1. Tissue

Worksheet

A. Fill in the blanks.

1. Plant tissues are basically categorised into two types: _____ and _____.
2. _____ is a type of supporting tissue found in almost all soft parts of a plant.
3. _____ is responsible for conduction of water in plants.
4. The main role of _____ tissue is to store fat.
5. Dendrons further divide to form _____.

B. State (T) for true and (F) for false statements.

1. Cells of meristematic tissues are tightly packed with no intercellular spaces. _____
2. Protective tissue is made up of double layer of loosely packed cells. _____
3. Yellow fibrous tissue is present in tendons which connect muscles to bones. _____
4. Phloem is also known as food conducting tissue. _____
5. Cells of the voluntary and cardiac muscles consist of striations. _____

C. Match the columns.

Column A	Column B
1. Muscular tissue	(a) Sclerenchyma
2. Skeletal tissue	(b) Vascular bundles
3. Connective tissue proper	(c) Cartilage
4. Supporting tissue	(d) Areolar tissue
5. Complex permanent tissue	(e) Voluntary and involuntary

D. Answer in short.

1. Name the types of cells present in blood.
2. Write a short note on most widely distributed connective tissue in animals.
3. What is intercalary meristem?
4. Classify permanent tissue on the basis of their origin.
5. Draw the diagram of a neuron.

E. Answer in detail.

1. What are meristematic tissues? Write their characteristics.
2. What are permanent tissues? Give their classification.
3. Write a note on vascular system of plants.
4. Explain types of fluid connective tissues.
5. Differentiate between voluntary and involuntary muscles.

Answers to Worksheet

A. 1. meristematic tissue, permanent tissue 2. Parenchyma
3. Xylem 4. adipose 5. dendrites

B. 1. True 2. False 3. False 4. True 5. True

C. 1. (e) 2. (c) 3. (d) 4. (a) 5. (b)

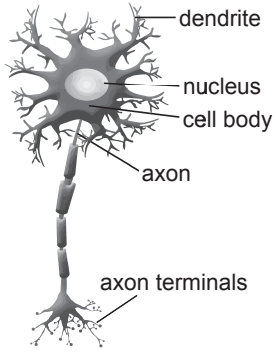
D. 1. Erythrocytes, leucocytes and thrombocytes are the types of cells present in blood.

2. Areolar tissue is the most widely distributed connective tissue in animals. It is present under the skin as a continuous layer. It fills up the spaces between various organs and acts as a packing material around the organs.

3. Intercalary meristem is located at the base of nodes where leaves attach and the region of the internodes where cell division occurs for longer time. They are responsible for stem elongation or longitudinal growth.

4. On the basis of their origin, permanent tissues can be classified as follows.
   (a) Dermal tissue
   (c) Vascular tissue
   (c) Ground or fundamental tissue

5.



A nerve cell or a neuron

E. 1. Meristematic tissue is made up of a group of cells which divide continuously and very fast. This tissue is found in the growing regions of plants such as tips of roots, stems and branches. Their function is to make the plants grow. Some characteristics of meristematic tissues are as follows.

- The cells of a meristematic tissue are small and usually cubical.
- They have thin cell walls.
- They are tightly packed with no intercellular spaces.
- They have dense cytoplasm with a large prominent nuclei.
- They have either many small vacuoles or no vacuoles at all.

2. Permanent tissues are composed of cells that have attained their definite form and size. They do not divide further. They are produced from meristematic tissues and get differentiated into various types of permanent tissues. They may be living or dead and thin-walled or thick-walled.

Depending on their origin, permanent tissues can be classified as follows.

- Dermal tissue
- Vascular tissue
- Ground or fundamental tissue

Depending on the type of cells constituting a permanent tissue, they are classified as follows.

- Simple permanent tissue
- Complex permanent tissue

3. Complex permanent tissue forms the vascular system of plants. It is made up of more than one type of cells which work together to perform a common function. Their main function is to conduct water and transport food material to various parts of a plant. Complex tissues include xylem and phloem. Together they constitute the vascular system.

   Xylem: It is mainly responsible for conduction of water and minerals from the roots to the top of plants. It is made of four types of cells.

   Phloem: The main function of phloem is to transport prepared food material from the leaf to the storage organs and the growing regions. Hence, it is also known as the food conducting tissue. It is a complex tissue made up of four kinds of cells.

4. Fluid connective tissue is of two types.

   Blood: It is composed of a straw-coloured fluid called plasma, and various cells. Three types of cells are present in blood.

   - Red blood cells (RBCs) or erythrocytes
   - White blood cells (WBCs) or leucocytes
   - Blood platelets or thrombocytes

   Blood plasma is composed of dissolved proteins, glucose, various electrolytes and water.

   The main function of blood is to transport substances like glucose, amino acids, oxygen, etc. in the body. It also provides protection from foreign bodies.

   Lymph: It is the straw-coloured fluid surrounding the body cells. It can also be called blood without the red blood cells. It plays a very important role in protecting the body against infection. It also helps to transport fats.

5.

Voluntary muscles	Involuntary muscles
• These muscles are under our control or will.	• These muscles are not under our control or will.
• They have striations and are called striated muscles.	• They do not have striations and are called unstriated muscles.
• Their cells are multinucleated.	• Their cells are uninucleated.

2. Kingdom Classification

Worksheet

A. Fill in the blanks.

1. _____ arranged all organisms into five kingdoms.
2. Bacteria and blue-green algae belong to the kingdom _____.
3. Cnidarians have _____ symmetrical body.
4. All vertebrates have a _____ circulatory system. closed
5. Vertebrates have a well-developed _____.

B. State (T) for true and (F) for false statements.

1. Annelids are aquatic animals with a streamlined body. _____
2. Slug, oyster and octopus belong to phylum Mollusca. _____
3. Red, brown and green algae are included in kingdom Plantae. _____
4. Fungi are made up of hyphae. _____
5. In binary fission, the nucleus of *Amoeba* undergoes multiple divisions. _____

C. Match the columns.

Column A	**Column B**
1. *Amanita*	(a) Platyhelminthes
2. *Treponema*	(b) Fungi
3. *Euglena*	(c) Annelids
4. Flatworms	(d) Bacteria
5. Segmented worms	(e) Protozoa

D. Answer in short.

1. Give two harmful effects of bacteria.
2. Give two harmful effects of fungi.
3. Write the main features of kingdom Plantae.
4. Write two characteristic features each of phylum Porifera and phylum Cnidaria.
5. Write two characteristic features each of class Aves and class Pisces.

E. Answer in detail.

1. What are the advantages of classification?
2. What are the ways in which certain bacteria can be useful?
3. Explain how reproduction takes place in *Amoeba*.
4. Write characteristic features of roundworms.
5. Name any one class of kingdom Animalia that has warm-blooded creatures. Write their characteristic features.

Answers to Worksheet

A. 1. Whittaker 2. Monera 3. radially 4. closed 5. backbone

B. 1. False 2. True 3. True 4. True 5. False

C. 1. (b) 2. (d) 3. (a) 4. (e) 5. (c)

D. 1. Two harmful effects of bacteria are as follows.
- Bacteria cause diseases in animals, humans and plants. Tuberculosis, tetanus, whooping cough, cholera, leprosy, diphtheria and pneumonia are some diseases caused by bacteria in human beings.
- Bacteria are also responsible for spoilage of food, rotting of fruits, vegetables and meat, and souring of milk.

2. Two harmful effects of fungi are as follows.
- Fungi mostly cause skin diseases in human beings like ringworm, athlete's foot and dhobi's itch. They also cause infection in the lungs, ears and nervous system.
- Many plant diseases are also caused by fungi. Rust and smut are common diseases in wheat plants caused by *Puccinia* and *Ustilago*, respectively.

3. The main features of kingdom Plantae are as follows.
- They are multicellular with a well-defined nucleus.
- They have chlorophyll.
- They are autotrophs and can make their own food.
- Their cells have a cell wall.

4. Following are the two characteristic features of phylum Porifera.
- They may be cylindrical, vase-like or irregular in shape.
- They cannot move. They are fixed to the bottom of a pond or sea.

Following are the two characteristic features of phylum Cnidaria.
- They have a hollow, tube-like body with only one opening called mouth.
- They have many small openings or pores all over the body. Water along with oxygen and food enters the body cavity through these pores.

5. Following are the two characteristic features of class Aves.
- They are warm-blooded animals, i.e., their body temperature does not change with the temperature of the surroundings.
- Their body is covered with feathers.

Following are the two characteristic features of class Pisces.
- Pisces are aquatic animals with a streamlined body.
- They have a heart with two chambers.

E. 1. The advantages of classification are as follows.
- Classification helps us to identify different organisms and place them in particular groups.
- It helps us to study the organisms more easily and systematically.
- It highlights the relationship between different organisms.
- The characteristics of all the members of a group can be studied by studying the characteristics of a few members only.
- Classification also helps in studying the process of evolution from simple to complex organisms.

2. Following are the ways in which of certain bacteria can be useful.
    - Saprophytic bacteria decompose or break down the dead remains of plants and animals into simpler substances which are restored in the soil. Thus, the nutrients which were once taken from the soil by plants and animals are returned to the soil and its fertility is maintained. Therefore, these bacteria are known as decomposers.
    - Some bacteria are used in sewage disposal plants because they have the ability to decompose organic wastes rapidly.
    - Although nitrogen is present in abundance in air, it cannot be utilised by plants as such. However, some bacteria like *Rhizobium* that live in the root nodules of leguminous plants like pea, gram and bean, can absorb nitrogen from the atmosphere and convert it into nitrates which serve as natural fertilisers for plants.
    - Some bacteria help in making food items like curd, cheese and vinegar. For example, *Lactobacillus* converts lactose (milk sugar) into lactic acid and helps in the formation of curd.
3. *Amoeba* reproduces asexually by binary fission and multiple fission.
    - **Binary fission:** In this process, a single *Amoeba* divides to form two daughter amoebae. Under favourable conditions, nuclear division occurs followed by the cytoplasmic division resulting in the formation of two daughter cells or two amoebae.
    - **Multiple fission:** In this process, a single *Amoeba* divides to form many daughter amoebae. During unfavourable conditions, amoeba forms a cyst around itself and its nucleus undergoes multiple division. Each daughter nuclei, thus formed, develops into an *Amoeba* when the cyst bursts open on getting favourable conditions.
4. Following are the characteristic features of roundworms.
    - Roundworms belong to phylum Nemathelminthes. They are found in fresh and sea water, and in soil. They also exist as parasites in plants and animals.
    - They have a soft, cylindrical, unsegmented body without a body cavity. The body is bilaterally symmetrical.
    - They have a mouth at one end through which the food is pulled in. The anus is present at the other end of the body.
    - Some common examples of roundworms are *Ascaris*, hookworm and pinworm found in man and eelworms found in potato plants.
5. Creatures of class mammalian are warm-blooded. Following are their characteristic features.
    - This class includes all animals like cow, dog, camel, lion, tiger, elephant, squirrels and human beings.
    - They have hair on their body.
    - They give birth to young ones.
    - They have mammary glands which produce milk for the babies.
    - They breathe through lungs.
    - They have a four-chambered heart.
    - They have external ears, nose and specialised teeth.
    - Most mammals have a tail and four limbs.

3. Plant Life

Worksheet

A. Fill in the blanks.

1. Green plants take in _____ from the atmosphere during photosynthesis and release _____ thereby purifying the air.
2. _____ maintains a balance between oxygen and carbon dioxide in the atmosphere.
3. The transport system of plants is called the _____.
4. Energy stored in food molecules is released when they break down due to _____ reactions.
5. The exchange of gases takes place through _____ present in mature roots and woody stems.

B. State (T) for true and (F) for false statements.

1. During the day, insoluble starch is converted back to soluble sugar. _____
2. More the intensity of light, slower is the rate of photosynthesis. _____
3. Although the process of respiration takes place day and night, the process of photosynthesis takes place only during the daytime. _____
4. No respiration means no life. _____
5. More the intensity of sunlight, higher is the rate of photosynthesis. _____

C. Match the columns.

Column A	**Column B**
1. Leaves	(a) Captures sunlight
2. Xylem	(b) Transports food
3. Phloem	(c) Site of exchange of gases
4. Chlorophyll	(d) Site of photosynthesis
5. Stomata	(e) Transports water

D. Answer in short.

1. Define respiration.
2. Give the word equation for aerobic respiration and anaerobic respiration.
3. Define photosynthesis.
4. How does carbon dioxide affect photosynthesis?
5. What are lenticels?

E. Answer in detail.

1. Differentiate between aerobic and anaerobic respiration.
2. What happens to photosynthesis in plants with red, brown or violet leaves?
3. State the significance of photosynthesis.
4. How does water and sunlight affect the rate of photosynthesis?
5. Why are leaves the main site of photosynthesis?

Answers to Worksheet

A. 1. carbon dioxide, oxygen
2. Photosynthesis
3. vascular system
4. oxidation
5. lenticels

B. 1. False 2. False 3. True 4. True 5. True

C. 1. (d) 2. (e) 3. (b) 4. (a) 5. (c)

D. 1. The process of breakdown of food in the cells with the release of energy is called respiration.

2. Aerobic respiration

$$\underset{\text{glucose}}{C_6H_{12}O_6} + \underset{\text{oxygen}}{6O_2} \longrightarrow \underset{\text{carbon dioxide}}{6CO_2} + \underset{\text{water}}{6H_2O} + \underset{\text{38 (ATP)}}{\text{Energy}}$$

Anaerobic respiration

$$\underset{\text{glucose}}{C_6H_{12}O_6} \longrightarrow \underset{\text{ethanol}}{2C_2H_5OH} + \underset{\text{carbon dioxide}}{2CO_2} + \underset{\text{2ATP}}{\text{Energy}}$$

3. Photosynthesis is a process by which green plants manufacture their food in the presence of sunlight and chlorophyll by using raw materials like carbon dioxide from air and water from soil.

4. As the amount of carbon dioxide in the air increases, the rate of photosynthesis also increases.

5. The mature roots and woody stems of some trees have small pores called lenticels. The exchange of gases takes place through these pores present in the bark.

E. 1.

Aerobic respiration	Anaerobic respiration
• The breakdown of food (glucose) takes place in the presence of oxygen.	• The breakdown of food takes place in the absence of oxygen.
• Glucose is completely oxidised.	• Glucose is incompletely oxidised.
• Thirty-eight molecules of ATP are released from oxidation of each glucose molecule.	• Only two molecules of ATP are released from oxidation of each glucose molecule.

2. In all such leaves, green colour pigment is also present in addition to red, brown, yellow and other pigments. However, the amount of red, brown, yellow or other pigments is very high in comparison to the green pigment and therefore, these pigments mask the green colour. Photosynthesis does take place in all these leaves.

Some plants have white and green parts in the same leaf. They are called variegated leaves. Photosynthesis will not take place in the white portions of such leaves. Common examples are those of money plant, croton and coleus.

3. Photosynthesis is important for the following reasons.

   Synthesis of food: All living organisms depend on food for survival. Green plants are unique as they are able to synthesise food. Therefore, all animals directly or indirectly depend on plants for food.

   Purification of atmosphere: Green plants take in carbon dioxide from the atmosphere during photosynthesis and release oxygen thereby purifying the air.

   Maintaining a balance: Photosynthesis maintains a balance between oxygen and carbon dioxide in the atmosphere. This balance will be disturbed in the absence of photosynthesis.

4. **Water:** If there is less water in the soil, the rate of photosynthesis reduces as there is less water in the cytoplasm and chloroplast. As a result, the stomata close and carbon dioxide does not enter the plants. Plants absorb water from the soil through their roots. This water is then transported up to the leaves through the stem. Xylem tissue present in the stem is responsible for conduction of water. Along with water, minerals present in the soil are also absorbed.

   Sunlight: It is absorbed by the chlorophyll present in the leaves. More the intensity of sunlight, higher is the rate of photosynthesis.

5. All green parts of the plant carry out the process of photosynthesis, but leaves are the main organs involved in this process for the following reasons.
   - Leaves contain the green pigment called chlorophyll which helps to capture the sun's energy (light).
   - Leaves provide broad, wide and flat surface for absorption of light and carbon dioxide.
   - Leaves have minute pores called stomata (singular—stoma) on one or both surfaces which help in exchange of carbon dioxide and oxygen between the leaf and the atmosphere.