पुना International School

Shree Swaminarayan Gurukul, Zundal

SCIENCE -IX

(BIOLOGY)

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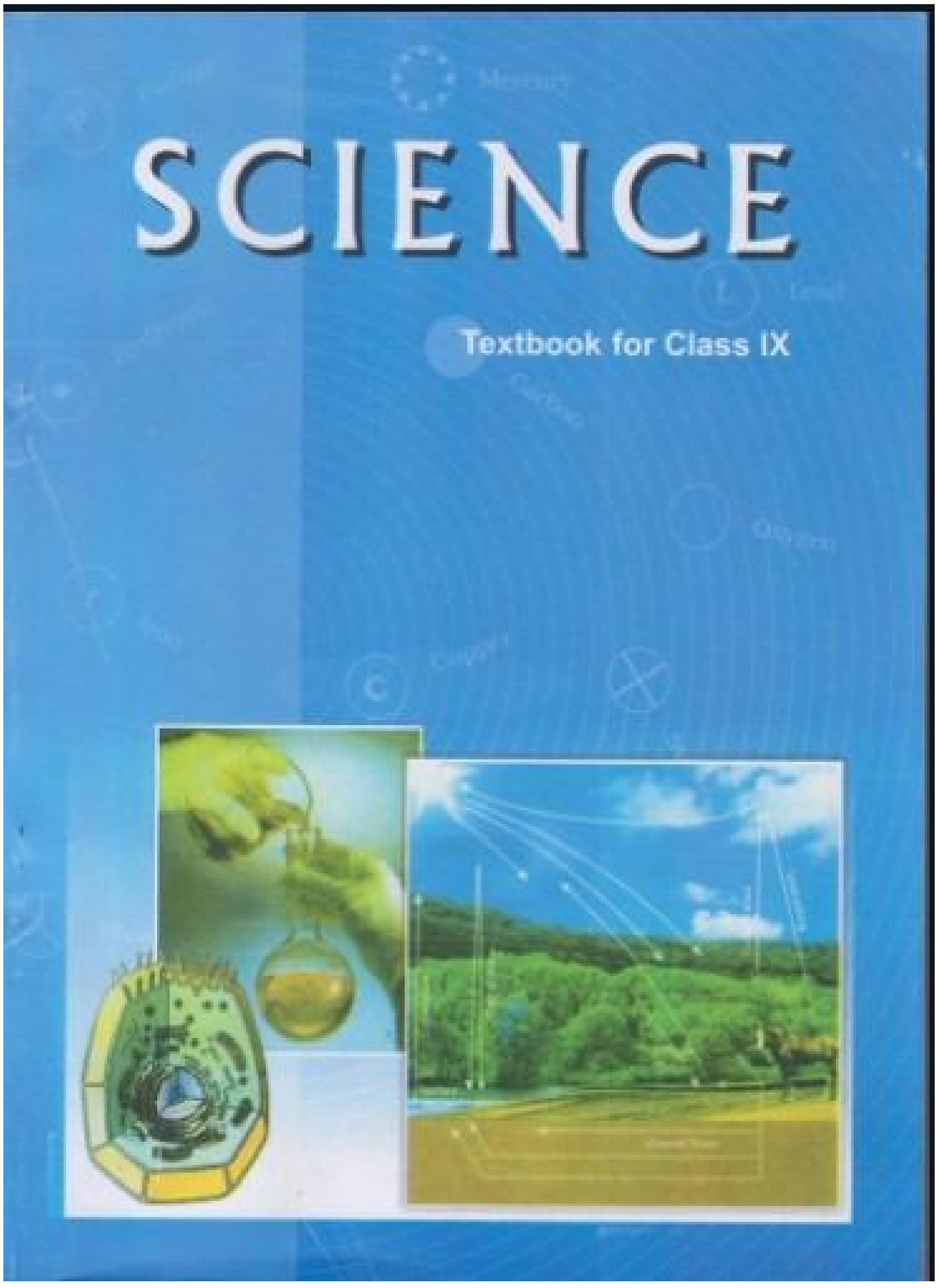
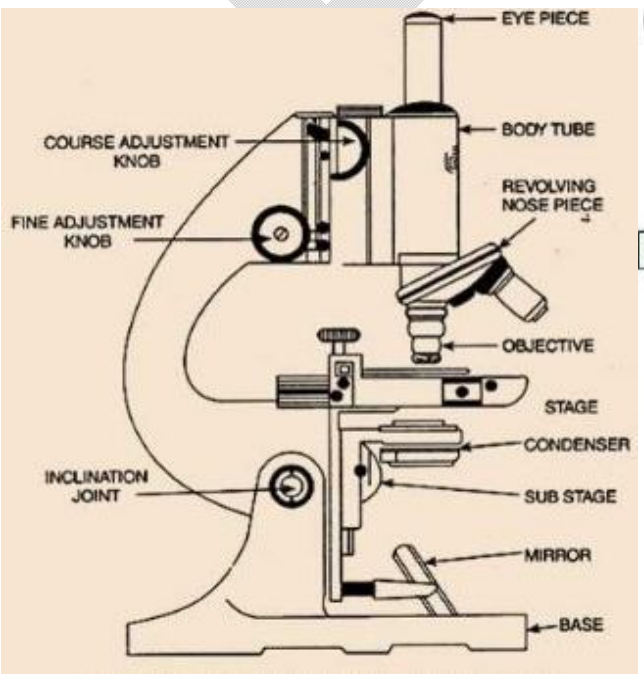

SCIENCE
Textbook for Class IX

INDEX



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1. Who discovered cells, and how?

Ans. In 1665, an English scientist named Robert Hooke discovered cells. He examined a thin slice of cork under a self-designed microscope and observed that the cork resembled the structure of a honey comb. Hooke named these tiny compartments as 'cells'.

2. Why is the cell called the structural and functional unit of life ?

Ans. All living organisms are made up of cells so cell is the basic building unit of a living organism and all the activities performed by a living organism are sum total of activities performed by its cells hence cell is called the structural and functional unit of life.

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1. How do substances like CO_2 and water move in and out of the cell? Discuss.

Ans. The exchange of gases (CO_2 and O_2) between cells takes place by diffusion process.

Diffusion is defined as movement of a substance from a region of higher concentration to lower concentration. CO_2 is formed inside cell due to respiration and it accumulates in the cell so its concentration is high in the cell as compared to the surroundings. On the other hand O_2 is utilized inside cell during respiration and therefore its concentration decreases inside the cell while remains comparatively high in the surroundings. s a result CO_2 diffuses out and O_2 diffuses into the cell.

2. Why is the plasma membrane called a selectively permeable membrane?

Ans. Plasma membrane is a highly specific structure. It is made up of lipids and proteins

which selectively allows the entry of substances into cell and exit of some other substances from the cell i.e. selectively permeable.

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1. Fill in the gaps in the following table illustrating differences between prokaryotic and eukaryotic cells.

Prokaryotic Cell	Eukaryotic Cell
1. Size: generally small (1-10 µm) 1 µm = 10–6 m	1. Size : generally large (5-100 µm)
2. Nuclear region: _____ _____ and known as_____	2. Nuclear region: well defined and surrounded by a nuclear membrane
3. Chromosome: single	3. More than one chromosome
4. Membrane-bound cell organelles Absent.	4. _____, _____

Ans.

(Page No.65)

1. Can you name the two organelles we have studied that contain their own genetic material?

Ans. Chloroplasts and Mitochondria.

2. If the organisation of a cell is destroyed due to some physical or chemical influence, what will happen?

Ans. If the organisation of a cell is destroyed due to some physical or chemical influence then such cell would not survive any more as all components of that cell are digested up by its lysosomes.

3. Why are lysosomes known as suicide bags?

Ans. Lysosomes are cell organelles filled with hydrolytic(digestive) enzymes. When a cell is damaged, its lysosomes may burst out and its enzymes digest up its own cell. Due to this, we can say that lysosomes are suicide bags.

4. Where are proteins synthesised inside the cell?

Ans. Ribosomes are the sites for protein synthesis inside the cell.

(Chapter – end)

1. Make a comparison and write down ways in which plant cells are different from animal cells.

Ans.

Plant cell	Animal cell
1. cell wall is present.	1. cell wall is absent.
2. Plastids are present.	2. Plastids are absent.
3. They have dictyosomes instead of golgi body.	3. They have golgi apparatus.
4. centrosomes and centrioles are absent.	4. centrosomes and centrioles are present.
5. Vacuoles are larger in size.	5. vacuoles are smaller in size.
6. Daughter cells separate from each other due to formation of cell plate.	6. Daughter cells separate from each other due to contrition or furrow formation.

2. How is a prokaryotic cell different from a eukaryotic cell?

Ans.

Prokaryotic cell	Eukaryotic cell
1. Nuclear region is not surrounded by a nuclear membrane.	1. A double layered nuclear envelope is present around the nuclear region.
2. Nucleolus is absent.	2. nucleolus is present.
3. Only one chromosome.	3. more than one chromosomes are present.
4. membrane bound cell organelles are absent.	4. membrane bound cell organelles are present.

3. What would happen if the plasma membrane ruptures or breaks down?

Ans. The rupture or break down of cell's plasma membrane indicates that cell is damaged and in such condition the lysosomes of the damaged cells may burst and the digestive enzymes present inside those lysosomes would digest their own cell. This will result into death of the cell.

4. What would happen to the life of a cell if there was no Golgi apparatus?

Ans. The functions of golgi apparatus includes storage, modification and packaging of products in the vesicles. If there was no golgi apparatus for a cell then all sort of storage, modification, packaging and dispatch of materials within and outside the cell would be impossible.

5. Which organelle is known as the powerhouse of the cell? Why?

Ans. It is Mitochondria of the cell also known as the power house of the cell because it synthesizes energy in the form of ATP molecules during respiration which is vital for various life activities.

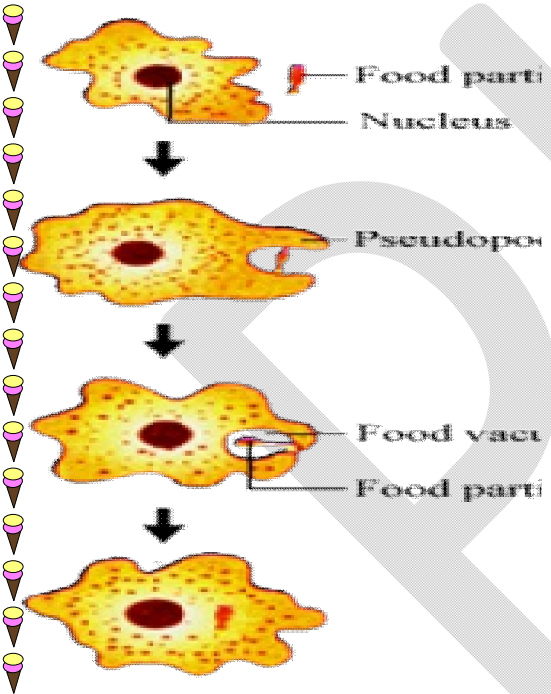
6. Where do the lipids and proteins constituting the cell membrane get synthesised? Ans. The endoplasmic reticulum is of two types:

i) Smooth endoplasmic reticulum (SER): It is responsible for the synthesis of lipids constituting cell membrane.

ii) Rough endoplasmic reticulum (RER) : It bears the ribosomes and is therefore responsible for the synthesis of proteins constituting cell membrane.

7. How does an *Amoeba* obtain its food?

Ans. Amoeba feeds on microorganisms (like planktons) which float on water. It develops false feet or pseudopodia to surround the food. It captures the food within a sac like structure called the food vacuole inside which digestion of food takes place.



8. What is osmosis?

Ans. Osmosis is the movement of water(solvent) from a region of high water concentration through a semipermeable membrane to a region of low concentration of water. It can take place only in liquid medium and not in solid or gases. Example is absorption of water from soil by plant roots.

9. Carry out the following osmosis experiment:

Take four peeled potato halves and scoops each one out to make potato cups. One of

these potato cups should be made from a boiled potato. Put each potato cup in a trough containing water. Now,

(a) Keep cup A empty

(b) Put one teaspoon sugar in cup B

(c) Put one teaspoon salt in cup C

(d) Put one teaspoon sugar in the boiled potato cup D.

Keep these for two hours. Then observe the four potato cups and answer the following: (i) Explain why water gathers in the hollowed portion of B and C.
(ii) Why is potato A necessary for this experiment?
(iii) Explain why water does not gather in the hollowed out portions of A and D.

Ans. i) When we put one teaspoon sugar in cup B and one teaspoon salt in cup C, the hypertonic solution is formed inside so through osmosis, water from outside enters inside and collects in the hollowed portion of cups B & C.

ii) Potato A is necessary to observe osmosis.

iii) In hollowed out portion of A & D there is no solution (liquid medium) present therefore osmosis cannot take place and as a result water does not gather.

Extra Short Answer Questions

30. Why are lysosomes known as 'suicide-bags' of a cell?

Ans. Lysosomes are known as 'suicide-bags' because when cell gets damaged during the disturbance in cellular metabolism, lysosomes may burst and the digestive enzymes thus released digest their own cell.

31. Do you agree that "A cell is a building unit of an organism". If yes, explain why?

Ans. I agree with the statement that "A cell is a building block of an organism". This is true because all living beings are made up of cells and cell is the smallest independent unit of living beings.

32. Why does the skin of your finger shrink when you wash clothes for a long time?

Ans. Soap solution is very concentrated - Hypertonic solution, so water moves out of your finger cells by osmosis.

33. Why is endocytosis found in animals only?

Ans. Cell wall is absent in animals. Due to this, movement of substances inside the cells is easier in animals than in plants. Due to this, endocytosis is found in animals only.

34. A person takes concentrated solution of salt, after sometime, he starts vomiting. What is the phenomenon responsible for such situation? Explain.

Ans. Swallowing a concentration solution of salt results in exosmosis from cells of the alimentary canal. Due to this, dehydration occurs in the person. As a result, the person vomiting.

35. Name any cell organelle which is non membranous.

Ans. Ribosome

36. We eat food composed of all the nutrients like carbohydrates, proteins, fats, vitamins, minerals and water. After digestion, these are absorbed in the form of glucose, aminoacids, fatty acids, glycerol etc. What mechanisms are involved in absorption of digested food and water?

Ans. Diffusion and osmosis respectively

37. If you are provided with some vegetables to cook. You generally add salt into the vegetables during cooking process. After adding salt, vegetables release water. What mechanism is responsible for this?

Ans. Exosmosis

38. If cells of onion peel and RBC are separately kept in hypotonic solution, what the following will take place? Explain the reason for your answer.

(a) Both the cells will swell.

(b) RBC will burst easily while cells of onion peel will resist the bursting to some

. (c) a and b both are correct.

d) RBC and onion peel cells will behave similarly.

39. Bacteria do not have chloroplast but some bacteria are photoautorophic in and perform photosynthesis. Which part of bacterial cell performs this?

Ans. Small vesicles which are associated with plasma membrane are present in such bacteria. These vesicles contain pigments which can trap solar energy to produce food.

40. Match the following A and B

Column A	Column B
(a) Smooth endoplasmic reticulum	(i) Amoeba
(b) Lysosome	(ii) Nucleus
(c) Nucleoid	(iii) Bacteria
(d) Food vacuoles	(iv) Detoxification
(e) Chromatin material and nucleolus	(v) Suicidal bag

Ans. a—(iv); b—(v); c—(iii); d—(i); e—(ii).

41. Write the name of different plant parts in which chromoplast, chloroplast and leucoplast are present.

Ans. Flower and Fruit—

Chromoplast Leaves of the

plant—Chloroplast Root of the

plant—Leucoplast

42. Name the organelles which show the analogy written as under

(a) Transporting channels of the cell _____

Ans. Endoplasmic reticulum

(b) Power house of the cell ____

Ans. Mitochondria

(c) Packaging and dispatching unit of the cell _____

Ans. Golgi body

d)Digestive bag of the cell _____

Ans. Lysosome

(e) Storage sacs of the cell _____

Ans. Vacuole

(f) Kitchen of the cell _____

Ans. Chloroplast

g)Control room of the cell _____

Ans. Nucleus

43. How is a bacterial cell different from an onion peel cell?

Ans.

Bacteria Cell	Onion peel cell
(i) Cell wall is made peptidoglycan.	(i) Cell wall is made of cellulose.
(ii) Nucleus is absent	(ii) Nucleus is present.
(iii) Vacuole is absent	(iii) Vacuole is present.
(iv) These are prokaryotes.	(iv) These are eukaryotes.

44. How do substances like carbon dioxide (CO_2) and water (H_2O) move in and out the cell?

Ans. Carbon dioxide moves through diffusion, while water moves through osmosis.

45. How does amoeba obtain its food?

Ans. Amoeba makes pseudopodia to surround a food particle. It then ingest the food particles; along with a drop of water and then forms food vacuole. This process of obtaining food by Amoeba is called endocytosis.

46. Name the two organelles in a plant cell that contain their own genetic material and ribosomes.

Ans. Mitochondria and plastids

47. Why are lysosomes also known as "scavengers of the cells"?

Ans. Lysosomes contain enzymes which are used for destroying worn out parts of the cell. Lysosomes also destroys waste materials. Due to this, lysosomes are also known as 'scavengers of the cells'.

Ans. Nucleus

49. Which kind of plastid is more common in

(a) roots of the plant

Ans. Leucoplast

(b) leaves of the plant

Ans. Chloroplast

(c) flowers and fruits

Ans. Chromoplast

50. Why do plant cells possess large sized vacuole?

Ans. Vacuoles not only store many important substances, they also contain cell sap that give turgidity to cell.

51. How are chromatin, chromatid and chromosomes related to each other?

Ans. Chromosomes are made up of chromatids and chromatids are made up of chromatin.

52. What are the consequences of the following conditions?

(a) A cell containing higher water concentration than the surrounding medium

Ans. Exosmosis

(b) A cell having low water concentration than the surrounding medium.

Ans. Endosmosis

(c) A cell having equal water concentration to its surrounding medium.

Ans. No effect

Lesson 5 The fundamental unit of life

Q.1 Who discovered cell, and how?

Ans: Robert Hooke discovered cells in 1665 while examining **a** thin slice of cork through **a** self-designed microscope. He saw that the cork resembled the

structure of a honey comb consisting of many little compartments. Those small boxes are called cells.

Q 2 Why is the cell called the structural and functional unit of life?

Ans A cell is capable of carrying out all necessary activities of life independently. So, they are called functional or basic unit of life.

Q 3 How do substances like CO_2 and water move in and out of the cell?

Ans: CO2 moves by diffusion and H20 move by osmosis through cell membrane.

Q 4 Why is the plasma membrane called a selectively permeable membrane?

Ans : It is so called selectively permeable membrane because it allows only the entry and exit of some substances, not all.

Q 5 Can you name the two organelles we have studied that contain their own genetic material?

Ans: The two organelles which have their own genetic material are:

1. Mitochondria
2 Plastids

Q 6 If the organization of a cell is destroyed due to some physical or chemical influence ,what will happen?

Ans : The cell will not be able to revive and lysosomes will digest it.

Q 7 Why are lysosomes known as suicide bags?

Ans : When the cell gets damaged, lysosomes may burst, and the enzymes digest their own cell. Therefore lysosomes are known as suicide bags.

Q 8 Where are proteins synthesised inside the cell?

Ans : The proteins are synthesised in the ribosomes that are known as proteins factories

Q 9 Write the difference between plants and animals cells.

Q 10 Difference between prokaryotic and eukaryotic cell

Q 11 What would happen if plasma membrane ruptures or breaks ?

Ans: If plasma membrane ruptures or breaks down then molecules or some substances will move freely in and out

Q 12 What would happen to the life of a cell if there were no Golgi apparatus?

Golgi apparatus has a function of storage , modification and packing of products in vesicles .If there were no Golgi bodies packaging and

despatching of materials synthesised by the cell will be stocked.

Q13 Which organelle is known as the power house of the cell? Why?

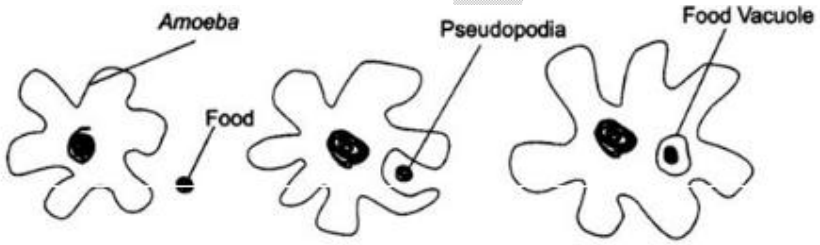
Ans: Mitochondria is known as the powerhouse of the cell because it releases energy required for different activities of life

Q14 Where do the lipids and proteins constituting the cell membrane get Synthesised ?

Ans:Lipids and proteins are synthesised in ER

Q15 How does an Amoeba obtain its food ?

Ans : Amoeba takes its food by the cell membrane which forms the food vacuole



Endocytosis in *Amoeba*

Q16 What is an osmosis ?

Ans : Osmosis is the processes of movements of water molecule from a region of higher concentration through a semi permeable membrane to the lower concentration

Chapter - 5

The Fundamental Unit of Life

Multiple Choice Questions

1. Which of the following can be made into crystal?

(a) A Bacterium

(b) An Amoeba

(c) A Virus

(d) A Sperm

Ans.(c) A Virus

Explanation: Virus does not have a cell; like other options. Virus is composed of nuclear material enclosed in a protein coat. Due to this, it can be into crystal.

2. A cell will swell up if

a) The concentration of water molecules in the cell is higher than the concentration of water molecules in surrounding medium

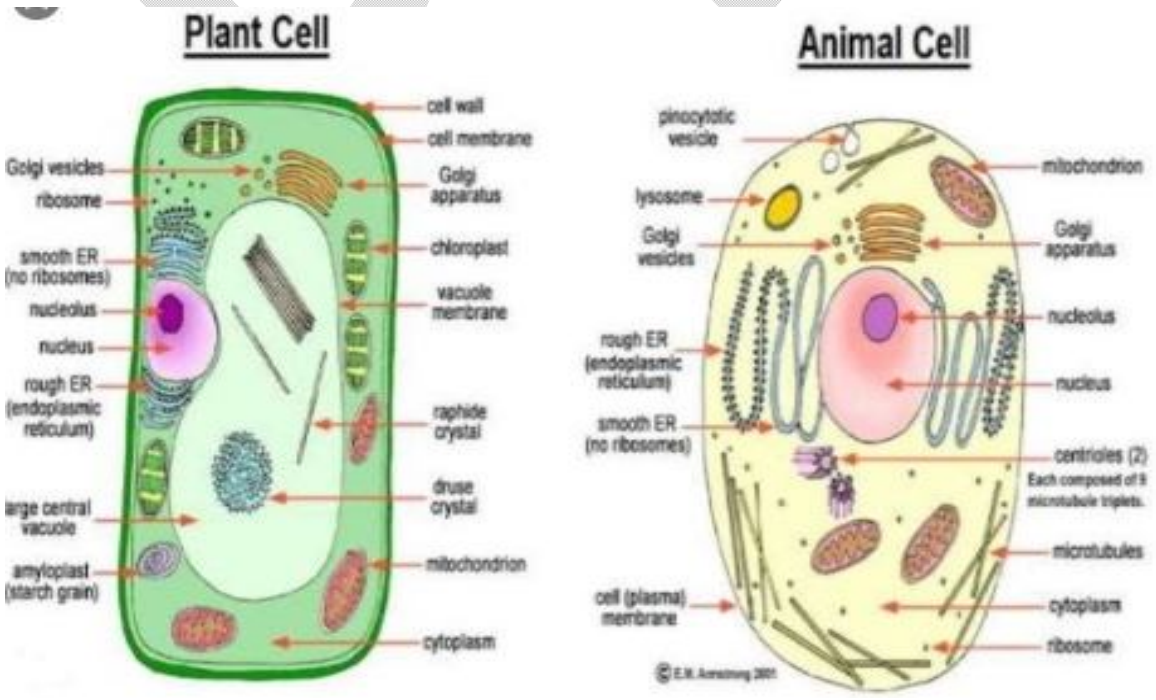
b) The concentration of water molecules in surrounding medium is higher than water molecules concentration in the cell

c) The concentration of water molecules is same in the cell and in the surrounding medium

d) Concentration of water molecules does not matter

Ans.(b) The concentration of water molecules in surrounding medium is higher than the concentration of water molecule in the cell

Explanation: If concentration of water molecules in surrounding medium is higher than water molecules concentration in the cell, it will result in movement of water into the cell. This will result in cell getting swelled up.



2. Chromosomes are made up of

(a) DNA

(b) protein

(c) DNA and protein

(d) RNA

Ans.(c) DNA and protein

3. Which of these options are not a function of Ribosomes?

(i) It helps in manufacture of protein molecules

(ii) It helps in manufacture of enzymes

(iii) It helps in manufacture of hormones

(iv) It helps in manufacture of starch molecules

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (iii) and (iv)

(d) (iv) and (i)

Ans.(c)(iii) and (iv)

Explanation: Ribosomes are responsible for protein synthesis. Enzymes are composed of protein. Hence, options (iii) and (iv) are incorrect.

5. Which of these is not related to endoplasmic reticulum?

(a) It behaves as transport channel for proteins between nucleus and cytoplasm

(b) It transports materials between various regions in cytoplasm

(c) It can be the site of energy generation

(d) It can be the site for some biochemical activities of the cell

Ans.(c) It can be the site of energy generation

Explanation: Energy generation is the function of mitochondria.

6. Following are a few definitions of osmosis

Read carefully and select the correct definition

(a) Movement of water molecules from a region of higher concentration to a region of lower concentration through a semipermeable membrane

(b) Movement of solvent molecules from its higher concentration to lower concentration

(c) Movement of solvent molecules from higher concentration to lower concentration of solution through a permeable membrane

(d) Movement of solute molecules from lower concentration to higher concentration of solution through a semipermeable membrane

Ans. (a) Movement of water molecules from a region of higher concentration to a region of lower concentration through a semipermeable membrane

7. Plasmolysis in a plant cell is defined as

(a) break down (lysis) of plasma membrane in hypotonic medium

(b) shrinkage of cytoplasm in hypertonic medium

(c) shrinkage of nucleoplasm

(d) none of them

Ans.(b)shrinkage of cytoplasm in hypertonic medium

Explanation: When a cell is kept in hypertonic solution, it results in exosmosis. Most of the fluid goes out of the cell; resulting in shrinkage of cytoplasm.

8. Which of the following are covered by a single membrane?

(a) Mitochondria

(b) Vacuole

(c) Lysosome

(d) Plastid

Ans. (b) and (c) Vacuole and lysosome

Explanation: Other organelles in the options are double – membrane structures.

9. Find out the false sentences

(a) Golgi apparatus is involved with the formation of lysosomes

(b) Nucleus, mitochondria and plastid have DNA; hence they are able to make their own structural proteins

(c) Mitochondria is said to be the power house of the cell as ATP is generated in them.

(d) Cytoplasm is called as protoplasm

Ans. (a) Golgi apparatus is involved with the formation of lysosomes

Explanation: Golgi apparatus is involved in synthesis and storage of certain biomolecules and has no role to play in the formation of lysosomes.

10. Find out the correct sentence

(a) Enzymes packed in Lysosomes are made through RER (rough endoplasmic reticulum)

(b) Rough endoplasmic reticulum and smooth endoplasmic reticulum produce lipid and protein respectively

(c) Endoplasmic reticulum is related with the destruction of plasma membrane

(d) Nucleoid is present inside the nucleoplasm of eukaryotic nucleus

Ans.(a) Enzymes packed in Lysosomes are made through RER (rough endoplasmic reticulum)

Explanation: RES has ribosomes on the surface and ribosomes are responsible for protein synthesis and thus for enzymes synthesis as well. Hence, option 'a' is correct and option 'b' is incorrect. ER has no role to play in destruction of plasma membrane. The undefined nuclear region in prokaryotes is called nucleoid.

11. Which cell organelle plays a crucial role in detoxifying many poisons and drugs in a cell?

(a) Golgi apparatus

(b) Lysosomes

(c) Smooth endoplasmic reticulum

(d) Vacuoles

Ans.(c) Smooth endoplasmic reticulum

Explanation: In the liver cells of vertebrate, SER plays an important role in detoxifying many poisons and drugs.

12. The proteins and lipids, essential for building the cell membrane, are manufactured by

(a) rough endoplasmic reticulum

(b) golgi apparatus

(c) plasma membrane

(d) mitochondria

Ans.(a) rough endoplasmic reticulum

Explanation: Endoplasmic reticulum synthesise both lipids and proteins. However, RER mainly synthesise proteins and SER mainly synthesise lipids.

13. The undefined nuclear region of prokaryotes are also known as

(a) nucleus

(b) nucleolus

(c) nucleic acid

(d) nucleoid

Ans.(d)nucleoid

14. The cell organelle involved in forming complex sugars from simple sugars are

(a) endoplasmic reticulum

(b) ribosomes

(c) plastids

(d) golgi apparatus

Ans.(d)golgi apparatus

Explanation: Golgi apparatus is involved in repackaging of many biomolecules.

15. Which out of the following is not a function of vacuole?

(a) Storage

(b) Providing turgidity and rigidity to the cell

(c) Waste excretion

(d) Locomotion

Ans.(d) Locomotion

Explanation: Locomotion is carried out by specialized structures which are outside the cell but vacuoles are inside the cell.

16. Amoeba acquires its food through a process, termed

(a) exocytosis

(b) endocytosis

(c) plasmolysis

(d) exocytosis and endocytosis both

Ans.(b)endocytosis

Explanation: The Term endocytosis is composed of two term, i.e. 'endo' means towards inside and 'cytosis' means movement related to cell.

17. Cell wall of which one of these is not made up of cellulose?

(a) Bacteria

(b) Hydrilla

(c) Mango tree

(d) Cactus

Ans.(a) Bacteria

Explanation: Other options show plants in which cell wall is made of cellulose. But cell wall of bacteria is made of peptidoglycan.

18. Silver nitrate solution is used to study

(a) endoplasmic reticulum

(b) golgi apparatus

(c) nucleus

(d) mitochondria

Ans.(b)golgi apparatus

Explanation: Camillo Golgi carried out 'black reaction' which involved use of silver nitrate. This helped him in staining individual nerve and cell structures.

19. Organelle other than nucleus, containing DNA is

(a) endoplasmic reticulum

(b) golgi apparatus

(c) mitochondria

(d) lysosome

Ans.(c)mitochondria

Explanation: Mitochondria and chloroplast contain DNA and hence have capability of replication.

20. Kitchen of the cell is

(a) mitochondria

(b) endoplasmic reticulum

(c) chloroplast

(d) golgi apparatus

Ans.(c)chloroplast

Explanation: Food is produced in plants inside chloroplasts. Hence, chloroplast is called the kitchen of the cell.

21. Lipid molecules in the cell are sythesized by

(a) smooth endoplasmic reticulum

(b) rough endoplasmic reticulum

(c) golgi apparatus

(d) plastids

Ans.(a)smooth endoplasmic reticulum

22. Cell arises from pre-existing cell was stated by

(a) Haeckel

(b) Virchow

(c) Hooke

(d) Schleiden

Ans. (b) Virchow

Explanation: This postulation of Virchow made an addition to the earlier cell theory.

23. Cell theory was given by

(a) Schleiden and Schwann

(b) Virchow

(c) Hooke

(d) Haeckel

Ans.(a) Schleiden and Schwann

Explanation: They were the first to propose the cell theory which stated that all plants and animals are made up of cell and cell is the basic unit of life.

24. The only cell organelle seen in prokaryotic cell is

(a) mitochondria

(b) ribosomes

(c) plastids

(d) lysosomes

Ans.(b)ribosomes

Explanation: Other cell organelles are absent in prokaryotic cells.

25. Organelle without a cell membrane is

(b) golgi apparatus

(c) chloroplast

(d) nucleus

Ans.(a)ribosome

Explanation: Other cell organelles are membrane – bound.

26. 1 µm is

(a) 10^{-6} m

(b) 10^{-9} m

(c) 10^{-10} m)

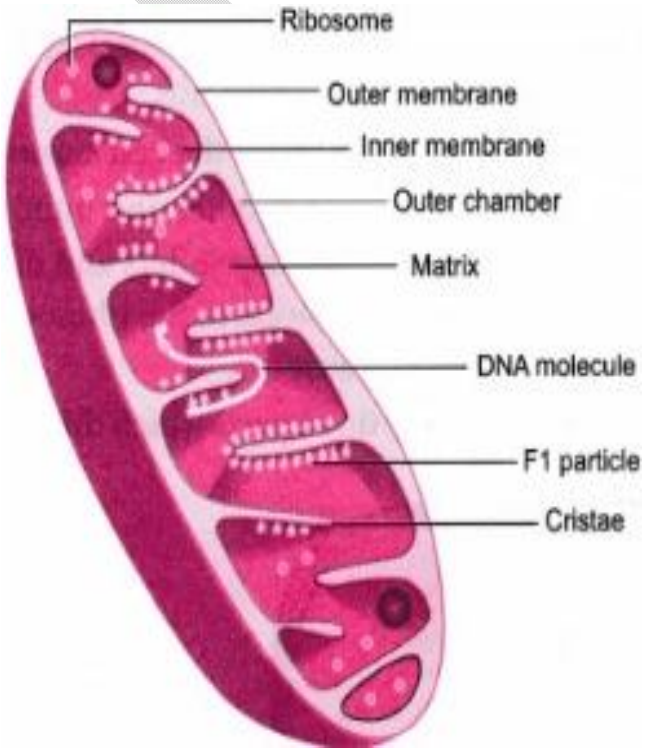
10^{-3} m

Ans.(a)10^{-6} m

27. Lysosome arises from (a) endoplasmic reticulum (b) golgi apparatus

(c) nucleus

(d) mitochondria



Ans.(b)golgi apparatus

28. Living cells were discovered by

(a) Robert Hooke

(b) Purkinje

d) Robert Brown

Ans.(c) Leeuwenhoek

Explanation: Robert Hooke was the first to observe cells but he observed dead cells of cork. It was Leeuwenhoek who was the first to observe living cells.

29. Select the odd one out

(a) The movement of water across a semipermeable membrane is affected by the amount of substances dissolved in it.

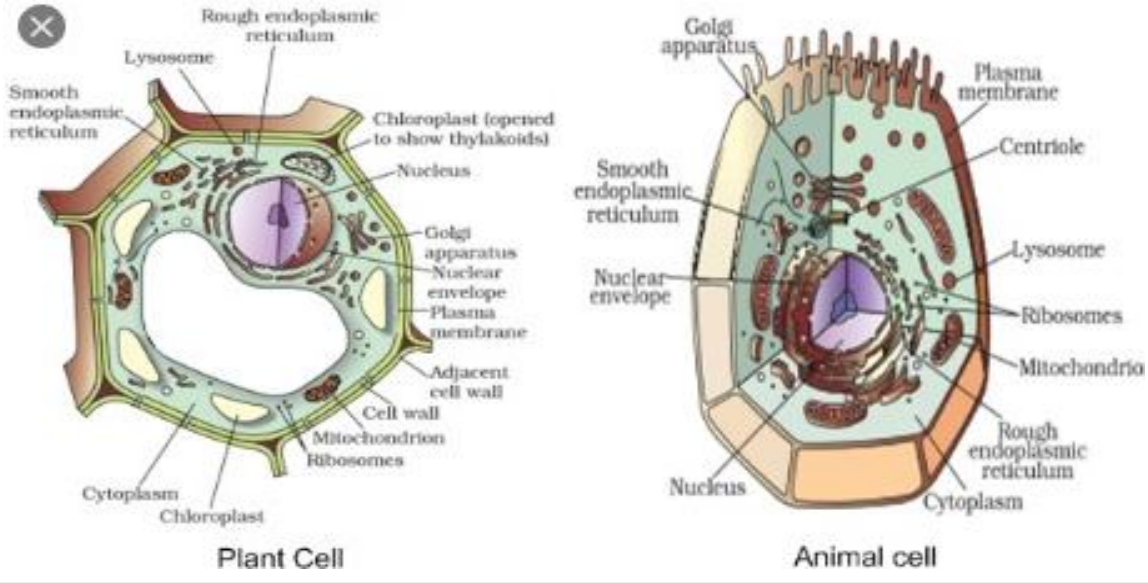
(b) Membranes are made of organic molecules like proteins and lipids

(c) Molecules soluble in organic solvents can easily pass through the membrane.

(d) Plasma membranes contain chitin sugar in plants

Ans.(d) Plasma membranes contain chitin sugar in plants

Explanation: This is a wrong statement, while others are correct.



Chapter - 6

Tissues

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1. What is tissue?

Ans. It is a group of cells similar in origin and structure and they are specialized to perform a particular function like muscle cells in our body forms the muscle tissue that bring about body movements (specific function).

2. What is the utility of tissues in multi-cellular organisms?

Ans. There is a clear cut division of labour in multicellular organisms i.e. different parts of the body of a multicellular organism perform specific functions. For example, brain controls all other parts of body, heart pumps blood to all parts of body, kidneys remove waste materials from body, sense organs collect information from external sources for sensory perception etc. All these functions would never be possible without formation of tissues in multicellular organisms.

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1. Name types of simple tissues.

Ans. The simple tissues (found in plants) are of following three types:

i) parenchyma **ii)**
collenchyma **iii)**
sclerenchyma

2. Where is apical meristem found?

Ans. The apical meristem is found at the apex (growing tips) of the stem and roots.

3. Which tissue makes up the husk of coconut?

Ans. Sclerenchymatous fibres

4. What are the constituents of phloem?

Ans. The constituents of phloem are: sieve tubes, companion cells, phloem parenchyma phloem fibres (bast).

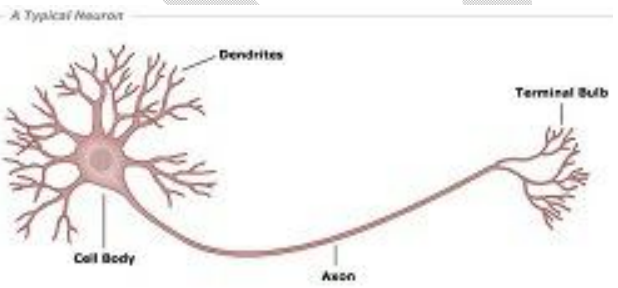
(Page No. 78)

1. Name the tissue responsible for movement in our body.

Ans. Muscle/muscular tissue.

2. What does a neuron look like?

Ans. A neuron comprises of a cell body (cyton) along with one or more short branches(Dendron) and one hair like long branch (axon).



3. Give three features of cardiac muscles.

Ans. (i) Cardiac muscles are involuntary i.e. they don't work under our will.

(ii) Its cells are cylindrical, branched, striated and uninucleate.

(iii) It shows rhythmic contraction and relaxation throughout the person's life.

4. What are the functions of areolar tissue?

Ans. Areolar tissue is a kind of filler tissue found between skin and muscles, around our

blood vessels and nerve cells and also in the bone marrow. Its functions are therefore

i) To fill the space inside organs.

ii) To help in repair and maintenance of nearby tissues/organs.

iii) To support and prevent injuries to internal organs.

Chapter – end

1. Define the term "tissue".

Ans. It is a group of cells similar in origin and structure and they are specialized to perform a particular function like muscle cells in our body forms the muscle tissue that brings about body movements(specific function).

2. How many types of elements together make up the xylem tissue? Name them.

Ans. Xylem tissue is made up of following 4 types of elements:

i) Tracheids

ii) vessels

iii) Xylem fibres

iv) Xylem parenchyma

3. How are simple tissues different from complex tissues in plants?

Ans.

Simple tissue	Complex tissue
i) It is made up of only one type of cells. ii) All cells of this tissue work as individual units to perform a particular function. Eg. parenchyma, collenchyma and sclerenchyma tissues.	i) It is made up of more than one type of cells. ii) Cells of this tissue work together as one single unit to bring about a particular function. Eg. xylem and phloem tissues.

4. Differentiate between parenchyma, collenchyma and sclerenchyma on the basis of their cell wall.

Ans.

Parenchyma	Collenchyma	Sclerenchyma
Cell wall is thin and made up of cellulose.	Cell wall is irregularly thickened at corners due to deposition of pectin.	Cell wall is very thick due to deposition of impermeable substance lignin.

5. What are the functions of the stomata?

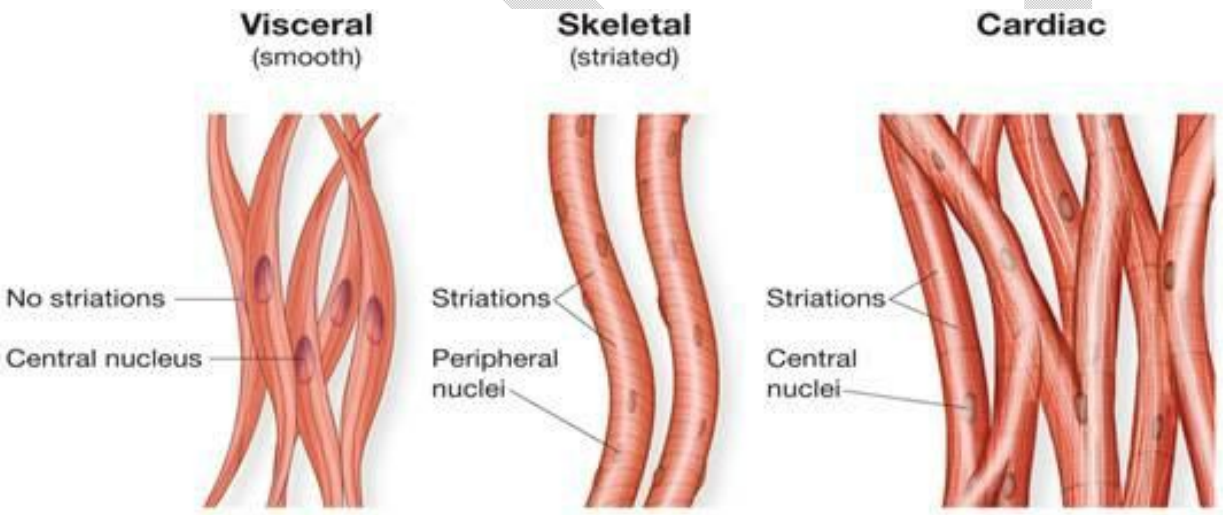
Ans. The functions of stomata are:

i) gaseous exchange like exchange of CO_2 and O_2.

ii) Process of transpiration i.e. loss of excess water in the form of water vapour occurs through stomata.

6. Diagrammatically show the difference between the three types of muscle fibres.

Ans.



Contracts	Slowly	Rapidly	Rapidly
Found	Viscera, blood vessels	Trunk, extremities, head and neck	Heart
Control	Involuntary	Voluntary	Involuntary

7. What is the specific function of the cardiac muscle?

Ans. Cardiac muscles are the muscles of heart that pumps blood to all parts of body and the pumping needs rhythmic contraction and relaxation of cardiac muscles throughout the life

without any fatigue.

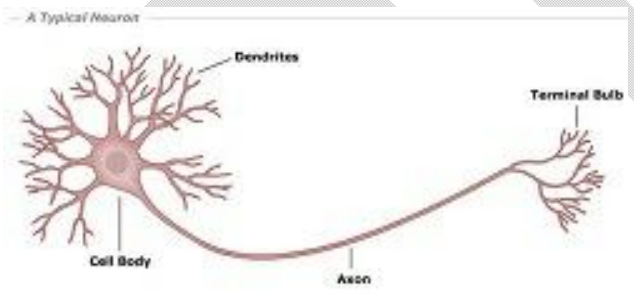
8. Differentiate between striated, unstriated and cardiac muscles on the basis of their structure and site/location in the body.

Ans.

Striated muscle	Unstriated muscle	Cardiac muscle
They show light and dark bands (striations) when we stain them. Their cells are elongated and cylindrical also unbranched. Cells are multinucleate.	They don't show any striations on staining. Their cells are long but spindle shaped and unbranched. Cells are uninucleate.	They show striations on staining. Their cells re cylindrical and branched. Cells are uninucleate.
They are responsible to bring about voluntary movements (like tongue, limbs etc)	They are involuntary in action (walls of tubular organs, blood vessels etc)	They are again involuntary in their function (contraction and relaxation of heart)

9. Draw a labelled diagram of a neuron.

Ans.



10. Name the following.

(a) Tissue that forms the inner lining of our mouth.

(b) Tissue that connects muscle to bone in humans.

(c) Tissue that transports food in plants.

(d) Tissue that stores fat in our body.

(e) Connective tissue with a fluid matrix.

f) Tissue present in the brain.

Ans. (a) epithelial tissue

(b) tendons

(c) phloem

(d) adipose tissue

(e) blood

(f) nerve tissue

11. Identify the type of tissue in the following: skin, bark of tree, bone, lining of kidney tubule, vascular bundle.

Ans.

Skin	Epithelial tissue
Bark of tree	Sclerenchymatous tissue
Bone	Connective tissue
Lining of kidney tubule	Cuboidal epithelial tissue
Vascular bundle	Complex permanent tissue

12. Name the regions in which parenchyma tissue is present.

Ans. Parenchymatous tissue is present in the epidermis, cortex, pith of the stem, root, leaves, flowers and fruits of plants.

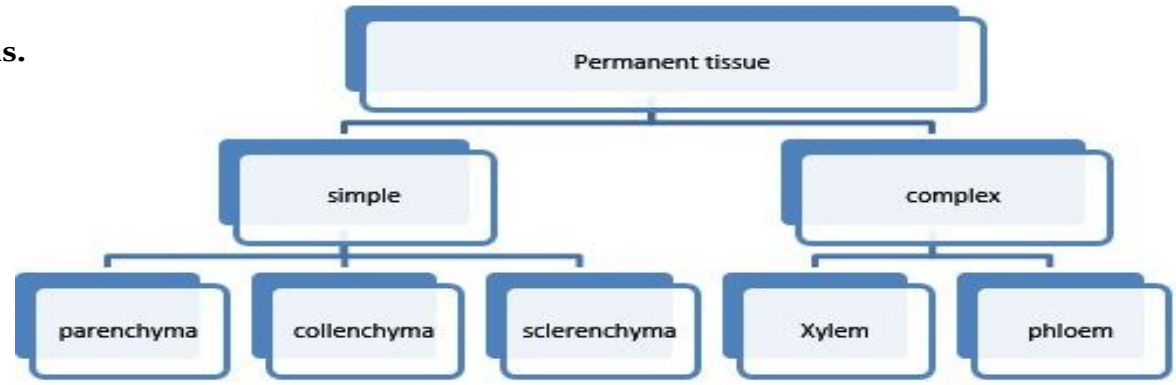
13. What is the role of epidermis in plants?

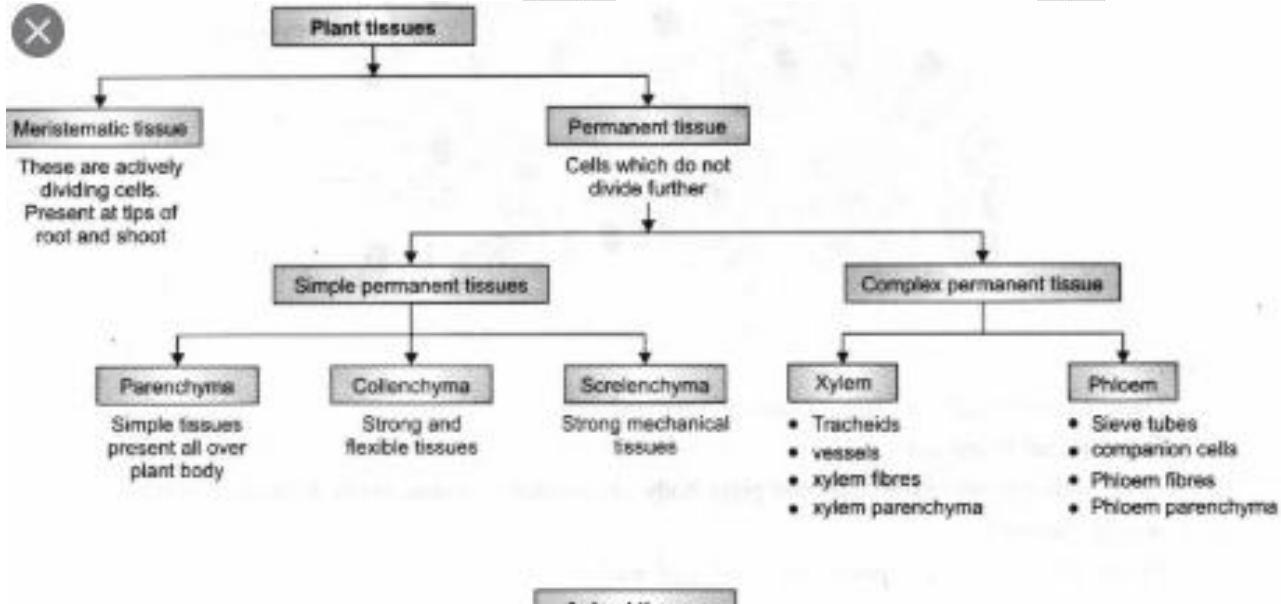
Ans. It is a protective layer to the plant parts. It can also absorb water from soil like in the roots and even allow exchange of gases through stomata. It also helps in preventing the entry of pathogens.

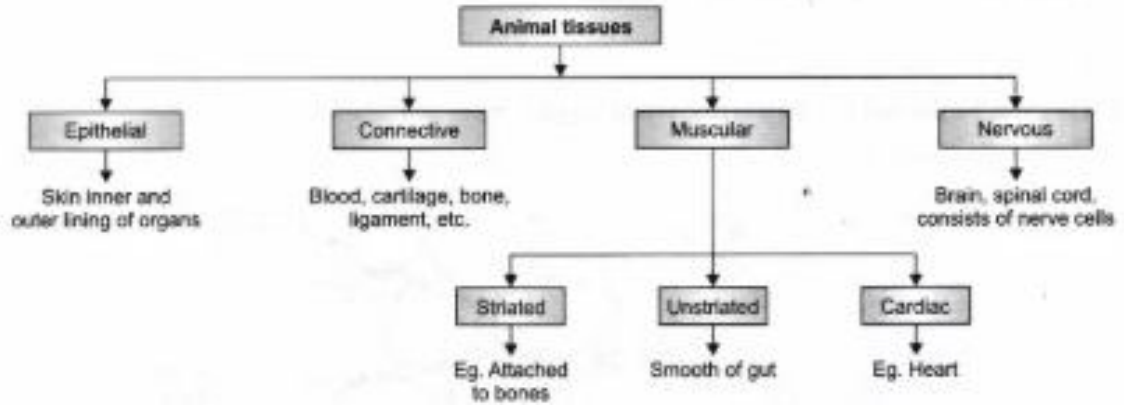
Ans. In plants the secondary meristem cuts off many external layers of cells that are dead and arranged in a compact manner. Such layers together make cork. They have deposition of suberin which is very hard and impermeable hence protects plants from unfavorable conditions and microbial attack etc.

15. Complete the table:

Ans.







Short Answer Questions

34. Animals of colder regions and fishes of cold water have thicker layer of subcutaneous fat. Describe why?

Ans. Fat acts as subcutaneous insulation of body for thermoregulation. The animals living in cold regions have various layers of fat so that the temperature of the body can be maintained and also because fats do not allow the internal heat to escape out of the body.

35. Match the column (A) with the column (B)

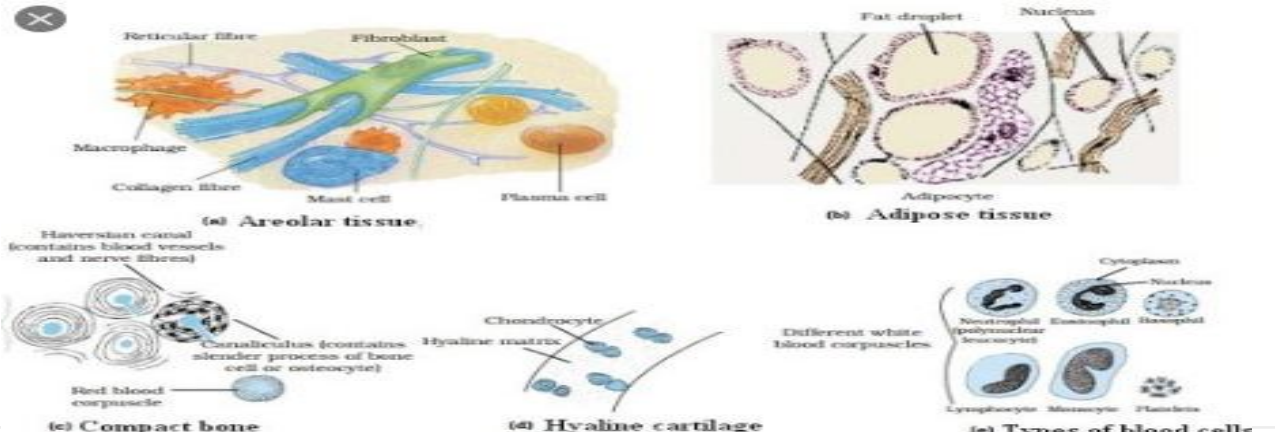
Column (A)	Column (B)
(a) Fluid connective tissue	(i) Subcutaneous layer
(b) Filling of space inside the organs	(ii) Cartilage
(c) Striated muscle	(iii) Skeletal muscle
(d) Adipose tissue	(iv) Areolar tissue
(e) Surface of joints	(v) Blood
(f) Stratified squamous epithelium	(vi) Skin

Ans. a—(v); b—(iv); c—(iii); d—(i); e—(ii); f—(vi);

36. Match the column (A) with the column (B)

Column A	Column B
(a) Parenchyma	(i) Thin walled, packing cells
(b) Photosynthesis	(ii) Carbon fixation
(c) Aerenchyma	(iii) Localized thickenings
(d) Collenchyma	(iv) Buoyancy
(e) Permanent tissue	(v) Sclerenchyma

Ans. a—(i); b—(ii); c—(iv); d—(iii); e—(v);

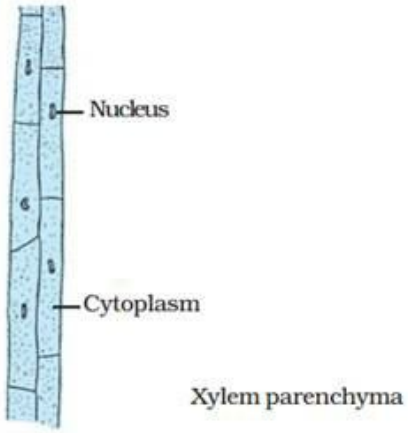


7. If a potted plant is covered with a glass jar, water vapours appear on the wall of glass jar. Explain why?

Ans. Transpiration takes place through stomata. Water vapour comes out of leaves during transpiration. When a potted plant is covered with a glass jar, water vapour (coming out because of transpiration) condenses on the wall of glass jar and hence it appears as fine droplets.

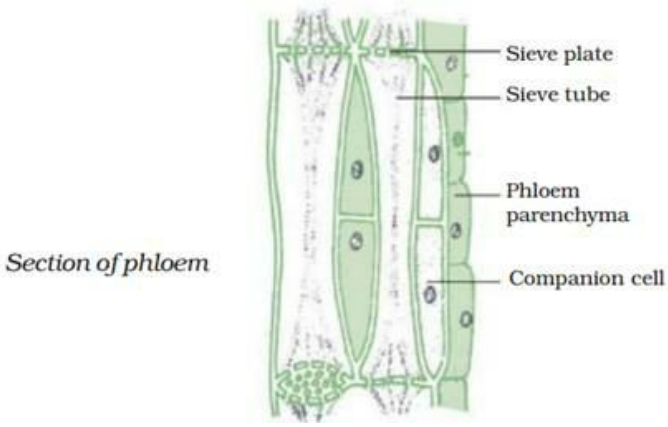
8. Name the different components of xylem and draw a living component?

Ans. Xylem consists of tracheids, vessels, xylem parenchyma and xylem fibres.



9. Draw and identify different elements of phloem.

Ans. Sieve tubes, companion cells, phloem fibres and phloem parenchyma.



10. Write true (T) or false (F)

(a) Epithelial tissue is protective tissue in animal body.

(b) The lining of blood vessels, lung alveoli and kidney tubules are all made up of epithelial tissue.

(c) Epithelial cells have a lot of intercellular spaces.

(d) Epithelial layer is permeable layer.

(e) Epithelial layer does not allow regulation of materials between body and external environment.

Ans. (a)—T, (b)—T, (c)—F, (d) —T, (e)—F

11. Differentiate between voluntary and involuntary muscles. Give one example of each type.

Ans.

Voluntary muscles	Involuntary muscles
(i) Their action is under our conscious control.	(i) Their action is not under our conscious control.
(ii) Cells are multinucleate.	(ii) Cells are uninucleate.
(iii) Example: Skeletal muscles	(iii) Example: Smooth muscle

12. Differentiate the following activities on the basis of voluntary (V) or involuntary (IV) muscles.

(a) Jumping of frog

(b) Pumping of the heart

(c) Writing with hand

(d) Movement of chocolate in your intestine

Ans. (a)—V, (b)—IV, (c)—V, (d) —IV

13. Fill in the blanks

(a) Lining of blood vessels is made up of _____.

Ans. squamous epithelium

(b) Lining of small intestine is made up of _____.

Ans. columnar epithelium

(c) Lining of kidney tubules is made up of _____.

Ans. cuboidal epithelium

(d) Epithelial cells with cilia are found in _____ of our body.

Ans. respiratory tract

14. Water hyacinth float on water surface. Explain.

Ans. A special type of parenchyma; called aernchyma is present in water hyacinth. This tissue has air-filled spaces inside and because the air gets trapped inside especially in the stem part so it becomes buoyant. Due to this, water hyacinth floats on water surface.

15. Which structure protects the plant body against the invasion of parasites?

Ans. Epidermis having thick cuticle and dermal tissue to prevent the invasion of parasites and other harmful agents.

16. Fill in the blanks

(a) Cork cells possesses _____ on their walls that makes it impervious to gases and water.

Ans. suberin

(b) _____ have tubular cells with perforated walls and are living in nature.

Ans. sieve tubes

(c) Bone possesses a hard matrix composed of _____ and _____.

Ans. calcium and phosphorus

17. Why is epidermis important for the plants?

Ans. Epidermis is important for plants due to the following reasons :

(i) it gives protection

(ii) helps in gaseous exchange

(iii) checks water loss

(iv) root hairs arising from epidermis helps in absorption of water and minerals.

(a) _____ are forms of complex tissue.

Ans. Xylem and phloem

(b) _____ have guard cells.

Ans. Stomata

(c) Cells of cork contain a chemical called _____.

Ans. Suberin

(d) Husk of coconut is made of _____ tissue.

Ans. Sclerenchyma

(e) _____ gives flexibility in plants.

Ans. Collenchyma

(f) _____ and _____ are both conducting tissues.

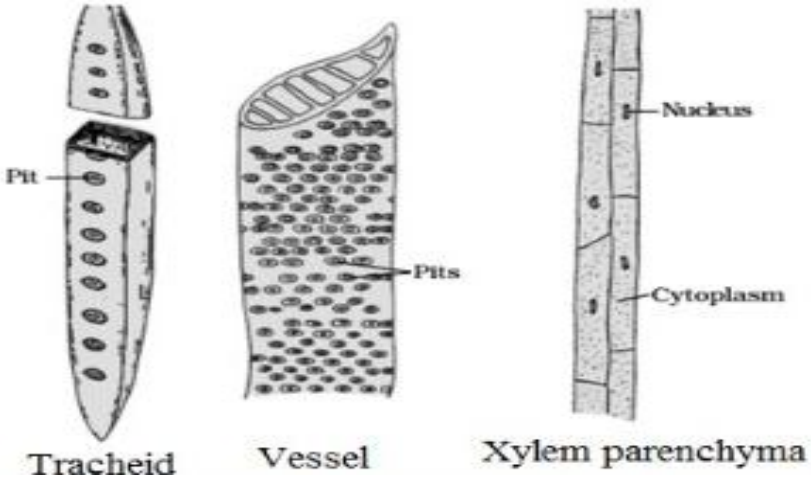
Ans. Xylem; phloem

(g) Xylem transports _____ and _____ from soil.

Ans. Water; minerals

(h) Phloem transport _____ from _____ to other parts of the plant.

Ans. food; leaves



Chapter 7

Diversity in Living Organisms

(Page No. 80)

1. Why do we classify organisms?

Ans. A large number of organisms exist on this earth. We cannot study such enormous biodiversity one by one i.e. studying variety of life forms individually is an impossible task. Hence, we make groups or categories of organisms depending upon their similarities and dissimilarities with other organisms. This allows an easier and systematic study of the life forms.

2. Give three examples of the range of variations that you see in life forms around you.

Ans. i) Life forms vary in their size – Some organisms are too small and cannot be seen with naked eyes like microorganisms while others are too big like the biggest animal which is the blue whale.

ii) Number and type of cells – Some organisms have a prokaryotic cell like bacteria and that single cell performs all the required functions while others have eukaryotic cells organized into tissue, organ and even organ systems like human beings.

iii) Mode of nutrition – Some organisms are autotrophic i.e. capable of making their own food eg plants while other organisms are heterotrophic i.e. they are dependent on other organisms for their food supply.

(Page No. 82)

1. Which do you think is a more basic characteristic for classifying organisms?

(a) the place where they live.

(b) the kind of cells they are made of. Why?

Ans. The classification of organisms based on the place where they live is not quite convincing because other living in the same habitat they hardly share any other feature for example whales, corals, starfishes, octopus, fishes, sharks etc all are aquatic i.e. they live in water their appearance and all other features are very different.

Therefore classification of organisms based on the kind of cells they are made of is more widely accepted. For such catergorisation organisms belonging to prokaryotic group will have a particular cell structure and functional pattern which will be different from the eukaryotic group.

2. What is the primary characteristic on which the first division of organisms is made?

Ans. The primary characteristic on which the first division of organisms is made is that whether the organisms are prokaryotic or eukaryotic.

3. On what bases are plants and animals put into different categories?

Ans. On the basis of their mode of nutrition as well as their body designs plants and animals are put into different categories. Plants are autotrophic and perform photosynthesis whereas animals are heterotrophic and get food from the outside. Plant cells have cell wall whereas animal cells do not have any cell wall.

(Page No. 83)

1. Which organisms are called primitive and how are they different from the so-called advanced organisms?

Ans. Such organisms that possess quite simple structure and their body design haven't changed much from their ancient sort of details even after long period of evolution on earth are called as the primitive organisms like bacteria who are still single celled and prokaryotic while advanced organisms have complex body design like trees and humans.

2. Will advanced organisms be the same as complex organisms? Why?
Ans. Yes we can say that the advanced organisms are the same as complex organisms because advancement has occurred due to the process of evolution where a group of simple organisms have changed themselves into the complex forms of life for better survival.

(Page No. 85)

1. What is the criterion for classification of organisms as belonging to kingdom Monera or Protista?
Ans. The criterion used for classification of organisms as belonging to kingdom Monera or Protista is their cell structure. Both Monerans as well as Protists are unicellular or single celled organisms but among monerans the cell is prokaryotic i.e. do not contain well defined nucleus while in protists the cell is eukaryotic i.e. have a well-defined nucleus.

2. In which kingdom will you place an organism which is single celled, eukaryotic and photosynthetic?
Ans. Kingdom Protista.

3. In the hierarchy of classification, which grouping will have the smallest number of organisms with a maximum of characteristics in common and which will have the largest number of organisms?
Ans. Smallest number of organisms with a maximum of characteristics in common will be Species while grouping with largest number of organisms with common characteristics will be Kingdom.

(Page No. 88)

1. Which division among plants has the simplest organisms?
Ans. Division thallophyta.

2. How are pteridophytes different from the phanerogams?
Ans. Pteridophytes do not produce seeds but develop naked embryos while phanerogams

3. How do gymnosperms and angiosperms differ from each other?
Ans.

Gymnosperms	Angiosperms
They are plants producing male and female cones. They develop seeds but those seeds are naked i.e. fruits are not formed.	They are flowering plants hence produce flowers as reproductive organs. They develop seeds those are covered inside fruits i.e. fruit formation occurs.

(Page No. 94)
1. How do poriferan animals differ from coelenterate animals? Ans.

Poriferans	Coelenterates
They bear pores on their body.	Pores are absent on body.
They have cellular level of body organization.	They have tissue grade of body organization.
Mesoglea absent.	Mesoglea(body cavity) present.

2. How do annelid animals differ from arthropods? Ans.

Annelids	Arthropods
Body cavity is true coelom.	Body cavity is haemocoel like in cockroach.
Body segmented and segments are	Body segmented into head, mesothorax and

3. What are the differences between amphibians and reptiles? Ans.

Amphibians	Reptiles
Body is soft and slimy without scales.	Body is covered with scales.
Fertilisation external and lay eggs in water.	Fertilization internal and lay eggs on land eg turtles.

4. What are the differences between animals belonging to the Aves group and those in the mammalian group?

Ans.

Aves	Mammalia
They lay eggs from which young ones hatch out.	They give birth to the young ones.
Body is covered with feathers.	Body is covered with hairs.
Bones are hollow or pneumatic.	Bones are filled with bone marrow.

(Chapter – end)

1. What are the advantages of classifying organisms?

Ans. Because of the huge biodiversity i.e. variety of life forms existing on earth it becomes very difficult to study them individually so scientists have made groups of organisms based on their similarities and dissimilarities. Such categorization of organisms is known as classification which help us to study them easily and systematically.

2. How would you choose between two characteristics to be used for developing a hierarchy in classification?

Ans. We would choose the characteristic related to their structure and function that will help developing a hierarchy from one level to the next level. Like arthropods are organisms with jointed appendages but among arthropods insects and spiders make separate groups having peculiar characteristics to define them. Hence we can make the hierarchy in classification by selecting general to specific characteristics.

3. Explain the basis for grouping organisms into five kingdoms.

Ans. The basis for grouping organisms into five kingdoms is as follows:

a) The organisms are made of prokaryotic or eukaryotic cells.

b) The organism has a single cell in its body or is a multicellular life form.

c) The organism prepares its own food or is dependent on other for food.

4. What are the major divisions in the Plantae? What is the basis for these divisions? Ans.

Thallophyta	Bryophyta	Pteridophyta	Gymnosperms	Angiosperms
Plant body not differentiated into root, stem and leaf.	Develop root like structures called	Develop vascular tissue for conduction but lack seeds.	Develop naked sees and lack flowers.	Develop seeds covered inside fruits and produce

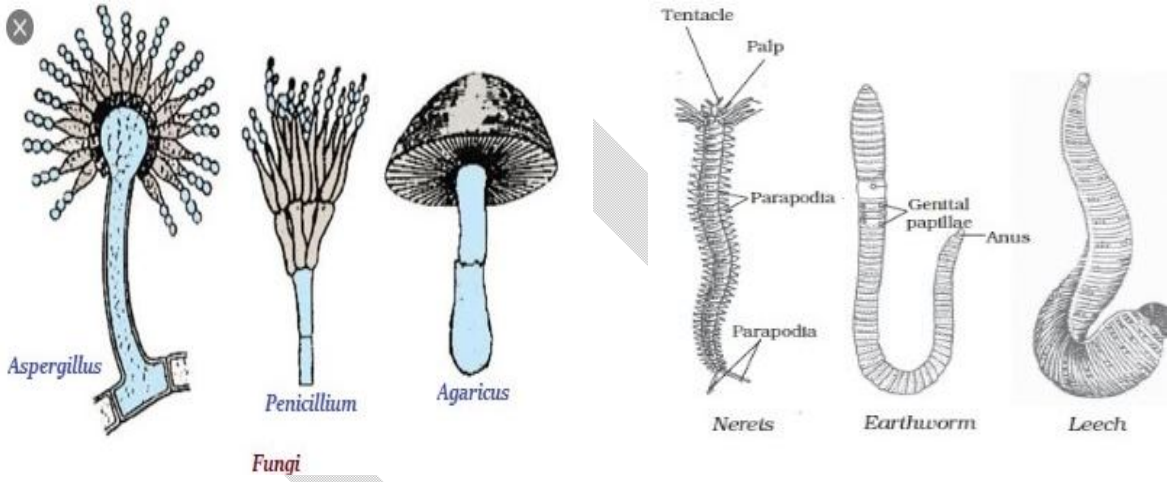
5. How are the criteria for deciding divisions in plants different from the criteria for deciding the subgroups among animals?

Ans. Animals are classified into subgroups on the basis of their level of body organization (cellular, tissue, organ grade) and symmetry, body cavity and presence or absence of notochord etc.

6. Explain how animals in Vertebrata are classified into further subgroups.

Ans. Animals in Vertebrata are classified into further subgroups based on their development of nervous system, circulatory system, reproductive methods etc. On the basis of the above mentioned characters the vertebrata is divided into following classes:

1. Exoskeleton of scales, breathing through gills - PISCES
2. Breathing through gills only in larva, skin slimy - AMPHIBIA
3. Exoskeleton of scales , laying eggs outside water - REPTILIA
4. Exoskeleton of feathers , lays eggs, flight possible - AVES (BIRDS)
5. Exoskeleton of hair, external ears, give birth to young ones - MAMMALIA



Chapter – 13

Why Do We Fall Ill

(Page No. 178)

1. State any two conditions essential for good health. **Ans.** Two conditions essential for good health are:

- better sanitation or clean surroundings, and
- availability of sufficient and nutritious food.

2. State any two conditions essential for being free of disease.

Ans. Two conditions essential for being free of disease:

- Living in hygienic environment
- Getting vaccinated against common infectious diseases.

3. Are the answers to the above questions necessarily the same or different? Why?

Ans. Answers of above question (1,2) are interconnected but different. It is because being disease free does mean being healthy.

(Page No. 180)

1. List any three reasons why you would think that you are sick and ought to see a doctor. If only one of these symptoms were present, would you still go to the doctor? Why or why not?

Ans. If we have fever, headache, stomach-ache, loose motions, cough and sneeze etc we feel weak. Then we would feel that we are sick and ought to see a doctor. If only one of these symptoms are present we should still go to see the doctor. Any of these symptoms may be

initial signs of a severe disease.

1. In which of the following case do you think the long-term effects on your health are likely to be most unpleasant?

• if you get jaundice,

• if you get lice,

• if you get acne.

Why?

Ans. The long-term effects on our health are likely to be most unpleasant if we get jaundice because the symptoms severely affect our internal organs and persist for long time. In contrast to jaundice, lice can be removed easily with short treatment and so is the acne. Both of these do not produce long term effects on the body.

(Page No. 187)

2. Why are we normally advised to take bland and nourishing food when we are sick?

Ans. We are normally advised to take bland and nourishing food when we are sick because we are weak during illness and need complete nourishment for faster recovery. Such a food is easily digested and replenish our lost vitamins, minerals and other nutrients along with energy.

3. What are the different means by which infectious diseases are spread?

Ans. Infectious diseases can be spread by following means:

a) through contaminated food and water

b) through air

c) through vectors or carriers (housefly, mosquito etc)

d) through direct skin contact or sexual contact

(c) through cuts and wounds

5. What precautions can you take in your school to reduce the incidence of infectious diseases?

Ans. To reduce the incidence of infectious diseases in my school the precautions will include:

(i) providing clean drinking water

(ii) educating students about causes of infectious diseases

(iii) vaccination of students against common infectious diseases from time to time

(iv) proper sanitation or clean environment in school and its surroundings to eradicate vectors of infectious diseases

(v) by not allowing the affected students to attend the classes till they recover from infectious diseases.

6. What is immunisation?

Ans. If one person has chicken pox once, there is no chance of suffering from it again. This happens because when the immune system first sees an infectious microbe, it responds against it and then remembers it specifically. So the next time that particular microbe, or its close relatives enter the body, the immune system responds with even greater vigour. This eliminates the infection even more quickly than the first time around. This is the basis of the principle of immunization.

7. What are the immunisation programs available at the nearest health centre in your locality? Which of these diseases are the major health problems in your area?

Ans. DPT vaccine: it is for diphtheria, whopping cough and tetanus in infants.

Pulse polio vaccine: it is to prevent polio.

BCG vaccine: Bacillus Calmette Guerin vaccine for tuberculosis.

Hepatitis vaccine

TAB vaccine for typhoid.

Tuberculosis and diarrhea are the major health problems in our area.

(Chapter – end)

1. How many times did you fall ill in the last one year? What were the illnesses?

(a) Think of one change you could make in your habits in order to avoid any of/most of the above illnesses.

(b) Think of one change you would wish for in your surroundings in order to avoid any of/most of the above illnesses.

Ans. I fall ill only once last year. I had suffered from typhoid.

(a) I will avoid street food specially those which are cooked at unhygienic places and kept uncovered.

(b) I shall keep my surroundings cleaner than earlier.

2. A doctor/nurse/health-worker is exposed to more sick people than others in the community. Find out how she/he avoids getting sick herself/himself.

Ans. A doctor/nurse/health-worker is exposed to more sick people than others in the community still they avoid getting sick themselves because they take care of the preventive measures like personal and community hygiene/cleanliness and immunisation to prevent infectious diseases. They also wash hands with soaps thoroughly after serious examination of patients.

3. Conduct a survey in your neighbourhood to find out what the three most common diseases are. Suggest three steps that could be taken by your local authorities to bring down the incidence of these diseases.

Ans. Three most common diseases in my locality are diarrhoea, malaria and tuberculosis and following steps I would suggest to be taken by our local authorities to bring down the incidence of these diseases :

i. Supply of safe drinking water and preventing incidences of open drains.

ii. Improved and hygienic environment,free of garbage and wastes thrown in the open.

iii. Eradication of mosquitoes

iv. Immunisation/vaccination camps

4. A baby is not able to tell her/his caretakers that she/he is sick. What would help us to find out

(a) that the baby is sick?

(b) what is the sickness?

Ans. (a) Symptoms that help us to find that baby is sick, are

(i) continuous crying and restlessness in the child

(ii) improper intake of food and body temperature

(iii) loose motions

(b) Baby is suffering from diarrhoea.

5. Under which of the following conditions is a person most likely to fall sick?

(a) when she is recovering from malaria.

(b) when she has recovered from malaria and is taking care of someone suffering from chicken-pox.

(c) when she is on a four-day fast after recovering from malaria and is taking care of someone suffering from chicken-pox. Why?

Ans. A person is most likely to fall sick when she is on a four-day fast after recovering from malaria and is taking care of someone suffering from chicken-pox because a four day fast will make her body weak due to improper supply of food. Also, malaria is a very fatal disease and it will take some time for the body organs to function normally. Above all, she is taking care of someone who is suffering from most fearful infectious viral disease i.e.. chicken pox, she has more chances of getting an infection due to above mentioned reasons.

6. Under which of the following conditions are you most likely to fall sick?

(a) when you are taking examinations.

(b) when you have travelled by bus and train for two days.

(c) when your friend is suffering from measles. Why?

Ans. We are most likely to fall sick when a friend is suffering from measles since measles is an infectious/communicable disease that can spread easily from one person to the other.

Chapter - 14

Natural Resources

(Page No. 193)

1. How is our atmosphere different from the atmospheres on Venus and Mars?

Ans. On Earth air is a mixture of a number of gases mainly nitrogen (78%) and oxygen (21%) while carbon dioxide is only 0.03% while on planets such as Venus and Mars the major

component of the atmosphere is found to be carbon dioxide. In fact, carbon dioxide constitutes up to 95-97% of the atmosphere on Venus and Mars.

3. How does the atmosphere act as a blanket?

Ans. The atmosphere covering the Earth is like a blanket because air is a bad conductor of heat. The atmosphere keeps the average temperature of the Earth fairly steady during the day and even during the course of the whole year. The atmosphere prevents the sudden increase in temperature during the daylight hours. And during the night, it slows down the escape of heat into outer space.

3. What causes winds?

Ans. When air is heated by radiation from the heated land or water, it rises. But since land gets heated faster than water, the air over land would also be heated faster than the air over water bodies. Therefore, during the day, the air above the land gets heated faster and starts rising. As this air rises, a region of low pressure is created and air over the sea moves into this area of low pressure. The movement of air(wind) from one region to the other creates winds.

4. How are clouds formed?

Ans. When water bodies are heated during the day, a large amount of water evaporates and

goes into the air. Some amount of water vapour also get into the atmosphere because of various biological activities. This air also gets heated. The hot air rises up carrying the water vapour with it. As the air rises, it expands and cools. This cooling causes the water vapour in the air to condense in the form of tiny droplets. This condensation of water is facilitated if some particles could act as the 'nucleus' for these drops to form around. Normally dust and other suspended particles in the air perform this function. An enormous collection of tiny droplets of water appear as clouds. When the droplets have grown big and heavy,they fall down in the form of rain.

5. List any three human activities that you think would lead to air pollution.

Ans. following are the human activities that lead to air pollution.

1. Burning of fossil fuels like coal and petroleum releases different oxides of nitrogen and sulphur in air.
2. Burning of wood release suspended particles and smoke in air.
3. Use of harmful chemicals like aerosols, CFCs etc.

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1. Why do organisms need water?

Ans. All organisms are made up of cells. All cellular processes take place in a water medium. All the reactions that take place within our body and within the cells occur between substances that are dissolved in water.

Substances are also transported from one part of the body to the other in a dissolved form. Hence, organisms need to maintain the level of water within their bodies in order to stay alive.

2. What is the major source of fresh water in the city/town/village where you live?

Ans. Major sources of water are:

- rain water that provides water to all other sources
- lakes, ponds and pools

- rivers, wells and tube wells
- dams

. Do you know of any activity which may be polluting this water source?

ns. The fertilisers and pesticides used in our farms, sewage from our towns and cities and he waste from factories, specific industries also use water for cooling in various operations nd later return this hot water to water-bodies. Such activities are polluting the water odies.

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. How is soil formed?

ns. Over long periods of time, thousands and millions of years, the rocks at or near the urface of the Earth are broken down by various physical, chemical and some biological rocesses. The end product of this breaking down is the fine particles of soil. Factors esponsible are as follows:

The Sun: The Sun heats up rocks during the day so that they expand. At night, these rocks ool down and contract. Result is formation of cracks.

Water: Water helps in the formation of soil in two ways. One, water could get into the cracks n the rocks formed due to uneven heating by the Sun. If this water later freezes, it would ause the cracks to widen.

Wind: In a process similar to the way in which water rubs against rocks and wears them own, strong winds also erode rocks down.

iving organisms: The lichens grows on the surface of rocks. While growing, they release ertain substances that cause the rock surface to powder down and form a thin layer of soil. Other small plants like moss are able to grow on this surface now and they cause the rock to reak up further. The roots of big trees sometimes go into cracks in the rocks and as the roots row bigger, the crack is forced bigger.

2. What is soil erosion?

Ans. The removal and transportation of top soil from its original position to another place with the help of certain agents such as strong winds and fast running water is called soil erosion.

7. What are the methods of preventing or reducing soil erosion?

Ans. The methods of preventing or reducing soil erosion are as follows:

- prevention of deforestation and overgrazing.
- afforestation and reforestation
- improved methods of agriculture
- Making strong embankments along the river banks

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1. What are the different states in which water is found during the water cycle?

Ans. Water occurs in all three states of matter during the water cycle:

1. Water vapours in the air which ultimately form clouds, and
2. Rain water that falls on Earth and is available to us in water bodies or as underground water.
3. Dew, snow, sheet or hail

2. Name two biologically important compounds that contain both oxygen and nitrogen.

Ans. Urea, Nucleic acids (DNA and RNA), Proteins.

3. List any three human activities which would lead to an increase in the carbon dioxide content of air.

Ans. Three human activities which would lead to an increase in the carbon dioxide content of air are:

- burning of coal and petroleum
- combustion of wood

- deforestation(cutting down forests)

. What is the greenhouse effect?

Ans. An increase in the percentage of gases which trap solar radiations, causesthe average emperatures to increase worldwide and this is called Greenhouse effect. Carbon dioxide , ethane etc. are greenhouse gases. An increase in the carbon dioxide content in the tmosphere for example, would cause more heat to be retained by the atmosphere and lead global warming.

. What are the two forms of oxygen found in the atmosphere?

ns. Molecular oxygen (O_2) and Ozone (O_3)

(Chapter – end)

. Why is the atmosphere essential for life?

Ans. We need atmosphere for following reasons:

(i) It works like a blanket and traps the radiations reflected back from earth surface that keeps the average temperature of earth quite steady and suitable for sustenance of life.

(ii) It provides carbon dioxide for photosynthesis and oxygen for respiration and combustion.

(iii) Prevents sudden change in temperature.

(iv) Enables us to hear sounds.

. Why is water essential for life?

Ans. Water is essential for life because:

1. All organisms are made up of cells. All cellular processes take place in a water medium. All the reactions that take place within our body and within the cells occur between substances that are dissolved in water.

2. Substances are also transported from one part of the body to the other in a dissolved form.
3. Essential for digestion.
4. Helpful in excretion and egestion.
5. Regulates our body temperature by sweating and evaporation.

3. How are living organisms dependent on the soil? Are organisms that live in water totally independent of soil as a resource?

Ans. Plants need simple nutrients like certain elements for their proper growth and they get most of these elements from soil. With the help of these elements plants prepare their own food in the presence of sunlight. Since all other organisms are dependent upon plants for their nutrition hence we can say that organisms that live in water are not totally independent of soil as a resource. Another reason is that organic matter from soil dissolves into water and provides nutrients to the aquatic organisms.

4. You have seen weather reports on television and in newspapers. How do you think we are able to predict the weather?

Ans. The informations about the weather are recorded by meteorological laboratories present in different cities of the country. Information such as direction and speed of wind, average daily minimum and maximum temperature,relative humidity, patterns of cloud formation, etc., are recorded with the help of instruments and then displayed on television, published in newspapers and broadcasted on the radio.

5. We know that many human activities lead to increasing levels of pollution of the air, water-bodies and soil. Do you think that isolating these activities to specific and limited areas would help in reducing pollution?

Ans. Many human activities lead to increasing levels of pollution of the air, water-bodies and soil. Isolating such activities to specific and limited areas may help in reducing water and soil pollution but it may hardly make any difference to air pollution severity. The reason is gases will spread from isolated places and reach everywhere. Instead of isolating we must stress on sustainable management of our resources and cut down or replace their use like using

cleaner fuels like CNG in place of fossil fuels.

6. Write a note on how forests influence the quality of our air, soil and water resources.

Ans. Quality of air: Forests have trees and plants that absorb carbon dioxide and liberate oxygen thus maintaining their levels in the biosphere.

Quality of soil: Roots of trees hold the soil particles and prevent soil erosion from taking place. Dead trees and plants or their parts add humus and organic matter to soil thus making it fertile.

Quality of water: Forest allows easy going of the water cycle in nature with cloud formation and condensation in the form of rain.

Chapter 15

Improvement in Food Resources

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1. What do we get from cereals, pulses, fruits and vegetables?

Ans. We get carbohydrates from cereals, proteins from pulses, vitamins and minerals from

fruits and vegetables.

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1. How do biotic and abiotic factors affect crop production?

Ans. Crop production can go down due to biotic (diseases due to infection by vriuses or fungi, insects) and abiotic (drought, salinity,water logging, heat,cold and frost) stresses under different situations.

2. What are the desirable agronomic characteristics for crop improvements?

Ans. The desirable agronomic characteristics for crop improvements are as follows:

1. For cereal crops desirable characteristic is dwarfness since such plants will utilise less amount of nutrients.
2. For fodder crops desirable characteristics are tallness and profuse branching so that we can obtain more amount of leaves for feeding our animals.

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1. What are macro-nutrients and why are they called macronutrients?

Ans. There are sixteen nutrients which are essential for plants. Among these thirteen nutrients, six are required in large quantities and are therefore called macronutrients.

Macronutrients: nitrogen, phosphorus, potassium, calcium, magnesium, sulphur.

2. How do plants get nutrients?

Ans. Nutrients are supplied to plants by air, water and soil.

Source	Nutrients provided
Air	carbon, oxygen
Water	hydrogen, oxygen
Soil	nitrogen, phosphorus, potassium, calcium, magnesium, sulphur, iron, manganese, boron, zinc, copper, molybdenum, chlorine

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1. Compare the use of manure and fertilizers in maintaining soil fertility.

Ans. Manure is prepared by the decomposition of animal excreta and plant waste so contains large quantities of organic matter and also supplies small quantities of nutrients to the soil that improves soil fertility.

Fertilizers are commercially produced in factories to supply nitrogen, phosphorus and potassium that ensures soil fertility in terms of proper dose, time, and observing pre and post-application precautions.

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1. Which of the following conditions will give the most benefits? Why?

(a) Farmers use high-quality seeds, do not adopt irrigation or use fertilizers.

(b) Farmers use ordinary seeds, adopt irrigation and use fertilizer.

(c) Farmers use quality seeds, adopt irrigation, use fertilizer and use crop protection measures.

Ans. (c) Farmers use quality seeds, adopt irrigation, use fertilizer and use crop protection measures.

(i) The use of good quality seeds increases the total crop production. If a farmer is using good quality seeds, then a majority of seeds will germinate properly, and will grow into a healthy plant.

(ii) Proper irrigation methods improve the water availability to crops.
(iii) Fertilizers ensure healthy growth and development in plants by providing the essential nutrients such as nitrogen, phosphorus, potassium, etc.
(iv) Crop protection measures include various methods to control weeds, pests, and infectious agents.
If all these necessary measures are taken by a farmer, then the overall production of crops will increase.

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1. Why should preventive measures and biological control methods be preferred for protecting crops?

Ans. Prevention is better than cure so it is true for plants also. Preventive measures (such as use of resistant varieties of crops) and biological control methods should be preferred for protection of crops because they are ecologically safe, target specific and harmless to other life forms.

2. What factors may be responsible for losses of grains during storage?

Ans. Factors that may be responsible for losses of grains during storage are:
Abiotic factors: Unfavourable conditions of humidity and temperature.
Biotic factors: Insects, rodents, bacteria, fungi etc that feed on grains.

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1. Which method is commonly used for improving cattle breeds and why?

Ans. The method of cross breeding is commonly used for improving cattle breeds.
For example in milch animals exotic or foreign breeds (for example, Jersey, Brown Swiss) are selected for long lactation periods, while local breeds (for example, Red Sindhi, Sahiwal) show excellent resistance to diseases. The two can be cross-bred to get animals with both the desired qualities.

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1. Discuss the implications of the following statement:

"It is interesting to note that poultry is India's most efficient converter of low fibre food stuff (which is unfit for human consumption) into highly nutritious animal protein food."

Ans. Under poultry the birds kept are fed on agricultural waste material and broken grains etc which are not useful for humans but those birds consuming such waste provide us with eggs and meat which is highly nutritious animal protein food hence the statement made is quite appropriate.

1. What management practices are common in dairy and poultry farming?

Ans. The management practices that are common in dairy and poultry farming are:

Proper feeding

Proper cleaning and shelter facilities

Protection from unfavorable climatic conditions and diseases.

Protection from pests.

2. What are the differences between broilers and layers and in their management?

Ans.

Broilers	Layers
▪ used for meat purpose. ▪ Broiler chickens are fed with vitamin-rich supplementary feed for good growth rate and better feed efficiency and care is taken to avoid mortality and to maintain feathering an carcass quality	▪ used for egg production. ▪ Layers don't need any specific diet as prescribed for broilers their requirements are simpler.

Other than above differences housing, nutritional and environmental requirements of broilers are somewhat different from those of egg layers.

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1. How are fish obtained?

Ans. There are two ways of obtaining fish. They can be obtained by:

a) Capture fishing: It is the way of obtaining fish from their natural resources (rivers, lakes, oceans).

b) Culture fishery: It is also known as fish farming where selected fishes are reared and bred.

. What are the advantages of composite fish culture?

Ans. Compositefish culture has following advantages:

- Both local and imported fish species can be used in such systems.
- Due to non-competitive nature of selected fishes food available in all the parts of the water reservoir is used.
- Increases the fish yield from the water reservoir (intensive fish farming).

. What are the desirable characters of bee varieties suitable for honey production?

ns. The desirable characters of bee varieties suitable for honey production are:

high honey collection capacity.

they must sting less.

They should stay in a given beehive for long periods, and breed very well.

2. What is pasturage and how is it related to honey production?

ns. Pasturage refers to the flowers available to the bees for nectar and pollen collection. he value or quality of honey depends upon the pasturage. Along with this the kind of lowers available will determine the taste and quality of the honey.

(Chapter – end)

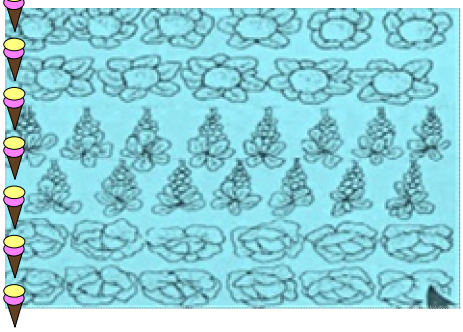
. Explain any one method of crop production which ensures high yield.

ns. To ensure high yield various cropping patterns can be very useful. The cropping atterns to be mentioned here are:

- mixed cropping

- inter cropping
- crop rotation

Mixed cropping is growing two or more crops simultaneously on the same piece of land, for example, wheat + gram, or wheat +mustard, or groundnut + sunflower. This reduces risk and gives some insurance against failure of one of the crops.



Inter-cropping is growing two or more crops simultaneously in the same field in a definite pattern (as shown below). The crops are selected such that their nutrient requirements are different. This ensures maximum utilisation of the nutrients supplied, and also prevents pests and diseases from spreading to all the plants belonging to one crop in a field for example, soyabean + maize, or finger millet (*bajra*) + cowpea (*lobia*).

Crop rotation is growing of different crops on a piece of land in a pre-planned succession. Depending upon the duration, crop rotation is done for different crop combinations. The availability of moisture and irrigation facilities decide the choice of the crop to be cultivated after one harvest. If crop rotation is done properly then two or three crops can be grown in a year with good harvests. For example - Maize + Mustard are grown in one year rotation and Maize + Potato + Sugarcane + Peas are grown in two years rotation.

2. Why are manure and fertilizers used in fields?

Ans. Manure helps in enriching soil with nutrients and organic matter and increasing soil fertility. The bulk of organic matter in manure helps in improving the soil structure. Fertilizers are used to ensure good vegetative growth (leaves, branches and flowers), giving rise to healthy plants by providing specific nutrients like nitrogen, phosphorus and potassium.

3. What are the advantages of inter-cropping and crop rotation?

Ans.

Advantages of inter cropping	Advantages of crop rotation
Inter cropping ensures maximum utilisation of the nutrients supplied, and also prevents pests and diseases from spreading to all the plants belonging to one crop in a field. This way, both crops can give better returns.	Crop rotation if well planned allows replenishment of soil nutrients without using even fertilisers like growing leguminous plants after a non-leguminous crop in the same field will ensure nitrogen enrichment of that soil. Hence it prevents any decrease in the soil fertility.

4. What is genetic manipulation? How is it useful in agricultural practices?

Ans. Plant breeding or hybridisation method that involves crossing two different plant varieties to obtain a new and better variety is called genetic manipulation.
In agricultural practices to reduce the application of insecticides and fungicides or even fertilizers such varieties are being prepared that are:

- high yielding
- pest resistant
- resistant to environmental stress
- doesn't need fertilizers for good growth

All these features help not only to improve quality and quantity of products but also reduces chances of environmental pollution.

5. How do storage grain losses occur?

Ans. There are various biotic and abiotic factors responsible for the storage grain losses:
Biotic factors: Insects, rodents, bacteria, fungi etc that feed on grains.
Abiotic factors: Unfavourable conditions of humidity and temperature.
Thus, combination of biotic and abiotic factors causes infestation of insects, degradation in quality, loss in weight, poor germinability, discolouration of produce, poor marketability and economic loss.

Ans. Animal husbandry is the scientific management of animal livestock. It includes various aspects such as feeding, breeding and disease control.
As the population increases and so do living standards increase, the demand for milk, eggs and meat is also going up. Also, the growing awareness of the need for proper treatment of livestock has brought new limitations in livestock farming. Thus, livestock production also needs to be improved. This improvement can be brought about by good animal husbandry practices like providing good food and preventing diseases in the cattles that will benefit farmers to obtain better quality and quantity products.

7. What are the benefits of cattle farming? Ans. Cattle farming has dual benefits:
(i) Draught animals for farm labour (males)i.e. for agricultural work such as tilling, irrigation and carting.
(ii) Milch animals (dairy animals) which are milk producing females.

8. For increasing production, what is common in poultry, fisheries and bee-keeping? Ans. For increasing production, steps that are common in poultry, fisheries and bee-keeping are as follows:
Variety improvement, housing, rearing, sanitation, disease control and marketing.

9. How do you differentiate between capture fishing, mariculture and aquaculture? Ans.

Capture fishing	Mari culture	Aquaculture
It is the method of catching fishes from natural resources.	These are culture fisheries that are maintained in the marine water bodies only to rear and	These culture fisheries are maintained in freshwater or marine bodies and