PREVIOUS QUESTIONS XI 2012-2024 : *Chapter 4 - Anatomy of Flowering plants*

1Mark Questions

1. Analyse the given statements and correct the false statements with respect to the underlined word.
   a) In roots, vascular tissues are conjoint.
   b) Cork cambium is otherwise called phelloderm. *2012 March*

2. Fill in the blank.
   Epidermal hairs on the stem of certain plants are called..... *2017 2nd term*

3. Choose the CORRECT answer.
   All tissues on the innerside of the endodermis together constitute....
   a) Conjuctive tissue b) Stele
   c) Pericycle d) Vascular bundle
   2018 Imp.

4. Choose the correct answer.
   Casparian strips are present in ...
   (a) Dicot root (b) Dicot leaf
   (c) Dicot stem (d) Monocot stem
   2020 March

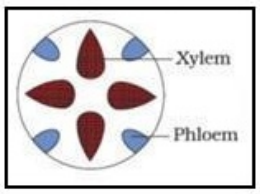
5. Choose the correct answer.
   Vascular bundles which have cambium between xylem and phloem is called _____
   (a) Open vascular bundle
   (b) Closed vascular bundle
   (c) Radial vascular bundle
   (d) Peripheral vascular bundle
   2020 Imp.

6. The ground tissue of leaf is called _____
   a) Guard cell b) Subsidiary cell
   c) Mesophyll d) Epidermis
   2022 2nd term

7. What are bulliform cells ? *2022 2nd term*

8. All the tissues on the inner side of endodermis together constitute _____. *2023 Model*

9. Name the type of vascular bundle in the figure:



2023 March

10. Name the waxy thick layer seen over the epidermis which prevents the loss of water. *2023 Imp*

11. Analyse the statement and correct false statement.
    i) Ground tissue of leaf is called mesophyll
    ii) Specialised cells present in the vicivity of guard cell is called Bulliform cells.
    2023 2nd term

2 Marks Questions

1. In an anatomy lab, Ramu and Salim were taking transverse sections (T.S.) of two specimens A and B respectively. Their observations are given in the table. Complete the table.

Specimen A	Specimen B
1a.Closed vascular bundles	1b.Open vascular bundles
2a.	2b.
3a.	3b.

2012 March

2. Two types of plant specimens were given to students for microscopical observation. They were directed to note down the features they observed. Major features noted by students were summarised in the box below.

a) Radial vascular bundles and are 20 in number
b) Collateral vascular bundles arranged in the form of a ring and vascular bundles are few in number
c) Xylem round in shape
d) Xylem is exarch
e) Cambium present in between xylem and phloem
f) Xylem is endarch

a) Name the two specimens.
b) Substantiate your answer by picking up the features of specimens from the box and write them in two columns.
2013 Imp.

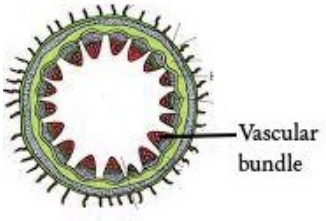
3. Stomata are small openings present in the epidermis of leaves. The stomata are bound by guard cells. Mention the role of guard cells in stomatal mechanism. *2014 Imp.*

4. The internal anatomy of dicot and monocot stems show many differences. Mention any four differences between their vascular bundles. *2016 Imp.*

5. The following are the characters of dicot stem and monocot stem. Identify the characters and write in appropriate column.
   a) Sclerenchymatous hypodermis
   b) Collenchymatous hypodermis
   c) Vascular bundles are conjoint, closed
   d) Vascular bundles are arranged in a ring
   2017 Imp.

6. Anatomical features of a plant part are given below.
   Collenchymatous hypodermis
   Open vascular bundles
   Identify the plant part and write other three features of the identified plant part. *2017 2nd term*

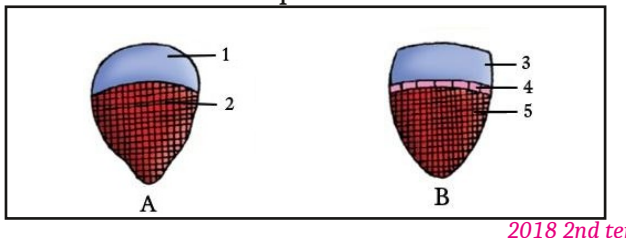
7. Observe the T.S of a plant part given below:



   Identify the plant part and explain any two features of its vascular bundles. *2018 Imp.*

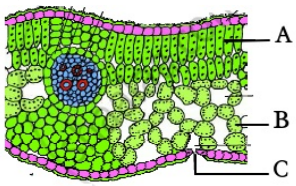
8. The opening and closing of stomata is aided by the peculiarities of bean shaped guard cells. Mention any two such peculiarities. *2018 Imp.*

9. Identify the types of vascular bundles given below and label the parts.



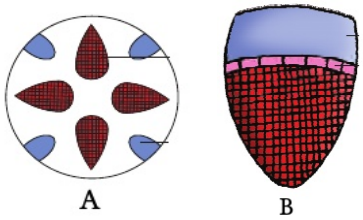
2018 2nd term

10. Observe the T.S. of a leaf given below:



   (a) Label A, B and C.
   (b) Identify the type of leaf .
   2019 Model

11. Observe the diagrams showing various types of vascular bundles. Identify and differentiate A and B.

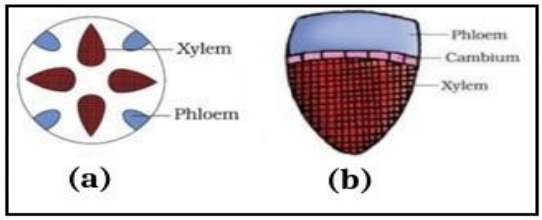


2019 2nd term

12. Write any two anatomical differences between stem and Root of Angiosperms. *2021 Model*

13. Differentiate endarch and exarch xylem. *2021 Sept.*

14. Observe the figure. Identify the types of vascular bundles.



2021 Sept.

15. The tissue between the upper and lower epidermis in dorsi-ventral leaf is called mesophyll tissue.
   (a) Name the two types of cells seen in mesophyll tissue.
   (b) What is the function of mesophyll tissue ? *2021 Imp.*

16. Given below are some characteristics of dicot root and dicot stem. Arrange them under suitable columns in the table provided.
   (a) Presence of casparian strips.
   (b) Vascular bundles arranged in the form of a ring.
   (c) Two or four xylem and phloem patches.
   (d) Conjoint, open, vascular bundles with endarch protoxylem.

Dicot root	Dicot stem
•	•
•	•

2021 Imp.

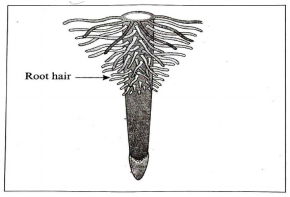
17. What are bulliform cells? Mention their function. *2022 Model*

18. How do conjoint vascular bundles differ from radial vascular bundles ? *2022 June*

19. The mesophyll tissue of Dicot leaf consists of two types of cells
   (a) Name them.
   (b) Write the function of Mesophyll. *2022 Imp*

20. The anatomy of dicot leaf and monocot leaf show many differences. Mention any two differences. *2022 2nd term*

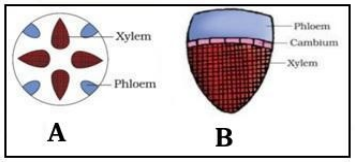
21. Rearrange the following regions of roots, as seen in the roots in vertical section.



i) Region of elongation
ii) Root cap
iii) Region of meristematic activity
iv) Region of maturation *2023 2nd term*

22. Write two anatomical difference between dicot root and monocot root. *2023 2nd term*

23. Observe the diagrams of vascular bundles. Identify and differentiate 'A' and 'B' *2023 2nd term*



24. Some anatomical features of stem and root are given below. Arrange them in appropriate columns.
Radial vascular bundles, Endarch xylem, Conjoint vascular bundle, Exarch xylem

STEM	ROOT

2024 Model

25. What is meant by:
a) Open Vascular bundle
b) Closed Vascular bundle *2024 Model*

3 Marks Questions

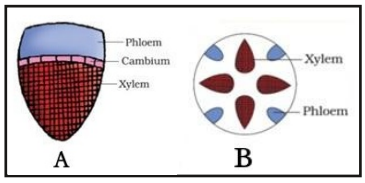
1. In the anatomy lab, Eugin observed the following features in the T.S. of a plant part.
a) Radial and polyarch xylem bundles
b) Parenchymatous (homogenous) cortex
c) Large pith
d) Epidermis with epidermal hairs
e) Pericycle
f) Endodermis with casparian strips
i) Identify the plant. ($^1/_2$)
ii) Re-arrange the given regions from the periphery to the centre in their correct sequence. ($1^1/_2$)
iii) Give an account of casparian strips. (1)
2013 March .

2. Match the following columns A and B.

A	B
~~a) Companion cells~~	i) Stomata
~~b) Lenticels~~	ii) Chlorophyll bearing cells
c) Bulliform cells	iii) Casparian strips
d) Subsidiary cells	iv) Present between xylem and phloem
e) Mesophyll cells	~~v) Phloem tissue~~
f) Endodermal cells	vi) Empty, colourless cells
	~~vii) Exchange of gases~~

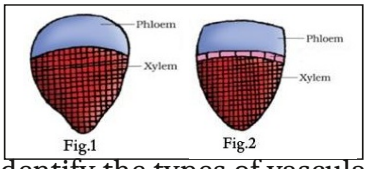
2014 March

3. The following figures show two types of vascular bundles:



a) Identify the vascular bundles A and B
b) Briefly explain A and B in one or two sentences. *2014 Imp.*

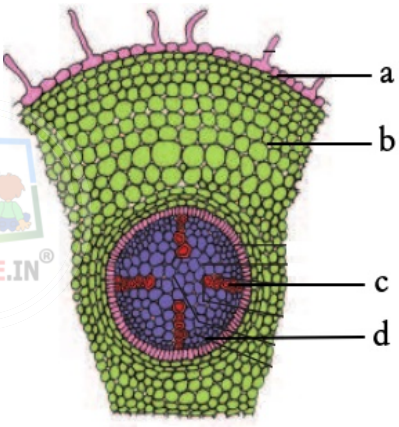
4.



Identify the types of vascular bundle in figure 1 and 2. Write the features of each vascular bundle. (**Hint** : Any two points each) *2015 Imp.*

5. Distinguish between leaf anatomy of dicot leaf and monocot leaf.
(**Hint** : Any three points each) *2015 Imp.*

6.Observe the diagram given below.



Label the parts a,b, c & d.
Write any two features of the vascular bundles seen in the figure. *2017 2nd term*

7.The tissue found between the upper and lower epidermis of a leaf is called mesophyll.
a) Write the type of cells found in this tissue in a dicot leaf.
b) Mention two differences between a dicot leaf and monocot leaf. *2018 March*

8.Observe the terms given below:
Xylem, Root hairs, Pith, Stomata, Cambium, Bulliform cells.
From this, identify and write the structures seen in epidermal tissue system. Write their functions.
(**Hint** : 3 structures) *2019 March*

9.The following are the anatomical features of flowering plants. Arrange these features in the table given below:

(i) Exarch xylem
(ii) Presence of hypodermis
(iii) Palisade parenchyma cells
(iv) Conjoint and open vascular bundles
(v) Endodermis with casparian strips
(vi) Large empty bulliform cells

STEM	ROOT	LEAF
• •	• •	• •

2019 Imp.

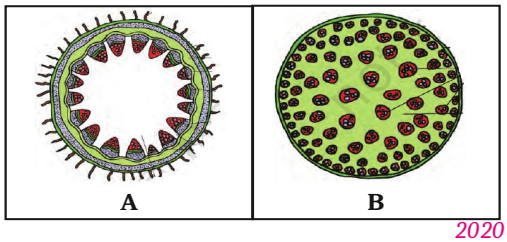
10.Anatomical features of two plant specimens are given below:

a) Name the two specimens.
b) Substantiate your answer by arranging them in two columns.

More than six radial vascular bundles
Large number of vascular bundles arranged in the form of a ring
Xylem round in shape
Xylem is exarch
Cambium present between Xylem and Phloem
Xylem is endarch

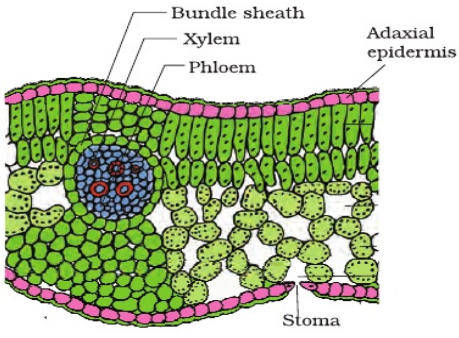
2019 2nd term

11.Following are the diagrams showing primary structure of dicot stem (A) and monocot stem (B).Write any three differences between them.



2020 Model

12.Observe the figure given below:



Write any three features on mesophyll cells from the figure. *2020 March*

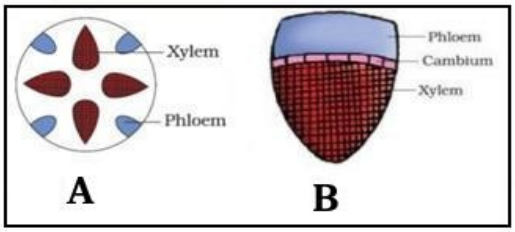
13.Arrange the following anatomical characters in appropriate column:

Conjoint vascular bundle
Upper and lower epidermis
Exarch xylem
Radial vascular bundles
Endarch xylem
Ground tissue is called mesophyll

Stem	Root	Leaf

2020 Imp.

14. Identify the types of vascular bundles labelled as A and B. Write any two features of each vascular bundle. *2022 2nd term*



15.The following are the anatomical features of flowering plants. Arrange these features in the table given below:

(i) Exarch xylem
(ii) Presence of hypodermis
(iii) Palisade parenchyma
(iv) Conjoint and open vascular bundle
(v) Endodermis with casparian strips
(vi) Large empty bulliform cells

STEM	ROOT	LEAF

2023 Model

16.The following are the anatomical features of flowering plants. Arrange these features in the table given below:

- Spongy parenchyma
- Hypodermis Present
- Exarch Xylem
- Conjoint and open vascular bundle
- Large empty bulliform cells
- Endodermis with Casparian strip

ROOT	STEM	LEAF
•	•	•
•	•	•

2023 March

17. Write three differences between the anatomy of Dicot Leaf and Monocot Leaf. *2023 Imp*

Answer key

1Mark Questions

1. a) In roots, vascular tissues are *Radial.*
2. Trichomes
3. b) Stele
4. (a) Dicot root
5. (a) Open vascular bundle
6. c) Mesophyll
7. In grasses, certain adaxial epidermal cells along the veins modify themselves into large, empty, colourless cells. These are called bulliform cells.
8. Stele
9. Radial
10. Cuticle
11. ii) Specialised cells present in the vicivity of guard cell is called *subsidiary cells.*

2 Marks Questions

1.

Specimen A	Specimen B
1a.Closed vascular bundles	1b.Open vascular bundles
2a. A large number of scattered vascular bundles.	2b. A large number of vascular bundles are arranged in a ring
3a. Vascular bundles are conjoint and surrounded by a sclerenchymatous bundle sheath.	3b. Vascular bundle is conjoint and with endarch protoxylem

2. a) Monocot root and Dicot stem

b)

Monocot Root	Dicot Stem
a) Radial vascular bundles and are 20 in number	b)Collateral vascular bundles arranged in the form of a ring and vascular bundles are few in number
c) Xylem round in shape	e) Cambium present in between xylem and phloem
d) Xylem is exarch	f) Xylem is endarch

3. The guard cells possess chloroplasts and regulate the opening and closing of stomata.
4. Dicot stem : A large number of vascular bundles are arranged in a ring, vascular bundle is conjoint, open, and with endarch protoxylem.

Monocot stem : A large number of scattered vascular bundles, each surrounded by a sclerenchymatous bundle sheath, Vascular bundles are conjoint and closed, Peripheral vascular bundles are generally smaller than the centrally located ones, The phloem parenchyma is absent, and water-containing cavities are present within the vascular bundles ***(any 4)***

5.

Dicot Stem	Monocot Stem
b) Collenchymatous hypodermis	a)Sclerenchymatous hypodermis
d) Vascular bundles are arranged in a ring	c) Vascular bundles are conjoint, closed

6. Dicot stem : A large number of vascular bundles are arranged in a ring, vascular bundle is conjoint and with endarch protoxylem.
7. Dicot stem : A large number of vascular bundles are arranged in a ring, vascular bundle is conjoint, open and with endarch protoxylem. ***(any 2)***
8. The outer walls of guard cells (away from the stomatal pore) are thin and the inner walls (towards the stomatal pore) are highly thickened. The guard cells possess chloroplasts. ***(any 2)***
9. A. Closed B. Open
   1. Phloem 2. Xylem 3. Phloem
   4. Cambium 5. Xylem
10. (a) A. Palisade mesophyll B. Spongy mesophyll C. Stoma
    (b) Dorsiventral/Dicotyledonous Leaf
11. A. Radial : xylem and phloem within a vascular bundle are arranged in an alternate manner along the different radii.
    B. Conjoint open : the xylem and phloem are jointly situated along the same radius of vascular bundles. Cambium is present between phloem and xylem.
12. Stem : Epidermis overed with a thin layer of cuticle/trichomes may or may not be present/ vascular bundle is conjoint/open or closed/endarch protoxylem ***(any 2)***
    Root : Cuticle absent/ Root hairs present/ Endodermis has casparian strips/Vascular tissues radially arranged/Exarch protoxylem ***(any 2)***
13. Endarch : protoxylem facing the centre as in stem
    Exarch : protoxylem facing the periphery as in root

14. (a) Radial (b) Conjoint open
15. (a) Palisade and Spongy
(b) Photosynthesis
16.

Dicot Root	Dicot Stem
(a)Presence of casparian strips. (c)Two or four xylem and phloem patches.	(b)Vascular bundles arranged in the form of a ring. (d)Conjoint, open, vascular bundles with endarch protoxylem.

17. Large, empty, colourless cells found in the upper(adaxial) epidermis along the veins in grasses are called bulliform cells.
When the bulliform cells absorb water and are turgid, the leaf surface is exposed and when they are flaccid due to water loss, they make the leaves curl inwards to minimise water loss.
18. Conjoint vascular bundles : xylem and phloem are jointly situated along the same radius of vascular bundles.
Radial vascular bundles : xylem and phloem within a vascular bundle are arranged in an alternate manner along the different radii.
19. (a) Palisade and Spongy
(b) Photosynthesis
20. Dicot leaf : The abaxial epidermis generally bears more stomata than the adaxial epidermis/ mesophyll has two types of cells – the palisade parenchyma and the spongy parenchyma/the size of the vascular bundles varies with the size of the veins.***(any 2)***
Monocot leaf : The stomata are present on both the surfaces of the epidermis/the mesophyll is not differentiated into palisade and spongy parenchyma/in graddes, certain adaxial epidermal cells are modified into Bulliform cells/except in main veins, vascular bundles are nearly similar sized.***(any 2)***
21. i) Region of maturation
ii) Region of elongation
iii) Region of meristematic activity
iv) Root cap
22.

Dicot Root	Monocot Root
Limited number of vascular bundles/ Xylem polygonal/ Secondary growth present/Air cavities absent/Small pith ***(any 2)***	Numerous vascular bundles/Xylem round/Secondary growth absent/Air cavities present/ Large pith ***(any 2)***

23. A. Radial vascular bundles : xylem and phloem within a vascular bundle are arranged in an alternate manner along the different radii.
B. Conjoint open vascular bundles : xylem and phloem are jointly situated along the same radius of vascular bundles and cambium present
24.

Stem	Root
Endarch xylem Conjoint vascular bundle	Exarch xylem Radial vascular bundles

25. a) Open Vascular bundle : Cambium present in between xylem and phloem in a conjoint bundle
b) Closed Vascular bundle : Cambium absent in between xylem and phloem in a conjoint bundle

3 Marks Questions

1. i) Dicot root
ii) d) Epidermis with epidermal hairs
b) Parenchymatous (homogenous) cortex
f) Endodermis with casparian strips
e) Pericycle
a) Radial and polyarch xylem bundles
c) Large pith
iii) The tangential and radial walls of the endodermal cells have a deposition of water-impermeable, waxy material suberin in the form of casparian strips.
2.

A	B
c) Bulliform cells	vi) Empty, colourless cells
d) Subsidiary cells	i) Stomata
e) Mesophyll cells	ii) Chlorophyll bearing cells
f) Endodermal cells	iii) Casparian strips

3. a) A. Conjoint open B. Radial
b) Conjoint open vascular bundles : xylem and phloem are jointly situated along the same radius of vascular bundles and cambium present
Radial vascular bundles : xylem and phloem within a vascular bundle are arranged in an alternate manner along the different radii.

4. 1.Conjoint closed : xylem andphloem are jointly situated along the same radius of vascular bundles and cambium absent
   2. Conjoint open : xylem and phloem are jointly situated along the same radius of vascular bundles and cambium present

5.

Dicot Leaf	Monocot Leaf
The abaxial epidermis generally bears more stomata than the adaxial epidermis/ mesophyll has two types of cells –the palisade parenchyma and the spongy parenchyma/the size of the vascular bundles varies with the size of the veins. ***(any 3)***	The stomata are present on both the surfaces of the epidermis/the mesophyll is not differentiated into palisade and spongy parenchyma/in graddes, certain adaxial epidermal cells are modified into Bulliform cells/except in main veins, vascular bundles are nearly similar sized. ***(any 3)***

6. a. Epidermis b. Cortex c. Xylem d. Phloem
   There are usually two to four xylem and phloem patches/Xylem Polygonal/Radial arrangement/ Exarch protoxyem ***(any 2)***
7. a) Palisade and Spongy
   b) Dicot leaf : The abaxial epidermis generally bears more stomata than the adaxial epidermis/ mesophyll has two types of cells – the palisade parenchyma and the spongy parenchyma/the size of the vascular bundles varies with the size of the veins.***(any 2)***
   Monocot leaf : The stomata are present on both the surfaces of the epidermis/the mesophyll is not differentiated into palisade and spongy parenchyma/in graddes, certain adaxial epidermal cells are modified into Bulliform cells/except in main veins, vascular bundles are nearly similar sized.***(any 2)***
8. Root hairs : absorb water and minerals from the soil.
   Stomata : regulate the process of transpiration and gaseous exchange.
   Bulliform cells : they make the leaves curl inwards to minimise water loss.

9.

STEM	ROOT	LEAF
(ii) Presence of hypodermis (iv) Conjoint and open vascular bundles	(i) Exarch xylem (v)Endodermis with casparian strips	(iii) Palisade parenchyma cells (vi) Large empty bulliform cells

10. a) Monocot root, Dicot stem

b)

Monocot Root	Dicot Stem
More than six radial vascular bundles. Xylem round in shape. Xylem is exarch.	Large number of vascular bundles arranged in the form of a ring. Cambium present between Xylem and Phloem. Xylem is endarch.

11.

Dicot Stem	Monocot Stem
Ground tissue differentiated into cortex, endodermis, pericycle and pith.	Ground tissue undifferentiated.
Hypodermis collenchymatous.	Hypodermis schlerenchymatous.
Limited number of vascular bundles arranged in the form of a ring.	Large number of scattered vascular bundles.
Schlerenchymatous bundle cap.	Schlerenchymatous bundle sheath.
Vascular bundles conjoint, open.	Vascular bundles conjoint, closed.
Vascular bundles similar in size.	Peripheral bundles are smaller.
Phloem paremchyma present.	Phloem parenchyma absent.
Water containing cavities absent in vascular bundles ***(any 3)***	Water containing cavities present in vascular bundles ***(any 3)***

12. Mesophyll is made up of parenchyma. It has two types of cells – the palisade parenchyma and the spongy parenchyma. The adaxially placed palisade parenchyma is made up of elongated cells, which are arranged vertically and parallel to each other. The oval or round and loosely arranged spongy parenchyma is situated below the palisade cells and extends to the lower epidermis. There are numerous large spaces and air cavities between these cells.

13.

STEM	ROOT	LEAF
Conjoint vascular bundle. Endarch xylem.	Exarch xylem. Radial vascular bundles.	Upper and lower epidermis. Ground tissue is called mesophyll.

14. A. Radial : xylem and phloem within a vascular bundle are arranged in an alternate manner along the different radii. Found in root.
    B. Conjoint open vascular bundles : xylem and phloem are jointly situated along the same radius of vascular bundles and cambium present

15.

STEM	ROOT	LEAF
(ii) Presence of hypodermis (iv) Conjoint and open vascular bundle	(i) Exarch xylem (v)Endodermis with casparian strips	(iii) Palisade parenchyma (vi) Large empty bulliform cells

16.

STEM	ROOT	LEAF
• Hypodermis Present • Conjoint and open vascular bundle	• Exarch Xylem • Endodermis with Casparian strip	• Spongy parenchyma • Large empty bulliform cells

17.

Dicot Leaf	Monocot Leaf
The abaxial epidermis generally bears more stomata than the adaxial epidermis/ mesophyll has two types of cells –the palisade parenchyma and the spongy parenchyma/the size of the vascular bundles varies with the size of the veins. ***(any 3)***	The stomata are present on both the surfaces of the epidermis/the mesophyll is not differentiated into palisade and spongy parenchyma/in graddes, certain adaxial epidermal cells are modified into Bulliform cells/except in main veins, vascular bundles are nearly similar sized. ***(any 3)***