

Morphology of Flowering Plants — NEET MCQs with Solutions

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Q1. Root nodules in leguminous plants harbour which nitrogen-fixing microorganism?

- (A) Azotobacter
- (B) Rhizopus
- (C) Rhizobium
- (D) Anabaena

Q2. Stilt roots that arise from lower nodes of maize and grow obliquely into soil primarily provide which benefit?

- (A) Gas exchange in waterlogged soil
- (B) Atmospheric moisture absorption
- (C) Mechanical support
- (D) Nitrogen fixation

Q3. Pneumatophores of Rhizophora grow in which direction relative to the soil surface, and why?

- (A) Downward into deeper anaerobic layers
- (B) Horizontally parallel to soil surface
- (C) Vertically upward above soil surface
- (D) Obliquely downward for mechanical anchorage

Q4. In an onion bulb, reserve food is stored primarily in the

- (A) Stem cortex
- (B) Fibrous roots
- (C) Fleshy scale leaves
- (D) Nodes of the disc stem

Q5. A thin, elongated, prostrate stem that creeps along the soil surface and produces new plants at each node via adventitious roots is best described as a

- (A) Offset
- (B) Runner
- (C) Sucker
- (D) Stolon

Q6. Cladode differs from phylloclade in that a cladode

- (A) Is flattened with unlimited internodal growth
- (B) Is cylindrical and stores only water
- (C) Consists of a single modified internode of limited growth
- (D) Grows subterranean and bears scale leaves

Q7. A plant shows whorled phyllotaxy and simple leaves. Which of the following is correct?

- (A) One leaf arises per node
- (B) Two leaves arise per node
- (C) More than two leaves arise at the same node
- (D) Leaflets are arranged in a whorl along the rachis

Q8. Which of the following is TRUE about a compound leaf?

- (A) Incisions of the lamina stop before reaching the midrib
- (B) Leaflets bear axillary buds at their base
- (C) The lamina is divided completely up to the midrib or petiole, forming distinct leaflets
- (D) Each leaflet functions as an independent leaf with its own node

Q9. In parallel venation, which of the following subtypes is correctly described?

- (A) Veins form a network with a single midrib
- (B) Veins converge at the leaf tip only
- (C) Veins run parallel to each other along the length or breadth of the lamina
- (D) Veins radiate from multiple points on the midrib

Q10. Head or capitulum type of inflorescence is characteristic of

- (A) Mustard (Brassica)
- (B) Pea (Pisum sativum)
- (C) Onion (Allium cepa)
- (D) Sunflower (Helianthus annuus)

Q11. Dichasial cyme is correctly described as a cymose inflorescence where

- (A) One lateral branch develops below each terminal flower
- (B) Two lateral branches develop simultaneously below each terminal flower
- (C) More than two lateral branches arise below each terminal flower
- (D) The axis coils due to unequal branching

Q12. Which of the following correctly explains the definite growth of cymose inflorescence?

- (A) The lateral branches grow faster and suppress main axis elongation
- (B) The main axis produces only one flower and stops
- (C) The cymose axis lacks apical dominance, causing early termination
- (D) The apical meristem of the main axis differentiates into a floral meristem, terminating vegetative growth

Q13. Epipetalous stamens are those which are attached to

- (A) Petals
- (B) Sepals
- (C) Perianth
- (D) Ovary

Q14. Which of the following correctly describes the site and product of microsporangia in an anther?

- (A) Microsporangia are located in the filament and produce ovules
- (B) Microsporangia are located inside the anther lobes and produce pollen grains
- (C) Microsporangia are part of the gynoecium and produce eggs
- (D) Microsporangia are located in the thalamus and produce spores

Q15. In brinjal (Solanum melongena), stamens are attached to petals (epipetalous) AND anthers dehisce by pores. Which combination is correctly described by NCERT terminology?

- (A) Syngenesious + longitudinal dehiscence
- (B) Epiphyllous + poricidal dehiscence
- (C) Epipetalous + poricidal dehiscence
- (D) Epipetalous + longitudinal dehiscence

Q16. Which of the following fruits develops from the entire inflorescence?

- (A) Simple fruit
- (B) Aggregate fruit
- (C) True fruit
- (D) Multiple fruit

Q17. Silique is the characteristic fruit of which plant family?

- (A) Solanaceae
- (B) Brassicaceae
- (C) Fabaceae
- (D) Liliaceae

Q18. Which of the following correctly describes the capsule as a fruit type?

- (A) It develops from an apocarpous ovary and dehisces only along the dorsal suture
- (B) It is an indehiscent fruit derived from a monocarpellary ovary
- (C) It develops from an inferior ovary and never dehisces
- (D) It develops from a syncarpous ovary and shows varied modes of dehiscence such as loculicidal and septicidal

Q19. In non-albuminous dicot seeds such as gram and pea, the primary site of food storage is

- (A) Endosperm
- (B) Testa
- (C) Tegmen
- (D) Cotyledons

Q20. If the endosperm of a seed is retained and remains nutritive at maturity, the seed is classified as

- (A) Non-albuminous
- (B) Perispermic
- (C) Exalbuminous
- (D) Albuminous

Q21. In most dicot seeds, the endosperm is consumed before seed maturation. Which of the following CORRECTLY explains why castor (*Ricinus*) is an exception to this pattern?

- (A) Castor is a monocot and follows monocot seed development rules
- (B) Castor cotyledons are highly reduced and cannot store food
- (C) Castor endosperm degenerates but is replaced by perisperm
- (D) Castor is an albuminous dicot in which endosperm persists at maturity as the primary food reserve

Q22. In the floral diagram of Solanaceae, the calyx is represented as

- (A) Five free sepals arranged alternately with petals
- (B) Five fused sepals shown as a united ring
- (C) Absent, replaced by a scarious bract
- (D) Four fused sepals in a cross-shaped pattern

Q23. Inflorescence in Solanaceae is generally cymose. Which of the following BEST distinguishes cymose from racemose inflorescence?

- (A) Cymose has unlimited apical growth; racemose has terminal flowers
- (B) Racemose has terminal flowers and definite growth
- (C) Cymose has a terminal flower on the main axis, limiting further elongation
- (D) Cymose always produces solitary flowers on long peduncles

Q24. Which of the following CORRECTLY explains why stamens in Solanaceae are called epipetalous?

- (A) Their anthers are fused around the style forming a cone
- (B) Their filaments arise from the receptacle and grow alongside petals
- (C) Their filaments are adnate (fused) to the corolla tube
- (D) Their stamens are fused with each other into a single bundle

Answer key and explanations

Q1. Answer: (C) Rhizobium

Rhizobium is the symbiotic nitrogen-fixing bacterium housed in legume root nodules, converting atmospheric N_2 to ammonia usable by the plant. Azotobacter is a free-living nitrogen fixer (not symbiotic in nodules). Rhizopus is a fungus — a common distractor used to test recall precision.

Q2. Answer: (C) Mechanical support

Stilt roots in maize and sugarcane arise from lower stem nodes and grow obliquely downward, anchoring the tall stem mechanically. Pneumatophores (Rhizophora) grow upward for gas exchange — the opposite direction. The oblique downward growth for support is the NEET-level diagnostic feature of stilt roots.

Q3. Answer: (C) Vertically upward above soil surface

Pneumatophores grow vertically upward (negatively geotropic) above the waterlogged soil surface to access atmospheric oxygen, which cannot diffuse through anaerobic marsh soil. Stilt roots grow obliquely downward — the opposite direction — for mechanical support. Confusing the growth direction of pneumatophores with stilt roots is the most common NEET-level error in this sub-topic.

Q4. Answer: (C) Fleshy scale leaves

The onion bulb stores food in concentric fleshy scale leaves. The stem is reduced to a short, disc-like structure from which adventitious roots arise; it does not store food itself.

Q5. Answer: (B) Runner

Runner (e.g., Cynodon, Oxalis) is a long, slender, prostrate stem growing on the soil surface, rooting at nodes to form new plants. Stolon is similar but grows underground or at an angle; offset is short and thick, typical of aquatic rosette plants.

Q6. Answer: (C) Consists of a single modified internode of limited growth

Cladode (e.g., Asparagus) is a modified stem of a single internode — green and photosynthetic but of limited growth. Phylloclade (e.g., Opuntia) consists of multiple flattened, leaf-like stem segments with unlimited growth potential.

Q7. Answer: (C) More than two leaves arise at the same node

Whorled phyllotaxy means more than two leaves arise at the same node — as in Alstonia. This is independent of whether leaves are simple or compound; the phyllotaxy describes arrangement, not leaf type.

Q8. Answer: (C) The lamina is divided completely up to the midrib or petiole, forming distinct leaflets

In a compound leaf, the lamina is completely divided — incisions reach all the way to the midrib (pinnate) or the petiole base (palmate) — forming distinct leaflets. Simple leaves never have incisions reaching the midrib.

Q9. Answer: (C) Veins run parallel to each other along the length or breadth of the lamina

Parallel venation is classified as unicostate parallel (single midrib, veins running parallel to it) and multicostate parallel (several veins from base). In all types, veins do not anastomose to form a network — that defines reticulate venation.

Q10. Answer: (D) Sunflower (Helianthus annuus)

Capitulum is the inflorescence of family Asteraceae — sunflower is the classic NCERT example with many sessile florets on a flattened receptacle. Onion (Option D) shows umbel — a common confusion.

Q11. Answer: (B) Two lateral branches develop simultaneously below each terminal flower

In dichasial cyme, exactly two lateral branches arise symmetrically below each terminal flower. One branch = monochasial (Option A), the primary distractor.

Q12. Answer: (D) The apical meristem of the main axis differentiates into a floral meristem, terminating vegetative growth

Definite growth occurs because the apical meristem converts to a floral meristem — the axis literally ends in a flower. Option B (lateral suppression) is a tempting mechanistic trap but is incorrect; the cause is meristematic differentiation.

Q13. Answer: (A) Petals

Epipetalous = stamens adnate (adhering) to petals — example: brinjal (*Solanum melongena*). This is an adhesion condition. Stamens attached to perianth (tepals) = epiphyllous, seen in Liliaceae.

Q14. Answer: (B) Microsporangia are located inside the anther lobes and produce pollen grains

Microsporangia are housed within the thecae of the anther; they undergo meiosis to ultimately produce pollen grains (microspores). Ovules are produced in the ovary of the gynoecium — a critical distinction.

Q15. Answer: (C) Epipetalous + poricidal dehiscence

Brinjal has epipetalous stamens (adhesion to petals) and poricidal anther dehiscence (pores at tip). This dual-feature question is a high-frequency NEET trap — students who know only one feature choose D.

Q16. Answer: (D) Multiple fruit

Multiple (composite) fruits such as pineapple and mulberry develop from an entire inflorescence, where flowers fuse together along with other floral parts. This distinguishes them from aggregate fruits (single apocarpous flower) and simple fruits (single ovary).

Q17. Answer: (B) Brassicaceae

Silique is the diagnostic fruit of Brassicaceae (mustard family), formed from a bicarpellary syncarpous ovary with a persistent replum after dehiscence. Fabaceae produces legumes; Solanaceae produces berries. Family-to-fruit matching is a frequent NEET question pattern.

Q18. Answer: (D) It develops from a syncarpous ovary and shows varied modes of dehiscence such as loculicidal and septicidal

Capsule arises from a syncarpous (fused carpel) ovary and can dehisce in multiple ways — loculicidal (through locule wall), septicidal (through septa), or poricidal. Option B describes a follicle; Option C describes an achene/caryopsis. The syncarpous origin is the key distinguishing fact.

Q19. Answer: (D) Cotyledons

In non-albuminous seeds, endosperm is consumed during embryogenesis and food reserves are sequestered in the enlarged, fleshy cotyledons. Testa and tegmen are protective layers with no significant storage function.

Q20. Answer: (D) Albuminous

Albuminous (endospermic) seeds retain the endosperm as the principal food reserve at maturity (e.g., castor, maize, wheat). Non-albuminous and exalbuminous are synonymous terms for seeds where endosperm is consumed — Option D is a trap synonym for Option B.

Q21. Answer: (D) Castor is an albuminous dicot in which endosperm persists at maturity as the primary food reserve

Castor (*Ricinus communis*) is a dicot that retains endosperm at seed maturity — making it albuminous. This is the critical exception: most dicots are non-albuminous, but castor is not. Option C (perisperm) is a trap — castor has endosperm, not perisperm. Option A is factually wrong.

Q22. Answer: (B) Five fused sepals shown as a united ring

Solanaceae shows gamosepalous calyx (K(5)) with five fused sepals represented in floral diagrams as a continuous ring. Four sepals in cross arrangement describes Brassicaceae (cruciform calyx), a common distractor.

Q23. Answer: (C) Cymose has a terminal flower on the main axis, limiting further elongation

In cymose inflorescence, the main axis terminates in a flower, preventing further apical extension — growth continues through lateral axes. Racemose inflorescence (Option B) has unlimited apical growth, not terminal flowers — a common reversal trap.

Q24. Answer: (C) Their filaments are adnate (fused) to the corolla tube

Epipetalous = stamens attached to petals; specifically, filaments fuse with the gamopetalous corolla tube. Option D describes monadelphous condition (as in *Hibiscus*). Option A describes syngenesious androecium (as in *Asteraceae*).

Modifications and their examples

Modification	Examples
Storage roots	Carrot and turnip (tap roots); sweet potato (adventitious roots)
Prop roots	Banyan tree
Stilt roots	Maize, sugarcane
Pneumatophores	Rhizophora (roots grow vertically upwards for respiration)
Underground stems for storage	Potato (tuber), ginger and turmeric (rhizome), zaminkand, Colocasia
Stem tendrils	Cucumber, pumpkins, watermelon, grapevines
Stem thorns	Citrus, Bougainvillea
Flattened or fleshy stems	Opuntia (flattened), Euphorbia (fleshy cylindrical)
Runner / Stolon / Offset / Sucker	Grass and strawberry / mint and jasmine / Pistia and Eichhornia / banana, pineapple and Chrysanthemum
Leaf tendrils	Peas
Leaf spines	Cacti
Insect-catching leaves	Pitcher plant, Venus flytrap
Parthenocarpic fruit	Banana
Drupe	Mango, coconut
Albuminous (endospermic) dicot seed	Castor