2. PLANT TISSUES

TEACHING TASK:

NEET LEVEL QUESTIONS
Multiple Choice Questions

1.Meristematic tissues are composed of
Answer: B) Immature cells
Explanation: Meristematic tissues consist of actively dividing, undifferentiated, immature cells with thin cell walls and dense cytoplasm.

2.Which of the following is a lateral meristem?
Answer: D) B & C
Explanation: Lateral meristems contribute to secondary growth (increase in girth). Both **vascular cambium** (B) and **cork cambium** (C) are lateral meristems.

3.Meristem present at the tip of radicle is called
Answer: B) Root apex
Explanation: The meristem at the tip of the radicle (embryonic root) is the **root apical meristem**, responsible for primary growth of the root.

4.A single tissue in plant comprises
Answer: A) Only one type cell
Explanation: A simple tissue (e.g., parenchyma, collenchyma, sclerenchyma) consists of only one type of cell, unlike complex tissues which have multiple cell types.

5.Which of the following is a living mechanical tissue?
Answer: D) Collenchyma
Explanation: Collenchyma is a living mechanical tissue providing flexibility and support due to its thickened cell walls. Sclerenchyma is dead, and aerenchyma is not mechanical.

6.Chlorenchyma differs from parenchyma in having
Answer: B) Chlorophyll
Explanation: Chlorenchyma is a type of parenchyma specialized for photosynthesis due to the presence of chlorophyll.

7.In desert plants, rate of water loss gets reduced due to the presence of
Answer: A) Cuticle
Explanation: The cuticle, a waxy layer on the epidermis, reduces water loss in desert plants by preventing transpiration.

8.A tracheid differs from a vessel in having
Answer: B) Discontinuous lumen which are separated by end wall
Explanation: Tracheids have a discontinuous lumen with end walls, whereas vessels have perforated end walls forming a continuous tube.

9.Vessels and companion cells are characteristic of xylem and phloem of
Answer: C) Angiosperm
Explanation: Vessels (in xylem) and companion cells (in phloem) are characteristic features of angiosperms. Gymnosperms lack vessels, and bryophytes/ pteridophytes lack companion cells.

10.Trachea, tracheids, wood fibres, and parenchymatous tissues are found in
Answer: A) Xylem
Explanation: Xylem contains tracheids, vessels (trachea), xylem fibers, and xylem parenchyma.

11.Sieve tubes have
Answer: D) Possess a broad lumen and perforated cross walls
Explanation: Sieve tubes have perforated cross walls (sieve plates) and a broad lumen, facilitating translocation of food materials.

12.Sieve tubes are better suited for translocation because of these
Answer: D) Possess a broad lumen and perforated cross walls
Explanation: The broad lumen and perforated sieve plates allow efficient transport of organic nutrients.

13.Companion cells are usually seen associated with
Answer: D) Sieve tubes
Explanation: Companion cells are metabolically active cells that support sieve tubes in phloem for translocation.

More Than One Answer

14.Identify the wrong statement
Answer: C) iii & iv
Explanation:
i. Correct: Collenchyma occurs in the epidermis, cortex, and pith.
ii. Correct: Parenchyma's main function is food storage.
iii. Incorrect: Vascular tissues (xylem and phloem) primarily conduct, not provide mechanical strength (though xylem fibers contribute to strength).
iv. Incorrect: Sclerenchyma provides mechanical support, not transport.

15.Identify wrong statement
Answer: C) iii & iv
Explanation:
i. Correct: Xylem and phloem are complex tissues.
ii. Correct: Vascular tissues (xylem and phloem) transport water, minerals, and food.
iii. Incorrect: Xylem and phloem are complex tissues, not simple tissues.
iv. Incorrect: Vascular tissues are not primarily for storage; parenchyma stores food.

Assertion & Reason

16.A) Sclerenchyma fibre constitute the major mechanical tissue of the plants
R) The cells are thick walled and is made up of cellulose (or) Lignin (or) both
Answer: A) A & R are true & R explains A
Explanation: Sclerenchyma fibers provide mechanical strength due to their thick walls, which are lignified or cellulosic, supporting the assertion.

17.A) Death of sieve tube membrane results in the death of its adjacent companion cell
R) Both are derived from the same mother cell
Answer: A) A & R are true & R explains A
Explanation: Sieve tubes and companion cells are derived from the same mother cell, and companion cells support sieve tubes metabolically. If sieve tubes die, companion cells, being dependent, also die.

18.A) Xylem & phloem are complex tissues
R) Complex tissue is a collection of different types of cells
Answer: A) A & R are true & R explains A
Explanation: Xylem and phloem are complex tissues because they consist of multiple cell types (e.g., tracheids, vessels, sieve tubes, companion cells), as stated in the reason.

19.Match the following
Answer: A) 1-d, 2-c, 3-b, 4-a
Explanation:

Parenchyma: d. Thin-walled, packing cells

Aerenchyma: c. Buoyancy (due to air cavities in hydrophytes)

Collenchyma: b. Localized thickenings (at corners)

Permanent tissue: a. Sclerenchyma (a type of permanent tissue)

20.Match the following
Answer: C) 1-b, 2-d, 3-a, 4-c
Explanation:

Apical meristem: b. Tips of roots and stems

Lateral meristem: d. Width or girth (e.g., vascular cambium, cork cambium)

Intercalary meristem: a. Cork cambium (incorrect in options; should be base of leaves/internodes)

Vascular tissues: c. Xylem and phloem

Comprehensive

21.Conducting tissues are
Answer: C) A and B
Explanation: Xylem (water and minerals) and phloem (food materials) are conducting tissues.

22.Components of xylem are
Answer: A) Tracheids
Explanation: Xylem includes tracheids, vessels, xylem parenchyma, and xylem fibers. Companion cells, sieve tubes, and phloem fibers are phloem components.

23.Conduction of water and food done by
Answer: A) Xylem, phloem
Explanation: Xylem conducts water and minerals, while phloem conducts food materials.

24.Phloem fibres are
Answer: B) Sclerenchyma fibres
Explanation: Phloem fibers are sclerenchymatous, providing mechanical support and used in textiles like flax, hemp, and jute.

TEACHING TASK:

NEET LEVEL QUESTIONS
Multiple Choice Questions

1.Tissue may be defined as
Answer: C) A group of cells common in origin, form, and function
Explanation: Tissues are groups of cells with common origin, structure, and function working together.

2.Each meristematic cell is
Answer: D) All the above
Explanation: Meristematic cells have thin, uniform cellulose cell walls, are non-vacuolated, and have conspicuous nuclei.

3.Meristem present at the leaf base of grasses is
Answer: B) Intercalary
Explanation: Intercalary meristems are found at the base of leaves or internodes in grasses, aiding in growth.

4.Permanent tissues are
Answer: C) Living or dead
Explanation: Permanent tissues can be living (e.g., parenchyma, collenchyma) or dead (e.g., sclerenchyma, tracheids).

5.Primary growth in a plant body is brought about by
Answer: C) Apical
Explanation: Apical meristems at the tips of roots and shoots are responsible for primary growth (length increase).

6.Parenchyma is a
Answer: A) Simple tissue
Explanation: Parenchyma is a simple tissue composed of one cell type, involved in storage, photosynthesis, etc.

7.Parenchyma which takes up the function of photosynthesis is called
Answer: B) Chlorenchyma
Explanation: Chlorenchyma contains chloroplasts, enabling photosynthesis.

8.Aerenchyma is a common tissue found in
Answer: C) Hydrophytes
Explanation: Aerenchyma, with air cavities, is typical in hydrophytes to provide buoyancy.

9.Parenchyma cells containing chloroplasts are called
Answer: C) Chlorenchyma
Explanation: Chlorenchyma is parenchyma with chloroplasts for photosynthesis.

10.Parenchyma cells containing air cavities are
Answer: A) Aerenchyma
Explanation: Aerenchyma has large air spaces, aiding buoyancy in aquatic plants.

11.Cell walls of sclerenchyma are rich in
Answer: C) Lignin
Explanation: Sclerenchyma cell walls are thickened with lignin, providing mechanical strength.

12.Flexibility in plants is due to
Answer: A) Collenchyma
Explanation: Collenchyma provides flexibility and support due to its unevenly thickened cell walls.

13.The husk of coconut is made of
Answer: D) Sclerenchyma
Explanation: The coconut husk consists of sclerenchymatous fibers, providing strength.

DESCRIPTIVE TYPE QUESTIONS

1.What will happen if

a. **Apical meristem is damaged or cut?**

Answer: If the apical meristem is damaged or cut, primary growth (increase in length) of the shoot or root will stop or be severely impaired. The apical meristem is responsible for the elongation of stems and roots. Damage may prevent the formation of new leaves, stems, or roots from the affected apex. However, the plant may compensate by activating lateral buds or adventitious meristems to form branches or new roots.

Explanation: Apical meristems are located at the tips of shoots and roots, driving primary growth. Their removal halts longitudinal growth in that region, though the plant may adapt through other meristematic tissues.

b. **Cork is not formed in older stems and roots?**

Answer: If cork (periderm) is not formed in older stems and roots, the plant will lack a protective secondary covering to replace the epidermis. This leads to increased water loss, vulnerability to pathogens, mechanical damage, and desiccation. The outer tissues may rupture due to secondary growth (increase in girth), exposing internal tissues to infections and environmental stress, potentially causing plant death.

Explanation: Cork, formed by the cork cambium, acts as a protective barrier in older stems and roots, preventing water loss and pathogen entry. Without it, the plant is highly susceptible to damage.

2.A tissue present in the plant A located inside the vascular bundles and helps in the conduction of water and minerals. Tissue B present on the outermost part of the plant organs or parts which is having structure C which helps in exchange of gases.

a. **Name the tissue A**: Xylem

b. **Name the tissue B**: Epidermis

c. **Name the structure C**: Stomata

Explanation:

Tissue A (Xylem): Xylem is a complex tissue located within vascular bundles, responsible for conducting water and minerals from roots to other plant parts.

Tissue B (Epidermis): The epidermis is the outermost protective layer of plant organs (e.g., leaves, stems), preventing water loss and pathogen entry.

Structure C (Stomata): Stomata are pores in the epidermis, primarily on leaves, that facilitate gas exchange (CO, and O,) and transpiration.

Note on Provided Key: The provided key lists “B - Mesophyll” for Tissue B, which is incorrect. Mesophyll is an internal tissue (parenchyma in leaves), not the outermost layer. The correct answer is **Epidermis**.

3.Name the plant tissue which shows the following characteristics:

a. **Made up of living cells showing thickening, provide mechanical support to the plant.**

Answer: Collenchyma

Explanation: Collenchyma is a simple tissue composed of living cells with unevenly thickened cell walls (due to cellulose and pectin) that provide flexible mechanical support, especially in young stems and leaves.

b. **Made up of dead cells showing thickening, provide mechanical support to the plants, are made of one type of cells.**

Answer: Sclerenchyma

Explanation: Sclerenchyma is a simple tissue made of dead cells with thick, lignified cell walls, providing rigid mechanical support. It includes fibers and sclereids, both of which are uniform in function (support).

c. **Made up of living cells containing green coloured chloroplasts, possesses intercellular spaces.**

Answer: Chlorenchyma

Explanation: Chlorenchyma is a type of parenchyma tissue containing chloroplasts, enabling photosynthesis. It has intercellular spaces, especially in leaves (e.g., mesophyll), to facilitate gas exchange.

Note on Provided Key: The provided key lists "Parenchyma" for part c, which is partially correct, as chlorenchyma is a specialized parenchyma. However, **Chlorenchyma** is the precise term for parenchyma with chloroplasts.

ADVANCED LEVEL QUESTIONS

More Than One Answer

1.Which of the following statement is true?

i. Apical meristem occurs at the tips of shoots and roots.

ii. Lateral meristems bring about increase in the length of internode.

iii. Intercalary meristems bring about increase in the width or girth.

iv. Lateral meristems occur on the sides almost parallel to the long axis of the root, stem, branch.

Answer: **C) i & iv**

Explanation:

i. True: Apical meristems are located at the tips of shoots and roots, responsible for primary growth (length).

ii. False: Lateral meristems (e.g., vascular cambium, cork cambium) increase girth, not internode length.

iii. False: Intercalary meristems (at the base of leaves or internodes) contribute to length, not girth.

iv. True: Lateral meristems are located along the sides, parallel to the long axis of stems and roots, causing secondary growth (girth).

2.Which of the following is incorrect?
i. Parenchyma is a primitive simple tissue made up of cells which are similar in structure and function.
ii. Collenchyma, like parenchyma, is a simple tissue.
iii. Sclerenchyma is a complex tissue.
iv. Sclereids are thick-walled, hard, and strongly lignified.
Answer: **D) only iii**
Explanation:
i. True: Parenchyma is a simple tissue with cells similar in structure and function, involved in storage, photosynthesis, etc.
ii. True: Collenchyma is a simple tissue, like parenchyma, providing mechanical support.
iii. False: Sclerenchyma is a simple tissue, not complex, as it consists of one cell type (fibers or sclereids). Complex tissues (e.g., xylem, phloem) have multiple cell types.
iv. True: Sclereids are sclerenchymatous cells with thick, lignified walls, providing hardness and support.

Assertion & Reason

3.A) Permanent tissue is composed of matured cells.
R) Meristematic tissue is a group of actively dividing cells.
Answer: **B) A & R are true but R doesn't explain A**
Explanation:
Assertion: True. Permanent tissues consist of mature cells that have lost the ability to divide and have differentiated into specific functions.
Reason: True. Meristematic tissues are composed of actively dividing, undifferentiated cells.
However, the reason describes meristematic tissues, not why permanent tissues are mature, so it does not explain the assertion.

4.A) The rigidity in leaf is due to Sclerenchyma.
R) Sclerenchyma are dead tissue and provide mechanical strength.
Answer: **A) A & R are true & R explains A**
Explanation:
Assertion: True. Sclerenchyma provides rigidity in leaves due to its thick, lignified cell walls.

Reason: True. Sclerenchyma cells are dead at maturity and provide mechanical strength due to lignification. The reason explains why sclerenchyma contributes to rigidity.

Match the Following

5.Match the following:
Meristematic tissue [ ] A) Base of internodes
Apical meristem [ ] B) Side, long axis of root
Lateral meristem [ ] C) Growing points of a plant
Intercalary meristem [ ] D) Tip of shoots and roots
Answer: **B) 1-c, 2-d, 3-b, 4-a**
Explanation:
Meristematic tissue: C) Growing points of a plant (general term for all meristems, responsible for growth).
Apical meristem: D) Tip of shoots and roots (responsible for primary growth).
Lateral meristem: B) Side, long axis of root (e.g., vascular cambium, cork cambium for girth increase).
Intercalary meristem: A) Base of internodes (found in grasses, aids in length growth).

6.Match the following:
Tracheids [ ] A) Living cells
Vessels [ ] B) Cylindrical tubes
Xylem parenchyma [ ] C) Non-living thick lignin
Xylem Fibre [ ] D) Non-living elongated cells
Answer: **C) 1-d, 2-b, 3-a, 4-c**
Explanation:
Tracheids: D) Non-living elongated cells (elongated, dead cells with pitted walls).
Vessels: B) Cylindrical tubes (formed by end-to-end dead cells with perforated walls).
Xylem parenchyma: A) Living cells (store nutrients, living component of xylem).
Xylem fiber: C) Non-living thick lignin (dead, lignified cells for mechanical support).

7.Match the following:
Sieve tubes [ ] A) Helping to sieve tubes
Companion cells [ ] B) Storage of food
Phloem parenchyma [ ] C) Mechanical support
Phloem Fibres [ ] D) Conducting elements
Answer: **A) 1-d, 2-a, 3-b, 4-c**

Explanation:
Sieve tubes: D) Conducting elements (transport organic nutrients).
Companion cells: A) Helping to sieve tubes (support sieve tubes metabolically).
Phloem parenchyma: B) Storage of food (stores nutrients in phloem).
Phloem fibers: C) Mechanical support (sclerenchymatous, provide strength).

Comprehensive

8.Permanent tissues are formed from
Answer: **C) Meristematic tissue**
Explanation: Permanent tissues are derived from meristematic tissues after differentiation, losing their ability to divide.

9.Parenchyma present in
Answer: **D) All the above**
Explanation: Parenchyma is found in roots, stems, leaves, fruits, and seeds, performing functions like storage and photosynthesis.

10.Which one acts as living mechanical tissue?
Answer: **B) Collenchyma**
Explanation: Collenchyma is a living simple tissue with thickened cell walls, providing flexible mechanical support. Sclerenchyma is dead, and parenchyma is not primarily mechanical.

11.Sclerenchyma cell walls deposition of
Answer: **B) Lignin**
Explanation: Sclerenchyma cell walls are thickened with lignin, providing rigidity and strength.

12.Identify the simple tissue
Answer: **C) Parenchyma, collenchyma, sclerenchyma**
Explanation: Simple tissues consist of one cell type. Parenchyma, collenchyma, and sclerenchyma are simple tissues, while xylem and phloem are complex tissues.

ADDITIONAL QUESTIONS:

SINGLE ANSWER TYPE

1.The outermost primary meristem gives rise to

Answer: **A) Epidermis**

Explanation: The outermost primary meristem, the protoderm, differentiates into the epidermis, the protective outer layer of the plant.

2.Vascular cambium is an example of

Answer: **C) Secondary meristem**

Explanation: Vascular cambium is a lateral meristem responsible for secondary growth (increase in girth), making it a secondary meristem.

3.The complex tissue includes

Answer: **A) Xylem**

Explanation: Complex tissues consist of multiple cell types. Xylem (with tracheids, vessels, parenchyma, fibers) is a complex tissue, while sclerenchyma and collenchyma are simple tissues.

4.Which meristem helps in increasing girth?

Answer: **A) Lateral meristem**

Explanation: Lateral meristems (e.g., vascular cambium, cork cambium) increase the girth of stems and roots through secondary growth.

5.Wood is the common name for

Answer: **B) Secondary Xylem**

Explanation: Wood is primarily composed of secondary xylem, produced by the vascular cambium during secondary growth.