. Outer membrane is very porous and the inner membrane is deeply folded. These folds create a large surface area for ATP (Adenosine Triphosphate) molecule synthesis. ATP is the energy currency of a cell; hence the Mitochondria are called as Power House of a Cell. Mitochondria have their own DNA and Ribosomes; therefore they can make their own proteins.
23. **Plastids:** They are present only in plant cells. They are two types.
    1. Chromoplasts (Colored Plastids: Chloroplasts – Green pigmented and useful in Photosynthesis and also contains various other pigments like yellow or orange)
    2. Leucoplasts (White or colorless plastids; stores materials such as oils, proteins, fats etc.) Plastids are also covered by a double membrane. The matrix is called Stroma, seat for enzymatic actions. Plastids have their own DNA and Ribosomes; therefore they can make their own proteins.
24. **Vacuoles:** Storage sacs for solid or liquid contents. They are small in size in animals while plants have large, may occupy 50-90 % of the cell volume. Helps to provide turgidity and rigidity to the cell. Many substances like amino acids, sugars, organic acids and proteins are stored in vacuoles. In Amoeba food vacuole is specialized to play an important role.
25. **Cell:** It is the fundamental structural unit of living organisms, helps in respiration, obtaining nutrition and clearing waste material or forming a new protein.

Differences between Plant cell and Animal Cell

(Please refer to Fig. 5.5 Animal cell & 5.6: Plant cell NCERT Book Page-63&64)

ANIMAL CELL	PLANT CELL
Cell wall absent	**Cell wall present**
Plasma membrane is the outer layer which provides turgidity to the cell	**Cell wall is the outer layer which gives rigidity and turgidity to the cell**
Vacuoles are small in size	**Vacuoles are big in size**
Plastids are absent	**Plastids are present**
Nucleus lies in the centre.	**Nucleus lies on one side**

Question Bank

1. All the living organisms are composed of fundamental unit called as……. (Cell)
2. Who discovered the nucleus in the cell…….(Robert Brown)
3. Who saw the free living cells for the first time……..(Leeuwenhoek)
4. Name two unicellular organisms ……. ……..(Amoeba, Chlamydomonas,)
5. Write two differences between prokaryotes and eukaryotes……..(Nuclear region/ Chromosome)
6. What are the two types of ERs ……. (RER/ SER)
7. What are the functions of Golgi Bodies? (It includes the storage, modification and package of cell products. The complex sugars are made from simple sugars in the Golgi apparatus).
8. What are the types of plastids (Chromoplasts& Leucoplasts)
9. Which are the substances stored in vacuoles? (Substances like amino acids, sugars, organic acids and proteins are stored in vacuoles)
10. Draw and label Animal cell & Plant cell(Ref NCERT Book Page-63&64)

QUESTION PAPER:FORMATIVE ASSESSMENT – I (For Practice)

Marks- 40 Time: 90 minutes

* General Instructions

1. Questions 1-5 (1 Mark each) 2. Questions 6-10 (2 Mark each)

3. Questions 11-15 (3Mark each) 4. . Questions 16-17 (5Mark each)

Q.1 What is ATP, expand the term ……..

Q.2 Cellulose is a Fat (Mention,True/False)……

Q.3 Which cell organelle is synthesizing the enzymes for the Golgi Apparatus……

Q.4 The flexibility of the cell membrane to engulf food and other material is called Endocytosis (Mention, True / False) ……

Q.5 What is the main function of Leucoplasts?

Q.6 Draw the structure of Ovum.

Q.7 Why the Plasma membrane is called as Selective Permeable Membrane?

Q.8 Describe what is an isotonic solution

Q.9 What is Plasmolysis?

Q.10 Write any two parts of a Compound microscope.

Q.11 Distinguish between Prokaryotic and Eukaryotic Cell.

Q.12 Write about the three properties of Cytoplasm.

Q.13 What is the significance of Vacuoles

Q.14 Write a short notes on Mitochondria.

Q.15 Explain the concept of diffusion.

Q.16 Draw the structure of a plant Cell and label it.

Q.17 Write the differences between a plant and animal cell.

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Chapter 6: "Tissues"

KEY CONCEPTS : *[*rating as per the significance of concept]*

CONCEPTS	RATING
Meristems in plants	**
Permanent tissues in plants	****
Animal tissues	*****

1. **Tissue** is a group of cells having similar origin, structure& function. Study of tissues is called **Histology**
2. In unicellular organism (Amoeba) single cell performs all basic functions, whereas in **multi-cellular organisms** (Plants and Animals) shows **division of labor as Plant tissue & Animal tissues**.
3. Plant tissues are two types: Meristems & Permanent tissues.
4. **Meristems:** The Meristems are the tissues having the power of cell division. It is found on those region of the plant which grows.
5. Types of Meristems;

    1. **The Apical meristems – It is present** at the growing tip of the stem and roots and increases the length.
    2. **The lateral meristems - present** at the lateral side of stem anf root (cambium) and increases the girth.
    3. **The intercalary meristems - present** at internodes or base of the leaves and increases the length between the nodes.

(Please refer to Fig. 6.2: location of meristems in plant body , NCERT Book Page- 69).

26. **Permanent tissues:** Two types such as Simple permanent tissues & Complex permanent tissues.

a) **Simple permanent tissues:** subdivided as

(i): **Parenchyma:** Tissues provide the support to plants.They are loosly packed and has large intracellular space.

- Parenchyma with chlorophyll which performs photosynthesis is called as chlorenchyma.
- The parenchyma with large air spaces to give buoyancy is called as aerenchyma .Parenchyma also stores food and water.

(ii**) Collenchyma**: Tissue provides mechanical support, thickened at the corners, have very little intercellular space. It allows easy bending of various parts of a plants without breaking

(iii) **Sclerenchyma**: Tissue makes the plant hard and stiff, thickened due to lignin and no intercellular space. Cells of this tissue are dead and commonly seen in the husk of coconut.

(iv**) Guard cells& Epidermal tissue**: the tissue aids in protection and exchange of gases. Guard cells kidney shaped in dicots, dumb bell shaped in monocots to guard the stomata. The epidermal tissues of roots aid in absorption of water and minerals. The epidermal tissues in desert plants have a thick waxy coating of Cutin with waterproof quality. The epidermal tissues form the several layer thick Cork or the Bark of the tree.
(Please refer to Fig. 6.3- 6.6, NCERT Book Page-70-73).

b) **Complex permanent tissues:** The complex tissues are made of more than one type of cells. All these cells coordinate to perform a common function.

They are subdivided as;

Xylem: It consists of tracheids, vessels, xylem parenchyma and xylem fibers. The cells have thick walls,

Function - aids in conduction of water and minerals.

Phloem: It consists of sieve tubes, companion cells, phloem parenchyma, and phloem fibers.

Function - Phloem transports food material to other parts of the plants.

(Please refer to Fig. 6.7, NCERT Book Page-73).

6. **Animal tissues**: Sub divided as ***epithelial tissue, connective tissue, muscular tissue and nervous tissue.***

i. **Epithelial tissue**: It is a protective covering forming a continuous sheet. Simple epithelium is the one which is extremely thin in one layer, whereas stratified epithelium are arranged in pattern of layers.

Depending on shape and function they are classified as:

a) **Squamous epithelium** in the lining of mouth and esophagus.
b) **Cuboidal epithelium** in the lining of kidney tubules and salivary glands.
c) **Columnar epithelium** in the intestine &Columnar epithelium with cilia in the lining of respiratory tract.
d) **Glandular epithelium** in the Glands aids in a special function as gland cells, which can secrete at the epithelial surface.

(Please refer to Fig. 6.9, NCERT Book Page-75).

ii) Connective Tissue: Five Types, such as;

a) Blood: The Blood is a fluid connective tissue. Blood plasma has RBCs (Red Blood Cells) WBCs (White Blood Cells) and platelets. Blood plasma contains proteins, salts and hormones. Blood flows and transports gases, digested food, hormones and waste materials.

b) Bone: The bone is a connective tissue with hard matrix, composed of calcium and phosphorus. A bone is connected by another bone with another connective tissue called ligaments. A bone is connected by muscle with another connective tissue called tendon.

c) Cartilage: The cartilage is a connective tissue with solid matrix composed of proteins and sugars. It is commonly seen in nose, ear, trachea, and larynx.

d) Areolar Connective Tissue: It is found between the skin and muscles, around the blood vessels. It supports internal organs and aids in repair of tissues.

e)Adipose Connective Tissue: It is filled with fat globules for the storage of fat. It acts as insulator. ***(Please refer to Fig. 6.10, NCERT Book Page-76).***

Muscular tissues: They have special contractile proteins responsible for movements. Three types, such as;

Striated muscles/skeletal muscles/voluntary muscles :

They are cylindrical, un-branched and multinucleated.They have dark bands and light bands.

Unstriated muscles/smooth muscles/involuntary muscles:

They are commonly called as Smooth muscles, having no striations (dark bands/ light bands are absent). Commonly found alimentary canal, uterus, Iris of an Eye. They are spindle shaped. Involuntary in nature

Cardiac Muscles: They are commonly called as Heart muscles, cylindrical,

branched and uni-nucleate. Involuntary in nature.(Please refer to Fig. 6.11, NCERT Book Page-77).

Nervous Tissue: The tissue responds to stimuli. The brain, spinal cord and nerves are composed of nervous tissue or neurons. A neuron consists of Cell Body, cytoplasm, Nucleus, Dendrite, Axon, nerve ending. The neuron impulse allow us to move our muscles when we want to respond to stimuli. (Please refer to Fig. 6.12, NCERT Book Page-78).

Question Bank

1. Define the term tissue……. (A group of cells forms tissue)
2. What is Histology? (Study of different tissues)
3. How many types of meristems are present in plants? (3 : **Apical meristems, Lateral meristem, Intercalary meristem**)
4. Name the Parenchyma with chlorophyll which performs photosynthesis…… (chlorenchyma)
5. Which plant tissue makes the plant hard and stiff and thickened due to lignin with no intercellular spaces ……..(Sclerenchyma)
6. Give the details of epidermal tissue in Plants. (For protection and exchange of gases. Guard cells kidney shaped in dicots, dumb bell shaped in monocots to guard the stomata. The epidermal tissues of roots aid in absorption of water and minerals.)
7. Which elements constitute the Phloem? (Sieve tubes, companion cells, phloem parenchyma, and phloem fibers.)
8. Distinguish between ligament and tendon (A bone to bone connective tissue called ligament. A bone to muscle connective tissue called tendon**.)**
9. Name the three muscular tissues in the animals**……..(**Striated muscles ,Un- Striated muscles, Cardiac Muscles)
10. Draw the neuron and label it (Please refer to Fig. 6.12, NCERT Book Page-78).

QUESTION PAPER: FORMATIVE ASSESSMENT – I (For Practice)

Marks- 40 Time: 90 minutes

* General Instructions

1. Questions 1-5 (1 Mark each) 2. Questions 6-10 (2 Mark each)

3. Questions 11-15 (3Mark each) 4. . Questions 16-17 (5Mark each)

Q.1 What is a group of cells that are similar in structure and work called?

Q.2 Which is the hardest connective tissue?

Q.3 What is the name of Blood matrix?

Q.4 By what process permanent tissues are formed?

Q.5 Two bones are connected with ligaments. Mention True/ False…….

Q.6 What are the two main types of tissues found in plants?

Q.7 Draw the structure of Stomata and label it.

Q.8 Write the main functions of parenchyma

Q.9 What are the fluid connective tissues?

Q.10 What is the difference between voluntary and involuntary muscles?

Q.11 Write a short notes on Cardiac muscles.

Q.12 Draw a labeled diagram of areolar tissue.

Q.13 Mention the three elements of Xylem tissue.

Q.14. Write a short notes on Glandular Epithelium.

Q.15. Write three significant points about Sclerenchyma

Q.16 With the help of suitable diagram, describe the Phloem.

Q.17 Draw and label the Nerve Cell.Explain in brief.

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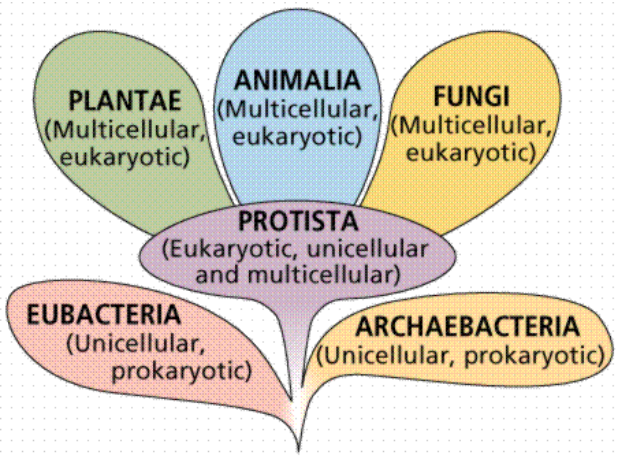
Chapter 7: "Diversity in Living Organisms"

KEY CONCEPTS : *[*rating as per the significance of concept]*

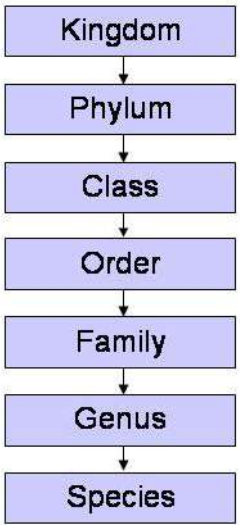
CONCEPTS	**RATING**
Basis of classification	***
Hierarchy of classification	****
Kingdom Plantae	*****
Kingdom Animalia	*****

1. Each **organism** is different from all other organisms.
2. In this activity, we decide which **characteristics** (we can run, but the Banyan tree can't run is a characteristic) are important in forming the desired **category.**
3. **Greek thinker Aristotle classified animals according to whether they lived on land, in water or in air.** This classification is a landmark in ideology, but has limitations. For example, animals that live in the sea include Corals, Whales, Octopus, Starfish, and Shark. In fact they are different from each other.
4. **Classification and Evolution:** organisms are classified based on body design, hierarchy in developing, relation to evolution. **Charles Darwin** first described the idea of evolution in 1859 in his book " **The Origin of Species**"
5. The Biologists, such as Haeckel, Whittaker & Carl Woese tried to classify all living organisms into broad Kingdoms. **The Whittaker proposed five kingdoms: Monera, Protista, Fungi, Plantae and Animalia. Carl Woese introduced by dividing Monera into Archaebacteria and Eubacteria.**



6. **Hierarchy of Classification** :

Linnaeus's System of Classification



7. **Monera**: They have **unicellular, Prokaryotic organisms** (do not have defined nucleus or organelles). The cell wall may or may not present. The mode of nutrition is **autotrophic** (synthesizing food on their own) (**or)heterotrophic** (getting food from environment). **Ex. Bacteria, Anabaena**. ((Please refer to Fig. 7.1 Monera NCERT Book Page-83)
8. **Protista:** They have **unicellular eukaryotic organisms** (do have well defined nucleus or organelles). The body is covered by **cilia, flagella for locomotion**. The mode of nutrition is **autotrophicorheterotrophic**. Ex. Diatoms, protozoans.(Please refer to Fig. 7.2 NCERT Book Page-84)

9. **Fungi:** These are multi-cellular **eukaryotic organisms with cell wall, made up of Chitin.** They do not perform Photosynthesis (**heterotrophic), Saprophytic** (derive nutrition from decaying material). Ex. Aspergillus, Penicillium, Mushroom, Rhizopus. The fungi living with algae forms **Lichen** (Symbiotic **Association**) .(Please refer to Fig. 7.3 NCERT Book Page-84).
10. **Plantae:** These are multi-cellular eukaryotic organisms with cell wall, made up of Cellulose. Able to perform photosynthesis (**autotrophic). Ex. Rice, wheat.**
11. **Animalia: These are multi-cellular eukaryotic organisms without cell wall.** They are not able to perform photosynthesis **(heterotrophic). Ex Human beings, Peacock.**

(Please refer to Fig. 7.4 NCERT Book Page-85).

DETAILS OF KINGDOM PLANTAE

1. The kingdom Plantae is further classified as Thallophyta, Bryophyta, Pteridophyta, Gymnosperms, Angiosperms .

2.Thallophyta: The plants do not have well defined body design, commonly called as" **Algae**", mostly aquatic. Ex. **Spirogyra, Ulothrix.** ***(Please refer to Fig. 7.5 NCERT Book Page-86).***

3. **Bryophyta:** These are commonly called as the **"Amphibians of Kingdom".** The plant body is differentiated into **roots like, stem like and leaf like structures**. No specialized tissues for the conduction of water and food.Ex. Marchantia, Funaria. (Please refer to Fig. 7.6 NCERT Book Page-86).

4.**Pteridophyta:** These are commonly called as the **"First vascular land plants ".** The plant body is differentiated into root, stem and leaf. Specialized tissues for the conduction of water and food are developed in these plants. The reproductive organs are inconspicuous. Ex. Marsilea, Fern. (Please refer to Fig. 7.7 NCERT Book Page-87).

Special Note: The reproductive organs are inconspicuous in Thallophyta, Bryophyta, Pteridophyta are can't develop seeds. They are together called as" **Cryptogamae (Non-Flowering Plants)**". The plants with well differentiated reproductive organs and that

ultimately **make seeds** are called**" Phanerogams (Flowering Plants)**". This group is further classified **Gymnosperms** (Bear naked Seeds) &**Angiosperms** (Bears seeds inside Fruit).

5. **Gymnosperms:** These are commonly called as "**Naked seed bearing plants".** They areusually perennial, evergreen and woody. Ex. Pinus, Cycas (Please refer to Fig. 7.8 NCERT Book Page-87).

6. **Angiosperms:** These are commonly called as **"Enclosed seed bearing plants**". Plants with seeds having a single cotyledon are called as" **Monocotyledons or Monocots".** Plants with seeds having two cotyledons are called as "**Dicots". Ex. Ipomoea, Paphiopedium.**
(Please refer to Fig 7.9 &. 7.10 NCERT Book Page-87 ;Fig. 7.11 Page-88).

DETAILS OF KINGDOM ANIMALIA

These are Eukaryote, multicultural and hetero-tropic.

They are further classified as **Non- Chordates**(Porifera, Coelenterata, Platyhelminthes , Nematoda, Annelida, Arthropoda, Mollusca, Echinodermata) and **Chordates** { Protochordata, Vertebrata (Pisces, Amphibians, Reptilia, Aves, Mammalia)} .

I.Non- Chordates

1. **Porifera:** The word Porifera" **means organisms with holes**"**.** The **canal system** helps in circulating water, food, oxygen. They are non-motile with cellular level of organization and mainly **marine** organisms with hard outer coat called as **Skeleton.** They are commonly called as **Sponges. Ex. Spongilla, Sycon(Please refer Fig. 7.12, NCERT Text Book Page- 89)**

2. Coelenterata: The wordCoelenterata" **means organisms with body cavity calledCoelenteron"** . They are radially symmetrical, **Diploblastic** (two layers of cells), commonly called as **Cnidarians (** Stinging cells for protection are present in the body). Ex. Hydra, Sea Anemone **(Please refer Fig. 7.13, NCERT Text Book Page- 89).**

3. Platyhelminthes: The word **Platyhelminthes means organisms with flatworms (dorsocentrally flattened)**".They are bilaterally symmetrical **Triploblastic** (three layers of

cells), **either free-living or parasitic**. **No true Coelom is present - Acoelomates.** Ex. Planaria(Free living) , Tape worm(Parasitic)**(Please refer Fig. 7.14, NCERT Text Book Page- 90).**

4. Nematoda: The word **Nematoda** "means **organisms with roundworms".** They are bilaterally symmetrical **Triploblastic** (three layers of cells), **familiar with parasitic worms**. The **false Coelom is called as Pseudocoelome. Ex. Ascaris, Wuchereria (Filarial worm causes elephantiasis).)(Please refer Fig. 7.15, NCERT Text Book Page- 90).**

5.Annelida: The word **Annelida** " **means organisms with metameric-segmented".** They are bilaterally symmetrical Triploblastic(three layers of cells) with closed circulatory system, **familiar with earth worms**. The **Coelom is called as true Coelom. Ex. Neris, Earth worm, Leech (Please refer Fig. 7.16, NCERT Text Book Page- 90).**

6. Arthropoda: The word **Arthropoda** "means **organisms with jointed legs"** They are bilaterally symmetrical Triploblastic(three layers of cells), **familiar with cockroaches**. The **Coelom is blood filled called as Haemo Coelom. Ex. Prawn, Scorpion, Housefly (Please refer Fig. 7.17, NCERT Text Book Page- 91).**

7. Mollusca: The word **Mollusca** "means **organisms with soft body"** They are bilaterally symmetrical, Triploblastic(three layers of cells), **familiar with Octopus, Pila**. Foot is for moving, kidney like organ for excretion, with open circulatory system. **Ex. Unio, chiton(Please refer Fig. 7.18, NCERT Text Book Page- 91).**

8. Echinodermata: The word **Echinodermata** "means **organisms with spiny skinned". Exoskeleton is with calcium carbonate.** They are radially symmetrical **Triploblastic** (three layers of cells) with coelomic cavity, **familiar with Star fish**. They are **exclusively free-living marine animals**. Ex**. Sea Cucumber, Feather Star (Please refer Fig. 7.19, NCERT Text Book Page- 91).**

II.Chordates: They are further classified as two major groups such as **Protochordata& Vertebrata**

(A).Protochordata: Notochord present in at least larval forms, but very rudimentary. It is a rod like supporting structure, runs along with nervous tissue from the gut of animal. They

are bilaterally symmetrical, triploblastc(three layers of cells) with a Coelom, **familiar with Amphioxus**. Ex. **Balanoglossus(Please refer Fig. 7.20, NCERT Text Book Page- 92).**

(B).Vertebrata: Notochord is replaced by vertebral column and internal skeleton. They are bilaterally symmetrical, triploblastic, coelomic and segmented having paired gill pouches. Vertebrates are grouped into five classes.

1. Pisces: These are commonly called as **"fishes", exclusively aquatic. Body is streamlined** and a **tail for locomotion. Gills for respiration, heart is two chambered, cold blooded, skin is covered with scales, plates. They are cold-blooded animals. Skeleton of bone (Rohu) / cartilage(Shark). They lay eggs. Ex. Lion Fish, Dog Fish (Please refer Fig. 7.21, NCERT Text Book Page- 92).**

2. Amphibians: These are commonly called as **"Amphibians"** because they can **live on land and in water". Body is streamlined** and a **webbed foot/ foot for locomotion. Gills or lungs or skin for respiration, heart is three chambered, cold blooded, skin is lack of scales, plates. They are cold-blooded animals. They lay eggs. Ex. Rana, Hyla (Please refer Fig. 7.22, NCERT Text Book Page- 93).**

3. Reptilia: These are commonly called as **"Reptilians". A lung for respiration, heart is three chambered (Crocodile heart is four chambered), skin have scales. They are cold-blooded animals. They lay eggs. Ex. Snakes, Turtles (Please refer Fig. 7.23, NCERT Text Book Page- 93).**

4. **Aves :**These are commonly called as **"Birds". A lung for respiration, heart is four chambered, fore limbs are modified for flight, skin has feathers. They are warm-blooded animals. They lay eggs. Ex. Ostrich (Flightless Bird), Pigeon, Sparrow (Please refer Fig. 7.24, NCERT Text Book Page- 94).**

5. Mammalia: These are commonly called as **"animals with mammary glands for producing milk to nourish their young ones". A lung for respiration, heart is four chambered, skin has hairs, sweat or oil glands. They are warm-blooded animals. They lay eggs (Platypus, Echidna), give birth to young ones poorly developed (Kangaroo) & give birth to developed**

young ones (Human beings). Ex. Lion, Whale, Bat *(Please refer Fig. 7.25, NCERT Text Book Page- 94& Fig.7.26, classification of Animals, Page- 95).*

DETAILS OF NOMENCLATURE

NOMENCLATURE: The system of **scientific naming or nomenclature** was **introduced by Carolus Linnaeus**. It is **unique to identify in the world.** We limit ourselves to writing **the names of the Genus and Species** of that particular organism**.** The world over, it has been agreed that both these names will be used in **Latin forms**.When **printed** is given in **italics** and when **written by hand**, the Genus and Species name have to be **underlined separately. Ex. Ostrich** (Common name)**: *Struthiocamelus***(scientific name with two parts namely the Genus and Species).

QUESTION BANK

1. What is the book written by Charles Darwin?..... (The Origin of Species)

2. Who proposed the five kingdoms such as, Monera, Protista, Fungi, Plantae and Animalia? (Whittaker)

3.Monera members areunicellular, Prokaryotic organisms, mention TRUE/ FALSE ….. (TRUE)

4. The Diatoms belongs to the kingdom**.....** (Protista)

5. TheAnabaena belongs to the kingdom ……(Monera)

6…….. are commonly called as the"Amphibians of Plant Kingdom".**(** Bryophyta**)**

7. The warm-blooded animals with fore limbs modified for flight, skin has feathers are called as…….. (Aves/Birds)

8. Write the four salient features of Reptiles.

9.Compare the Pisces and Amphibians.

10..Write the five salient features of Mammalia, give two examples.

QUESTION PAPER:FORMATIVE ASSESSMENT – I (For Practice)

Marks- 40 Time: 90 minutes

* General Instructions

1. Questions 1-5 (1 Mark each) 2. Questions 6-10 (2 Mark each)

3. Questions 11-15 (3Mark each) 4. . Questions 16-17 (5Mark each)

Q.1 Anabaena is member of the Phylum……

Q.2 Aspergillum is a member of the Phylum……..

Q.3 Define the term Autotrophic mode of nutrition…….

Q.4 The fungus living with algae is called as ……..

Q.5 Name the scientist who has divided the Monera into two sub-groups……..

Q.6 Draw and label Paramecium.

Q.7 Distinguish the meaning of terms Gymnosperms and Angiosperms.

Q.8 What is Pseudocoelome? Give one example of it.

Q.9 What is Haemocoelome? Give one example of it.

Q.10 Write two salient features of mammalian group.

Q.11 What is the basis of nomenclature of organisms, give the scientific name of Ostrich.

Q.12 Give three salient features of Amphibia.

Q.13 Mention three features of Chordates.

Q.14. Draw and label Balanoglossus.

Q.15 Give two salient features of Aves and mention one example of a flightless bird.

Q.16 Write about the Hierarchy of Classification- Groups and mention basic unit of classification.

Q.17 Give the salient features of Bryophytes and draw the diagram of Funaria.

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Chapter 13: "Why do we fall ill?"

KEY CONCEPTS : *[*rating as per the significance of concept]*

CONCEPTS	RATING
Significance of Health	**
Disease and Its causes	***
Infectious diseases	*****
Principles of prevention of diseases	****

1."Health" is a state of being well enough to function well physically, mentally, and socially.

2."Disease"(disturbed ease) means being uncomfortable. One or more systems of the body will change, give rise to "Symptoms" (Cough, loose motions, pus formation, headache, fever, breathlessness, vomiting, fits, unconsciousness, inflammation , swelling and general effects - a Doctor look for the basis of symptoms). Diseases are basically two types- Acute Disease & Chronic Disease

3. Acute Disease: The disease which lasts for only a short period of time is called Acute Disease Ex. Common Cold.

4.Chronic Disease: The disease which lasts for long period of time is called Chronic Disease Ex. Tuberculosis.

Acute Disease	Chronic Disease
They are short duration disease	They are long lasting disease
Patient recovers completely after the cure	Patient does not recover completely
There is no loss of weight or feeling of tiredness afterward	There is often loss of weight of feeling of tiredness
There is short duration loss of work and efficiency	There is a prolonged loss of work and efficiency

5. Causes of Diseases : Most of the diseases have many causes, rather than one single cause, like unclean water, nourishment, genetic differences, genetic abnormalities e.g. Based on the causes diseases are of two types: Non-Infectious Diseases and Infectious Diseases.

6. Non-Infectious Diseases: Not caused by infectious agents, mostly internal and non-infectious cause. Ex. Cancer

7. **Infectious Diseases:** Caused by infectious agents.

SN	**Type Of Disease**	Example
1	**Bacterial diseases**	- Typhoid, Cholera, Tuberculosis, Acne, Anthrax,
2	**Viral diseases**	- Common Cold, Influenza, Dengue fever, AIDS, Japanese encephalitis or brain fever
3	**Fungal diseases**	Skin diseases
4	**Protozoan diseases**	-Malaria (Plasmodium), Kalaazar (Leishmania), Sleeping sickness(Trypanosomes)
5	**Worm diseases**	- Ascariosis (Round worm), Elephantiasis(Wuchereria)

(Please refer Fig. 13.1 (a-e), NCERT Text Book Page- 181).

a)The infectious diseases spread by agents are called as **Communicable Diseases.**

SN	**Type of Disease**	Example
1	**Air born Diseases**	- Pneumonia, common cold, Tuberculosis;
2	**Water born diseases**	- Cholera, hepatitis
3	**Sexual Diseases**	- HIV, Syphilis.
4	**Animal born Disease**	- Rabbis. *(Vector- the animal carrying infectious agent from a sick person to another potential host without getting affected Ex. Mosquito carrying Malaria Parasite).

(Please refer Fig. 13.2 & 13.3, NCERT Text Book Page- 183).

9. Principles of Treatment:

1. **Antibiotics-** many bacteria make a cell wall to protect themselves, the antibiotic (Penicillin) blocks the bacterial process that builds cell wall and blocks the biochemical pathways. Antibiotics do not work against viral infections. Antiviral medicine is harder than making Antibacterial medicine because Virus has only few biochemical mechanisms of their own. Other medicines bring down fever, reduce pain or loose motions. We can take bed rest to conserve energy.

10 Principles of Prevention : Following three limitation are normally confronted while treating an infectious disease:

- Once someone has disease, their body functions are damaged and may never recover completely.
- Treatment will take time, which means that someone suffering from a disease is likely to be bedridden for some time even if we can give proper treatment.
- The person suffering from an infectious disease can serve as the source from where the infection may spread to other people.

General ways of preventing infectious disease :

- Air-borne – We can prevent exposure by providing living condition that are not overcrowded.
- Water-borne – prevent by providing safe drinking water. This is done by treating the water to kill any microbial contamination.
- Vector-borne – We can provide clean environment, which would not allow mosquito breeding.

11. **Immunity:** Even in cells there is repair mechanism called" **Immunity".** Immune cells manage to kill off the infectious agents. **Smallpox disease** is eliminated by developing memory cells for particular infection by mimics the microbes, called" **Vaccine"**. The **basis of Immunization**- if you had smallpox once, there was no chance of suffering from it again. Proper nutrition is essential to maintain body immunity. There are vaccines against tetanus, diphtheria, whooping cough, measles, polio and many other diseases.

12. **Prevention of disease is better than cure. Hygiene is the basic key to maintain good health.**

QUESTION BANK:

1. Define Health……. (It is astate of being well enough to function well physically, mentally, and socially)

2. Name any two Symptoms of diseases…… (Cough& loose motions)

3. The disease which last for only a short period of time is called……(Acute Disease)

4. State whether Tuberculosis is aChronic Disease or Acute Disease…… (Chronic Disease)

5. Mention the causal organism for Sleeping sickness …… (Trypanosoma)

6.Cholera is a waterborne disease, mention TRUE/ FALSE …….. (TRUE)

7. Antibiotics do not work against viral infections, mention TRUE/ FALSE …….. (TRUE)

8. Write short notes on Immunity

(Even in cells there is repair mechanism called" Immunity"**.** Immune cells manage to kill off the infectious agents.)

9. Explain with an example the term Vaccine. (Smallpox disease is eliminated by developing memory cells for particular infection by mimics the microbes, called" Vaccine").

10. State reasons to support "Prevention of disease is better than cure".

QUESTION PAPER:FORMATIVE ASSESSMENT – I (For Practice)

Marks- 40 Time: 90 minutes

* General Instructions

1. Questions 1-5 (1 Mark each) 2. Questions 6-10 (2 Mark each)

3. Questions 11-15 (3Mark each) 4. . Questions 16-17 (5Mark each)

Q.1 Define Health

Q.2 Mention any two symptoms of diseases.

Q.3 Typhoid is a bacterial disease. Mention True/ False…….

Q.4 Sleeping sickness is caused by……

Q.5 Elephantiasis is caused by…….

Q.6. Mention two Air born diseases1……..2…….

Q.7 Mention two Sexually Transmitted Diseaes1……..2…….

Q.8 Mention two Viral Diseaes1……..2…….

Q.9 What is called vector. Give one example.

Q.10 Give two examples of Chronic diseases.

Q.11 Distinguish between Infectious and Non-infectious diseases.

Q.12 Write a short notes on Small Pox.

Q.13 What is immunity? Write short notes on it.

Q.14 What is Vaccination? Give the details, how it works in human body.

Q.15 Write three reasons for Cancers.

Q.16 What are the basic five principles of treatment for diseases.

Q.17 How Hygiene could help you to maintain good health and mention five situations to take care about health.

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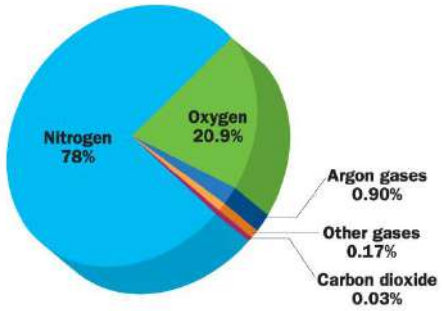
Chapter 14: "Natural resources"

KEY CONCEPTS : *[*rating as per the significance of concept]*

CONCEPTS	RATING
Breath of air	**
A wonder liquid	***
Biogeochemical cycles	*****

1. The" **Biosphere"** is the life supporting zone of the earthwith three sub-zones called as **lithosphere (rock** part**), atmosphere** (air part)and **hydrosphere** (water part)**.**

Breath of air
2. Composition of Air



3.The interactions between different components of **the Biosphere** to maintain **the balance between the biotic and a biotic component** makes **"Biogeochemical cycle". Ex. Water Cycle, Nitrogen Cycle, Carbon cycle, Oxygen Cycle,**

4. Role of atmosphere in climate control : atmosphere act as protective blanket for the earth. Since atmosphere is a bad conductor of heat, it keeps the average temperature of the earth constant. At night, it slows down the escape of heat into outer space.

5. **The movement of air :** the atmosphere gets heated from the radiation that is reflected back by the land or water bodies. As a result of heating, convection currents are set up in the air. Since land gets heated faster than water, the air over land gets heated faster than air above water bodies.

6. In coastal regions, during the day, the air above the land gets heated faster and starts rising. So a region of low pressure is created and air over sea moves into this area of low pressure. The movement of air from one region to the other region causes **Wind.**

7. During the day, the direction of wind would be from the sea to the land and at night, both land and sea starts to cool. Since water cools down slower than the land, the air above water would be warmer than air above land, thus the direction of wind would be from the land to the sea.

8. **Air pollution** : it is an undesirable change in the physical, chemical or biological characteristics. It is caused due to an increase in the content of harmful substances (pollutant) such as oxides of nitrogen and sulphur, etc.

9. **Harmful effect of air pollution :**

- It affects the respiratory system causing breathing difficulties eg; bronchitis, asthma, lung cancer, tuberculosis, etc.
- Burning of fossil fuels like coal and petroleum releases oxides of nitrogen and sulphur. Inhalation of these gases is dangerous.
- Combustion of fossil fuel also increases the amount of suspended particles in air. The presence of high levels of all these pollutants, reduce visibility in cold weather where water also condenses out of air forming **smog.**
- **Acid rain** formed from the gases like sulphur dioxide and nitrogen oxides present in polluted air. It causes damage to living and non- living thing.

3. The Water Cycle:

a) The process in which water evaporates and falls on the land as rain and later flows back into the sea via rivers is known as the **"Water Cycle".** Water flows through rocks containing soluble minerals, some of them get dissolved in the water. Thus the rivers carry many nutrients from the land to sea and these are used by the marine organisms.

b) When the water vapors condense as water droplets and grow big and heavy, they fall down in the form of **"rain".** It ranges from 5 cm to 200 cm of rain fall in a year in our

country. In large parts of India, rains are mostly brought by the south-west or north-east monsoons. Depressions in the Bay of Bengal may also cause rains in some areas.

c) **Water is a wonder liquid** because all cellular processes take place in a water medium; substances are transported in a dissolved form; terrestrial forms require fresh water to maintain the equilibrium of salts; major resource to determine the life on the earth.

d) The dissolved fertilizers (NPK fertilizers), pesticides (DDT), sewage (Disease causing Organisms), waste from factories (Mercury) and water released from the dams can affect the life forms on the earth. The dissolved Oxygen is being used by the animals and plants that live in water, would adversely affect the aquatic organisms. The change in temperature would be dangerous for the eggs and larvae of the various animals particularly susceptible to temperature changes. It leads to "**water pollution".**

(Please refer Fig. 14.5, NCERT Text Book Page- 197).

4. **Nitrogen Cycle:**

a) The nitrogen gas makes up 78% of our atmosphere. It is essential for the synthesis of proteins, DNA, RNA, urea, alkaloids and Vitamins.

b) The simple molecular nitrogen from the atmosphere is converted into more complex molecules in the living beings and back again to atmosphere is called "**Nitrogen Cycle".**

i) Nitrogen fixation by Lightening: During lightning, the molecular nitrogen is converted into oxides of nitrogen and dissolves in water to give nitric and nitrous acids and fall on lands along with rains. These are then utilized by various life forms.

ii) **Nitrogen fixation by Bacteria:** The molecular nitrogen is converted into nitrates and nitrites, by free living bacteria or the bacteria present in the root nodules of legumes.

iii) The conversion of molecular nitrogen into nitrates and nitrites is called as" **Nitrification".** Plants generally covert them into amino acids. The conversion of nitrates and nitrates into Ammonia is called as" **Ammonification".** The conversion of Ammonia into molecular Nitrogen is called as" **Denitrification". Thereby nitrates and nitrites are converted into**

molecular or elemental nitrogen in the nature. (Please refer Fig. 14.6, NCERT Text Book Page- 198).

5. **The Carbon cycle:**

i) The **Carbon dioxide** gas makes up 0.039 % of our atmosphere. Carbon occurs in the elemental form as **diamonds and graphite** in earth. Carbon is essential **for the synthesis of proteins, carbohydrates, fats, nucleic acids and Vitamins** in living organisms.

ii) The **Carbon dioxide Fixation:** Green plants convert Carbon dioxide into glucose in the presence of sunlight through Photosynthesis. The glucose molecules are converted into other biologically important molecules. And many marine animals use carbonates dissolved in sea water to make shells, exoskeletons.

iii) **The combustion**: The Carbon dioxide in the atmosphere is added by the process of combustion, where fuels are burnt to provide energy for various needs like heating, cooking, transportation, and industrial process.

iv) **The Greenhouse Effect**: The percentage of Carbon dioxide in the atmosphere is said to have doubled since the industrial revolution when human beings stated burning fossil fuels on a very large scale. The Carbon dioxide is a greenhouse gas. The increase in the Carbon dioxide content would cause more heat to be retained by the atmosphere and **lead to Global Warming**. It is called" **Greenhouse Effect"**

v) The **carbon cycle is repeated through different physical and biological activities**. (Please refer Fig. 14.7, NCERT Text Book Page- 199).

6 .Oxygen Cycle:

i) The Oxygen gas makes up 21 % of our atmosphere. Oxygen is essential component **of proteins, carbohydrates, fats, nucleic acids** in living organisms.

ii) Oxygen from our atmosphere is used up in three processes, namely combustion, respiration and in the formation of oxides of nitrogen. Oxygen is returned to the atmosphere in only one major process, that is, Photosynthesis, it is called as **Oxygen Cycle.**

iii) The **air is heated faster than water**; the air over land would also be heated faster than the air over water bodies. The movement of air from one region to the other creates winds, during the day the direction of the wind would be from the sea to land. At night, both land and sea start to cool.

iv) The oxides of nitrogen and sulphur gases dissolve in rain to gives rise to **"Acid rains"**. The smog is a visible indication of **Air Pollution**. The **pollutants** bring respiratory, cardiac problems and **allergies**. The organisms called **Lichens** are found on the bark of trees, they are indicators of pollution free environment. Three atoms of Oxygen (O_3) is called as **Ozone.** The Ozone is poisonous but absorbs harmful radiations from the Sun. The Ozone layer around the earth, if, dwindles further may cause Health hazards including Cancers . Recently discovered the **Ozone hole; in the region of Antarctica.** ***(Please refer Fig. 14.8 & 14.9, NCERT Text Book Page- 200).***

QUESTION BANK

1. What are the three sub-zones in the Biosphere? **{Lithosphere (rock** part**), atmosphere** (air part)and **hydrosphere** (water part)}**.**
2. The process in which water evaporates and falls on the land as rain and later flows back into the sea via rivers is known ……(Water Cycle).
3. In large parts of India, rains are mostly brought by…… monsoons.(the south-west or north-east monsoons).
4. Why water is a wonder liquid? Justify (A major resource to determine life on the earth)
5. What are the four major water Pollutants?{ (NPK fertilizers, pesticides (DDT), sewage (Disease causing Organisms), waste from factories (Mercury)}
6. Write a short notes on Nitrogen fixation by Bacteria.{The molecular nitrogen is converted into nitrates and nitrites, by free living bacteria or the bacteria present in the root nodules of legumes}.
7. What is Greenhouse Effect? {The Carbon dioxide is a greenhouse gas. The increase in the Carbon dioxide content would cause more heat to be retained by the atmosphere and lead to Global Warming. It is called**"** Greenhouse Effect"}
8. What is the percentage of Oxygen gas in our atmosphere? {21 %}

9. Which organisms are found on the bark of trees as indicators of pollution free environment? { Lichens}
10. Write about the Ozone hole in the Antarctica**.** {The Ozone layer around the earth is dwindling further to damage and cause Health hazards including Cancers. Recently discovered Ozone hole in the Antarctica.}

QUESTION PAPER:FORMATIVE ASSESSMENT – I (For Practice)

Marks- 40 Time: 90 minutes

* General Instructions

1. Questions 1-5 (1 Mark each) 2. Questions 6-10 (2 Mark each)

3. Questions 11-15 (3Mark each) 4. . Questions 16-17 (5Mark each)

Q.1 What is called Lithosphere, define it.

Q.2 Water covers 75% of the Earth's surface. Mention True/ false…….

Q.3 What is the percentage of Carbon dioxide on Venus……..

Q.4 What is the range of temperature on the Moon……..

Q.5 Define the term Pollutant…….

Q.6 What are the two ways to fix Carbon dioxide on earth.

Q.7 Mention any two important features of Water.

Q.8 How the Depressions effect our environment?

Q.9 Define the term Soil Pollution. Give one reason for it.

Q.10 How changes of temperature effect living organisms in water?

Q.11 What is Humus? Mention its importance in two points.

Q12 What is deforestation? Give two reasons for it.

Q.13. Define Global Warming, mention two causes for it.

Q.14 What is Ozone Depletion? Give two reasons for it.

Q.15 Draw the schematic diagram of Water Cycle in the nature.

Q.16. Write any five salient features of Nitrogen Cycle with a suitable diagram.

Q.17 Write about Industrial Pollution and mention five effects in the environment.

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Chapter 15: "Improvement in food resources"

KEY CONCEPTS : *[*rating as per the significance of concept]*

CONCEPTS	**RATING**
Improvement in crop yield	***
Crop variety improvement	****
Crop production management	*****
Crop protection management	***
Animal Husbandry	****

1. **Food Resources**: Cereals (Wheat, rice, maize, millets and sorghum) provide us carbohydrates; Pulses (Grams, pea and lentil) provide us proteins; Oil seeds (Soya bean, ground nut, sesame, and castor) provide us fats; Vegetables, spices and fruits provide us a range of minerals, nucleic acids and vitamins. In addition to these food crops, fodder crops like *berseem, oats or sudan grass are raised as food for the livestock are called as* fodder crops.

2. *The **Kharif crops:*** The crops grown in rainy season are called as *Kharif crops (Paddy, Soya bean, pigeon pea and maize). They are* grown from June to October.

3. The ***Rabi crops:*** *The* crops grown in winter season are called ***Rabi crops*** (Wheat, gram, peas, and mustard). They are grown November to April.

Compare ***Kharif crops and Rabi crops:***

SN	Crop	Season	Example
1	***Kharif crops***	June to October (Rainy Season)	*Paddy, Soya bean, and maize*
2	***Rabi crops***	November to April (winter season)	Wheat, gram, peas, and mustard

4. **The Green Revolution**: Food supplies are generally as proteins, carbohydrates, fats, minerals, nucleic acids and vitamins in all living organisms. Indian population is growing enormously. Green Revolution is the need of the hour to increase food-grain production.

5. **Sustainable Practices**: For sustained livelihood, one should undertake mixed farming, intercropping, and integrated farming practices, for example, combining agriculture with livestock/ poultry/ fisheries/bee-keeping. The major group of activities for improving crop yield can be classified as: **Crop varietal improvement, Crop production improvement, Crop protection improvement**

6. **The Crop varietal improvement:**

a) Hybridization: It refers to crossing between genetically dissimilar plants**;**It is all to get higher yield, improved quality, biotic and abiotic resistance, change in maturity duration, wider adaptability and desirable agronomic characteristics.

SN	Type	Context
1	Intervarietal Hybridization	between different varieties
2	Interspecific Hybridization	between different species
3	Intergeneric Hybridization	between different genera
4	Genetically Modified Crops (GMC).	Another way of improving the crop is by introducing a gene that would provide the desired characteristic.

7. **The Crop production improvement:** They include" **no cost production"," low cost production" or "high cost production"** practices.

a) Nutrients(Sixteen elements are required for growth are called as essential elements Carbon, oxygen, hydrogen+ Macronutrients & Micronutrients. They increase the yield):

SN	Macronutrient	Micronutrient
1	Six elements are required in larger quantity	Other seven elements are required in small quantity
2	Ex.Nitrogen, phosphorus, calsium,Postasium, magnisium, sulphur	Ex. Iron, manganese, boron, zink, copper, molybdinum, chlorine

b)**Manure & Fertilizers:**

SN	Manure	Fertilizers
1	Manure is prepared by the decomposition of animal excreta and plant waste is called as Humus. It decides the texture of the soil. Compost: Farm waste, cow dung etc. Vermi compost: Compost prepared by using earthworms.	Fertilizers are commercially produced plant nutrients. Excess fertilizers destroy the soil fertility. Organic farming: No use of chemicals fertilizers, herbicides, pesticides etc.(Culturing blue green algae, neem leaves, healthy cropping systems.
2	It is cheap and prepared in rural homes and fields	It is costly and is prepared in factories
3	It is voluminous and bulky	It is compact and concentrated
4	It is inconvenient to store, transport, handle.	It is easy to store, transport, handle.
5.	It is not nutrient specific.	It is nuteient specific and can provide specifically nitrogen, phosphorus etc.
	Add great humus to the soil	Does not add humus to the soil.

3. **Irrigation:** India has variety of water resources: Wells, canals, river lift system, tanks, rainwater harvesting, water shedding management to increase in ground water levels and to check the water flowing away to the sea. Planning to reduce soil erosion.
4. **Cropping patterns:**

SN	Mixed cropping	Inter-cropping	Crop rotation
1	Two or more crops grown simultaneously on the same piece of land	Two or more crops grown simultaneously on the same piece of land in a definite pattern	Growing different crops on a piece of land in a pre-planned succession
2	Ex. Wheat+ Gram; Wheat+ Mustard; Wheat+ gram; Groundnut+ sunflower.	Soyabean + maize/bajra+Cowpea ((Please refer Fig. 15.2, NCERT Text Book Page- 208).	Two or three crops can be grown in a year depending upon the duration.

3	A type of insurance against failure of one of the crops.	A few rows of one crop alternate with a few rows of a second crop. Crops are selected such that their nutrient requirements are different. This ensures the maximum utilization of the nutrients supplied and prevents pests and diseases spreading in the crop field.	The availability of moisture and irrigation facilities decides the choice of the crop to be cultivated.

8. Crop protection improvement/ management: Field crops are infested by large number of weeds, insects pests, diseases & storage of grains

SN	Weeds	Insect pests	Diseases	Storage of grains
1	Weeds are unwanted plants in the crop field	Insect pest is nuisance in the crop field	Disease is caused by pathogens in the field	Different factors are responsible.
2	Weeds take up nutrients and reduce the growth	Insect pest affect the health of crop and reduce the yield.	Diseases alter the physiology of crops and reduce the yield	Different factors reduce the quality of stored grains
3	Ex. Xanthium, Parthenium	Ex. Caterpillars, dragonfly	Ex. Bacteria, Virus	Biotic factors: insects, rodents, fungi Abiotic factors: moisture & temperature
4	Removal of weeds at an early stage is recommended. Spray weedicides	Spread of chemicals such as pesticides	Spread of chemicals to kill pathogens	Systematic management of ware house.

9. Animal Husbandry: It is a scientific management of animal livestock, includes feeding, breeding and diseases control. Animal-based farming includes cattle farming, Poultry farming, fish farming, and bee Keeping.

SN	Content	Cattle farming	Poultry farming	Fish farming	Bee Keeping.
1	Purpose	Milk (milch animals) and	Meat, chicken, egg	Cheep source of animal protein.	Honey, wax, medicinal

		draught labor (draught animals) in agriculture.	production	Fish production is aquaculture. Growing of marine fishes is called mariculture.	preparations. Additional income to the farmer.
2	Cross breeding: To get desired qualities	Exotic- quality of lactation Indigenous breeds- quality of disease resistance	Exotic & Indigenous breeds	Both Exotic & Indigenous fishes are used	Exotic- high honey collection capacity &stingless. Indigenous bees- are used
3	Desirable maintenance	Good ventilation in sheds Roughage/ concentrates Protection from parasites & skin diseases Vaccination	Good ventilation in sheds Roughage/ concentrates Protection from parasites & skin diseases Vaccination	Fish farming/ locating large schools of fish/ use of satellites and echo-sounds In Composite fish culture seed is wild, mixed with other species. Hormonal stimulation to bring desired quality in fish production.	Value or quality depends upon the pasturage or the flowers available for the taste of honey.
4	Example	Exotic or foreign breeds (Jercy, brown Swiss) Local breeds (Red sindhi, Sahiwal)	Exotic- Leghorn Indigenous breeds- Aseel	Fresh water (Macrobrachium) & Marine(Peneaus) prawns Fresh water fishes Marine fishes(Bombay duck, sardines) Common	Apisceranaindica dorsata A.florae

QUESTION BANK

1. Give two examples of Cereals (Wheat, rice)
2. *Define the Kharif crop and give two examples (*The crops grown in rainy season are called as *Kharif crops Ex. Paddy, Soya bean).*
3. Write about the importance of Green Revolution (Indian population is growing enormously. Green Revolution is the need of the hour to increase food-grain production.
4. Define the term Hybridization(Crossing between genetically dissimilar plants**)**
5. What is the importance of Genetically Modified Crops? (It is another way of improving the crop is by introducing a gene that would provide the desired characteristic.)
6. Define the term mixed cropping and give two examples. (Two or more crops grown simultaneously on the same piece of landEx. Wheat+ Gram; Wheat+ Mustard)
7. Distinguish between weeds, insects pests(Weeds are unwanted plants in the crop field Insect pest is nuisance in the crop field)
8. What is Animal Husbandry**?** It is a scientific management of animal livestock, includes feeding, breeding and diseases control. Animal-based farming includes cattle farming, Poultry farming, fish farming, and bee keeping.
9. Distinguish between aquaculture and mariculture. (Fish production is aquaculture. Growing of marine fishes is called mariculture.)
10. What is the importance of Bee Culture? (It is useful for honey, wax, medicinal preparations. And also for additional income to the farmer.)

QUESTION PAPER:FORMATIVE ASSESSMENT – I (For Practice)

Marks- 40 Time: 90 minutes

* General Instructions

1. Questions 1-5 (1 Mark each) 2. Questions 6-10 (2 Mark each)

3. Questions 11-15 (3Mark each) 4. . Questions 16-17 (5Mark each)

Q.1 Maize and Millets are Pulses. Mention True/False……

Q.2 What is the Scientific name of Honey Bee…….

Q.2 What led us to improve food grain production?

Q.3 Which revolution led to the availability of milk for efficient use?

Q.4 What is the process of injecting semen of desired bull into the vagina of cows is called?

Q.5 Name any one exotic breed usually used for variety of improvement programmes.

Q.6 What is the significance of GMC

Q.7 Mention the significance of Irrigation in developing agriculture.

Q.8. What is Pest and give one example.

Q.9 What is Weed and give one example.

Q.10 Give two examples for Inter-cropping.

Q.11 Distinguish between Kharif and Rabi Crops

Q.12 What is called Sustainable Practice in improvement in food resources.

Q.13. Mention three techniques of Hybridization used to achieve desirable agronomic characteristics.

Q.14.Distinguish between Macro Nutrients and Micro Nutrients

Q.15 Distinguish between Compost and Vermi Compost.

Q.16 Distinguish between Cattle farming and Poultry farming.

Q.17 Distinguish between Fish farming and Bee keeping.

-------X-------