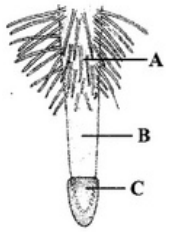
MORPHOLOGY OF FLOWERING PLANTS

1. Which of the following statements is correct with respect to the given figure showing different zones of a typical root?



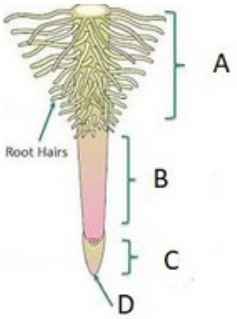
(A) Part B mainly helps in absorption of water.
(B) Quiescent centre is present in part B.
(C) Part A is most suitable for anatomical studies of root.
(D) Differentiation of cells can be observed in part C.

2. Match Column-I with Column-II and select the correct option from the codes given below.

Column-I	Column-II
A. Conical	(i) *Brassica rapa*
B. Fusiform	(ii) *Daucus carota*
C. Napiform	(iii) *Raphanus sativus*
D. Tuberous	(iv) *Mirabilis jalapa*

(A) A-(ii), B-(iii), C-(i), D-(iv)
(B) A-(iii), B-(ii), C-(i), D-(iv)
(C) A-(ii), B-(i), C-(iii), D-(iv)
(D) A-(ii), B-(iii), C-(iv), D-(i)

3. What is the origin of root hairs in the regions of root-tip?



(A) A
(B) B
(C) C
(D) D

4. Identify the type of modified root and select the correct statement regarding this.

(A) It is the tuberous root of *Dahila* that stores inulin as reserve food.

(B) It is modified tap root that occurs in *Dahlia*.

(C) It is a modified adventitious root that stores reserve food material.

(D) These roots are modified to provide mechanical support to the plant.

5. Select the group of plants that possess stilt roots.
   (A) *Zea mays, Rhizophora mangal*
   (B) *Pandanus odoratissimus, Ficus benghalensis*
   (C) *Rhizophora mangal, Hedera helix*
   (D) *Ficus benghalensis, Pisum sativum*

6. Read the given statements and select the correct option.
   Statement 1: Root cap protects the root meristem from the friction of the soil and its outer cells are continuously replaced by newer ones.
   Statement 2: The effect of the soil-friction damages the outer cells of root cap which are peeled off and replaced by new cells produced by root meristem.
   (A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
   (B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.
   (C) Statement 1 is correct and Statement 2 is incorrect.
   (D) Both statements 1 and 2 are incorrect.

7. Given are some differences between an underground stem and a root. Select the option that identifies the incorrect pair of difference.

	Underground stem	Root
(i)	It is differentiated into nodes and internodes.	It is not differentiated into nodes and internodes.
(ii)	Scale leaves are present at the nodes.	Scale leaves are absent in roots.
(iii)	Axillary buds are present in the axil of scale leaves.	Axillary buds are present at root tips.
(iv)	Branches arise exogenously.	Branches arise endogenously.
(v)	Root hair and root caps are absent.	Root hair and root caps are present.
(vi)	Flowers and fruits are usually present.	Flowers and fruits are absent.
(vii)	These usually perform the function of food storage.	These always perform the function of food storage.

(A) (vi) and (vii) (B) (ii), (iii) and (vii)

(C) (iii), (vi) and (vii) (D) (ii), (iii), (vi) and (vii)

8. Read the given statements are select the correct ones.

(i) Root caps are present in prop roots.

(ii) Pneumatophores help to get oxygen for respiration.

(iii) Edible part of ginger is underground stem.

(iv) Hydrophytes usually possess a well developed root system.

(A) (i) and (ii) (B) (ii) and (iii)

(C) (i), (ii) and (iii) (D) (i), (ii), (iii) and (iv)

9. Following table summarizes the differences between phylloclades and cladodes (cladophylls).

	Phylloclades	Cladodes
(i)	Both main stem and branches are modified to function like leaves.	Only the branches are modified to take over the function of leaves.
(ii)	Phylloclade has unlimited or indefinite growth.	Cladode also has unlimited or indefinite growth.
(iii)	It consists of several nodes and internodes.	It is usually one internode long.

(iv)	True leaves are commonly caduceus.	True leaves are either reduced to scales or modified to spines.
(v)	Examples: *Ruscus aculeatus, Asparagus,* etc.	Examples: *Opuntia, Euphorbia royleana,* etc.

Pick up the wrong differences and select the correct option.

(A) (i) and (ii) (B) (ii) and (v)

(C) (iii) and (v) (D) (ii) and (iv)

10. Read the following statements and select the correct option.

Statement 1: The stem tubers are the swollen ends of specialized underground stem branches, which help in vegetative propagation of the plant.

Statement 2: *Solanum tuberosum* is an example of a stem tuber which stores inulin as the main reserve food material.

(A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.

(B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.

(C) Statement 1 is correct and Statement 2 is incorrect.

(D) Both statements 1 and 2 are incorrect.

11. Match Column-I with Column-II and select the correct option from the codes given below.

Column-I	Column-II
A. Thorns	(i) Vegetative propagation
B. Phylloclades	(ii) Defensive mechanism
C. Runners	(iii) Mechanical support
D. Stilt roots	(iv) Absorption of nutrition
E. Haustoria	(v) Photosynthesis

(A) A-(v), B-(iv), C-(iii), D-(ii), E-(i)
(B) A-(ii), B-(v), C-(iii), D-(i), E-(iv)
(C) A-(ii), B-(v), C-(i), D-(iii), E-(iv)
(D) A-(iii), B-(v), C-(iv), D-(i), E-(ii)

12. Select the mismatched pair out of the following.
(A) Rhizome – *Dryopteris, Nelumbo nucifera*
(B) Corm – *Crocus sativus, Amorphophallus*
(C) Sucker – *Curcuma domestica, Zingiber officinale*
(D) Tuber – *Helianthus tuberosus, Solanum tuberosum*

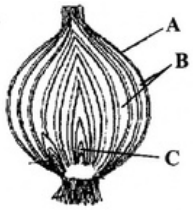
13. Match Column-I with Column-II and select the correct option.

Column-I	Column-II
A. Vegetative buds	(i) Buds develop in axils of leaves
B. Floral buds	(ii) Buds produce leafy shoots
C. Axillary buds	(iii) Reproductive buds that produce flowers
D. Accessory buds	(iv) Additional buds borne at leaf bases

(A) A-(ii), B-(iii), C-(i), D-(iv)
(B) A-(iii), B-(ii), C-(i), D-(iv)
(C) A-(iv), B-(iii), C-(ii), D-(i)
(D) A-(i), B-(ii), C-(iv), D-(iii)

14. With regard to the given figure, select the correct answer.
(A) It possesses one or more nodes.
(B) It grows aerially for some distance and finally touches the ground.
(C) It is present in *Fragaria, Jasminum* etc.
(D) All of these

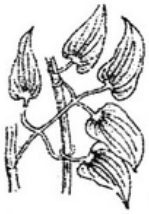
15. The given figure represents the V.S. of bulb of *Allium cep.* Identify the different parts and select the correct option.



	A	B	C
(A)	Fleshy scales	Tunic	Terminal bud
(B)	Tunic	Terminal bud	Fleshy scales
(C)	Tunic	Fleshy scales	Terminal bud
(D)	Terminal bud	Fleshy scales	Tunic

16. Different parts of a leaf are modified into tendrils which help the plant in climbing up. Identify the type of tendril that is seen in *Clematis*.

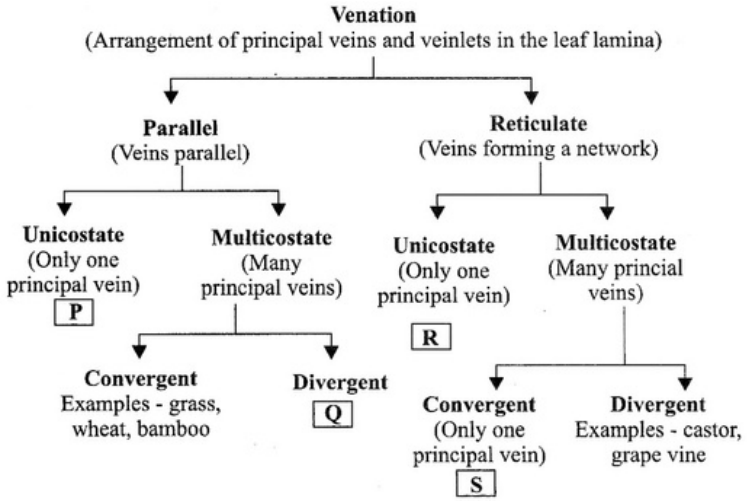
(A) 

(B) 

(C) 

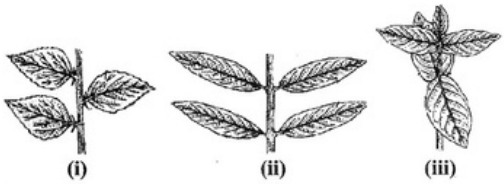
(D) 

17. Study the following flowchart and select the correct option for P, Q, R and S.



	P	Q	R	S
(A)	Banana, Canna	Fan palm	Mango, Peepal	*Smilax, Zizyphus*
(B)	Banana, Canna	*Smilax, Zizyphus*	Mango, Peepal	Fan palm
(C)	Mango, Peepal	Banana,	Fan palm	*Smilax, Zizyphus*
(D)	Mango, Peepal	*Canna* Fan palm	*Smilax, Zizphus*	Banana, *Canna*

18. Study the given figures and identify the kind of phyllotaxy.



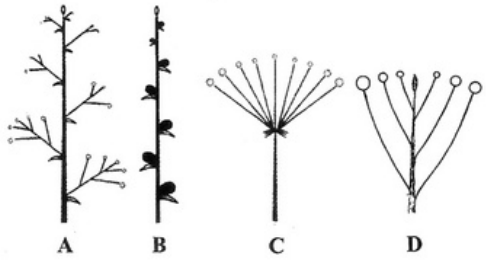
	(i)	(ii)	(iii)
(A)	Alternate	Opposite superposed	Opposite decussate
(B)	Alternate	Opposite superposed	Whorled
(C)	Opposite decussate	Alternate	Whorled
(D)	Opposite decussate	Whorled	Alternate

19. Select the incorrect match with respect to the plant and the relative plant part modified for food storage.
(A) *Lathyrus odoratus* (Sweet potato) - Root
(B) *Solanum tubersosum* (Potato) – Stem
(C) *Zingiber officinale* (Ginger) - Rhizome
(D) *Dahlia* (Dahlia) – Leaves

20. In (i) type of inflorescence, main axis terminates in a flower, hence is limited in growth and flowers are borne in (ii) succession.

	(i)	(ii)
(A)	racemose	acropetal
(B)	racemose	basipetal
(C)	cymose	acropetal
(D)	cymose	Basipetal

21. The given figure shows some type of inflorescences. Select the option that correctly identifies them.



	A	B	C	D
(A)	Panicle	Spike	Corymb	Catkin
(B)	Spike	Panicle	Corymb	Catkin
(C)	Panicle	Catkin	Umbel	Spike
(D)	Umbel	Panicle	Spike	Corymb

22. Identify the types of inflorescence shown in figure and select the correct option for A and B.

	A	B
(A)	Cymose	Racemose
(B)	Racemose	Cymose
(C)	Racemose	Racemose
(D)	Cymose	Cymose

23. Match Column-I with Column-II and select the correct option from the codes given below.

Column-I	Column-II	
A. Pedicel	(i)	Reduced leaf
B. Peduncle	(ii)	Stalk of the flower
C. Bract	(iii)	Stalk of the leaf
D. Petiole	(iv)	Inflorescence axis

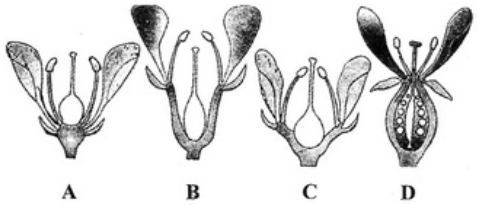
(A) A-(ii), B-(iv), C-(i), D-(iii)

(B) A-(iii), B-(iv), C-(i), D-(ii)

(C) A-(iii), B-(ii), C-(i), D-(iv)

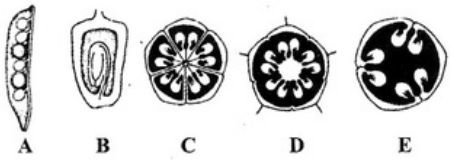
(D) A-(ii), B-(iii), C-(i), D-(iv)

24. On the basis of relative position of different floral parts on the thalamus, a flower can be hypogynous, perigynous or epigynous. With respect to the given figures (A, B, C and D), select the correct option.



	A	B	C	D
(A)	Hypogynous	Perigynous	Epigynous	
(B)	Hypogynous	Epigynous	Perigynous	
(C)	Epigynous	Hypogynous	Perigynous	Perigynous
(D)	Hypogynous	Hypogynous	Perigynous	Epigynous

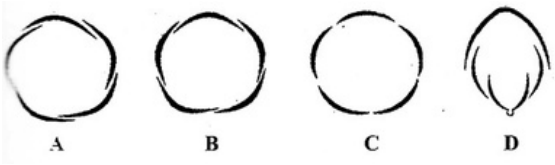
25. Identify the different types of placentations shown in figure and select the correct option.



	A	B	C	D	E
(A)	Axile	Marginal	Free central	Parietal	Basal

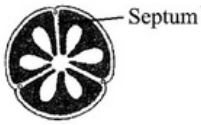
(B) Marginal	Basal		Axile	Free central	Parietal
(C) Marginal	Axile		Parietal	Free central	Basal
(D) Marginal	Parietal		Axile	Basal	Free central

26. Identify the different types of aestivation (A, B, C and D) and select the correct option.



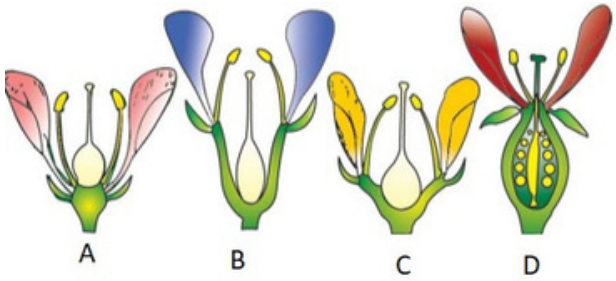
B	A		C	D
(A) Valvate	Twisted		Imbricate	Vexillary
(B) Imbricate	Twisted		Valvate	Vexillary
(C) Twisted	Imbricate	Vexillary	Valvate	
(D) Twisted	Imbricate	Valvate	Vexillary	

27. Which kind of placentation is represented by the given figure?



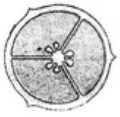
(A) Marginal (B) Axile
(C) Parietal (D) Basal

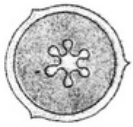
28. Which of the following floral forms (A – D) represent the flowers with hypogynous condition?



(A) A and B (B) B and C (C) C and D (D) Only A

29. Which of the following figures represent a typical placentation as seen in *Hibiscus rosa sinensis* (China rose)?

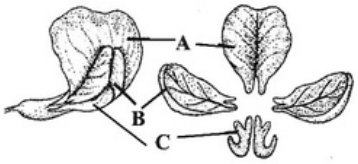
(A)  (B) 

(C)  (D) 

30. Select the incorrect pair out of the following:

(A) Monadelphous - *Hibiscus*
(B) Diadelphous – *Cucurbita*
(C) Polyadelphous – *Citrus*
(D) Syngenesious – *Helianthus*

31. Select the correct option for A, B and C in the given diagram of papilionaceous corolla.



	A	B	C
(A)	Keel	Wings	Vexillum
(B)	Vexillum	Keel	Wings
(C)	Vexillum	Wings	Keel
(D)	Wings	Keel	Vexillum

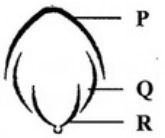
32. In _____ aestivation, sepals or petals in a whorl just touch one another at the margins, without overlapping, as is found in _____.
(A) valvalte, *Calotropis* (B) valvate, *Hibiscus*
(C) twisted, *Calotropis* (D) twisted, *Hibiscus*

33. Read the given statements.

(i) Gynoecium occupies the highest position while the other floral parts are situated below it.
(ii) Ovary is superior.
(iii) Examples are Brassica, Hibiscus, brinjal, etc.
Which condition of flowers is being described by the above statements?

(A) Hyopgyny
(B) Perigyny
(C) Epigyny
(D) None of these

34. The given figure represents vexillary aestivation. Select the suitable labels for P, Q and R.



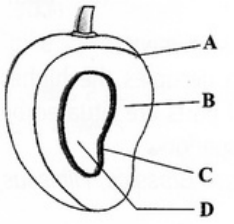
	P	Q	R
(A)	Standard	Wing	Ala
(B)	Standard	Keel	Wing
(C)	Wing	Keel	Carina
(D)	Standard	Ala	Carina

35. Match Column-I with Column-II and select the correct option from the codes given below.

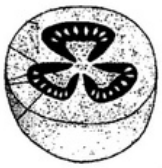
Column-I	Column-II
A. Marginal	(i) Sunflower, marigold
B. Parietal	(ii) Pea
C. Axile	(iii) Mustard, *Argemone*
D. Free central	(iv) *Hibiscus*, tomato, lemon
E. Basal	(v) *Dianthus, Primrose*

(A) A-(ii), B-(iii), C-(iv), D-(v), E-(i)
(B) A-(i), B-(iii), C-(ii), D-(v), E-(iv)
(C) A-(i), B-(ii), C-(iii), D-(iv), E-(v)
(D) A-(iii), B-(ii), C-(iv), D-(v), E-(i)

36. Given figure represents a drupe of mango. Select the option that correctly identifies A, B, C and D.



	A	B	C	D
(A) Pericarp		Epicarp	Mesocarp	Endocarp
(B) Epicarp		Mesocarp	Endocarp	Seed
(C) Mesocarp	Epicarp		Endocarp	Seed
(D) Epicarp		Mesocarp	Seed	Endocarp

37. 

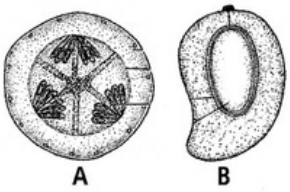
Select the incorrect statement regarding the given figure.

(A) It represents the baccate fruit of *Lycopersicon esculentum.*

(B) It is derived from a monocarpellary apocarpous gynoecium.

(C) It represents the true berry of tomato.

(D) Both B and C

38. 

Identify the given types of fruits and select the correct answer.

(A) A = Pepo, B = Nut

(B) A = Pepo, B = Drupe

(C) A = Balausta, B = Drupe

(D) A = Drupe, B = Pepo

39. Select the mismatched pair out of the following.

(A) Syconus – *Ficus carica*

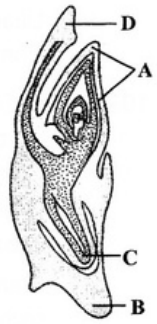
(B) Sorosis – *Ananas camosus*

(C) Pome – *Mangifera indica*

(D) Cremocarp – *Coriandrum sativum*

40. Given figure represents longitudinal section of a monocotyledonous embryo.

Identify the parts labeled as A, B, C and D from the list (i – vii) and select the correct option.



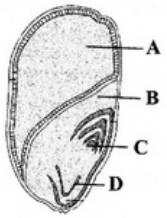
(i) Scutellum (ii) Coleoptile

(iii) Shoot apex (iv) Epiblast

(v) Radicle (vi) Root cap (vii) Coleorhiza

	A	B	C	D
(A)	(i)	(vi)	(vii)	(ii)
(B)	(ii)	(vii)	(v)	(i)
(C)	(iv)	(iii)	(vi)	(vii)
(D)	(iii)	(vii)	(vi)	(ii)

41. Identify A, B, C and D in the given figure showing L.S. of a monocot seed and select the correct option.

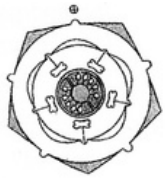


	A	B		D
(A)	Endosperm	Scutellum	(B)	Radicle
	Endosperm	Scutellum		Plumule
(C)	Scutellum	Endosperm	Radicle	Plumule
(D)	Plumule	Radicle	Scutellum	Endosperm

42. X is a scar on the seed coat through which the developing seeds were attached to the fruit; above the X is a small pore called Y. Identify X and Y and select the correct option.

	X	Y
(A)	Micropyle	Hilum
(B)	Hilum	Micropyle
(C)	Testa	Tegmen
(D)	Chalaza	Micropyle

43. Study carefully the given floral diagram and select the option which correctly represents the related floral formula (F.F.).



(A) $\%\,\varphi\,K_{(5)}C_{1+2+(2)}A_5\overline{G}_{(2)}$

(B) $\oplus\,\varphi\,K_{(5)}\overset{\frown}{C_5}\,A_5\,\underline{G}_{(2)}$

(C) $\oplus\,\varphi\,P_{5+5}A_{(5)}\underline{G}_{(2)}$

(D) $\oplus\,\varphi\,\hat{K}_{(5)}\overset{\frown}{C_{(5)}}\,A_5\,\underline{G}_{(2)}$

44. Identify the missing words (A, B, C and D) and select the correct option.

Family	Inflorescence	Flower	Stamens	Gynoecium
Fabaceae	A	B	10	D
Solanaceae	Solitary, axillary or cymose	Actinomorphic	5	Bicarpellary
Lilliaceae	Solitary, cymose or racemose	Actinomorphic	C	Tricarpellary

	A	B	C	D
(A)	Racemose	Zygomorphic	3 + 3	Monocarpellary
(B)	Racemose	Actinomorphic 5		Bicarpellary
(C)	Cymose	Zygomorphic	3 + 3	Tricarpellary
(D)	Cymose	Actinomorphic 5		Multicarpellary

45. Study carefully the given floral diagram and select the option which correctly represents the related flora formula (F.F.)

(A) $\oplus \male\!\female P_{(3+3)} A_{3+3} \underline{G}_{(3)}$

(B) $\oplus \male\!\female P_6 A_6 \underline{G}_{(3)}$

(C) $\oplus \male\!\female P_{5+5} A_{(5)} \underline{G}_{(2)}$

(D) $\oplus \male\!\female K_{(5)} C_{(5)} A_{(5)} \underline{G}_{(2)}$

ANSWERS

1. C 2. A 3. A 4. C 5. A 6. A 7. C 8. C 9. B 10. C
11. C 12. C 13. A 14. D 15. C 16. B 17. A 18. A 19. D 20. D
21. D 22. B 23. A 24. A 25. C 26. D 27. B 28. D 29. A 30. B
31. C 32. A 33. A 34. D 35. A 36. B 37. B 38. B 39. C 40. B
41. A 42. B 43. D 44. A 45. A

SOLUTIONS

3. Root hairs develop from the region of maturation of root. It represents the zone of differentiation or maturation because different types of primary tissues differentiate or mature in this region. Hence, option A, that is, region of maturation is the correct option. Given figure is of fasciculated root, which is the
4. modified adventitious root that stores food material. Hydrophytes are plants adapted for growing in water, water
8. logged soil or on a substrate that becomes inundated on a regular basis. In hydrophytes, roots are of secondary importance so they are poorly developed.

15. In onion he fleshy scales represent leaf bases in the outer part and scale leaves in the central region. The occur in concentric fashion. The bulb is covered by a whitish or pinkish tunic. Fleshy scales enclose terminal bud. Fleshy scales represent the edible part of onions.
16. The petiole, rachis and the stalk of the leaflets (petiolules) in Clematis are sensitive to contact and can coil around the support to help the plant in climbing. Such tendrils are known as rachis and petiolute tendrils.
19. In Dahlia, adventitious roots are modified to fasciculated fleshy roots which store food. Swollen roots or root tubers occur in clusters and lie at the base of stem.
28. In hypogynous condition of a flower, ovary is situated on the torus above all the floral organs. The ovary is superior.

Hence, the image A represents hypogynous condition of the flower.

32. In valvate aestivation, margins of the adjacent petals touch each other but without overlapping e.g., corolla of Brassica, Calotropis.

37. Given figure represents true berry or baccate fruit of Lycopersicum esculentum (tomato).

40. A – Coleoptile
    B – Coleorhiza
    C – Radicle
    D – Scutellum