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Department of Botany
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CORE COURSE- C 5
(MORPHOLOGY AND ANATOMY)

Multiple choice questions:

1. The study of tissue is called
    a. Cytology
    b. Pathology
    c. <u>Histology</u>
    d. Embryology
2. The term meristem was given by
    a. <u>Nageli</u>
    b. Cohn
    c. Hanstein
    d. Schmidt
3. Which of the following is not a simple tissue
    a. Parenchyma
    b. <u>Xylem parenchyma</u>
    c. Collenchymas
    d. Sclerenchyma
4. Which tissue is responsible for the axial growth of plants
    a. <u>Apical meristem</u>
    b. Lateral meristem
    c. Intercalary meristem
    d. Intracalary meristem
5. What are the constituents of phloem
    a. Sieve elements
    b. Companion cells
    c. <u>Both of these</u>
    d. None of these
6. What is the shape of parenchyma cells
    a. Regular
    b. Polygonal
    c. Triangle
    d. <u>Isodiametric</u>
7. In which of the following is living tissue
    a. Parenchyma tissue

b. <u>Collenchymas tissue</u>

c. Sclerenchyma tissue

d. None of these

8. Which plant tissues are often called as stone cells

a. Parenchyma

b. Collenchymas

c. <u>Sclerenchyma</u>

d. None of these

9. Which type of tissue has lignified cell wall

a. Parenchyma

b. Collenchymas

c. <u>Sclerenchyma</u>

d. Cambium

10. Which of the following is complex tissue

a. Xylem

b. Phloem

c. Neither (a) nor (b)

d. <u>Both (a) and (b)</u>

11. The vascular cambium normally gives rise

a. Primary xylem

b. <u>Secondary xylem</u>

c. Periderm

d. Phelloderm

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

a. Collenchymas

b. <u>Phellem (cork cell)</u>

c. Phloem

d. Xylem parenchyma

13. Epidermis is produced from

a. Procambium

b. <u>Protoderm</u>

c. Phellogen

d. Ground meristem

14. Root hair develop from the region of

a. Elongation zone

b. Root cap

c. Meristematic activity

d. <u>Maturation zone</u>

15. Identify the wrong statement in context of heartwood

a. It is highly durable

b. <u>It conducts water and minerals efficiently</u>

c. It comprises dead elements with highly lignified walls

d. Organic compounds are deposited in it

16. Meristems helps in

a. Absorption of water

b. Absorption of minerals

c. Translocation of food

d. <u>Growth of plants</u>

17. Plerome forms

a. Endodermis

b. Epidermis

c. Cortex

d. <u>Stele</u>

18. Cortex is the region found between

a. <u>Epidermis and vascular bundle</u>

b. Pericycle and endodermis

c. Endodermis and pith

d. Endodermis and vascular bundle

19.The balloon-shaped structure called tyloses

a. Originate in the lumen of vessels

b. Characterise the sapwood

c. <u>Are extensions of xylem parenchyma cells into vessels</u>

d. Are linked to the ascent of sap through xylem vessels

20. Specialised epidermal cells surrounding the guard cells are called

a. Bulliform cells

b. Lenticels

c. Complementary cells

d. <u>Subsidiary cells</u>

21. Major characteristic of monocot in the presence of

a. <u>Vascular without cambium</u>

b. Cambium sandwiched between phloem and xylem

c. Open vascular bundles

d. Scattered vascular bundle

22. Lenticels are involved in

a. Food transport

b. Transpiration

c. Photosynthesis

d. <u>Gaseous exchange</u>

23. Age of a tree can be estimated by

a. <u>A number of annual rings</u>

b. Diameter of its heartwood
c. Its height and girth
d. Biomass

24. From which part of root, root hairs develop
    a. Region of maturation
    b. Region of elongation
    c. Meristematic region
    d. Region of root cap
25. Bordered pits are found in
    a. Vessel wall
    b. Sieve cells
    c. Sieve tube
    d. Companion cells
26. Which are the external protective tissues of the plant
    a. Cortex and epidermis
    b. Cork and Cortex
    c. Pericycle and cortex
    d. Epidermis and cork
27. Hydathodes are component of
    a. Vascular tissue system
    b. Ground tissue system
    c. Epidermal tissue system
    d. Cortex tissue system
28. Which of the following is a living structure
    a. Sclerenchyma
    b. Parenchyma
    c. Xylem vessel
    d. Tracheid
29. What is the main function of stomata
    a. Respiration
    a. Photosynthesis
    b. Gaseous exchange
    c. Transport
30. Interfascicular cambium develops from the cells of
    a. Medullary rays
    b. Xylem parenchyma
    c. Endodermis
    d. Pericycle
31. Companion cells are closely associated with
    a. Sieve elements

b. Vessel elements
c. Trichomes
d. Guard cells

32. Apical meristem divides from three meristematic regions
    a. Dermal, vascular and ground
    b. Calyptrogens, periblem and plerome
    c. <u>Protoderm, procambium and ground meristem</u>
    d. Lateral, intercalary and subapica
33. Intercalary meristem is derived from
    a. Protoderm
    b. Calyptrogens
    c. Lateral meristem
    d. <u>Apical meristem</u>
34. Phellogen is
    a. Intercalary meristem
    b. Apical meristem
    c. Primary meristem
    d. <u>Secondary meristem</u>
35. Closed vascular cambium lack
    a. Ground tissue
    b. Conjuctive tissue
    c. <u>Cambium</u>
    d. Pith
36. The cork cambium, cork and secondary cortex are collectively called
    a. Phellogen
    b. Periderm
    c. Phellem
    d. <u>Phelloderm</u>
37. Guard cells help in
    a. Protection against grazing
    b. <u>Transpiration</u>
    c. Guttation
    d. Fighting against infection
38. The bone-shaped sclereids is called
    a. Astrosclereids
    b. <u>Osteosclereids</u>
    c. Macrosclereids
    d. Trichosclereids
39. Roots are developed in
    a. Halophytes

b. Xerophytes
c. Mesophytes
d. <u>Hydrophytes</u>

40. In which type of environment most likely found xerophytes
a. Aquatic
b. <u>Deserts</u>
c. Rainforest
d. Terrestrial

41. Which cell helps to open and close the stomata
a. Palisade
b. <u>Guard</u>
c. Xylem
d. Epidermis

42. Which of the following is an adaptation of a xerophytes
a. Reduced root
b. <u>Hairy leaves</u>
c. Many stomata
d. Thin cuticle

43. Apical cell theory was given by
a. <u>Hofmeister</u>
b. Hanstein
c. Haberlandt
d. Grew

44. Korper- kappe theory was proposed by
a. <u>Scheupp</u>
b. Schmidt
c. Clowes
d. Wolf

45. Characteristics division of Korper- kappe theory are
a. Anticlinal
b. <u>T-type</u>
c. Irregular
d. Periclinal

46. Corpus is
a. Mantle of meristem
b. Central part of meristem
c. <u>Internal part of meristem</u>
d. Mass meristem

47. Tunica is
a. Mass meristem

b. <u>Mantle of meristem</u>

c. Internal mass of meristem

d. Central of meristem

48. Dermatogens produces

a. <u>Epidermis</u>

b. Hypodermis, cortex and pith

c. Hypodermis, cortex and endodermis

d. Pericycle, vascular strand and pith

49. Periblem produces

a. <u>Cortex</u>

b. Pericycle

c. Vascular bundle

d. Both (b) and (c)

50. Plerome is a histogen that gives rise to

a. Pericycle

b. Pith

c. Vascular bundles

d. <u>All the above</u>

51.Cortex is formed from

a. Cambium

b. Procambium

c. <u>Ground meristem</u>

d. Protoderm

52. The function of root cap is to

a. <u>Protect the root tip</u>

b. Protect the root hairs

c. Cover the root

d. Growth of the root

53. The characteristics of meristematic cell are

a. Thin wall and dense cytoplasm

b. Isodiametric with no intercellular spaces

c. Conspicuous nucleus

d. <u>All the above</u>

54. Meristematic cells are

a. Differentiated

b. Mature and dead

c. Mature and living

d. <u>Immature and living</u>

55. The cells having the ability to divide are

a. Specialized

b. Permanent
c. Meristematic
d. Glandular

56. The cambium is
a. Apical meristem
b. Lateral meristem
c. Intercalary meristem
d. Secondary meristem

57. The meristems that are located on lateral sides of shoot and roots are called
a. Cutin meristems
b. **Lateral meristems**
c. Vascular meristems
d. Epidermal meristems

58. The meristems that are located at the tips of shoots and roots are called
a. Cambium meristems
b. Vascular meristems
c. Apical meristems
d. Lateral meristems

59. The growth of lateral meristems is also known as
a. Primary growth
b. Secondary growth
c. Tertiary growth
d. Epidermal growth

60. The division of apical meristems leads to the
a. Decrease in vascular cambium
b. Increase in plant length
c. Decrease in plant length
d. Increase in vascular cambium

61. The division of lateral meristems leads to an increase in
a. Transpiration
b. Osmosis
c. Absorption
d. Growth of parts of plants

62. Write the name of permanent tissue has chlorophyll
a. Sclerenchyma
b. Chlorenchyma
c. Aerenchyma
d. None of these

63. In sclerenchyma tissue which substances responsible for make it strong and thickend

a. Protein
b. Lipase
c. Lignin
d. None of these

64. The food transported from leaves to other parts of plants by
a. Xylem
b. Phloem
c. Stem
d. Root

65. Tunica corpus theory is connected with
a. Root apex
b. Root cap
c. Shoot apex
d. Secondary growth

66. Cork is formed from
a. Cork cambium (phellogen)
b. Vascular cambium
c. Phloem
d. xylem

67.Pith and cortex do not differentiate in
a. Monocot stem
b. Dicot stem
c. Monocot root
d. Dicot root

68.Organisation of stem apex into corpus and tunica is determined mainly by
a. Planes of cell division
b. Regions of meristematic activity
c. Regions of meristems
d. None

69. Out of diffuse porous and ring porous woods, which is correct
a. Ring porous wood, carries more water for short period
b. Diffuse porous wood carries more water
c. Ring porous wood carries more water when need is higher
d. Diffuse porous wood is less specialised but conducts water rapidly throughout

70. Monocot leaves possess
a. Intercalary meristem
b. Lateral meristem
c. Apical meristem
d. Mass meristem

71.What is true about a monocot leaf
a. Reticulate venation
b. Absence of bulliform cells from epidermis
c. Mesophyll not differentiated into palisade and spongy tissues
d. Well differentiated mesophyll

72. Vascular cambium produces
    a. Primary xylem and primary phloem
    b. Secondary xylem and secondary phloem
    c. Primary xylem and secondary phloem
    d. Secondary dylem and primary phloem
73. Where do the casparian bands occur
    a. Epidermis
    b. Endodermis
    c. Pericycle
    d. Phloem
74. A bicollateral vascular bundle is characterised by
    a. Phloem being sandwitched between xylem
    b. Transverse splitting of vascular bundle
    c. Longitudinal splitting of vascular bundle
    d. Xylem being sandwitched between phloem
75. Which exposed wood will decay faster
    a. Sapwood
    b. Softwood
    c. Wood with lot of fibres
    d. Heartwood
76. As a tree grows older, which of the following increases more rapidly in thickness
    a. Heart wood
    b. Sap wood
    c. Phloem
    d. Cortex
77. Which of the following meristems is responsible for extrastelar secondary growth in dictyledonous stem
    a. Interfascicular cambium
    b. Intercalary meristem
    c. Phellogen
    d. Intrafascicular cambium
78. Vessels are found in
    a. All angiosperms and some gymnosperm
    b. Most of angiosperms and few gymnosperms
    c. All angiosperms, all gymnosperms and some pteridophyta
    d. All pteridophyta
79. Four radial vascular bundle are found in
    a. Dicot root
    b. Monocot root
    c. Dicot stem
    d. Monocot stem
80. Hydrophytes
    a. Have waxy cuticle
    b. Lack cuticle
    c. Thick cuticle

d. Thin cuticle

81. Sunken stomata found in
    a. Halophytes
    b. Hydrophytes
    c. Xerophytes
    d. Mesophytes
82. Example of xerophytes
    a. Nerium
    b. Nymphaea
    c. Typha
    d. Vallesneria
83. Example of hydrophytes
    a. Cactus
    b. Oputia
    c. Hydrilla
    d. Nerium
84. Stomata are present on underside of
    a. Flower
    b. Fruit
    c. Seed
    d. Leaf
85. The singular word for stomata is
    a. Stomata
    b. stomata's
    c. stoma
    d. stomas
86. Plants in deserts have only few stomata to reduce
    a. water intake
    b. water loss
    c. mineral content
    d. oxygen intake
87. During the day, the plants keep their
    a. stomata opens
    b. stomata closed
    c. phloem blocked
    d. xylem blocked
88. The inner side of guard cells is
    a. Rough
    b. Straight
    c. Concave
    d. Convex
89. The outer side of guard cells is
    a. Concave
    b. Convex

c. Rough
d. none of above

90. The number of guard cells of the stoma is
a. Ten
b. Two
c. Four
d. eight

91. loss of water from the stomata of leaves are known as
a. Exudation
b. Guttation
c. Transpiration
d. Evaporation

92. Sieve tube and companion cells are present in
a. Xylem
b. Phloem
c. Cork
d. Cambium

93. Xylem and phloem are example of
a. Epidermal tissue
b. Simple tissue
c. Protective tissue
d. Complex tissue

94. The flexibility in plants is due to a tissue called
a. Chlorenchyma
b. Parenchyma
c. Collenchymas
d. Sclerenchyma

95. Root cap takes part in
a. Formation of new cells
b. Absorption of water and minerals
c. Protection of root meristem
d. Storage of food

96. The type of arrangement in which protoxylem lies towards the outside and metaxylem lies towards the inside is called
a. Mesarch
b. Endarch
c. Exarch
d. None

97. The case in which xylem is present towards the inner side and phloem is present towards the outer side of vascular bundle is
a. Collateral
b. Bicollateral
c. Concentric
d. Blarel

98. Pith is composed of

a. Collenchyma
b. <u>Parenchyma</u>
c. Sclerenchyma
d. None

99. Which is correct for dicot root
a. Vascular bundles are scattered irregularly in ground tissues
b. <u>The vascular bundles are open</u>
c. Cambium is absent
d. There is no hard bast

100. Hydathodes are also known as
a. False stomata
b. <u>Water stomara</u>
c. Stomata
d. none

<u>SHORT QUESTIONS:</u>

1. Meristematic tissue
2. Permanent tissue.
3. Simple tissue.
4. Complex tissue.
5. What are pits? Write different types of pits?
6. Structure and function of plasmodesmata
7. Parenchyma tissue and its type
8. Collencyma tissue and its type
9. Sclerenchyma tisseue and its type
10. What is polarity in plants?
11. Classification of meristems.
12. Write short notes on water stomata?
13. Write short notes on different types of sclerieds with suitable diagram?
14. Organization of shoot apical meristem
15. Organization of root apical meristem.
16. Explain Histogen theory of SAM?
17. Draw a well-labelled diagram of monocot stem/ root.
18. Write the apical cell theory of RAM?
19. Draw a well-labelled diagram of monocot leaf.
20. What is the structure and functions of cambium?
21. Explain tyloses?
22. What is the structure and functions of stomata?
23. Sketch classification of plant tissue (Only flow chart).
24. Write different types of simple tissues and their functions?

25. Differentiate between sapwood and heartwood.
26. Differentiate between early and late wood.
27. What do you understand by secondary growth?
28. Function of epidermis.
29. Differentiate between ring and diffuse porus wood.
30. Cytodiffrentiation
31. Differentiate tracheids and sieve elements.
32. Explain rhytidome and lenticels in plants.
33. Different types of vascular bundles.
34. Quiescent center of root apical meristem.

LONG QUESTIONS:

1. Give an introduction and scope of plant anatomy?
2. What is plant anatomy? Explain applications of plant anatomy in systematic, forensics and pharmacognosy?
3. Describe in detail about an internal organization as well as the development of plant body?
4. What do mean by organogenesis? Explain their role during embryogenic development.
5. What is tissue? What are three main types of tissue systems?
6. What is epidermal tissue system? Discuss in brief?
7. What is tissue system? Describe classification of plant tissue in details?
8. What is complex tissue? What is the role of xylem and phloem in plant tissue?
9. Why sclerenchyma act as a mechanical tissue. Explain?
10. Explain Tunia-Corpus theory of shoot apical meristem?
11. Define meristems? Discuss apical cell theory of SAM?
12. Describe dicot stem or root with suitable diagram?
13. Explain Korper-kappe theory of root apical meristem?
14. What do you mean by Kranz anatomy? Describe dicot leaf with the help of suitable diagram?
15. What is cambium? What is the role of cambium in secondary growth?
16. Briefly discuss about secondary growth in root or stem?
17. Define stomata? Give classification of stomata on the basis of arrangement of subsidiary cells.
18. Write anatomical adaptations of xerophytic characters?
19. Write anatomical adaptations of hydrophytic characters?
20. What is trichome? Write different types of trichomes with example?