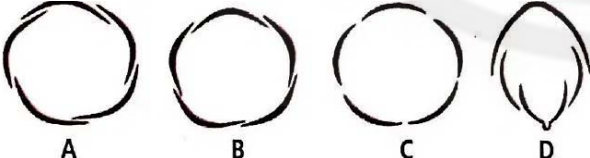


Ultimate KCET Crash Course 2026

BOTANY

DPP: 1

Morphology of flowering plants Anatomy of flowering plants

- Q1** Cotyledon of maize grain is called
 (A) coleoptile (B) scutellum
 (C) plumule (D) coleorhiza.
- Q2** In dicot plants, the root system formed due to direct elongation of radicle is best characterised by:
 (A) Short-lived primary root with stem-borne laterals
 (B) Primary root with roots arising only from nodes
 (C) Persistent primary root with lateral roots of higher orders
 (D) Cluster of roots arising from plumule region
- Q3** In epigynous flowers, other floral parts are:
 (A) Inserted below ovary
 (B) Inserted around ovary
 (C) Inserted above ovary
 (D) Fused with ovary
- Q4** Identify the different types of aestivation (A, B, C and D) and select the correct option.
- 
- (A) A - Valvate, B - Twisted, C - Imbricate, D - Vexillary
 (B) A - Imbricate, B - Twisted, C - Valvate, D - Vexillary
 (C) A - Twisted, B - Imbricate, C - Vexillary, D - Valvate
 (D) A - Twisted, B - Imbricate, C - Valvate, D - Vexillary
- Q5** The thimble-like structure at the apex of the root that protects the tender apex as it grows through the soil is
 (A) Region of maturation
 (B) Region of elongation
 (C) Root cap
 (D) Region of meristematic activity
- Q6** Keel is the characteristic feature of flower of
 (A) Aloe (B) Tomato
 (C) Tulip (D) Indigofera.
- Q7** In ___(i)___ type of inflorescence, the main axis terminates in a flower, hence is limited in growth and flowers are borne in ___(ii)___ succession.
 (A) (i) - Racemose, (ii) - Acropetal
 (B) (i) - Racemose, (ii) - Basipetal
 (C) (i) - Cymose, (ii) - Acropetal
 (D) (i) - Cymose, (ii) - Basipetal
- Q8** Which of the following option is correct about family Solanaceae ?
 (A) Pentamerous, bisexual, actinomorphic, hypogynous
 (B) Trimerous, actinomorphic, bisexual, hypogynous
 (C) Pentamerous, actinomorphic, unisexual, hypogynous
 (D) Pentamerous, zygomorphic, bisexual, epigynous
- Q9** The term 'Polyadelphous' is related to _____.
 (A) Corolla (B) Calyx
 (C) Gynoecium (D) Androecium



- Q10** A false fruit develops from:
 (A) Ovary
 (B) Ovary and thalamus
 (C) Ovule
 (D) Endosperm
- Q11** Which of the following is not the main function of root?
 (A) Absorption of water
 (B) Anchorage
 (C) Respiration
 (D) Storage of food
- Q12** The part of the embryo that gives rise to the root is:
 (A) Plumule (B) Radicle
 (C) Cotyledon (D) Tegmen
- Q13** **Radial symmetry is found in the flowers of**
 (A) Brassica (B) Trifolium
 (C) Pisum (D) Cassia
- Q14** Arrange the following floral whorls of a bisexual flower from inner to outer:
 (A) Corolla, calyx, androecium, Gynoecium
 (B) Calyx, corolla, Gynoecium, androecium
 (C) Gynoecium, Androecium, corolla, calyx
 (D) Androecium, calyx, Gynoecium, corolla
- Q15** Palmately compound leaves are found in:
 (A) Silk cotton (B) Neem
 (C) Mango (D) Pea
- Q16** The specialised cells in the epidermis of Monocot leaves that help in rolling and unrolling of leaves are
 (A) Epithem cells
 (B) Complementary cells
 (C) Bulliform cells
 (D) Trichoblast cells
- Q17** In monocot stem, the vascular bundles are:
 (A) Arranged in a ring
 (B) Scattered in the ground tissue
 (C) Present only near the periphery
 (D) Absent in the central part
- Q18** Arrange the following components of a stomatal complex starting from the stomatal pore:
 (a) Epidermal cells
 (b) Subsidiary cells
 (c) Guard cells
 Choose the correct option:
 (A) (c), (b), (a) (B) (a), (b), (c)
 (C) (b), (c), (a) (D) (a), (c), (b)
- Q19** Which of the following tissue systems constitutes bulk of the plant body?
 (A) Epidermal tissue system
 (B) Ground tissue system
 (C) Vascular tissue system
 (D) Both (A) and (C)
- Q20** A transverse section of a young stem shows hypodermis composed of living cells providing flexibility and strength. Which associated anatomical condition must also be present?
 (A) Hypodermis composed of sclerenchyma
 (B) Mechanical support through dead tissues
 (C) Location immediately below epidermis
 (D) Absence of intercellular spaces throughout cortex
- Q21** Which of the following tissues consist of living cells ?
 (A) Vessels
 (B) Tracheids
 (C) Companion cells
 (D) Sclerenchyma
- Q22** Hypodermis is -----in sunflower stem and -----in maize stem.
 (A) Parenchymatous, collenchymatous
 (B) Collenchymatous, sclerenchymatous
 (C) Sclerenchymatous, collenchymatous
 (D) Sclerenchymatous, sclerenchymatous



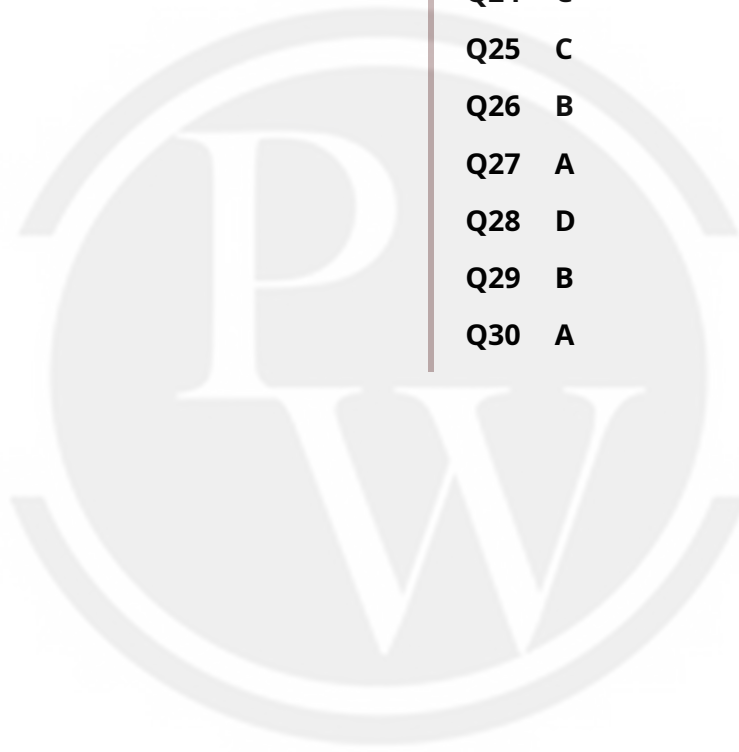
- Q23** Which of the following is incorrect about mesophyll
 (A) Ground tissue of leaf
 (B) Well differentiated into upper palisade and lower spongy parenchyma in leaves of plants with bulliform cells
 (C) Parenchymatous and photosynthetic
 (D) Thin walled cells
- Q24** A stem section shows numerous vascular bundles scattered in ground tissue, each bundle being conjoint and closed. Which additional feature must necessarily accompany this condition?
 (A) Presence of vascular cambium
 (B) Secondary growth capability
 (C) Sclerenchymatous bundle sheath
 (D) Medullary rays between bundles
- Q25** Assertion: Trichomes in the shoot system may be branched, unbranched, or secretory.
 Reason: Trichomes arise from sclerenchymatous cells of the cortex.
 (A) Both A and R are true, and R explains A
 (B) Both A and R are true, but R does not explain A
 (C) A is true, R is false
 (D) A is false, R is true
- Q26** In dorsiventral leaves, stomata are present:
 (A) Only on the upper surface
 (B) Only on the lower surface
 (C) On both surfaces equally
 (D) On the midrib only
- Q27** Cortex and pith are not distinguished in-
 (A) Monocot stem
 (B) Monocot root
 (C) Dicot stem
 (D) Dicot root
- Q28** Which of the following character is not related with companion cell ?
 (A) It is specialised parenchymatous cell
 (B) It helps in maintaining pressure gradient in the sieve tube
 (C) Its nucleus controls the function of sieve tube
 (D) It is connected to vessels through pit field
- Q29** The endodermis of a dicot root is characterised by:
 (A) Air cavities
 (B) Casparian strips
 (C) Suberin-free walls
 (D) Resin canals
- Q30** Statement I: Phloem transports organic nutrients.
 Statement II: It contains sieve tubes, companion cells, and phloem parenchyma.
 Choose the correct option:
 (A) Both statements are true
 (B) Both are false
 (C) I true, II false
 (D) I false, II true



Answer Key

Q1 B
Q2 C
Q3 C
Q4 D
Q5 C
Q6 D
Q7 D
Q8 A
Q9 D
Q10 B
Q11 C
Q12 B
Q13 A
Q14 C
Q15 A

Q16 C
Q17 B
Q18 A
Q19 B
Q20 C
Q21 C
Q22 B
Q23 B
Q24 C
Q25 C
Q26 B
Q27 A
Q28 D
Q29 B
Q30 A



Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

scutellum.

Video Solution:



Q2 Text Solution:

The radicle elongates directly to form the primary root in dicots.

This primary root persists throughout the life of the plant

Lateral roots arise from the primary root in successive orders.

These laterals are termed secondary, tertiary and so on.

Together they constitute a well-defined tap root system.

Video Solution:



Q3 Text Solution:

(C) Inserted above ovary

- Ovary is enclosed by the thalamus.
- Floral parts appear to arise from the top.
- Ovary is inferior.
- Found in guava, cucumber.

Video Solution:



Q4 Text Solution:

D. A - Twisted, B - Imbricate, C - Valvate, D - Vexillary

- **A:** The sepals or petals meet edge to edge without overlapping - **Valvate**
- **B:** Each sepal or petal is twisted, where one margin overlaps the next - **Twisted**
- **C:** Sepals or petals overlap but not in any particular direction - **Imbricate**
- **D:** One large petal (vexillum) overlaps the two lateral petals (wing petals), which in turn overlap the two smallest petals (keel petals) which are fused- **Vexillary**

Video Solution:



Q5 Text Solution:

(C) Root cap

- Thimble-like structure at root tip.
- Protects meristematic region.
- Helps root penetrate soil.
- Constantly replaced as it wears out.

Video Solution:**Q6 Text Solution:**

The flowers of Family Papilionaceae have butterfly shaped corolla (papilionaceous corolla). Posterior or outermost petal is the largest and is called standard or vexillum, two lateral petals are similar and generally clawed, are called wings or alae and the two anterior petals called keel are fused enclosing stamens and carpels. This type of petal arrangement is found in bean, gram, pea, *Indigofera* etc.

Video Solution:**Q7 Text Solution:**

In a **cymose inflorescence**, the main axis terminates in a flower, which means it is limited in growth. The flowers are then borne in **basipetal succession**, meaning the oldest flowers are at the top and the youngest flowers are at the bottom.

- **Racemose inflorescence:** In this type, the main axis continues to grow indefinitely, and flowers are borne in **acropetal succession** (oldest flowers at the base and youngest at the top).
- **Cymose inflorescence:** The main axis terminates in a flower, limiting its growth, and flowers are borne in **basipetal succession** (oldest flowers at the top and youngest at the bottom).

Video Solution:**Q8 Text Solution:**

- Flowers are pentamerous (multiples of 5).
- Bisexual and actinomorphic (radial symmetry).
- Ovary is superior hypogynous.

Video Solution:

Q9 Text Solution:**D. Androecium**

The term Polyadelphous is related to the grouping of stamens in the flower, where stamens are united by their filaments into multiple bundles.

Video Solution:**Q10 Text Solution:**

(B) Ovary

- False fruits develop from the ovary along with other floral parts.
- Thalamus becomes fleshy and contributes to the edible portion.
- The ovary does not form the entire fruit structure.
- Examples include apple and strawberry.

Video Solution:**Q11 Text Solution:**

Roots primarily perform several essential functions for the plant, including:

- **Absorption of water and minerals:** Roots absorb water and essential nutrients from the soil through their root hairs and other specialized cells.
- **Anchorage:** Roots anchor the plant in the soil, providing stability and support against forces such as wind and gravity.
- **Storage of food:** Roots store carbohydrates and other nutrients produced by the plant, serving as a reserve for future growth and development.

Respiration, on the other hand, primarily occurs in the leaves and other green parts of the plant where chloroplasts and mitochondria are actively involved in the process of photosynthesis and cellular respiration. While roots do undergo cellular respiration to generate energy for their metabolic processes, it is not their main function compared to absorption, anchorage, and storage of food.

Video Solution:

Q12 Text Solution:

(B) Radicle

- Radicle is the embryonic part that gives rise to the root.
- It is the first structure to emerge during germination.
- It grows downward into the soil.
- Plumule gives rise to the shoot.

Video Solution:**Q13 Text Solution:**

Brassica shows radial symmetry - actinomorphic flower

Video Solution:**Q14 Video Solution:****Q15 Text Solution:**

(A) Silk cotton

1. Palmate compound = leaflets attached at tip of petiole.
2. Example: Silk cotton.
3. Neem = pinnately compound.
4. Mango = simple leaf.

Video Solution:**Q16 Text Solution:**

(C) Bulliform cells

1. Bulliform cells = large, thin-walled.
2. Help rolling/unrolling of leaves.
3. Reduce water loss in drought.
4. Seen in grasses, maize.

Video Solution:

Q17 Text Solution:

B. Scattered in the ground tissue

- Vascular bundles are numerous and scattered.
- Each bundle is closed (without cambium).
- Surrounded by sclerenchymatous bundle sheath.
- No secondary growth occurs.

Video Solution:**Q18 Text Solution:**

(A) (c), (b), (a)

1. Innermost = **guard cells**.
2. Surrounding = subsidiary cells.
3. Outermost = epidermal cells.
4. Sequence = (c) (b) (a).

Video Solution:**Q19 Text Solution:****B: Ground tissue system**

The ground tissue system constitutes the bulk of the plant body. It includes tissues such as parenchyma, collenchyma, and sclerenchyma, which are responsible for a variety of functions including photosynthesis, storage, and support. In contrast, the epidermal tissue system forms the outer protective layer, and the vascular tissue system is involved in the transport of water, nutrients, and food.

Video Solution:**Q20 Text Solution:**

In dicot stem, hypodermis is collenchymatous.

Cells are living and flexible.

Hypodermis lies just beneath epidermis.

Provides mechanical support to young stem.

Other options contradict collenchyma traits.

Video Solution:

Q21 Text Solution:

(C) Companion cells

1. Companion cells are **living**, regulate sieve tubes.
2. Vessels & tracheids dead at maturity.
3. Sclerenchyma dead, lignified.
4. Hence correct = companion cells.

Video Solution:**Q22 Text Solution:****B: Collenchymatous, sclerenchymatous**

- Collenchymatous Hypodermis in Sunflower Stem:

- In the stem of sunflower, which is a dicot, the hypodermis consists of collenchymatous cells. Collenchyma cells are characterized by their thickened cell walls which provide support while allowing flexibility. This tissue is important for providing structural support to the plant stem.

- Sclerenchymatous Hypodermis in Maize Stem:

- In the stem of maize, which is a monocot, the hypodermis consists of sclerenchymatous cells. Sclerenchyma cells are characterized by their thick, lignified walls which provide rigid support and strength. These cells are typically dead at maturity and are crucial for supporting the plant and protecting it against various stresses.

Video Solution:

Q23 Text Solution:

B. Well differentiated into upper palisade and lower spongy parenchyma in leaves of plants with bulliform cells

This statement is incorrect because the differentiation into upper palisade and lower spongy parenchyma is a characteristic of mesophyll tissue, not specifically related to the presence of bulliform cells. Bulliform cells are specialized cells found in certain grasses and sedges that aid in leaf rolling and drought tolerance, but they are not directly responsible for the differentiation of mesophyll into palisade and spongy layers.

Video Solution:



Q24 Text Solution:

Monocot stem bundles are scattered.
 Bundles are conjoint and closed.
 Each is surrounded by sclerenchymatous sheath.
 Cambium and medullary rays absent.
 Hence option C.

Video Solution:



Q25 Text Solution:

Trichomes occur on the shoot epidermis.
 They can vary in structure and may be secretory.
 They help prevent water loss due to transpiration.
 Trichomes are epidermal appendages, not cortical in origin.
 Hence, assertion is correct but reason is incorrect.

Video Solution:



Q26 Text Solution:

B. Only on the lower surface

- Dorsiventral leaves are found in dicots.
- Palisade tissue on upper side and spongy tissue on lower side.
- Stomata mostly on lower epidermis.
- Reduces water loss through transpiration.

Video Solution:



Q27 Text Solution:**A: Monocot stem**

In monocot stems, the vascular bundles are scattered throughout the ground tissue, which is not differentiated into cortex and pith. This is in contrast to dicot stems, where the vascular bundles are arranged in a ring, allowing for the distinction between cortex (the outer layer) and pith (the central core).

Video Solution:**Q28 Text Solution:**

(D) Connected to vessels through pit field

1. Companion cells are linked with sieve tubes (phloem).
2. Help maintain pressure gradient, control sieve tubes.
3. Nucleus of companion regulates sieve tube.
4. They are not connected to **xylem vessels**.

Video Solution:**Q29 Text Solution:**

B. Casparian strips

- Endodermis is the innermost layer of cortex.
- Casparian strips are suberized bands on radial and tangential walls.
- They regulate movement of water and minerals into the stele.
- Help in selective absorption.

Video Solution:**Q30 Text Solution:**

A. Both statements are true

- Phloem translocates organic food from leaves to other parts.
- Composed of sieve tubes, companion cells, phloem parenchyma, and fibres.
- Sieve tubes are living and assist in translocation.
- Companion cells help in maintaining pressure flow.

Video Solution: