1. Which meristem is responsible for primary growth in plants?
A. Intercalary meristem
B. Lateral meristem
C. Apical meristem
D. Vascular cambium

✅Answer: C. Apical meristem

Explanation:
Apical meristems are present at root and shoot tips and cause primary growth (increase in length).

2. Which of the following tissues is dead at maturity?
A. Collenchyma
B. Parenchyma
C. Phloem
D. Sclerenchyma

✅Answer: D. Sclerenchyma

Explanation:
Sclerenchyma provides mechanical support and consists of dead thick-walled cells.

3. Which of the following is a complex permanent tissue?
A. Collenchyma
B. Xylem
C. Chlorenchyma
D. Aerenchyma

✅Answer: B. Xylem

Explanation:
Xylem is made of more than one type of cell (tracheids, vessels, xylem parenchyma, fibers) → complex tissue.

4. Identify the correct match of tissue with function:

Tissue Function

A. Xylem 1. Transport of water

B. Phloem 2. Transport of food
C. Collenchyma 3. Mechanical support
D. Parenchyma 4. Storage and photosynthesis

Options:
A. A–1, B–2, C–3, D–4
B. A–2, B–1, C–4, D–3
C. A–1, B–3, C–4, D–2
D. A–4, B–2, C–1, D–3

✅Answer: A. A–1, B–2, C–3, D–4

5. Which type of xylem element is absent in gymnosperms?
A. Tracheids
B. Vessels
C. Xylem parenchyma
D. Xylem fibers

✅Answer: B. Vessels

Explanation:
Vessels are characteristic of angiosperms; gymnosperms (e.g., pine) have only tracheids for water conduction.

6. Which meristem helps in secondary growth?
A. Apical meristem
B. Intercalary meristem
C. Lateral meristem
D. Root cap

✅Answer: C. Lateral meristem

Explanation:
Lateral meristems like vascular cambium and cork cambium lead to increase in girth → secondary growth.

7. In dicot stems, the collenchyma is usually found:
A. In pith
B. In medullary rays

C. Below epidermis in hypodermis
D. Surrounding xylem

✅Answer: C. Below epidermis in hypodermis

Explanation:
Collenchyma (living, thick at corners) provides mechanical support and lies in hypodermis of dicot stems.

8. The component of phloem which is living but enucleated is:
A. Companion cells
B. Phloem parenchyma
C. Sieve tube elements
D. Phloem fibers

✅Answer: C. Sieve tube elements

Explanation:
Sieve tubes are living but lack nucleus. They are functionally supported by companion cells.

9. Which one of the following correctly describes intercalary meristem?
A. Occurs at tips of root
B. Present between permanent tissues
C. Responsible for secondary growth
D. Formed from lateral meristem

✅Answer: B. Present between permanent tissues

Explanation:
Intercalary meristems are found between mature tissues (e.g., grass nodes) and help in regrowth.

10. Match the following tissues with their characteristics:

Tissue Characteristic

A. Parenchyma 1. Thin-walled, photosynthetic
B. Collenchyma 2. Living, irregularly thickened corners
C. Sclerenchyma 3. Dead, lignified thick walls
D. Xylem 4. Conducts water

Options:
A. A–1, B–2, C–3, D–4
B. A–4, B–3, C–2, D–1
C. A–1, B–3, C–2, D–4
D. A–2, B–1, C–3, D–4

✅Answer: A. A–1, B–2, C–3, D–4

Q 11. In a transverse section of dicot root, the vascular bundles are:

A. Conjoint and collateral
B. Radial and polyarch
C. Radial and diarch
D. Collateral and closed

✅Answer: B. Radial and polyarch

Explanation:
In dicot roots, xylem and phloem are arranged radially, and in mature roots the number of xylem arms may be more than six (polyarch).

Q12. In monocot stems, vascular bundles are:

A. Collateral, open and arranged in a ring
B. Collateral, closed and scattered
C. Radial, closed and polyarch
D. Bicollateral and scattered

✅Answer: B. Collateral, closed and scattered

Explanation:
Monocot stems have numerous vascular bundles, scattered throughout, and they are closed (no cambium, so no secondary growth).

Q13. Which of the following features is not found in a dicot stem cross-section?

A. Hypodermis is collenchymatous
B. Conjoint, open vascular bundles
C. Scattered vascular bundles
D. Presence of medullary rays

✅Answer: C. Scattered vascular bundles

Explanation:
Dicot stems have vascular bundles arranged in a ring, not scattered. Scattered bundles are found in monocot stems.

Q14. Which part of the root stores food in monocot plants?

A. Endodermis
B. Pericycle
C. Pith
D. Cortex

✅Answer: C. Pith

Explanation:
In monocot roots, the pith is large and well developed, and helps in storage.

Q15. Which of the following features is present in both dicot root and monocot root?

A. Conjoint vascular bundles
B. Cambium between xylem and phloem
C. Epiblema as outermost layer
D. Presence of pith

✅Answer: C. Epiblema as outermost layer

Explanation:
Epiblema (piliferous layer) is the outermost single-layered structure in both types of roots. It helps in absorption.

Q16. The vascular bundle in a dicot stem is described as:

A. Radial and open
B. Conjoint and closed
C. Conjoint and open
D. Bicollateral and closed

✅Answer: C. Conjoint and open

Explanation:
In dicot stems, vascular bundles are conjoint (xylem + phloem together) and open (with cambium) → allows secondary growth.

Q17. Casparian strips are chemically composed of:

A. Suberin
B. Cutin
C. Lignin
D. Cellulose

✅Answer: A. Suberin

Explanation:
Casparian strips are thickened suberinized bands present in the radial and transverse walls of endodermal cells.

Q18. Which cell layer forms lateral roots in dicot roots?

A. Endodermis
B. Pericycle
C. Cortex
D. Pith

✅Answer: B. Pericycle

Explanation:
Pericycle (outermost layer of vascular cylinder) is meristematic and gives rise to lateral roots in dicot roots.

Q19. (Secondary Growth – Q1)

Which of the following arises from vascular cambium during secondary growth?

A. Only secondary xylem
B. Only secondary phloem
C. Both secondary xylem and phloem
D. Only cork

✅Answer: C. Both secondary xylem and phloem

Explanation:
Vascular cambium is a lateral meristem that forms secondary xylem (inside) and secondary phloem (outside).

Q20. (Secondary Growth – Q2)

Cork cambium originates from:
A. Epidermis
B. Cortex
C. Hypodermis
D. Pericycle

✅Answer: B. Cortex

Explanation:
Cork cambium (phellogen) is formed from the outer cortical cells, and it produces cork (phellem) and phelloderm.

Q21. Which of the following is a feature of monocot root but NOT dicot root?

A. Polyarch xylem
B. Conjoint vascular bundles
C. Cambium present
D. Secondary growth occurs

✅Answer: A. Polyarch xylem

Explanation:
Monocot roots typically have many xylem arms (polyarch), while dicots usually show diarch to tetrarch. Monocots lack cambium and do not show secondary growth.

Q22. The innermost layer of cortex in roots, that regulates entry of water and solutes, is:

A. Pericycle
B. Endodermis
C. Epiblema
D. Hypodermis

✅Answer: B. Endodermis

Explanation:
Endodermis contains Casparian strips, making it selectively permeable, crucial in water and mineral uptake.

Q23. The term ‘open vascular bundle’ means:

A. Cambium is absent
B. Phloem is absent
C. Cambium is present between xylem and phloem
D. Vascular bundle is scattered

✅Answer: C. Cambium is present between xylem and phloem

Explanation:
Open vascular bundles have cambium → allow secondary growth. This is seen in dicot stems.

Q24. Identify the correct difference between monocot and dicot stems:

Feature	Dicot Stem	Monocot Stem
A. Vascular bundles	In ring	Scattered
B. Cambium	Present	Absent
C. Hypodermis	Collenchymatous	Sclerenchymatous
D. Medullary rays	Present	Absent

Choose correct option:
A. A and B only
B. A, B, and C only
C. All A, B, C, D
D. B and C only

✅Answer: C. All A, B, C, D

Explanation:
All features correctly differentiate dicot and monocot stem. Monocots have no cambium, no rays, scattered bundles, and sclerenchymatous hypodermis.

Q25. Match the plant organ with its most likely vascular bundle type:

Organ Vascular Bundle Type

A. Dicot stem 1. Conjoint, open
B. Dicot root 2. Radial
C. Monocot stem 3. Conjoint, closed
D. Monocot root 4. Radial

Choose the correct match:
A. A–1, B–2, C–3, D–4
B. A–2, B–1, C–3, D–4
C. A–1, B–3, C–2, D–4
D. A–1, B–4, C–3, D–2

✅Answer: A. A–1, B–2, C–3, D–4

Explanation:
Vascular bundle arrangement is organ-specific. Roots = radial, stems = conjoint (with/without cambium).

Q26. In dicot stems, which tissue is found between xylem and phloem in vascular bundles?

A. Conjunctive tissue
B. Cambium
C. Pericycle
D. Endodermis

✅Answer: B. Cambium

Explanation:
In dicot stems, vascular bundles are conjoint, collateral, and open due to presence of cambium.

Q27. In a transverse section of dicot stem, the tissue just inside the endodermis is:

A. Pericycle
B. Phloem
C. Cortex
D. Medullary rays

✅Answer: A. Pericycle

Explanation:
Pericycle lies just beneath endodermis, and above vascular tissues. It is parenchymatous in stems.

Q28. The pericycle in dicot roots contributes to:

A. Pith development
B. Lateral root formation
C. Phloem regeneration
D. Stomatal regulation

✅Answer: B. Lateral root formation

Explanation:
Lateral roots originate from pericycle, an example of endogenous organ development.

Q29. The function of sclerenchyma in monocot stems is primarily to:

A. Help in photosynthesis
B. Conduct water
C. Provide mechanical support
D. Absorb minerals

✅Answer: C. Provide mechanical support

Explanation:
Sclerenchyma, present as hypodermis in monocot stem, is dead and provides rigidity and strength.

Q30. (Assertion & Reason Type)

Assertion (A): Monocot roots lack secondary growth.
Reason (R): Monocot roots do not have vascular cambium.

Choose the correct option:
A. Both A and R are true, and R is the correct explanation of A
B. Both A and R are true, but R is not the correct explanation of A
C. A is true, R is false
D. A is false, R is true

✅Answer: A. Both A and R are true, and R is the correct explanation of A

Explanation:
Secondary growth requires vascular cambium, which monocot roots lack. Hence, no secondary thickening.

Q31. Which of the following statements about the endodermis is incorrect?

A. It is the innermost layer of cortex
B. It contains Casparian strips
C. It is present in both root and stem
D. It regulates entry of water into the vascular cylinder

✅Answer: C. It is present in both root and stem

Explanation:
Endodermis with Casparian strips is a feature of roots, not of stems in typical T.S.

Q32. Match the type of vascular bundle with the organ where it occurs:

Type	Organ
A. Conjoint, open	1. Dicot stem
B. Radial	2. Dicot root
C. Conjoint, closed	3. Monocot stem
D. Scattered bundles	4. Monocot stem

Options:
A. A–1, B–2, C–3, D–4
B. A–2, B–1, C–3, D–4
C. A–1, B–2, C–3, D–3
D. A–1, B–4, C–2, D–3

✅Answer: A. A–1, B–2, C–3, D–4

Explanation:

Dicot stem → Conjoint, open

Dicot root → Radial

Monocot stem → Conjoint, closed and scattered

Q33. Which of the following tissues is responsible for the formation of lateral roots?

A. Pericycle
B. Endodermis
C. Phloem
D. Cambium

✅Answer: A. Pericycle

Explanation:
Lateral roots originate endogenously from the pericycle, the outermost part of the stele.

Q34. Identify the tissue with both conducting and mechanical support roles:

A. Sieve tubes
B. Companion cells
C. Xylem vessels
D. Phloem fibres

✅Answer: C. Xylem vessels

Explanation:
Xylem vessels transport water and also provide mechanical support due to thick lignified walls.

Q35. The vascular bundles in monocot stems are:

A. Radial and closed

B. Scattered and closed
C. Conjoint and open
D. Conjoint and radial

✅Answer: B. Scattered and closed

Explanation:
Monocot stems have conjoint, closed vascular bundles that are scattered throughout ground tissue.

Q36. Which plant family has flowers with numerous stamens, monadelphous condition, and a fruit that is a capsule?

A. Cruciferae
B. Malvaceae
C. Fabaceae
D. Asteraceae

✅Answer: B. Malvaceae

Explanation:
Malvaceae:

Stamens are numerous, monadelphous (united into a tube)

Ovary is superior, fruit = capsule

Example: Hibiscus

Q37. Which one of the following plant families has a bilabiate corolla, zygomorphic flowers, and vexillary aestivation?

A. Asteraceae
B. Poaceae
C. Fabaceae
D. Malvaceae

✅Answer: C. Fabaceae

Explanation:

Fabaceae:

Zygomorphic flowers

Vexillary aestivation (standard, wings, keel)

Examples: Pea, Gram

Q38. Assertion (A): Poaceae members have lodicules instead of petals.

Reason (R): Lodicules help in opening the lemma and palea during flowering.**
A. Both A and R are true, and R explains A
B. Both A and R are true, but R doesn't explain A
C. A is true, R is false
D. A is false, R is true

✅Answer: A. Both A and R are true, and R explains A

Explanation:
In Poaceae, lodicules are small scales that replace petals and aid in flower opening.

Q39. Match the following plant families with their characteristic features:

Family	Feature
A. Asteraceae	1. Capitulum inflorescence
B. Poaceae	2. Spikelets and caryopsis
C. Cruciferae	3. Tetradynamous stamens
D. Malvaceae	4. Monadelphous stamens

Options:
A. A–1, B–2, C–3, D–4
B. A–2, B–1, C–4, D–3
C. A–1, B–3, C–2, D–4
D. A–3, B–2, C–1, D–4

✅Answer: A. A–1, B–2, C–3, D–4

Explanation:
Each family has distinct floral traits:

Asteraceae: Capitulum

Poaceae: Spikelets + caryopsis

Cruciferae: Tetradynamous stamens (4 long, 2 short)

Malvaceae: Monadelphous stamens

Q40. Identify the plant family with syngenesious stamens and composite inflorescence:

A. Fabaceae
B. Asteraceae
C. Cruciferae
D. Poaceae

✅Answer: B. Asteraceae

Explanation:
Asteraceae flowers have:

Syngenesious stamens (anthers fused, filaments free)

Capitulum inflorescence (composite head)

Q41. Which feature is absent in monocot stems but present in dicot stems?

A. Epidermis
B. Pith
C. Cambium
D. Cortex

✅Answer: C. Cambium

Explanation:
Monocot stems lack cambium in their vascular bundles, so secondary growth is absent.

Q42. Which statement about secondary growth is correct?

A. It is found only in monocots
B. It leads to increase in length
C. It originates from intercalary meristem
D. It causes increase in girth

✅Answer: D. It causes increase in girth

Explanation:
Secondary growth is due to lateral meristems (cambium + cork cambium), leading to increase in girth of stems and roots in dicots.

Q43. Which of the following correctly pairs a tissue with its meristematic origin?

A. Xylem – Protoderm
B. Epidermis – Procambium
C. Pericycle – Ground meristem
D. Cortex – Ground meristem

✅Answer: D. Cortex – Ground meristem

Explanation:

Ground meristem gives rise to cortex, pith, pericycle

Protoderm → Epidermis

Procambium → Primary xylem & phloem

Q44. Which family shows tetradynamous condition?

A. Asteraceae
B. Fabaceae
C. Cruciferae
D. Poaceae

✅Answer: C. Cruciferae

Explanation:
Cruciferae (Brassicaceae) have tetradynamous stamens: 6 total, 4 long and 2 short. Seen in mustard.

Q45. In grasses (Poaceae), the fruit is known as:

A. Achene
B. Drupe
C. Caryopsis
D. Samara

✅Answer: C. Caryopsis

Explanation:
In grasses, the fruit is a caryopsis, where seed coat is fused with the pericarp. Seen in wheat, rice, maize.