Anatomy of Flowering Plants

Question1

Which of the following simple tissues are commonly found in the fruit walls of nuts and pulp of pear?

[NEET 2024 Re]

Options:

A.

Sclereids

B.

Fibres

C.

Parenchyma

D.

Collenchyma

Answer: A

Solution:

Sclereids are commonly found in the hard parts of the plant such as fruit walls of nuts, or they occur in soft parts, i.e., pulp of the fruits, like pear.

Question2

Given below are two statements:

Statement I: In a dicotyledonous leaf, the adaxial epidermis generally bears more stomata than the abaxial epidermis.
Statement II: In a dicotyledonous leaf, the adaxially placed palisade parenchyma is made up of elongated cells, which are arranged vertically and parallel to each other.

In the light of the above statements, choose the correct answer from the options given below:

[NEET 2024 Re]

Options:

A.

Statement I is true but Statement II is false

B.

Statement I is false but Statement II is true

C.

Both Statement I and Statement II are true

D.

Both Statement I and Statement II are false

Answer: B

Solution:

In a dicotyledonous leaf, adaxial epidermis (upper surface) generally bears very less stomata and may even lack stomata. It has less number of stomata in comparison to abaxial surface.

The adaxially placed palisade parenchyma is made up of elongated cells, arranged vertically and parallel to each other.

Question3

Which of the following helps in maintenance of the pressure gradient in sieve tubes?

[NEET 2024 Re]

Options:

A.

Albuminous cells

B.

Sieve cells

C.

Phloem parenchyma

D.

Companion cells

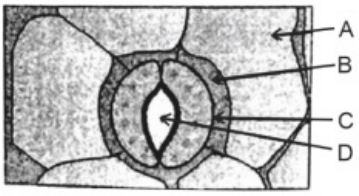
Answer: C

Solution:

The companion cells help in maintaining the pressure gradient in the sieve tubes.

Question4

In the given figure, which component has thin outer walls and highly thickened inner walls?



[NEET 2024]

Options:

A.

C

B.

D

C.

A

D.

B

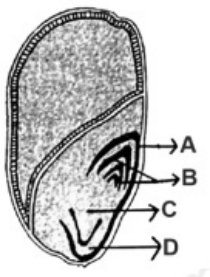
Answer: A

Solution:

Guard cells of stomata have thin outer wall and highly thickened inner walls.

Question5

Identify the part of the seed from the given figure which is destined to form root when the seed germinates.



[NEET 2024]

Options:

A.

A

B.

B

C.

C

D.

D

Answer: C

Solution:

Radicle is destined to form root.

In the given diagram ‘C’ represent radicle

Question6

Given below are two statements:
Statement I : Parenchyma is living but collenchyma is dead tissue.
Statement II : Gymnosperms lack xylem vessels but presence of xylem vessels is the characteristic of angiosperms.

In the light of the above statements, choose the correct answer from the options given below:

[NEET 2024]

Options:

A.

Both Statement I and Statement II are true

B.

Both Statement I and Statement II are false

C.

Statement I is true but Statement II is false

D.

Statement I is false but Statement II is true

Answer: D

Solution:

Collenchyma is also living tissue.

Gymnosperm lack xylem vessels but presence of xylem vessels is the characteristic of angiosperm.

Question7

Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R :
Assertion A : Late wood has fewer xylary elements with narrow vessels.
Reason R : Cambium is less active in winters.
In the light of the above statements, choose the correct answer from the options given below :

[NEET 2023]

Options:

A.

Both A and R are true but R is NOT the correct explanation of A

B.

A is true but R is false

C.

A is false but R is true

D.

Both A and R are true and R is the correct explanation of A

Answer: D

Solution:

In winter, the cambium is less active and forms fewer xylary elements that have narrow vessels, and this wood is called autumn wood or late wood.

Question8

Given below are two statements :
Statement I : Endarch and exarch are the terms often used for describing the position of secondary xylem in the plant body.
Statement II : Exarch condition is the most common feature of the root system.
In the light of the above statements, choose the correct answer from the

options given below:

[NEET 2023]

Options:

A.

Both Statement I and Statement II are false

B.

Statement I is correct but Statement II is false

C.

Statement I is incorrect but Statement II is true

D.

Both Statement I and Statement II are true

Answer: C

Solution:

Solution:

Endarch and exarch are the terms often used for describing the position of primary xylem in the plant body.

Primary xylem is of two types protoxylem and metaxylem. On the basis of relative position of protoxylem and metaxylem in the organ the arrangement of primary xylem can be endarch or exarch.

Exarch type of primary xylem is seen in roots. Therefore, Statement I is false and Statement II is true.

Question9

Identify the correct statements:
A. Lenticels are the lens-shaped openings permitting the exchange of gases.
B. Bark formed early in the season is called hard bark.
C. Bark is a technical term that refers to all tissues exterior to vascular cambium.
D. Bark refers to periderm and secondary phloem.
E. Phellogen is single-layered in thickness.
Choose the correct answer from the options given below:

[NEET 2023]

Options:

A.

A and D only

B.

A, B and D only

C.

B and C only

D.

B, C and E only

Answer: A

Solution:

Lenticels are lens shaped opening permitting exchange of gases between the outer atmosphere and internal tissue of the stem.
Bark that is formed early in the season is called early or soft bark. Towards the end of the season late or hard bark is formed.
Bark is non-technical term that refer to all tissues exterior to vascular cambium.
Bark refers to a number of tissue types, viz periderm and secondary phloem.
Phellogen is couple of layers thick

Therefore, only statement A and D are correct.

Question10

The transverse section of a plant part showed polyarch, radial and exarch xylem, with endodermis and pericycle. The plant part is identified as :

[NEET 2023 mpr]

Options:

A.

Monocot root

B.

Dicot root

C.

Dicot stem

D.

Monocot stem

Answer: A

Solution:

Solution:

Radial vascular bundles are present in roots. Monocot roots have polyarch and exarch condition of xylem.

Question11

Consider the following tissues in the stelar region of a stem showing secondary growth.
(A) Primary xylem
(B) Secondary xylem
(C) Primary phloem
(D) Secondary phloem
Arrange these in the correct sequence of their position from pith towards corts.

[NEET 2023 mpr]

Options:

A.

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

B.

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

C.

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

D.

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

Answer: A

Solution:

The correct sequence of tissues in the stelar region of the stem showing secondary growth from pith towards cortex is :

Primary Xylem → Secondary Xylem → Secondary Phloem → Primary Phloem

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Question12

Consider the following plant tissues :
(A) Axillary buds
(B) Fascicular vascular cambium
(C) Interfascicular cambium
(D) Cork cambium
(E) Intercalary meristem
Identify the lateral meristems among the above.

[NEET 2023 mpr]

Options:

A.

(A), (C) and (D) only

B.

(B),(C) and (D) only

C.

(A), (B), (C) and (E) only

D.

(A), (B), (D) and (E) only

Answer: B

Solution:

Explanation : Lateral meristems are the meristems that add to the width or girth in a process known as secondary growth. They are responsible for the secondary growth in plants and are found parallel to the sides of the plants.
1. Axillary buds (A) are not lateral meristems; they are capable of forming branches or flowers.
2. Fascicular vascular cambium (B) is a type of lateral meristem. It contributes to secondary growth and produces secondary vascular tissues.
3. Interfascicular cambium (C) is also a type of lateral meristem. It also contributes to secondary growth in the stem.
4. Cork cambium (D), also called phellogen, is a lateral meristem and it produces the cork, a part of the protective outer layer (periderm) in stems and roots.
5. Intercalary meristem (E) is not a type of lateral meristem but rather a type of apical meristem located at the base of leaves or internodes on a plant stem, which is involved in primary growth and elongation of the plant.

Therefore, the correct answer is option B : Fascicular vascular cambium (B), Interfascicular cambium (C) and Cork cambium (D) only.

Question13

Interfascicular cambium is present between [NEET Re-2022]

Options:

A. Secondary xylem and secondary phloem

B. Primary xylem and primary phloem

C. Pericycle and endodermis Two vascular bundles

D. Two vascular bundles

Answer: D

Solution:

Solution:

Interfascicular cambium is present between the two vascular bundles.

Question14

The type of tissue commonly found in the fruit wall of nuts is [NEET Re-2022]

Options:

A. Sclereid

B. Parenchyma

C. Collenchyma

D. Sclerenchyma

Answer: A

Solution:

Solution:

Sclereids are present in (a) Fruit walls of nuts like walnuts, almonds, etc.

(b) Pulp of fruits like guava, pear, sapota (cheeku), etc(c) Seed coats of legumes like peas, beans, etc.

(d) Leaves of Tea.

Question15

Initiation of lateral roots and vascular cambium during secondary growth takes place in cells of [NEET Re-2022]

Options:

A. Pericycle

B. Epiblema

C. Cortex

D. Endodermis

Answer: A

Solution:

Solution:

Pericycle is a primary tissue of plant roots and is the site for initiation of lateral roots and the secondary meristems, the vascular cambium and cork cambium (phellogen).

Question16

Read the following statements about the vascular bundles :

(a) In roots, xylem and phloem in a vascular bundle are arranged in an alternate manner along the different radii.
(b) Conjoint closed vascular bundles do not possess cambium
(c) In open vascular bundles, cambium is present in between xylem and phloem
(d) The vascular bundles of dicotyledonous stem possess endarch protoxylem
(e) In monocotyledonous root, usually there are more than six xylem bundles present

Choose the correct answer from the options given below : [NEET-2022]

Options:

A. (a), (b) and (d) Only

B. (b), (c), (d) and (e) Only

C. (a), (b), (c) and (d) Only

D. (a), (c), (d) and (e) Only

E. None of Above

Answer: E

Solution:

Solution:

All the statements are correct regarding vascular bundles but none of the options with such combinationis given.

Question17

In old trees the greater part of secondary xylem is dark brown and resistant to insect attack due to :
(a) secretion of secondary metabolities and their deposition in the lumen of vessels.
(b) deposition of organic compounds like tannins and resins in the central layers of stem.
(c) deposition of suberin and aromatic substances in the outer layer of stem.
(d) deposition of tannins, gum, resin and aromatic substances in the peripheral layers of stem.
(e) presence of parenchyma cells, functionally active xylem elements and essential oils.

Choose the correct answer from the options given below: [NEET-2022]

Options:

A. (a) and (b) Only

B. (c) and (d) Only

C. (d) and (e) Only

D. (b) and (d) Only

Answer: A

Solution:

Solution:

In old trees, the greater part of secondary xylem is dark brown due to deposition of organic compounds like tannins, resins, oils, gums, aromatic substances and essential oils in the central or innermost layers of the stem. These substances make it hard, durable and resistant to the attacks of micro-organisms and insects.

Question18

The anatomy of springwood shows some peculiar features. Identify the correct set of statements about springwood.
(a) It is also called as the earlywood
(b) In spring season cambium produces xylem elements with narrow vessels
(c) It is lighter in colour
(d) The springwood along with autumn wood shows alternate concentric rings forming annual rings
(e) It has lower density

Choose the correct answer from the options given below : [NEET-2022]

Options:

A. (a), (b), (d) and (e) Only

B. (a), (c), (d) and (e) Only

C. (a), (b) and (d) Only

D. (c), (d) and (e) Only

Answer: B

Solution:

Solution:

Spring wood is also called early wood. It is lighter in colour and has a lower density. The vessels are produced with the wider lumens to transport more water to meet the requirement by increased transpiring surface in spring season.

The spring and autumn wood appear as alternate concentric rings of light and dark colour forming annual rings.

Question19

Match List-I with List-II.

	List-I		List-II
(a)	Cells with active cell division capacity	(i)	Vascular tissues
(b)	Tissue having all cells similar in structure and function	(ii)	Meristematic tissue
(c)	Tissue having different types of cells	(iii)	Sclereids
(d)	Dead cells with highly thickened walls and narrow lumen	(iv)	Simple tissue

Select the correct answer from the options given below [NEET 2021]

Options:

A. (a)-(ii) b-(iv) c-(i) d-(iii)

B. (a)-(iv) b-(iii) c-(ii) d-(i)

C. (a)-(i) b-(ii) c-(iii) d-(iv)

D. (a)-(iii) b-(ii) c-(iv) d-(i)

Answer: A

Solution:

(a) Meristematic tissues are those tissues which have cells with active cell division capacity.
(b) Simple tissues are those tissues which have all the cells similar in structure and function.
(c) Vascular tissues are complex permanent tissues hence they have different types of cells.
(d) Sclereids are sclerenchymatous cells which are dead with highly thickened walls and narrow lumen.

Question20

Match List-I with List-II.

	List-I		List-II
(a)	Lenticels	(i)	Phellogen
(b)	Cork cambium	(ii)	Suberin deposition
(c)	Secondary cortex	(iii)	Exchange of gases
(d)	Cork	(iv)	Phelloderm

Choose the correct answer from the options given below. [NEET 2021]

Options:

A. (a)-(iv) (b)-(i) (c)-(iii) (d)-(ii)

B. (a)-(iii) (b)-(i) (c)-(iv) (d)-(ii)

C. (a)-(ii) (b)-(iii) (c)-(iv) (d)-(i)

D. (a)-(iv) (b)-(ii) (c)-(i) (d)-(iii)

Answer: B

Solution:

Solution:
• Lenticels are meant for exchange of gases.
• Phellogen is also known as cork cambium.
• Phelloderm is also called secondary cortex because it is the cortex that develops during secondary growth.
• Cork has deposition of suberin in their cell walls when they get mature.

Question21

Select the correct pair
[NEET 2021]

Options:

A. Large colorless empty cells in the epidermis of grass leaves ↔ Subsidiary cells

B. In dicot leaves, vascular bundles are surrounded by large thick-walled cells ↔ Conjunctive tissue

C. Cells of medullary rays that form part of cambial ring ↔ Interfascicular cambium

D. Loose parenchyma cells rupturing the epidermis and forming a lens shaped opening in bark ↔ Spongy parenchyma

Answer: C

Solution:

Solution:
• When the cells of medullary rays differentiated, they give rise to the new cambium called interfascicular cambium.
• Loose parenchyma cells rupturing the epidermis and forming a lens-shaped opening in bark are called complementary cells.
• Large colourless empty cells in the epidermis of grass leaves are called bulliform cells.
• In dicot leave, vascular bundles are surrounded by large thick walled cells called bundle sheath cells.

Question22

Identify the incorrect statement.
[2020]

Options:

A. Sapwood is involved in conduction of water and minerals from root to leaf

B. Sapwood is the innermost secondary xylem and is lighter in colour

C. Due to deposition of tannins, resins, oils etc., heart wood is dark in colour

D. Heart wood does not conduct water but gives mechanical support

Answer: B

Solution:

Solution:
(b) Correct statement: Sapwood is outermost secondary xylem. Outer secondary xylem or sapwood serves in water conduction, while the inner part called heartwood is composed of dead but structurally strong primary xylem.
Xylem formation begins when the actively dividing cells of growing root and shoot tips (apical meristems) give rise to primary xylem.

Question23

The roots that originate from the base of the stem are [2020]

Options:

A. Primary roots

B. Prop roots

C. Lateral roots

D. Fibrous roots

Answer: D

Solution:

Solution:
(d) The roots that originate from the base of the stem are fibrous roots. A fibrous root system is the opposite of a taproot system. It is usually formed by thin, moderately branching roots growing from the stem. A fibrous root system is universal in monocotyledonous plants and ferns. The fibrous root systems look like a mat made out of roots when the tree has reached full maturity.
Advantages of fibrous root systems include that they allow the plant to absorb water and minerals over a large surface area closer to the surface of the soil. They are also useful in helping prevent or reduce soil erosion since these root systems help hold the soil particles together.

Question24

The transverse section of a plant shows following anatomical features :
(i) Large number of scattered vascular bundles surrounded by bundle sheath
(ii) Large conspicuous parenchymatous ground tissue
(iii) Vascular bundles conjoint and closed
(iv) Phloem parenchyma absent Identify the category of plant and its part :

[2020]

Options:

A. Monocotyledonous root

B. Dicotyledonous stem

C. Dicotyledonous root

D. Monocotyledonous stem

Answer: D

Solution:

Closed vascular bundles are scattered and surrounded by bundle sheath embedded in large parenchymatous ground tissue is characteristic of monocot stem. The vascular bundles are open, conjoint, and arranged in a ring with inconspicuous pith in the dicot stem. In roots, the vascular tissues are arranged radially.So, the correct answer is '**Monocotyledonous stem**'

Question25

Regeneration of damaged growing grass following grazing is largely due to:
[2019]

Options:

A. Secondary meristem

B. Lateral meristem

C. Apical meristem

D. Intercalary meristem

Answer: D

Solution:

(d) Intercalary meristems are capable of cell division and they allow for rapid growth and regrowth of many monocots. Intercalary meristem, found in grasses, help to regenerate the parts removed by the grazing herbivores.
Intercalary meristem is a type of meristematic tissue associated with the growth in length in the middle position, thus the name. In particular, it is made up of meristematic cells that divide mitotically in the stem at the base of nodes and leaf blades. The growth at this point is referred to as intercalary growth.

Question26

Xylem translocates:
[2019]

Options:

A. Water only

B. Water and mineral salts only

C. Water, mineral salts and some organic nitrogen only

D. Water, mineral salts, some organic nitrogen and hormones

Answer: D

Solution:

Solution:
(d) Xylem is a type of complex tissue . it translocates water, mineral salts, organic nitrogen and hormones.

Question27

In the dicot root the vascular cambium originates from :
[OD 2019]

Options:

A. Intrafascicular and interfascicular tissue in a ring.

B. Tissue located below the phloem bundles and a portion of pericycle tissue above protoxylem.

C. Cortical region

D. Parenchyma between endodermis and pericycle.

Answer: B

Solution:

Solution:
(b) Vascular cambium is a secondary meristematic tissue, in dicot roots. It is originated from tissue located below the phloem bundles and a portion of pericycle tissue above the protoxylem.

The vascular cambium produces secondary xylem on the inside of the ring, and secondary phloem on the outside, pushing the primary xylem and phloem apart. The vascular cambium usually consists of two types of cells: Fusiform initials (tall, axially oriented) Ray initials (smaller and round to angular in shape)

Question28

Which of the statements given below is not true about formation of annual rings in trees?
[2019]

Options:

A. Annual ring is a combination of spring wood and autumn wood produced in a year.

B. Differential activity of cambium causes light and dark bands of tissue - early and late wood respectively.

C. Activity of cambium depends upon variation in climate.

D. Annual rings are not prominent in trees of temperate region.

Answer: D

Solution:

Solution:
(d) Growth rings are formed by the seasonal activity of cambium. In plants of temperate regions, cambium is more active in spring (less lignin deposition in xylem) and less active in autumn (more lignin deposition in xylem) seasons. In temperate regions climatic conditions are not uniform throughout the year. However in tropics climatic conditions are uniform throughout the year.

Question29

Casparian strips occur in
[2018]

Options:

A. Epidermis

B. Pericycle

C. Endodermis

D. Cortex

Answer: C

Solution:

Casparian strip is a band of cell wall material that is deposited in the radial and transverse walls of the endodermis of roots. It is made up of suberin and sometimes lignin. It regulate water and mineral uptake by the roots.

Question30

Secondary xylem and phloem in dicot stem are produced by [2018]

Options:

A. Apical meristems

B. Vascular cambium

C. Axillary meristems

D. Phellogen

Answer: B

Solution:

Solution:
(b) Secondary tissues are generated from the growth of a cambium. Vascular cambium gives rise to secondary xylem to the inside, and to secondary phloem to the outside.

Question31

Plants having little or no secondary growth are [2018]

Options:

A. Grasses

B. Deciduous angiosperms

C. Cycads

D. Conifers

Answer: A

Solution:

(a) Grasses are monocots and monocots usually do not have secondary growth. Palm like monocots have anomalous secondary growth.

Question32

The vascular cambium normally gives rise to (NEET 2017)

Options:

A. primary phloem

B. secondary xylem

C. periderm

D. phelloderm

Answer: B

Solution:

Solution:
(b) : Cells of vascular cambium divide periclinally both on the outer and inner sides to form secondary permanent tissues, i.e., secondary xylem and secondary phloem.

Question33

Root hair develop from the region of (NEET 2017)

Options:

A. elongation

B. root cap

C. meristematic activity

D. maturation.

Answer: D

Solution:

Solution:
(d) : Root hair are lateral tubular outgrowths that develop from the outer cells of zone of maturation or root hair zone.

Question34

Which of the following is made up of dead cells?
(NEET 2017)

Options:

A. Collenchyma

B. Phellem

C. Phloem

D. Xylem parenchyma

Answer: B

Solution:

Solution:
(b) : The phellem or cork consists of dead and compactly arranged rectangular cells that possess suberised cell wall.

Question35

Identify the wrong statement in context of heartwood.
(NEET 2017)

Options:

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

Solution:

Solution:
(b) : Heartwood is the non-functional part of secondary xylem, hence, it does not conduct water and minerals.

Question36

Cortex is the region found between
(NEET II 2016)

Options:

A. epidermis and stele

B. pericycle and endodermis

C. endodermis and pith

D. endodermis and vascular bundle.

Answer: A

Question37

The balloon-shaped structures called tyloses (NEET I 2016)

Options:

A. originate in the lumen of vessels

B. characterise the sapwood

C. are extensions of xylem parenchyma cells into vessels

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

Answer: C

Solution:

Solution:
(c) : Tyloses are balloon-like extensions of parenchyma cells that protrudes into the lumen of a neighbouring xylem vessel or tracheid through a pit in the cell wall. Tyloses form most commonly in older woody tissue, possibly in response to injury, they may eventually block the vessels and thus help prevent the spread of fungi and other pathogens within the plant. Tyloses may become filled with tannins, gums, pigments, etc., giving heartwood its dark colour, and their walls can remain thin or become lignified.

Question38

Specialised epidermal cells surrounding the guard cells are called (NEET I 2016)

Options:

A. bulliform cells

B. lenticels

C. complementary cells

D. subsidiary cells.

Answer: D

Solution:

Solution:
(d) : The leaf and stem epidermis of plant is covered with pores called stomata. Each stomata is surrounded by a pair of specialised epidermal cells known as guard cells which are in some cases further surrounded by another category of less modified epidermal cells known as subsidiary cells which provide support to the guard cells.

Question39

Read the different components from (i) to (iv) in the list given below and tell the correct order of the components with reference to their arrangement from outer side to inner side in a woody dicot stem
(i) Secondary cortex
(ii) Wood
(iii) Secondary phloem
(iv) Phellem
The correct order is
(2015)

Options:

A. (iv),(i),(iii),(ii)

B. (iv),(iii),(i),(ii)

C. (iii),(iv),(ii),(i)

D. (i),(ii),(iv),(iii)

Answer: A

Solution:

Solution:
(a) : In a woody dicot stem, phellem (cork) forms the outermost layer followed by phellogen and then secondary cortex (phelloderm). Secondary phloem forms a narrow circle on the outer side of vascularcambium whereas secondary xylem occurs on the inner side of vascular cambium.

Question40

A major characteristic of monocot root is the presence of
(2015 Cancelled)

Options:

A. vasculature without cambium

B. cambium sandwiched between phloem and xylem along the radius

C. open vascular bundles

D. scattered vascular bundles.

Answer: A

Solution:

Solution:
(a) : In monocot root, a large number of vascular bundles are arranged in the form of a ring around the central pith. Vascular bundles are closed because there is no cambium present between the xylem and phloem.

Question41

Vascular bundles in monocotyledons are considered closed because (2015 Cancelled)

Options:

A. there are no vessels with perforations

B. xylem is surrounded all around by phloem

C. a bundle sheath surrounds each bundle

D. cambium is absent.

Answer: D

Question42

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?
(2014)

Options:

A. Secondary xylem

B. Secondary phloem

C. Protoxylem

D. Cortical cells

Answer: C

Solution:

(c) : In stems, the protoxylem lies towards the centre (pith) and the metaxylem lies towards the periphery. This type of primary xylem is called Endarch. In root, the protoxylem lies towards periphery and metaxylem lies towards the centre, such arrangement is called exarch.

Question43

Tracheids differ from other tracheary elements in (2014)

Options:

A. having casparian strips

B. being imperforate

C. lacking nucleus

D. being lignified.

Answer: B

Solution:

Solution:
(b) : Tracheids are elongated, dead cells with hard lignified walls, wide lumens and narrow walls with spiral, annular, reticulate, scalariform and pitted thickening but without perforated end walls of septa. That is, they have intact end walls unlike vessels. Vessels are long cylindrical tube like structures made of many cells, called vessel members, each with lignified walls and a large central cavity. Vessel members are interconnected through perforation in their common walls.

Question44

Lenticels are involved in (NEET 2013)

Options:

A. food transport

B. photosynthesis

C. transpiration

D. gaseous exchange.

Answer: D

Solution:

Solution:
(d) : Lenticels are lens shaped openings formed in bark due to secondary growth. They permit gaseous exchange in woody trees. They also contribute to transpiration but in minute amounts because the suberised complementary cells present beneath the pore prevent excessive water loss.

Question45

Age of a tree can be estimated by (NEET 2013)

Options:

A. number of annual rings

B. diameter of its heartwood

C. its height and girth

D. biomass.

Answer: A

Solution:

Solution:
(a) : Two bands of secondary xylem i.e., autumn wood and spring wood are produced in one year. These two bands make an annual ring. The age of plant can be determined by counting the annual rings. It is called dendrochronology.

Question46

Interfascicular cambium develops from the cells of (NEET 2013)

Options:

A. endodermis

B. pericycle

C. medullary rays

D. xylem parenchyma.

Answer: C

Solution:

(c) : In dicot stems, the cells of cambium present between primary xylem and primary phloem is the intrasfascicular cambium. The cells of medullary rays, adjoining these intrafascicular cambium become meristematic and form the interfascicular cambium. Thus, a continuous ring of cambium is formed.

Question47

Meristematic tissue responsible for increase in girth of tree trunk is (KN NEET 2013)

Options:

A. intercalary meristem

B. lateral meristem

C. phellogen

D. apical meristem.

Answer: B

Solution:

Solution:
(b): Lateral meristems are the meristems which are present along the lateral sides of stem and roots. They divide only in radial direction. Intrastelar or vascular cambium ring formed by intra-fascicular (also called fascicular) and inter-fascicular cambium; and cork cambium (phellogen) are examples of this type of meristem. These meristems are responsible for increase in girth of stem and roots.

Question48

Bundle sheath cells (KN NEET 2013)

Options:

A. are rich in PEP carboxylase

B. lack RuBisCO

C. lack both RuBisCO and PEP carboxylase

D. are rich in RuBisCO.

Answer: D

Solution:

17. (d) : C_4 plants show kranz type of anatomy. In kranz anatomy, the mesophyll is undifferentiated and its cells occur in concentric layers around vascular bundles. The vascular bundles are surrounded by large sized bundle sheath cells which are arranged in wreath like manner in one to several layers. In C_4 plants there are two carboxylation reactions, first in mesophyll chloroplast and second in bundle sheath chloroplast. RuBP is present in bundle sheath chloroplasts where C_3 cycle takes place.

Question49

Which of the following statements is not true for stomatal apparatus? (KN NEET 2013)

Options:

A. Guard cells invariably possess chloroplasts and mitochondria.

B. Guard cells, are always surrounded by subsidiary cells.

C. Stomata are involved in gaseous exchange.

D. Inner wall of guard cells are thick.

Answer: B

Solution:

Solution:
(b) : The epidermal surface of the leaf exhibits 1,000 to 60,000 minute openings called stomata. The stomata are bordered by two specialized epidermal cells - the guard cells which in some cases are accompanied by subsidiary cells. The walls of guard cells are unevenly thickened. Each guard cell has thick, inelastic inner wall and thin, elastic outer wall. Stomatal aperture is present in between the guard cells. Guard cells are not always surrounded by accessory cells or subsidiary cells.

Question50

Gymnosperms are also called soft wood spermatophytes because they lack
(2012)

Options:

A. cambium

B. phloem fibres

C. thick-walled tracheids

D. xylem fibres.

Answer: D

Question51

Water containing cavities in vascular bundles are found in (2012)

Options:

A. sunflower

B. maize

C. Cycas

D. Pinus.

Answer: B

Question52

Closed vascular bundles lack (2012)

Options:

A. ground tissue

B. conjunctive tissue

C. cambium

D. pith.

Answer: C

Solution:

Solution:
(c) : Vascular bundle consists of complex tissues, the phloem and xylem. In dicots, between xylem and phloem, cambium is present which helps in secondary growth. This type of vascular bundle is called open. While in monocots cambium is absent, so these are called closed vascular bundles.

Question53

Companion cells are closely associated with (2012)

Options:

A. sieve elements

B. vessel elements

C. trichomes

D. guard cells.

Answer: A

Solution:

Solution:
(a) : Companion cell is a type of cell found within the phloem of flowering plants. Each companion cell is usually closely associated with a sieve element. They remain connected with sieve cells by plasmodesmata. They help in loading of phloem sieve cells with sugars through active transport.

Question54

The common bottle cork is a product of (2012)

Options:

A. dermatogen

B. phellogen

C. xylem

D. vascular cambium.

Answer: B

Solution:

Solution:
(b) : Cork cambium or phellogen is a type of cambium arising within the outer layer of the stems of woody plants, usually as a complete ring surrounding the inner tissues. The cells of the cork cambium divide to produce an outer corky tissue (cork or phellem) and an inner secondary cortex (phelloderm). The common bottle cork produced from Quercus suber is a product of phellogen.

Question55

As compared to a dicot root, a monocot root has (Mains 2012)

Options:

A. more abundant secondary xylem

B. many xylem bundles

C. inconspicuous annual rings

D. relatively thicker periderm.

Answer: B

Solution:

(b) : In monocot root, secondary growth is absent and vascular cylinder is in the form of several alternate and radial xylem and phloem bundles. The vascular bundles are arranged in the form of ring around central pith. Their number in maize ranges between $20-30$ whereas in Pandanus and palms, they may be upto 100 . Because of the presence of numerous xylem bundles and exarch condition, xylem of monocot root is polyarch. On the other hand, in dicot root, xylem and phloem are equal in number $(2-6)$ and alternately arranged $\mathrm{i.e.}$ they lie on different radii hence called radial bundles. According to number of ray (equivalent to number of xylem or phloem bundles) the roots may be diarch, triarch, tetrarch, pentarch or hexarch.

Question56

The cork cambium, cork and secondary cortex are collectively called (2011)

Options:

A. phelloderm

B. phellogen

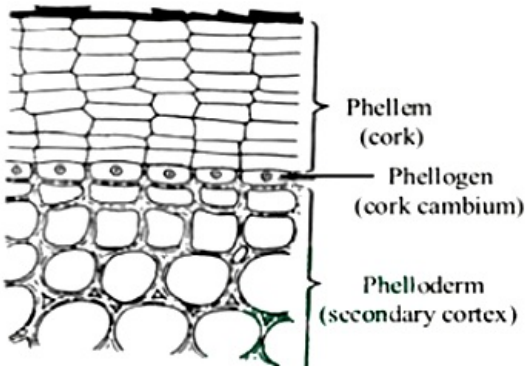
C. periderm

D. phellem.

Answer: C

Solution:

(c) : In hypodermis or outer cortical cells, a layer becomes meristematic which is known as cork cambium or phellogen. This phellogen also cuts off cells both on its outer side and inner side. The cells cut off on outer side are phellem or cork cells and cells cut off on inner side are phelloderm or secondary cortex. Phellem, phellogen and phelloderm collectively constitute periderm.



The function of periderm is protective (because at maturity epidermis ruptures and hence the function is performed by periderm).

Question57

Ground tissue includes (2011)

Options:

A. all tissues external to endodermis

B. all tissues except epidermis and vascular bundles

C. epidermis and cortex

D. all tissues internal to endodermis.

Answer: B

Solution:

(b) : Ground tissue can be defined as all the tissues except epidermis and vascular bundles. Ground tissue constitutes the interior of organs except vascular system. It consists of simple tissues such as parenchyma, collenchyma and sclerenchyma. Parenchymatous cells are usually present in cortex, pericycle, pith and medullary rays, in the primary stems and roots. Ground tissue system of the leaves is called mesophyll.

Question58

Some vascular bundles are described as open because these (Mains 2011)

Options:

A. are surrounded by pericycle but no endodermis

B. are capable of producing secondary xylem and phloem

C. possess conjunctive tissue between xylem and phloem

D. are not surrounded by pericycle.

Answer: B

Solution:

Solution:
(b) : In dicot stem, cambium is present between xylem and phloem, such vascular bundles are called open. In monocot stem, the cambium is absent, such vascular bundles are called closed. Cambium are the meristematic cells which produces secondary xylem and phloem.

Question59

Function of companion cells is (Mains 2011)

Options:

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

Solution:

Solution:
(d) : Companion cells move sugar and amino acids into and out of the sieve elements. In "source" tissue such as leaf companion cells use transmembrane proteins to take up sugar and amino acids by active transport. Movement of sugars in the phloem begins at the source, where sugars are loaded (actively transported) into a seive tube. Loading sets up a water potential gradient that facilitates movement of sugar.

Question60

Heartwood differs from sapwood in (2010)

Options:

A. presence of rays and fibres

B. absence of vessels and parenchyma

C. having dead and non-conducting elements

D. being susceptible to pests and pathogens.

Answer: C

Solution:

Solution:
(c) : In old trees, the greater part of secondary xylem is dark brown due to deposition of organic compounds like tannins, resins, oils, gums, aromatic substances and essential oils in the central or innermost layers of the stem. These substances make it hard, durable and resistant to the attacks of microorganisms and insects. This region comprises dead elements with highly lignified walls and is called heartwood. The heartwood does not conduct water but it gives mechanical support to the stem. The peripheral region of the secondary xylem, is higher in colour and is known as the sapwood. It is involved in the conduction of water and minerals from root to leaf.

Question61

Which one of the following is not a lateral meristem? (2010)

Options:

A. Intrafascicular cambium

B. Interfascicular cambium

C. Phellogen

D. Intercalary meristem

Answer: D

Solution:

Solution:
(d) : Meristem is classified on the basis of position in plant bodies into lateral meristem, apical meristem and intercalary meristem. Lateral meristem is present on the lateral sides, e . g., vascular cambium (fascicular and interfascicular cambium) and cork cambium (phellogen).

Question62

The chief water conducting elements of xylem in gymnosperms are (2010)

Options:

A. vessels

B. fibres

C. transfusion tissue

D. tracheids.

Answer: D

Solution:

Solution:
(d) : The chief water conducting elements of xylem in gymnosperms are tracheids. These are elongated cells with tapering ends and are dead because of deposition of lignin. These show scalariform, annular, reticulate or bordered pitted thickening. These are the only water conducting xylem elements in both gymnosperm and pteridophytes. Generally vessels are absent in gymnosperm with exceptions like Gnetum, Welwitschia, Ephedra.

Question63

For a critical study of secondary growth in plants, which one of the following pairs is suitable?
(2007)

Options:

A. Teak and pine

B. Deodar and fern

C. Wheat and maiden hair fern

D. Sugarcane and sunflower

Answer: A

Solution:

Solution:
(a) : Secondary growth is observed in dicots and gymnosperm. It is not observed in pteridophytes and rarely observed in monocots. Secondary growth results in increase in girth or diameter of the stem by formation of secondary tissue by the activity of lateral meristem. So for study of secondary growth, teak (angiosperm) and pine (gymnosperm) are best suited.

Question64

Transport of food material in higher plants takes place through
(Mains 2010)

Options:

A. companion cells

B. transfusion tissue

C. tracheids

D. sieve elements.

Answer: D

Question65

In barley stem vascular bundles are (2009)

Options:

A. closed and scattered

B. open and in a ring

C. closed and radial

D. open and scattered.

Answer: A

Solution:

Solution:
(a) : Barley is a monocotyledonous plant. The vascular bundle of stem is conjoint, collateral, exarch and closed (because cambium is absent). It is also scattered throughout the ground tissue.

Question66

Palisade parenchyma is absent in leaves of (2009)

Options:

A. mustard

B. soybean

C. gram

D. Sorghum.

Answer: D

Solution:

(d) : Palisade parenchyma is absent in leaves of Sorghum. It is a monocot plant where the parenchyma tissues of the leaves are not differentiated into palisade and spongy.

Question67

The annular and spirally thickened conducting elements generally develop in the protoxylem when the root or stem is (2009)

Options:

A. elongating

B. widening

C. differentiating

D. maturing.

Answer: C

Solution:

Solution:
(c) : The protoxylem differentiates in the parts of the primary body that have not completed their growth and differentiation. In fact in the shoot, the protoxylem matures among actively elongating tissues and is, therefore subjected to stresses. In the root, the protoxylem elements persist longer because here they mature beyond the region of maximum growth. In this differentiation annular and spiral thickening take place.

Question68

Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by (2009)

Options:

A. absence of secondary phloem

B. presence of cortex

C. position of protoxylem

D. absence of secondary xylem.

Answer: C

Solution:

(c) : In dicot root the protoxylem is located near the periphery of the vascular cylinder, the metaxylem farther inward. In roots xylem is exarch or centripetal. In dicot stem the protoxylem is located near the centre of vascular bundle and metaxylem is located near the periphery i.e., the xylem is endarch or centrifugal.

Question69

Vascular tissues in flowering plants develop from
(2008)

Options:

A. periblem

B. dermatogen

C. phellogen

D. plerome.

Answer: D

Solution:

Solution:
(d) : Dermatogen is the region or histogen of single layer of outermost cells formed from the apical meristem. Dermatogen gives rise to epidermis of stem and other aerial parts. Periblem is the middle histogen which forms the cortex of stem and roots. Plerome is the central histogen which forms stele or part of stem and root inner to endodermis. Part of plerome that forms vascular tissues is called procambium. The pericycle layer converts into a secondary meristem called cork cambium or phellogen which divides to form secondary cortex or phelloderm.

Question70

The length of different internodes in a culm of sugarcane is variable because of
(2008)

Options:

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

Solution:

(b) : Internode is the part of a plant stem, that occurs between two adjacent nodes. Intercalary meristem are internodal in position and is found in the stem of grasses and other monocotyledonous plants. In early stages the internode is wholly or partially meristematic but later on some of its parts become matured more rapidly than the rest so a definite continuous sequence of development is maintained i.e., mature tissue left behind whereas new ones grow which later shows variable length.

Question71

Passage cells are thin walled cells found in (2007)

Options:

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 of roots facilitating rapid transport of water from cortex to pericycle.

Answer: D

Solution:

Solution:
(d) : Endodermis is a single layered structure which separates cortex from stele. There are both thick walled and thin walled cells in the endodermis. The thin walled cells are known as passage cells or transfusion cells which are opposite the protoxylem groups. These cells help in rapid transport of water from cortex to pericycle.

Question72

A common structural feature of vessel elements and sieve tube elements is (2006)

Options:

A. enucleate condition

B. thick secondary walls

C. pores on lateral walls

D. presence of P-protein.

Answer: A

Solution:

(a) : Xylem is the principal water conducting tissue of the plant. It consists of four types of cellstracheids, vessels, xylem

fibres and xylem parenchyma.
Xylem vessels are hollow, elongated cells with open ends and pitted walls. Cells walls are lignified. At maturity nucleus is absent in vessels.
The constituent cells of the phloem are sieve elements (sieve cells, sieve tubes), companion cells, phloem fibres and phloem parenchyma cells.
Sieve tube members are long, slender, tube-like cells joined end to end, to form long tubular channels the sieve tubes. Sieve tube members possess specialized sieve areas on the end walls called sieve plate. Young sieve tube members have abundant cytoplasm but their is no nucleus. The nucleus disintegrates during their development.

Question73

In a woody dicotyledonous tree, which of the following parts will mainly consist of primary tissues?
(2005)

Options:

A. All parts

B. Stem and root

C. Flowers, fruits and leaves

D. Shoot tips and root tips

Answer: C

Solution:

Solution:
Meristem is the region marked by presence of active cell growth and the tissues present in meristem are termed as meristematic tissues. On the basis of their position in plant body, meristems are grouped as apical, lateral or intercalary meristem. Secondary growth is caused by lateral meristem.
A flower is defined as condensed shoot and is derived from shoot apical meristem by the process of specialization of leaves into floral appendages.
Leaf is green, exogenous, lateral outgrowth which develops from shoot apical meristem.
Fruit is a ripened ovary which serves to protect the ripening ovule.
Thus, flower, leaf and ovary develop from primary meristem and lack any lateral meristem that causes secondary growth, i.e., these structures mainly have primary tissues. Stem and roots have inter- and intra-fascicular cambium which is a lateral meristem (secondary) and produce secondary stelar (secondary xylem and phloem) and extra stelar tissues (phelloderm, phellogen and phellem). Shoot and root tip have apical meristem.

Question74

In a longitudinal section of a root, starting from the tip upward, the four zones occur in the following order:
(2004)

Options:

A. root cap, cell division, cell enlargement, cell maturation

B. root cap, cell division, cell maturation, cell enlargement

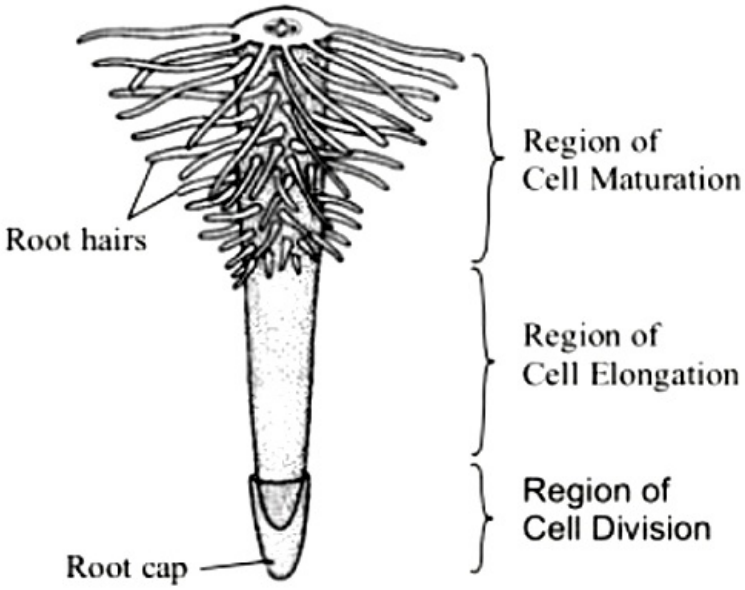
C. cell division, cell enlargement, cell maturation, root cap

D. cell division, cell maturation, cell enlargement, root cap

Answer: A

Solution:

(a) : The root system of a plant develops from the hypocotyl of the embryo of a seed. The root shows following four regions these usually merge into one another, without distinct boundaries between them.



Regions of the root

The zones, successively from the apex to the base are-
(i) Root cap zone : The apex of each root is covered by a cushion of thin walled cells known as root cap.
(ii) Region of cell division : It lies just behind the root cap. It is the main growing region of the root where active cell divisions take place.
(iii) Region of elongation : The region of elongation is responsible for growth in length of the root.
(iv) Region of maturation : Epidermal cells of this region give out small, thin, cylindrical unicellular outgrowths, known as root hairs. These are the main absorbing organs of the root.

Question75

The apical meristem of the root is present (2003)

Options:

A. only in radicals

B. only in tap roots

C. only in adventitious roots

D. in all the roots.

Answer: D

Solution:

(d): Parts of typical root : root cap, meristematic growing region, zone of elongation, root hair zone, zone of meriste-matic cells.
Apical meristem is terminal in position and responsible for terminal growth of the plant. Apical meristem is present at all root tips and shoot tips.

Question76

In which one of the following is nitrogen not a constituent? (2003)

Options:

A. Idioblast

B. Bacteriochlorophyll

C. Invertase

D. Pepsin

Answer: A

Solution:

Solution:
(a) : The major storage component of Avocado fruit is oil. It is stored in specialized mesocarp cells called idioblast.

Question77

The aleurone layer in maize grain is specially rich in (2003)

Options:

A. proteins

B. starch

C. lipids

D. auxins.

Answer: A

Solution:

Solution:
(a) : In monocotyledons the seeds are generally endospermous. The internal structure of grain can be studied in a longitudinal section. It shows two distinct regions upper large region, the endosperm and lower smaller region, the embryo. The endosperm is surrounded by a special one cell thick layer, called aleurone layer. It is filled with aleurone

grains which are proteinaceous in nature. Other components of this layer are phytin, carbohydrates and small amounts of phospholipids are also present.

Question78

Chlorenchyma is known to develop in the (2003)

Options:

A. cytoplasm of Chlorella

B. mycelium of a green mould such as Aspergillus

C. spore capsule of a moss

D. pollen tube of Pinus.

Answer: C

Solution:

Solution:
(c) : Chlorenchyma or assimilatory parenchyma are parenchymatous cells that possess abundant chloroplasts in them. They are capable of photosynthesis. A spore capsule of moss can perform photosynthesis because of the presence of chlorenchyma cells in them.

Question79

Diffuse porous woods are characteristic of plants growing in (2003)

Options:

A. alpine region

B. cold winter regions

C. temperature climate

D. tropics.

Answer: D

Solution:

(d) : In most of the gymnosperms, like conifers and cycads, vessels are absent and the wood is made entirely of tracheids. Such wood is known as nonporous. In angiosperms, on the other hand, the wood consists of both tracheids and vessels. The wide vessels appear as pores between otherwise small sized tracheary elements. Such a wood is known as porous. In porous wood, if vessels have essentially equal diameters and are uniformly distributed throughout the ring, the

wood is known as diffuse porous. It is characterstic of plants growing in tropics.

Question80

The cells of the quiescent centre are characterised by (2003)

Options:

A. having dense cytoplasm and prominent nuclei

B. having light cytoplasm and small nuclei

C. dividing regularly to add to the corpus

D. dividing regularly to add to tunica.

Answer: B

Solution:

(b) In the apices of some roots, (e.g., Zea mays or maize), there is a central region of cells which normally does not divide. This central inactive region was called quiescent centre by F.A.L. Clowes (1959, 1961). The cells of this region have lesser amounts of RNA and DNA so they have small nuclei. These cells also have a lower rate of protein synthesis. Mitochondria and endoplasmic reticulum are less developed. The cells of the quiescent centre are usually inactive. However, if already existing meristematic cells are injured or become inactive due to any other reason, the cells of quiescent centre become active.

Question81

Which of the following statements is true? (2002)

Options:

A. Vessels are multicellular with wide lumen.

B. Tracheids are multicellular with narrow lumen.

C. Vessels are unicellular with narrow lumen.

D. Tracheids are unicellular with wide lumen.

Answer: A

Solution:

Vessels are multicellular with wide lumen. They are made up of vessel elements lying one above the other. The wall of vessels is hard but not thick having wide lumen. Whereas tracheids are unicellular with narrow lumen.

Thus, the correct answer is 'Vessels are multicellular with wide lumen'.

Question82

Axillary bud and terminal bud derived from the activity of (2002)

Options:

A. lateral meristem

B. intercalary meristem

C. apical meristem

D. parenchyma.

Answer: C

Solution:

Solution:
(c) : Apical meristems are situated at the tips of the root and shoot. They take part in initial growth. Plants elongate and increase in height as a result of divisions in this meristem. Promeristem and primary meristem (root and shoot apices) are included in this type of meristem.

Question83

Four radial vascular bundle are found in (2002)

Options:

A. dicot root

B. monocot root

C. dicot stem

D. monocot stem.

Answer: A

Solution:

(a) : The vascular tissue of the root is characterised by radial arrangement of vascular bundles i.e., xylem and phloem occur in separate patches on alternate radii. The number of xylem and phloem groups vary from two to six. But tetrarch condition (four vascular bundles) is more common. Monocot root generally has more than six vascular bundles (polyarch). Vascular bundles in dicot stems are conjoint, collateral or bicollateral, endarch and open. They are arranged in a ring. In monocot stems the vascular bundles are conjoint, collateral, endarch and closed. They are scattered in the ground tissue.

Question84

Vessels are found in (2002)

Options:

A. all angiosperms and some gymnosperm

B. most of angiosperms and few gymnosperms

C. all angiosperms, all gymnosperms and some pteridophyta

D. all pteridophyta

Answer: B

Solution:

Solution:
(b) : Vessels are long tubelike structures ideally suited for the conduction of water and solutes. These are made up of a row of cylindrical cells arranged in longitudinal series. The partition walls of these cells are perforated and as such the entire structure becomes tubelike. The region of the wall where perforations occur is known as perforation plate. Vessels are found in the wood of almost all the angiosperms except certain primitive members of the order ranales (vesseless dicots), e.g., Trochodendron, Tetracentron, Drimys, Pseudowintera, etc.
Vessels also occur in some pteridophytes, such as Selaginella and in the members of order Gnetales of gymnosperms (e.g., Genetum, Ephedra and Welwitschia).

Question85

In plants inulin and pectin are (2001)

Options:

A. reserved material

B. wastes

C. excretory material

D. insect attracting material.

Answer: A

Solution:

(a) : Inulin is a water soluble fructosan. It is a common reserve food in members of family compositae. Pectin in a

mucopolysaccharides and occur in plant cell walls. At the time of fruit ripening wall pectins hydrolyse to give constituent sugars.

Question86

What happens in plants during vascularisation? (2000)

Options:

A. Differentiation of procambium, formation of primary phloem followed by formation of primary xylem

B. Differentiation of procambium followed by the formation of primary phloem and xylem simultaneously

C. Formation of procambium, primary phloem and xylem simultaneously

D. Differentiation of procambium followed by the formation of secondary xylem

Answer: B

Solution:

Solution:
(b) : In plants during vascularisation, differentiation of procambium occurs followed by the formation of primary phloem and xylem simultaneously.

Question87

Casparian strips are found in (1999)

Options:

A. epidermis

B. hypodermis

C. periderm

D. endodermis.

Answer: D

Solution:

(d) : Endodermis is single layered structure which separates cortex from stele. The cells of endodermis are barrel-shaped without intercellular spaces, living and containing starch. The radial and tangential walls of endodermal cells possess

thickenings of lignin, suberin and cutin in the form of strips or bands, which are known as casparian bands or casparian strips.

Question88

Which of the following meristems is responsible for extrastelar secondary growth in dicotyledonous stem?
(1998)

Options:

A. Interfascicular cambium

B. Intercalary meristem

C. Phellogen

D. Intrafascicular cambium

Answer: C

Solution:

Solution:
(c) : Extrastelar secondary growth means growth in the cortical region, external to stele. For extrastelar secondary growth the cork cambium or phellogen develops in the region outside the vascular tissue. This gives rise to cork or phellem and secondary cortex or phelloderm. All the three layers (i.e, cork, cork cambium and secondary cortex) together constitute periderm. Fascicular and interfascicular cambuim occurs in the stelar regions.

Question89

The periderm includes
(1998)

Options:

A. secondary phloem

B. cork

C. cambium

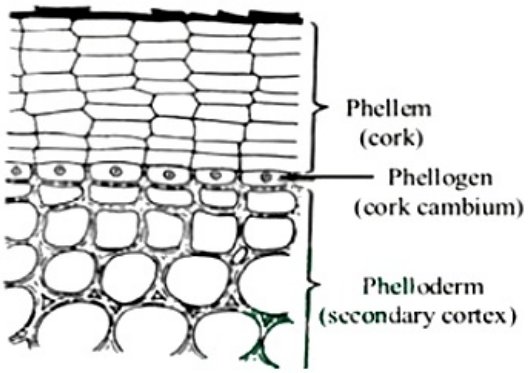
D. all of these.

Answer: B

Solution:

In hypodermis or outer cortical cells, a layer becomes meristematic which is known as cork cambium or phellogen. This

phellogen also cuts off cells both on its outer side and inner side. The cells cut off on outer side are phellem or cork cells and cells cut off on inner side are phelloderm or secondary cortex. Phellem, phellogen and phelloderm collectively constitute periderm.



The function of periderm is protective (because at maturity epidermis ruptures and hence the function is performed by periderm).

Question90

At maturity, which of the following is nonnucleated? (1997)

Options:

A. Palisade cell

B. Cortical cell

C. Sieve cell

D. Companion cell

Answer: C

Solution:

Solution:
(c) : In pteridophytes and gymnosperms, sieve tubes are not arranged in linear rows and hence called sieve cells. Sieve tube elements are the conducting element of phloem. These are arranged end to end in linear rows with septa (sieve plate) between two sieve tube elements. In the sieve plate, there are present sieve pores. Sieve tube elements are living and have thin cellulosic walls in young cells but they become thick walled and are without nuclei at maturity.

Question91

Which of the following is not true about 'sclereids'? (1996)

Options:

A. These are groups of living cells.

B. These are found in nut shells, guava pulp, pear.

C. These are also called stone cells.

D. These are form of sclerenchyma with fibres.

Answer: A

Solution:

Solution:
(a) : Sclereids are a type of sclerenchyma cells. They are short or irregular, their walls are very thick, irergular and the lumen is very narrow. These are dead cells and do not perform any metabolic functions. They show different types of lignin depositions and also have pits. They are present in hard parts like endocarp of coconut, hard seed coats fruit pulps. They are also called stone cells and are different types as brachysclereids, osteoclereids, macrosclereids, asterosclercids and fileform cells.

Question92

Casparian strip occurs in a
(1994)

Options:

A. endodermis

B. exodermis

C. pericycle

D. epidermis.

Answer: A

Solution:

Solution:
Endodermis is single layered structure which separates cortex from stele. The cells of endodermis are barrel-shaped without intercellular spaces, living and containing starch. The radial and tangential walls of endodermal cells possess thickenings of lignin, suberin and cutin in the form of strips or bands, which are known as casparian bands or casparian strips.

Question93

As a tree grows older, which of the following increases more rapidly in thickness?
(1994)

Options:

A. Heart wood

B. Sap wood

C. Phloem

D. Cortex

Answer: A

Solution:

Solution:
(a) : Heartwood or duramen is the dark coloured wood near the centre of the axis formed after many years of secondary growth of stem. A small outer region, however, remains light coloured. It is known as sap wood or alburnum. The heartwood is formed due to changes in the elements of the secondary xylem. As secondary growth proceeds most of the older elements of secondary xylem lose water and become filled with organic compounds such as oils, gums, resins, tannins, and aromatic and colouring materials. The wood becomes dark coloured due to accumulating of these substances and is also termed as duramen. The sap wood is the light coloured region of the secondary xylem. Cells of this region are functionally active. The elements of the secondary xylem added by cambial activity are those of sap wood. But gradually most of these elements get transformed into heart wood. Thus the amount of heart wood increases as the tree grows older. The amount of sap wood, however, remains almost constant.

Question94

Where do the casparian bands occur? (1994,1990)

Options:

A. Epidermis

B. Endodermis

C. Pericycle

D. Phloem

Answer: B

Solution:

Solution:
(b) : The innermost layer of soft cortex is called as endodermis. This uniseriate layer is characterised by the presence of casparian strips. This thickenings was first observed by Caspary, 1865 and hence the name.

Question95

Which of the following plant cells will show totipotency? (1993)

Options:

A. Sieve tubes

B. Xylem vessels

C. Meristem

D. Cork cells

Answer: C

Solution:

Solution:
(c) : Meristems shows the totipotency because xylem vessels and cork cells are dead while sieve tube cells do not possess nuclei.

Question96

Periderm is produced by
(1993)

Options:

A. vascular cambium

B. fascicular cambium

C. phellogen

D. intrafascicular cambium.

Answer: C

Solution:

Solution:
(c) : Periderm is produced by phellogen. The phellogen forms phellem on the outer face and phelloderm on the inner. The three layers i.e., phellem, phellogen and phelloderm jointly constitute the periderm.

Question97

A narrow layer of thin walled cells found between phloem/bark and wood of a dicot is
(1993)

Options:

A. cork cambium

B. vascular cambium

C. endodermis

D. pericycle.

Answer: B

Solution:

Solution:
(b) : A narrow layer of thin walled cells found between phloem/bark and wood of dicot is vascular cambium. Vascular cambium present inside a vascular bundle is called as intrafascicular cambium or fascicular cambium. The vascular cambium is a meristematic tissue.

Question98

Which exposed wood will decay faster? (1993)

Options:

A. Sapwood

B. Softwood

C. Wood with lot of fibres

D. Heartwood

Answer: A

Solution:

Solution:
(a) : Sap wood will decay faster. Sap wood is less durable because it is susceptible to attack by pathogen and insects.

Question99

Abnormal/anomalous secondary growth occurs in (1993)

Options:

A. Dracaena

B. ginger

C. wheat

D. sunflower.

Answer: A

Solution:

Solution:
(a) : Monocot trees such as palms grow in thickness by primary thickening meristem situated at the base of the leaf. Plants like Dracaena show secondary growth by a special cambium. It develops in the form of strips just outside the vascular region. This cambial strips produce secondary vascular bundles which is amphivasal in Dracaena.

Question100

Bordered pits are found in (1993)

Options:

A. sieve cells

B. vessel wall

C. companion cells

D. sieve tube wall.

Answer: B

Solution:

Solution:
(b) : Bordered pits are found in vessel wall. In bordered pits, the thickening material over arches the pit cavity in such a way that a pit chamber opens to the interior by a pit aperture.

Question101

A bicollateral vascular bundle is characterised by (1992)

Options:

A. phloem being sandwitched between xylem

B. transverse splitting of vascular bundle

C. longitudinal splitting of vascular bundle

D. xylem being sandwitched between phloem.

Answer: D

Solution:

(d) : A bicollateral vascular bundles is characterised by xylem being sandwiched between phloem. Here there are two cambuim rings e.g., Cucurbita.

Question102

Vascular cambium produces (1992,1990)

Options:

A. primary xylem and primary phloem

B. secondary xylem and secondary phloem

C. primary xylem and secondary phloem

D. secondary xylem and primary phloem.

Answer: B

Solution:

Solution:
(b) : Vascular cambium produces secondary xylem and secondary phloem. It is develop from the procambium which is an embryonic tissue, hence it is primary in origin. It is secondary in function for it forms the secondary tissues like secondary xylem, secondary phloem and secondary medullary rays. The cambium is a radially one cell thick zone of meristematic cells.

Question103

What is true about a monocot leaf? (1992,1990)

Options:

A. Reticulate venation

B. Absence of bulliform cells from epidermis

C. Mesophyll not differentiated into palisade and spongy tissues

D. Well differentiated mesophyll

Answer: C

Solution:

(c) : In monocot leaf, mesophyll cells are not differentiated into palisade and spongy tissues. But there is well differentiate mesophyll cells in dicot stem. Also in the upper epidermis, there are some large cells found in groups which

are called bulliform cells. The venation pattern in monocot is parallel.

Question104

Which is correct about transport of conduction of substances? (1991)

Options:

A. Organic food moves up through phloem

B. Organic food moves up through xylem

C. Inorganic food moves upwardly and downwardly through xylem

D. Organic food moves upwardly and downwardly through phloem

Answer: D

Solution:

Solution:
(d) : Phloem is the food conducting tissue of plants. The sieve tubes are food conducting elements of the plants. It is proposed that food is translocated by mass flow or by streaming currents of protoplasm.

Question105

An organised and differentiated cellular structure having cytoplasm but no nucleus is (1991)

Options:

A. vessels

B. xylem parenchyma

C. sieve tubes

D. tracheids.

Answer: C

Solution:

(c) : An organised and differentiated cellular structure having cytoplasm but no nucleus are sieve tubes. The sieve tubes are living cells. Their walls are thicker than surrounding parenchyma cells. Sometimes they have a special, shining nacreous thickening. Cytoplasm occurs in the form of thin lining enclosing a big central vacuole.

Question106

Angular collenchyma occurs in
(1991)

Options:

A. Cucurbita

B. Helianthus

C. Althaea

D. Salvia.

Answer: A

Solution:

Solution:
(a) : Angular collenchyma occurs in, Cucurbita. It has thickening at the angles and there are no intercellular spaces. It is generally found in leaf petioles.

Question107

For union between stock and scion in grafting which one is the first to occur
(1990)

Options:

A. formation of callus

B. production of plasmodesmata

C. differentiation of new vascular tissues

D. regeneration of cortex and epidermis.

Answer: A

Solution:

Solution:
(a) : Grafting is a technique in which cambium bearing shoot (scion = graft) of one plant is joined to cambium bearing stump (root system = stock) of a related plant through different unions like tongue grafting, wedge grafting etc. In grafting union between stock and scion produces undifferentiated mass of cells called callus. Therefore, for union between stock and scion in grafting, first to occur is the formation of callus. Callus is more or less corky secondary tissue developed lay woody plants over a wound. It is derived from cambium.

Question108

Pericycle of roots produces
(1990)

Options:

A. mechanical support

B. lateral roots

C. vascular bundles

D. adventitious buds.

Answer: B

Solution:

Solution:
(b) : Pericycle of root produces lateral roots. Endodermis is followed by pericycle. Usually it is a continuous layer but in some monocots it is interrupted by xylem and phloem. It is the site of origin of lateral roots and cork cambium. The root branches are, therefore described as endogenous in origin.

Question109

Collenchyma occurs is
(1990)

Options:

A. herbaceous climbers

B. woody climbers

C. climbing stems

D. water plants.

Answer: C

Solution:

(c) : Collenchyma occurs in climbing stems. Collenchyma occurs in the stem and petioles of dicot herbs. Due to deposition of pectin, it has high water retaining capacity. since pectin appears at the angles, it becomes a spongy tissues. The collenchyma is a mechanical tissue which gives tensile strength to the plant.

Question110

Collenchyma occurs in the stem and petioles of (1990)

Options:

A. xerophytes

B. monocots

C. dicot herbs

D. hydrophytes.

Answer: C

Solution:

(c) : Collenchyma occurs in climbing stems. Collenchyma occurs in the stem and petioles of dicot herbs. Due to deposition of pectin, it has high water retaining capacity. since pectin appears at the angles, it becomes a spongy tissues. The collenchyma is a mechanical tissue which gives tensile strength to the plant.

Question111

Monocot leaves possess (1990)

Options:

A. intercalary meristem

B. lateral meristem

C. apical meristem

D. mass meristem.

Answer: A

Solution:

Solution:
(a) : Monocot leaves possess intercalary meristem. Intercalary meristem are responsible for localised growth. Perhaps they have been separated or detached from the mother meristem e . g., meristem present at the base of leaves in many monocots, in the internode of grasses, at the top of peduncles of Plantago and Taraxacum etc.

Question112

Cork cambium and vascular cambium are (1990)

Options:

A. parts of secondary xylem and phloem

B. parts of pericycle

C. lateral meristem

D. apical meristem.

Answer: C

Solution:

Solution:
(c) : Cork cambium and vascular cambium are lateral meristems. Both are responsible for the secondary growth of stem. It also increases the girth of stem.

Question113

Out of diffuse porous and ring porous woods, which is correct? (1989)

Options:

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.

Answer: D

Solution:

Solution:
Ring porous and diffuse porous: Hardwoods might be isolated into ring-permeable and diffuse-permeable trees. In ring-permeable trees the vessels set down toward the start of the developing season are a lot bigger than resulting vessels set down toward the finish of the period (or ring). Diffuse-permeable trees structure vessels of generally a similar spiral distance across all through the developing season. Bigger vessel size allows more-fast water conduction, on the grounds that the pace of conduction differs with the fourth intensity of the range of the vessel lumen.Most ring-permeable trees are found in the north calm territories of the world. In various species the vessels become blocked by cell ingrowths from encompassing living cells. The impediments, called tyloses, may happen in the primary year after vessel development. The protoplast of an adjoining living cell multiplies through slim regions in the cell dividers known as pits. Red oak (Queues rubric) doesn't have tyloses, though white oak does; this is the reason white oak is utilized to make bourbon barrels, while red oak can't be used for this reason.

Question114

Sieve tubes are suited for translocation of food because they possess (1989)

Options:

A. bordered pits

B. no ends walls

C. broader lumen and perforated cross walls

D. no protoplasm.

Answer: C

Solution:

Solution:
(c) : Sieve tubes are suited for translocation of food because they possess broader lumen and perforated cross walls. Sieve tubes are elongated tubular conducting channels of phloem. The end wall possess many small pores and have thin cellulosic wall.

Question115

Death of protoplasm is a pre-requisite for a vital function like (1989)

Options:

A. transport of sap

B. transport of food

C. absorption of water

D. gaseous exchange.

Answer: A

Solution:

Solution:
(a) : Death of protoplasm is a pre-requisite for a vital functions like transport of sap. Xylem is a dead tissue and do not have protoplasm, xylem performs the function of transport of water or sap inside the plant from roots to leaves.

Question116

Organisation of stem apex into corpus and tunica is determined mainly by
(1988)

Options:

A. planes of cell division

B. regions of meristematic activity

C. rate of cell growth

D. rate of shoot tip growth.

Answer: A

Solution:

Solution:
(a) : The tunica corpus concept was given by Schmidt (1924) which was based on plane of divisions of cells. According to this concept there are two portions in shoot apex-tunica and corpus. The tunica shows only anti clinical divisions and thus it is responsible for surface growth. The corpus shows divisions in all plane and thus responsible for volume growth.

Question117

Pith and cortex do not differentiate in
(1988)

Options:

A. monocot stem

B. dicot stem

C. monocot root

D. dicot root.

Answer: A

Solution:

Solution:
(a) : Pith and cortex do not differentiate in monocot stem. since numerous vascular bundles lie scattered, the ground tissue system in a monocot stem is distinguishable into hypodermis and ground parenchyma.

Question118

Cork is formed from

(1988)

Options:

A. cork cambium (phellogen)

B. vascular cambium

C. phloem

D. xylem.

Answer: A

Solution:

Solution:
(a) : In hypodermis or outer cortical cells, a layer becomes meristematic which is known as cork cambium or phellogen. This phellogen also cuts off cells both on its outer side and inner side. The cells cut off on outer side are phellem or cork cells and cells cut off on inner side are phelloderm or secondary cortex.
The phellem or cork cells are dead and have deposition of a fatty substance called suberin (i.e., cork cells are suberized). Suberin is impervious to water and thus cork cells are buoyant (i.e., float on water).
Phellem, phellogen and phelloderm collectively constitute periderm.

Question119

Which meristem helps in increasing girth?
(1988)

Options:

A. Lateral meristem

B. Intercalary meristem

C. Primary meristem

D. Apical meristem

Answer: A

Solution:

Solution:
(a) : The meristem that helps in increasing girth is lateral meristem. The lateral meristem is responsible for lateral growth of the plant i.e., growth in thickness e.g., cambium and cork cambium. It divides only periclinally or radially and is responsible for increase in girth or diameter.

Question120

Tunica corpus theory is connected with

(1988)

Options:

A. root apex

B. root cap

C. shoot apex

D. secondary growth.

Answer: C

Solution:

(c) The tunica corpus concept was given by Schmidt (1924) which was based on plane of divisions of cells. According to this concept there are two portions in shoot apex-tunica and corpus. The tunica shows only anti clinical divisions and thus it is responsible for surface growth. The corpus shows divisions in all plane and thus responsible for volume growth.
