BIOLOGY

BOOKS - PRADEEP BIOLOGY (HINGLISH)

ANATOMY OF FLOWERING PLANTS

Notable Questions

1. Why the vascular strands (xylem and phloem) show radial arrangement in roots?

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2. Why the endodermal cells possess casparian strips in their radial and transverse walls ?

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Ncert Exercise With Answer

1. State the location and function of different types of meristem.

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2. Cork cambium forms tissues that form the cork. Do you agree with this statement? Explain.

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3. Explain the process of secondary growth in stems of woody angiosperm with help of schematic diagrams. What is the significance?

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4. Draw illustrations to bring out anatomical difference between

(a) Monocot root and dicot root

(b) Monocot stem and dicot stem

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5. Cut a transverse section of young stem of a plant from your school garden and observe it under the microscope. How would you ascertain whether it is a monocot stem or dicot stem? Give reasons.

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6. The transverse section of a plant material shows the following anatomical features, (a) the vascular

bundles are conjoint, scattered and surrounded by sclerenchymatous bundle sheaths (b) phloem parenchyma is absent. What will you identify it as?

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7. Why are xylem and phloem called complex tissues?

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8. What is stomatal apparatus? Explain the structure of stomata with a labelled diagram.

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9. Name the three basic tissue systems in the flowering plants. Give the tissue names under each system.

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10. How is the study of plant anatomy useful to us?

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11. What is periderm? How does periderm formation take place in dicot stem?

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12. Describe the internal structure of a dorsiventral leaf with the help of labelled diagrams.

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Additional Questions Very Short Answer Questions

1. What is meristems

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2. Name the type of plant tissue that characteristically thin-walled cells and retains the capacity of division even at maturity

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3. Name the tissue which provides mechanical strength to the plant organs.

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4. Indicate the location of cambium in a dicot stem.

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5. Name the two types of sieve elements found in phloem.

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6. Explain the role of lenticels

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7. Name the zone of slowly dividing cells in the middle of highly meristematic cells of the root tip.

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8. Name the tissue represented by the jute fibres used in making ropes.

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9. Name the anatomical layer in the root from which the lateral branch of root arises.

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10. Name the main components of xylem. Which of these is most suitable for carrying water?

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11. Name two examples of fruits having sclereids.

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12. What forms the cambial ring in a dicot stem during the secondary growth ?

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13. When do you refer to a vascular bundle as a closed bundle ?

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14. What makes the root's apical meristem sub-terminal ?

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15. Define open vascular bundle

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16. What category of a permanent plant cell is companion cell

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17. What is the function of a companion cell ?

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18. Mention any one characteristic of the sieve tube members

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19. What type of tissue constitutes calyptrogen

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20. Which tissue of the leaf contains the chloroplasts

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21. What is exarch condition ?

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22. Name the components of secondary xylem.

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23. Name the tissue involved in linear and lateral growth in plants.

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24. What is the function of phloem parenchyma ?

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25. Protoxylem is the first formed xylem. If the protoxylem lies next to phloem what kind of arrangement of xylem would you call it ?

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26. What is present at the surface of leaves which helps the plant prevent loss of water but is absent in roots?

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27. What part of the plant would show the following ?

(a) Radial vascular bundle

(b) Polyarch xylem

(c) Well develop pith

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28. What constitutes the cambial ring ?

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29. Give on basic functional difference between phellogen and phelloderm.

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Additional Questions Short Answer Questions

1. Why cambium is considered as lateral meristem?

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2. Define intercalary meristem

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3. Define meristematic tissue ? Write down characteristics of meristematic cells.

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4. Which one out of root or stem shows endarch arrangement of xylem ? What is meant by endarch arrangement

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5. Give two differences between the vascular bundles of monocot and dicot stems.

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6. Give any two differences between monocot stem and monocot root on the basis of vascular bundles.

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7. State the differences in the function of collenchyma and aerenchyma

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8. Mention two differences in the vascular bundles of sunflower and maize stems.

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9. Why are mechanical tissues lacking in hydrophytes ?

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10. Sieve tubes in angiosperms are associated with specialised parenchyma cells. Name those cells. How do they help sieve tube members.

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11. What is an annual ring ?

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12. Name a plant organ where endodermis is absent. Give one basic difference between endodermis and epidermis

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13. Below is a list of plant. From which part of the plant these are obtained.

(a) Coir

(b) hemp

(c) cotton

(d) jute.

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14. Epidermal cells are often modified to perform specialised functions in plants. Name some of them

and function they perform.

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15. What is the difference between fibres and sclereids in plant histology ? Give one example of each.

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16. What do you mean by leptocentric and hadrocentric vascular bundle ? Cite examples

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17. What is collenchyma ? Explain its structure and function in plant body of a herbaceous

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18. Describe the location of interfascicular cambium and formation of interfascicular cambium in a dicot stem

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19. How many types of meristems are present in plants ? Explain them.

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20. Fill in the blanks :

(A) Each annual ring corresponds to the growth of ..... of..... year

(B) Secondary growth helps in increasing the ..... of the roots and stems.

(C) A meristem is a localised region in which actual cell ..... occurs.

(D) The permanent tissues comprise cells which have ..... their capacity of division.

(E) Companion cells are specialised parenchyma cells which are closely associated with the ..... elements

(F) The vascular tissue system is formed by the ..... and .....

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21. (A) What are Casparian strips and what is their function ?

(B) Define concentric vascular bundle. What are their types ?

(C) What is wood botanically ?

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22. Write the precise function of

(a) sieve tube

(b) interfascicular cambium

(c) collenchyma

(d) aerenchyma.

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23. The stomatal pore is guarded by two kidney shaped guard cells. Name the epidermal cells surrounding the guard cells. How does a guard cell differ from an epidermal cell ? Use a diagram to illustrate your answer.

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24. A transverse section of the truck of a tree shows concentric rings which are known as growth rings. How are these rings formed ? What is the significance of these rings ?

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25. Point out the differences in the anatom of leaf of peepal (Ficus religiosa) and maize (Zea mays). Draw the diagrams and label the differences.

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Additional Questions Long Answer Questions

1. Name three permanent tissues found in flowering plants. Write the functions of xylem and phloem.

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2. Describe the tissue system in plants.

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3. Draw neat labelled diagram of a cross section of maize root.

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4. Describe secondary growth in a dicot root

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5. Describe the process of secondary growth in a dicot stem

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6. (A) What is the function of velamen ?

(B) What is plerome ?

(C) What is quiescent centre ?

(D) What is the function of collenchyma ?

(E) What is the chemical nature of cuticle ?

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7. A portion of transverse section of Maize stem is shown in the diagram . Label 1 - 9 . 

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8. Distinguish between the following

(a) Exarch and endarch condition of protoxylem

(b) Stele and vascular bundle

(c) Protoxylem and metaxylem

(d) Interfascicular cambium and intrafascicular cambium

(e) Open and closed vascular bundles

(f) Stem hair and root hair.

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Analytical Questions With Answer

1. (a) Which part of coconut plant is the source of coir fibres ? What is the morphological nature of coir fibre?

(b) Give alteast two other benefits of coconut plant.

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2. (a) Which plant tissue is removed during trimming of tips of hedge plant?

(b) How many types of meristems are found in plants ?

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3. What is heart wood and sap wood ? Explain

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4. What is dendrochronology ? How are annual rings formed in woody angiosperms ?

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5. What is palisade parenchyma?

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6. Where are companion cells located in flowering plants ? What is their function ?

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7. What are the characteristic differences found in the vascular tissue of gymnosperms and angiosperms ?

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8. Why are a large number of stomata are present at the lower surface of the dicotyledonous leaves in the terrestrial plants ?

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9. What are medullary rays and what are their functions

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10. Why is there secondary growth in dicots and no such growth in monocots:

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11. How will you differentiate between shoot apex and root apex on the basis of cell division and differendation

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12. Identify the tissue which shows the following features :

(a) All the cells are of one type

(b) The cells are living and have thin cellulose wall

(c) The cells have prominent nuclei and very few vacuoles

(d) The cells divide regularly

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13. Explain how branches and flowers arise from the axils of leaves.

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14. (a) Name the substances which get deposited at the comers of collenchymatous cells.

(b) What is the purpose of such deposition in these tissues ?

(c) Under what circumstances, the cells of collenchyma assimilate food.

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15. Where will you find the sclereids ?

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16. Identify the plant material which shows the following anatomical features - (a) the vascular bundles are conjoint, scattered and surrounded by a sclerenchymatous sheath , (b) phloem parenchyma is absent. Give the reasons for your identification.

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17. (a) Name the plants in which the guard cells of stomata are dumb-bell shaped.

(b) What are the constituents of stomatal apparatus ?

(c) What is the function of trichomes in the shoot system?

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18. What kind of adaptive feature develops in plants to avoid breaking of external tissue due to increase in thickness of stem and root as a result of secondary growth ? Give its salient features

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19. What features will you look in a transverse section to confirm that it is a dicotyledonous root ?

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20. What will you observe in a transverse section of a trunk to estimate the age of the tree ?

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Practice Questions Multiple Choice Question

1. Which one of the following statements pertaining to plant structure is correct

A. Cork laks stomata but lenticels carry out transpiration

B. Passage cells helps in transfer of foods from cortex to phloem

C. sieve tube elements possess cytoplasm but no nuclei

D. The shoot apical meristem has a quiescent centre

Answer: C

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2. Cork tissue arises from

A. Periderm

B. Phellogen

C. Phelloderm

D. Phellem

Answer: B

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3. inner darker, hardened portion of secondary xylem that cannot conduct water in older dicot stem is called

A. Alburnum

B. Bast

C. Wood

D. Duramen

Answer: D

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4. Fascicular , interfascicular and extra-fascicular cambium together constitute

A. Ground meristem

B. Apical meristem

C. Intercalary meristem

D. Lateral meristem

Answer: D

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5. A common structural feature of vessel elements and sieve tube elements is

A. Enucleate condition

B. Thick secondary walls

C. Pores on lateral walls

D. Presence of P-protein

Answer: A

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6. Bicollateral conjoint vascular bundles have

A. Xylem and phloem, which are arranged in an alternate manner on different radii

B. Xylem and phloem,' which are situated at the same radius and it has two groups of phloem along the two sides of xylem (inside and outside)

C. Xylem and phloem in same radius· but it has only one group of phloem outside the xylem

D. Phloem surrounds the xylem tissues

Answer: B

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7. Casparian thickenings are found in the cells of

Or

In dicot roots, cells of which region show casparian strips

A. Pericycle of the root

B. Endodermis of the root

C. Pericycle of the stem

D. Endodermis of the stem

Answer: B

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8. Grafting is successful in dicots but not in monocots because the dicots have-

A. Vascular bundles arranged in a ring

B. Cambium for secondary growth

C. Vessels with elements arranged end to end

D. Cork cambium

Answer: B

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9. In the sieve elements, which one of the following is the most likely function of P-protein-

A. Deposition of callose on sieve plates

B. Providing energy for active translocation

C. Autolytic enzymes

D. Sealing mechanism on wounding

Answer: D

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10. Passage cells are thin walled cells found in

A. Phloem elements that serve as entry points for substance for transport to other plant parts

B. Testa of seeds to enable emergence of growing embryonic axis during seed germination

C. Central region of style through which the pollen tube grows towards the ovary

D. Endodermis in roots facilitating rapid transport of water from cortex to pericycle

Answer: D

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11. For a critical study of secondary growth in plants, which one of the following pairs is suitable

A. Teak and pine

B. Deodar and fem

C. Wheat and maiden hair fem

D. Sugar cane and sunflower

Answer: A

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12. Length of petiole increases due to division of

A. Apical meristem

B. Lateral meristem

C. Intercalary meristem

D. All of these

Answer: C

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13. periderm is produced by

A. Cork cambium

B. Pro-cambium

C. Secondary cortex

D. Vasular cambium

Answer: A

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14. Meristematic tissue in vascular bundle is

A. Phellem

B. Procambium

C. Interfascicular cambium

D. Fascicular cambium

Answer: D

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15. Vessels and companion cells are found in

A. Angiosperms

B. Pteridophytes

C. Bryophytes

D. Thallophytes

Answer: A

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16. Lateral roots originate from

A. Endodermis cells

B. Pericycle cells

C. Epiblema

D. Cortical cells below root hairs.

Answer: B

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17. Opening in the core tissue which permit ex-change of gas between atmosphere and internal tissue is

called

A. Complementary tissue

B. Peridem

C. Lenticel

D. Bark

Answer: C

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18. Procambium produces

A. Epidermis

B. Pith

C. Vascular bundle

D. Vascular bundle and pith

Answer: C

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19. At maturity, which of the following is non-nucleated?

A. Palisade cell

B. Sieve cell

C. Companion cell

D. Cortical cell

Answer: B

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20. The histogen layer present at the apex of the shoot tip is called

A. Dermatogen

B. Procambium

C. Calyptrogen

D. Plerome

Answer: C

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21. Which of the following statements is/are true ?

Uneven thickening of cell wall is characteristic of sclerenchyma

Periblem forms the cortex of the stem and the root

Tracheids are the chief water transporting elements in gymnosperms

Companion cell is devoid of nucleus at maturity

A. (a) and (d) only

B. (b) and (c) only

C. (c) and (d) only

D. (b), (c) and (e) only

Answer: D

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22. The waxy material deposited in the casparian strip of the endodermis is

A. Pectin

B. Suberin

C. Cellulose

D. Lignin

Answer: B

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23. The vascular cambial ring of a dicot stem is

A. Primary in origin

B. Secondary in origin

C. Embryonic in origin

D. Partly primary and partly secondary in origin

Answer: D

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24. Consider the following statement

(A) In a dicot root, the vascular bundles are collateral and endarch

(B) The inner most layer of cortex in a dicot root is endodermis

(C) In a dicot root, the phloem masses are separated from the xylem by parenchymatous cells that are

known as the conjunctive tissue

Of these statement given above

A. (a) is true , but (b) and (c) are false

B. (b) is true , but (a)and (c) are false

C. (a) is false , but (b) and (c) are true

D. (c) is false , but (a) and (c) are true

Answer: C

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25. The length of different internodes in a culm of sugarcane is variable because

A. Size of leaf lamina at the node below each internode

B. Intercalary meristem

C. Shoot apical meristem

D. Position of axillary buds

Answer: B

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26. Vascular tissues in flowering plants develop from

A. Periblem

B. Dermatogen

C. Phellogen

D. Plerome

Answer: D

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27. Which of the following is nucleated

A. Vessel

B. Sieve cell

C. Tracheid

D. Companian cell

Answer: D

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28. Vascular tissue in higher plants develops from which of the following?

A. Procambium

B. Protoderm

C. Periblem

D. Cortex

Answer: A

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29. conjoint and closed vascular bundles with no phloem parenchyma are observed in

A. Monocot stem

B. Monocot root

C. Dicot stem

D. Dicot root

Answer: A

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30. Cuticle is absent in

A. Mesophytes

B. Young roots

C. Mature stems

D. Leaves

Answer: B

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31. Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by

A. Absence of secondary phloem

B. Presence of cortex

C. Position of protoxylem

D. Absence of secondary xylem

Answer: C

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32. Palisade parenchyma is absent in leaves of

A. Mustrard

B. Soyabean

C. Gram

D. Sorghum

Answer: D

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33. A transverse section of stem is stained first with safranin and then with fast green following the usual schedule of double staining for the preparation of a

permanent slide. What would be the colour of the stained xylem and phloem

A. Red and green

B. Green and red

C. Orange and yellow

D. Purple and orange

Answer: A

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34. Match the following and choose the correct option from below

$A.$	Meristem	$i.$	Photosynthesis storage
$B.$	Parenchyma	$ii.$	Mechanical support
$C.$	Collenchyma	$iii.$	Actively dividing cells
$D.$	Sclerenchyma	$iv.$	Stomate
$E.$	Epidermal tissue	$v.$	Sclereids

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

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

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

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

Answer: B

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35. Match the following and choose the correct option from below

$A.$	Cuticle	$i.$	Guard cells
$B.$	Bulliform cells	$ii.$	single layer
$C.$	Stomata	$iii.$	Waxy layer
$D.$	Epidermis	$iv.$	Empty colourless cell

A. A-iii,B-iv,C-i,D-ii

B. A-i,B-ii,C-iii,D-iv

C. A-iii,B-ii,C-iv,D-i

D. A-iii,B-ii,C-I,D-iv

Answer: A

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36. Identify the tissue system from among the following

A. Parenchyina

B. Xylem

C. Epidermis

D. Phloem

Answer: A

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37. Cells of this tissue are living and show angular wall thickning. They also provide mechanical support. The tissue is

A. Xylem

B. Sclerenchyma

C. Collenchyma

D. Epidermis

Answer: C

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38. Epiblema of roots is equivalent to

A. Pericycle

B. Endodermis

C. Epidermis

D. Stele

Answer: C

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39. A conjoint and open vascular bundle will be observed in the transverse section of

A. Monocot root

B. Monocot stem

C. Dicot root

D. Dicot stem

Answer: D

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40. Interfascicular cambium and cork cambium are formed due to

A. Cell division

B. Cell differentiation

C. Cell dedifferentiation

D. Redifferentiation

Answer: A

41. Phellogen and phellem respectively denote

A. Cork and cork cambium

B. Cork cambium and cork

C. Secondary cortex and cork

D. Cork and secondary cortex

Answer: B

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42. In which of the following pairs of parts of a flowering plants is epidermis absent?

A. Root tip and shoot tip

B. Shoot bud and floral bud

C. Ovule and seed

D. Petiole and pedicel

Answer: A

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43. How many shoot apical meristems are likely to be present in a twig of a plant possessing, 4 branches and 26 leaves

A. 26

B. 1

C. 5

D. 30

Answer: C

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44. A piece of wood having no vessels (trachea) must be belong to

A. Teak

B. Mango

C. Pine

D. Palm

Answer: C

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45. A plant tissue, when stained , showed the presence of hemicellulose and pectin in cell wall of its cells. The tissue represents

A. Collenchyma

B. Sclerenchyma

C. Xylem

D. Meristem

Answer: A

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46. Fibres are likely to be absent in

A. Secondary phloem

B. Secondary Xylem

C. Primary phloem

D. Leaves

Answer: D

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47. When wepeel the skin of a potato tuber, we remove

A. Periderm

B. Epidermis

C. Cuticle

D. Sapwood

Answer: A

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48. A vesselless piceof stem possessing prominent sieve tubes would belong to

A. Pinus

B. Eucalyptus

C. Grass

D. Trochodendron

Answer: D

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49. Which one of the following cells types always divides by anticlinal cell division?

A. fusiform initial cells

B. root cap

C. protoderm

D. phellogen

Answer: D

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50. What is the fate of primary xylem in a dicot root showing extensive secondary growth?

A. It is retained in the centre of the axis

B. It gets crushed

C. May or may not get crushed

D. It gets surrounded by primary phloem

Answer: A

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51. Medullary rays are made up of

A. parenchymatous cells

B. Sclerenchymatous cells

C. tracheids

D. fibres

Answer: A

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52. Monocot stem lacks

A. tracheids

B. Sieve tube

C. cambium

D. None of these

Answer: C

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53. Ground tissue includes

A. all tissues external to endodennis

B. all tissues except epidermis and vascular bundles

C. epidermis and cortex

D. all tissues internal to endodermis

Answer: B

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54. The cork cambium, cork and secondary cortex are collectively called

A. phellodenn

B. phellogen

C. peridenn

D. phellem

Answer: C

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55. Function of companion cells is

A. providing energy to sieve elements for active transport

B. providing water to phloem

C. loading of sucrose into sieve elements by passive transport.

D. loading of sucrose into sieve elements

Answer: D

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56. Some vascular bundles are described as open because these

A. are surrounded by pericycle but no endodermis

B. are capable of producing secondary xylem and phloem

C. possess conjuctive tissue between xylem and phloem

D. are not surrounded by pericycle

Answer: B

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57. In kranz anatomy, the bundle sheath cells have

A. thin walls, many intercellular spaces and no chloroplasts

B. thick walls, no intercellular spaces and large number of chloroplasts

C. Thin walls, no intercellulat spaces and several chloroplasts

D. thick walls, many intercellular spaces and few chloroplasts

Answer: B

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58. In land plants the guard cells differ from other epidermal cells in having

A. cytoskeleton

B. mitochondria

C. endoplasmic reticulum

D. chloroplasts

Answer: D

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59. Companion cells are closely associated with :

A. Sieve elements

B. Vessel elements

C. Trichomes

D. Guard cells

Answer: A

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60. The cambium which produces cork is known as

Or

The common bottle cork is a porduct of

Or

The meristem that is parallel to the longitudinal axis of the plant is

A. Dermatogen

B. Phellogen

C. Xylem

D. Vascular Cambmm

Answer: B

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61. Closed vascular bundles lack

A. Ground tissue

B. Conjunctive tissue

C. Cambium

D. Pith

Answer: C

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62. Water containing cavities in vascular bundles are found in

A. Sunflower

B. Maize

C. Cycas

D. Pinus

Answer: B

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63. as compared to a dicot root, a monocot root has

A. more abundant secondary xylem

B. many xylem bundles

C. inconspicuous annual rings

D. relatively thicker periderm

Answer: B

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64. Lenticels are involved in

A. gaseous exchange

B. food transport

C. photosynthesis

D. transpiration

Answer: A

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65. Interfascicular cambium develops from the cells of

A. xylem parenchyma

B. endodermis

C. pericycle

D. medullary rays

Answer: D

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66. Besides paddy fields, cyanobacteria are also found inside vegetative part of:

A. Cycas

B. Equisetum

C. Psilotum

D. Pinus

Answer: A

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67. Megasporangium is equivalent to

A. fruit

B. nucellus

C. ovule

D. embryo sac

Answer: C

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68. Tracheids differ from other tracheary elements in

A. having casparian strips

B. being imperforate

C. lacking nucleus

D. being lignified

Answer: B

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69. you are given a fairly old piece of dicot stem and a dicot root. Which of the following anatomical structures will you use to distinguish between the two.

A. Secondary xylem

B. Secondary phloem

C. Protoxylem

D. Cortical cells

Answer: C

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70. Match the Column I with II Column II

A. $\begin{matrix} A & B & C & D \\ 1 & 2 & 3 & 4 \end{matrix}$

B. $\begin{matrix} A & B & C & D \\ 3 & 1 & 2 & 4 \end{matrix}$

C. $\begin{matrix} A & B & C & D \\ 4 & 1 & 2 & 3 \end{matrix}$

D. $\begin{matrix} A & B & C & D \\ 4 & 3 & 2 & 1 \end{matrix}$

Answer: C

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71. Read the different components from (A) to (D) in the list given below and tell he correct order of the components with reference to their arrangement from outer side to inner side in a woody dicot stem

(A) Secondary cortex , (B) Wood

(C)Secondary phloem , (D) Phellem

A. (D), (C), (A), (B)

B. (C), (D), (B), (A)

C. (A), (B), (D), (C)

D. (D), (A), (C), (B)

Answer: D

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72. Pith cavity occurs in the stem of

A. Helianthus

B. Zea mays

C. Cucurbita

D. Dracaena

Answer: C

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73. Which of the following statements is true ?

A. Vessels are unicellular and with narrow lumen

B. Vessels are multicellular and with wide lumen

C. Tracheids are unicellular and with wide lumen

D. Tracheids are multicellular and with narrow lumen

Answer: C

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74. Cortex is the region found between

A. epidermis and stele

B. pericycle and endodermis

C. endodermis and pith

D. endodermis and vascular bundle

Answer: A

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75. the baloon- shaped structuces called tyloses

A. originate in the lumen of vessels

B. characterize the sapwood

C. are extensions of xylem parenchyma cells into vessels

D. are linked to the ascent of sap through xylem vessels

Answer: C

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76. A few drops of sap were collected by cutting across a plant stem by a suitable method. The sap was tested

chemically. Which one of the following test results indicates that it is phloem sap ?

A. Acidic

B. Alkaline

C. Low refractive index

D. Absence of sugar

Answer: B

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77. The vascular cambium normally gives rise to

A. primary phloem

B. secondary xylem

C. periderm

D. phelloderm

Answer: B

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78. Root hairs develop from the region of

A. elongation

B. root cap

C. meristematic activity

D. maturation

Answer: D

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79. Which of the following is made up of dead cells

A. Collenchyma

B. Phellem

C. Phloem

D. Xylem parenchyma

Answer: A

80. Identify the wrong statement in context of heartwood

A. It is highly durable

B. It conducts water and minerals efficiently

C. It comprises dead elements with highly lignified walls

D. Organic compounds are deposited in it

Answer: B

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81. Secondary xylem and phloem in dicot stem are produced by

A. apical meristems

B. vascular cambium

C. phellogen

D. axillary meristems

Answer: B

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82. casparian strip occur in

A. epidermis

B. pericycle

C. cortex

D. endodermis

Answer: B

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83. Plants having little or no secondary growth are

A. grasses

B. deciduous angiosperms

C. conifers

D. cycads

Answer: D

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Assertion Reason Type Questions

1. Assertion. The terminal meristem present at the apices of stems and roots is called apical meristem.

Reason. According to Histogen theory, there are three distinct apical layers which give rise to distinct tissue system of the body.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: a

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2. [A]: The inner most distinct layer of the cortex is called endodermis.

[R]: The cells of endodermis are nonliving and bear casparian strips

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: B

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3. [A] : The narrow band of meristematic tissue present between phloem and xylem is called cambium

[R] : In dicotyledonous stem a part of the procambium remains meristematic which is called cambium

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: C

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4. Assertion. Primary xylem is exarch in roots and endarch in stems.

Reason. Exarch condition of xylem facilitates inflow of

water from cortex whereas endarch condition favours ascent of sap

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: A

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5. Assertion. The radial walls of endodermal cells possess a conspicuous waxy thickening called Casperian strip.

Reason. Casparian thickenings block the passage of solute from one side of endodermis to the other via cell wall route.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: A

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6. Assertion. Secondary growth in thickeness is brought about by the activity of intercalary meristem. Reason. Intercalary meristem cuts secondary xylem and secondary phloem

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: D

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7. given below are assertion and reson. Point out if Assertion . In woody stems, the amount of heartwood

continues year after year.

Reason. the cambial activity continues uninterrupted.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: A

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8. Assertion. Quiescent centre of shoot apex is hemispherical in shape.

Reason. Quiescent centre becomes hemispherical due to more growth in the centre and less growth in the periphery.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: D

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9. Assertion. Cell differentiation in the root tip is bidirectional.

Reason. The outerwardly produced cells become part of root cap whereas the inwardly produced cells are added to the body of the root.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: A

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10. Assertion. Vascular cambium is considered as lateral meristem.

Reason. It gives rise to lateral shoots.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: C

11. Assertion. Casperian strips are formed on the inner tangential wall.

Reason. In roots, epidermis is not covered by cuticle.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: B

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12. Assertion. Vascular cambium is absent in monocots.

Reason. In monocot roots, secondary growth occurs by the activity of vascular cambium.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: C

13. Assertion. Sieve tube members have abundant cytoplasm but there is no nucleus.

Reason. Nucleus is present in companion cell.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the

Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: B

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14. Assertion (A) Secondary growth in dicot roots occur with the help of vascular cambium and phellogen.

Reason (R) Vascular cambium is formed from conjuctive parenchyma and part of pericycle.

A. If both Assertion and Reason are true and the Reason is a correct explanation of the Assertion

B. If both Assertion and Reason are true but Reason is not a correct explanation of the Assertion

C. If Assertion is true but the Reason is false

D. If both Assertion and Reason are false

Answer: C