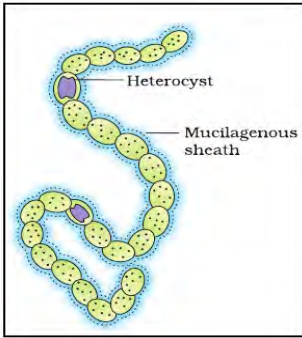


**1 Mark Questions**

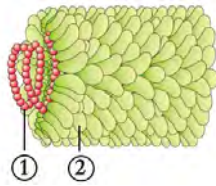
1. 'Diatoms, the chief producers in the oceans, are useful to us even after their death.' Evaluate the statement. 2012 March
2. Based on the relationship fill in the blanks.  
Euglena : protista  
Mycoplasma : \_\_\_\_\_ 2012 Imp.
3. Suggest the correct scientific term for the following:  
Algal partner in lichens 2012 Imp.
4. Botany teacher brought a diseased plant in the classroom. Manoj identified the pathogen as a virus. Can you list any two symptoms of disease, that helped him to identify the pathogen. 2013 March
5. Observe the relationship between the first pair and fill up the blanks using appropriate terms:  
a) Carolus Linnaeus - Two kingdom classification  
R H Whittaker - .....  
b) Thermoacidophiles - Extreme heat  
Halophiles - ..... 2013 Imp.
6. Identify the statement which is applicable to cyanobacteria.  
a) Important decomposers  
b) Form blooms in polluted water  
c) Presence of prominent nucleus  
d) Completely lack of a cellwall 2014 March
7. Name one word for the following:  
a) Symbiotic association of algae and fungi  
b) Viruses that attack bacteria 2014 Imp.
8. The class of fungi known as imperfect fungi is .....  
a) Ascomycetes  
b) Phycomycetes  
c) Deuteromycetes  
d) Basidiomycetes 2015 March
9. Observe the relationship between the first pair and fill in the blanks using appropriate terms:  
Bacillus Bacteria - Rod shaped  
Coccus Bacteria - ..... 2015 Imp.
10. The name 'Virus' that means venom or poisonous fluid was given by .....  
a) Pasteur  
b) Ivanowsky  
c) Beijerinck  
d) Stanley 2016 March
11. Cell wall deposits of diatoms are called diatomaceous earth. Write any two uses of it. 2016 Imp.
12. Read the following statements and select the correct statements from the given choices.  
i) Methanogens are present in the guts of ruminant animals.  
ii) Mycoplasma has distinct cell wall.  
iii) Viroids are infectious naked DNA molecules.  
iv) Algal component of lichen is phycobiont.  
a) (ii) and (iii)  
b) (i) and (iv)  
c) (i) and (iii)  
d) (ii) and (iv) 2017 March
13. Identify the kingdom based on the clues given below.  
a) Organisms are Eukaryotic.  
b) Their cell wall is made up of chitin. 2017 Imp.
14. Observe the figure given below and identify the blue green alga.  
 2018 Model.
15. Fill in the blank.  
In Anabaena specialized cells called ..... help in nitrogen fixation. 2018 March

16. Which one of the following features is applicable to bacteriophages?  
 a) They are bacterial viruses.  
 b) They have double stranded DNA as genetic material.  
 c) The protein coat is called capsid.  
 i) a) and b)  
 ii) b) and c)  
 iii) a) and c)  
 iv) All of the above 2018 Imp.
17. \_\_\_\_\_ are the smallest living cells. 2018 2nd term
18. Characteristic features of a protist are given below. Identify the group of protist.  
 (a) Saprophytic protist  
 (b) Under suitable condition, they form an aggregation called plasmodium. 2019 Model
19. Observe the relationship between the first two terms and fill in the blank.  
 a) Mushroom : Agaricus  
 b) Bread mould : ..... 2019 March
20. Which among the following is an example for flagellated protozoan?  
 (a) Amoeba  
 (b) Trypanosoma  
 (c) Paramoecium  
 (d) Plasmodium 2019 Imp.
21. Observe the given figures A and B. Identify the protista class in which these organisms belong.
- 
- (A) (B) 2019 1st term
22. Name the agent which cause Bovine Spongiform Encephalopathy (mad cow disease). 2019 1st term
23. Observe the relationship between the first pair and fill up the blanks using appropriate terms.  
 a) Rod shaped bacteria: bacillus;  
 Comma shaped bacteria : .....  
 b) Trypanosoma : flagellated protozoan;  
 Paramoecium : ..... 2019 2nd term
24. Which among the following produce biogas from the dung of ruminant animals ?  
 (a) Thermoacidophiles  
 (b) Cyanobacteria  
 (c) Methanogens  
 (d) Halophiles 2020 Model
25. Observe the relation, and fill up the blank.  
 Trypanosoma : Flagellated Protozoan  
 .....: Ciliated protozoan 2020 Model
26. Observe the figure given below. Name the organism.
- 
- 2020 March
27. Fill in the blank.  
 Archaeobacteria which can survive in hot springs are called \_\_\_\_\_ 2020 Imp.
28. Network of hyphae in fungi is called \_\_\_\_\_ 2021 Model
29. Choose the correct answer from the following.  
 AIDS in human being is caused by \_\_\_\_\_.  
 (a) Bacterium (b) Fungus  
 (c) Virus (d) Mycoplasma 2021 Model

### 2 Marks Questions

- The symbiotic association of fungi with roots of higher plants is called mycorrhizae. How is mycorrhizal association helpful to plants? 2014 Imp.
- R.H. Whittaker classified organisms into five kingdoms based on certain criteria. Write any four criteria. 2017 2nd term
- Some organisms show associations which are mutually benefited.  
 a) Which are the components of Lichens?  
 b) What is the ecological significance of lichens? 2018 2nd term
- Dead remains of diatoms are known as 'diatomaceous earth'. Write down two uses of 'diatomaceous earth' 2019 1st term

5. Observe the figure .  
 a) Identify the organism.  
 b) Mark the parts labelled as 1 and 2.



2019 1st term

7. What is the role of fungus in mycorrhiza?

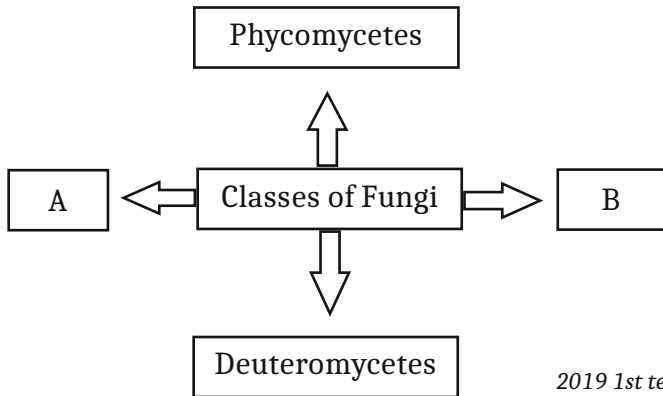
2020 Model

**3 Marks Questions**

1. Who proposed five kingdom classification? Write down the criteria for this classification. (5 criteria).

2019 1st term

6. Identify the two classes of fungi marked as A and B.



2019 1st term

**Chapter 2 - Plant Kingdom**

**1 Mark Questions**

1. Choose the correct answer.  
 The photosynthetic thalloid gametophyte of pteridophyte is called  
 A. Gemma  
 B. Prothallus  
 C. Protonema  
 D. Capsule

2017 2nd term

2. Observe the relationship and fill in the blanks.  
 a) Coralloid root : Association of roots with  $N_2$  fixing cyanobacteria  
 b) .....: Association of roots with fungi.

2019 1st term.

3. Fill in the blanks.

Class	Common Name	Stored Food
____(a)____	Green Algae	Starch
Rhodophyceae	Red Algae	____(b)____

2019 1st term.

**2 Marks Questions**

1. Most pteridophytes are homosporous, but there are exceptions.  
 a) Identify two heterosporous genera  
 b) 'Heterospory is a precursor to seed habit'. Point out any one common character found in heterospory and seed habit.
2. Eventhough algae are primary producers on aquatic ecosystems, man is benefited by algae in a variety of ways. Write any four points in favour of this statement.
3. The following is a list of characteristic features of angiosperms and gymnosperms. Choose those characters that blong to gymnosperms.  
 a) Tracheids alone form the conducting elements in xylem.  
 b) Production of fruits  
 c) Naked seeds  
 d) Cones are seen  
 e) Flowers absent  
 f) Xylem mainly contains vessels  
 g) Double fertilisation present

2012 March

2012 March

2012 Imp

4. 'Double fertilisation is an event unique to angiosperms'.  
 a)Mention the two fusions in this event.  
 b)Name the products obtained as a result of these fusions. *2013 March*
5. Give reasons for the following:  
 a)Bryophytes are called amphibians of plant kingdom.  
 b)Fertilisation in angiosperm is called double fertilisation. *2013 Imp*
6. Unlike a majority of the pteridophytes, genera like Selaginella and Salvinia show a unique feature in spore formation.  
 a)What is this feature?  
 b)Briefly comment on its significance *2014 March*

7. Match the following.

A	B
a)Floridean starch	Gymnosperm
b)Double fertilization	Red algae
c)Coralloid roots	Fern
d)Prothallus	Angiosperm

*2014 Imp.*

8. Complete the given table of algal divisions and their main characteristics by filling 'a', 'b', 'c' and 'd'.

Chlorophyceae	Chlorophyll-a,b	.....(a).....
Phaeophyceae	Chlorophyll-a,c and .....(b).....	Laminarin Mannitol
.....(c).....	Chlorophyll-a,d and Phycocyanin	.....(d).....

*2015 March*

9. 'Amphibians of plant kingdom' is used to denote a specific group in plant kingdom. Name the plant group and list any three vegetative or reproductive characters of that plant group. *2015 Imp*
10. Write any two distinguishing features of the algal class Rhodophyceae. *2016 March*
11. Distinguish between mycorrhiza and coralloid roots. *2016 March*

12. Double fertilization is a unique feature of angiosperms. Explain the two processes involved in double fertilization. *2016 Imp*
13. Algae are useful to man in a variety of ways. Suggest any four uses of algae. *2017 March*
14. Distinguish between protonema and prothallus. *2017 Imp*
15. Analyse the table and fill in the blanks.

A	B	C
(a) .....	Green algae	Starch
Phaeophyceae	(b) .....	(c) .....
Rhodophyceae	Red algae	(d) .....

*2017 2nd term*

16. Certain pteridophytes produce two types of spores. Name this condition. Write the evolutionary significance of this condition. *2017 2nd term*
17. Artificial system and natural system are two systems of classification. Who are the proponents of these two systems? Write the criteria used by them for these classifications. *2018 Model*

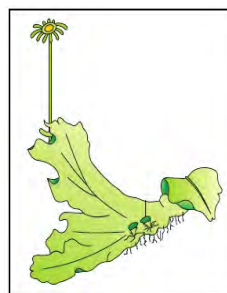
18. Certain life cycle patterns of various plant groups are given below:

Diplontic, Haplontic, Haplo - diplontic
--

Choose the life cycle pattern shown by gymnosperms and angiosperms. Write the peculiarities of the identified life cycle pattern.

*2018 Model*

19. The given figure shows a plant belonging to liverworts. Identify the plant. Name the asexual buds seen on it and write their features.



*2018 March*

20. Match the items of column A with column B.

Column A		Column B	
a)	Prothallus	i)	Asexual bud in liverwort
b)	Protonema	ii)	Sporophyte of angiosperms
c)	Antheridium	iii)	Thalloid gametophyte of pteridophytes
d)	Gemmae	iv)	Male sex organs in bryophytes
		v)	Gametophytic stage of mosses

2018 Imp.

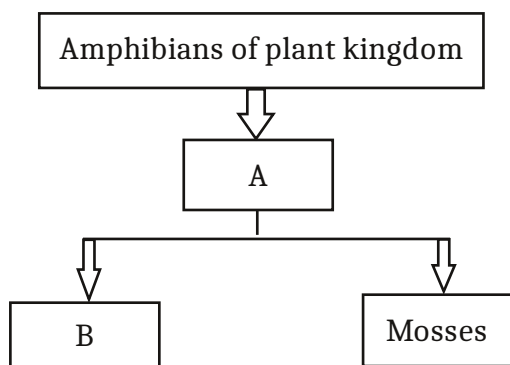
21. Identify the two events occur in double fertilization of angiosperms.

2018 2nd term

22. Write any two economic importance of bryophytes.

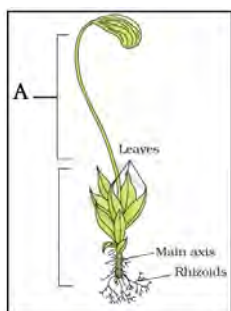
2018 2nd term

23. Analyse the flow chart and find out A and B.



2019 Model

24. Observe the figure given below. It shows two phases in the life cycle of a plant.



Identify the phase marked as A. Write any two peculiarities of this stage.

2019 March

25. Match the columns A and B

A	B
(i) Prothallus	(a) Mosses
(ii) Sporophylls	(b) Plant body of algae
(iii) Coralloid roots	(c) Gametophyte of Pteridophytes
(iv) Protonema	(d) Sporangia bearing leaves
	(e) Nitrogen fixation

2019 Imp.

26. Characters of a plant group is given below:

**Occur in damp, Humid and shaded localities. Amphibians of plant kingdom.**

- Identify the plant group.
- Why are they called "amphibians of plant kingdom"?

2019 1st term.

27. Match the following.

Type of classification	Characteristics
i) Numerical Taxonomy	a) Based on chromosome number, structure and behaviour
ii) Cytotaxonomy	b) Based on the uses and chemical constituents of plant
	c) Carried out using computers

2019 1st term.

28. Seleginella and Salvinia are pteridophytes which show heterospory.

- What is heterospory?
- Give its significance.

2019 1st term.

29. Match column I with column II

Column I	Column II
i) <i>Volvox</i>	a) Moss
ii) <i>Cycas</i>	b) Pteridophyte
iii) <i>Selaginella</i>	c) Algae
iv) <i>Sphagnum</i>	d) Gymnosperm

2019 1st term.

30. Agar is a commercial product obtained from red algae.

- Name the two algae which can be used to produce agar.
- Write any one use of agar.

2019 2nd term.



31. Match the items of column A with B:

(A)	(B)
(a) Double fertilization	(i) Bryophyte
(b) Heterospory	(ii) Algae
(c) Protonema	(iii) Gymnosperm
(d) Naked seeds	(iv) Pteridophyte
	(v) Angiosperm

2020 March

32. *Seleginella* and *Salvinia* show a unique feature in spore production.

- What is this feature?
- Comment on its significance.

2020 Imp.

33. Complete the table with appropriate terms :

Classes	Common Name	Major Pigments	Stored Food
Chlorophyceae	(a)	Chlorophyll a, b	(b)
(c)	Brown algae	Chlorophyll a, c Fucoxanthin	Manitol Laminarin
Rhodophyceae	Red algae	Chlorophyll a, d (d)	Floredean starch

2021 Model

34.(a) Which plants are known as 'Amphibians of the plant kingdom' ?

- Give reason.

2021 Model

Chapter 3 -Morphology of Flowering plants

1 Mark Questions

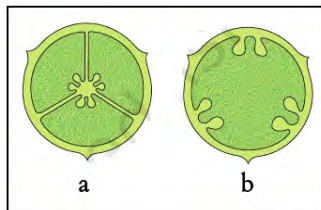
1. Observe the given relation and fill in the blanks.

Cucumber : Tendril

Citrus : .....

2012 March

2. Observe the following diagrams "a" and "b" and identify the placentation.



2012 Imp.

3. Observe the given relation and fill in the blanks.

a) Plumule : Coleoptile

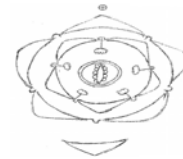
Radicle : .....

b) Starch : Amyloplast

Fat : .....

2013 March

4. Observe the floral diagram and answer the following questions:



a) Name the family

b) Write the nature of stamen

2013 Imp.

5. Normally, roots grow into the soil. But in some plants like *Rhizophora*, many roots come out of the ground and grow vertically upwards. What are these roots called? Give their function.

2014 March

6. Four stem modifications are given below. Three of them are underground stem modifications. Pick the odd one out as your answer.

(Potato, Opuntia, Ginger, Colocasia)

2015 Imp.

7. By examining the four matchpairs given below, find the correct matched pair from the alternatives given below.

(i) Racemose - Peduncle grows indefinitely
(ii) Epigynous flower - Ovary superior
(iii) Phyllotaxy - Arrangement of leaves on the stem
(iv) Coleoptile - Envelope covering the radicle

- a) (i) and (ii)
- b) (ii) and (iv)
- c) (ii) and (iii)
- d) (i) and (iii)

2016 Imp.

8. In the family Fabaceae, stamens are described as .....

- a) Five, epipetalous
- b) Ten, diadelphous
- c) Six, epipetalous
- d) Six, diadelphous

2017 Imp.

9. Observe the relationship between the first two terms and fill in the blank.

Epipetalous Stamen - Brinjal  
 ..... - Lily

2018 March

10. Observe the figure and identify the type of inflorescence.



2019 Model

11. Choose the correct answer.

The arrangement of veins and veinlets in leaf lamina.

- a) Phyllotaxy.
- b) Venation.
- c) Inflorescence.
- d) Placentation.

2019 1st term

12. Fill in the blank :

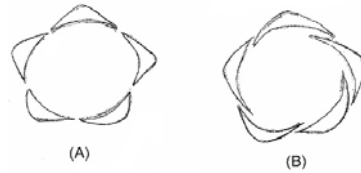
In Rhizophora certain roots grow vertically for breathing. Such roots are called \_\_\_\_\_.

2021 Model

2 Marks Questions

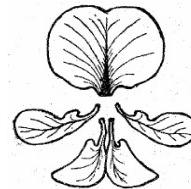
1. In cactus both leaves and stem are modified to perform different functions. Name the modifications and identify their functions. 2012 Imp.

2. The following figures show two types of aestivation. Answer the following questions.



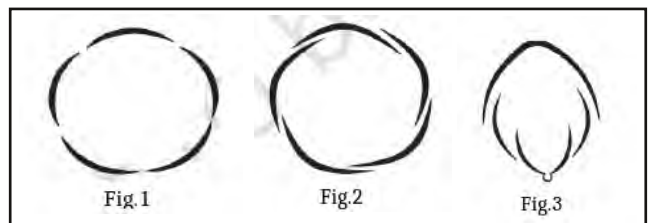
- a) Identify the types A and B
- b) How will you distinguish A and B? 2013 Imp.

3. The following diagram represents five petals of a flower in a part belonging to a major family. Answer the following questions.



- a) Identify the family.
- b) Write the floral formula of the flower. 2014 March.

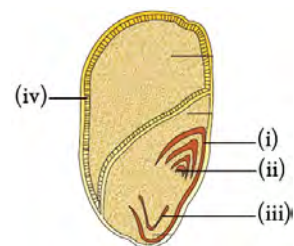
4.



Write the names of aestivation in figures 1, 2 and 3. Identify aestivation of petals in pea flowers from the above three aestivations. 2015 Imp.

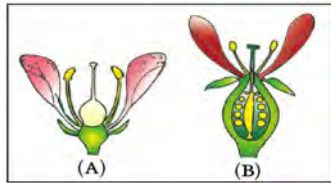
5. Identify the diagram and label the parts shown as...

- (i) .....
- (ii).....
- (iii).....
- (iv).....



2016 Imp.

6. Observe the diagrams given below.



Name the type of flowers A and B.  
Give one example of each.

2017 Imp.

7. Write two differences between racemose and cymose inflorescence.

2017 Imp.

8. Match the following:

Column A		Column B	
a)	Calotropis	i)	Vexillary
b)	China Rose	ii)	Valvate
c)	Cassia	iii)	Twisted
d)	Pea	iv)	Imbricate

2018 March

9. The following figures A and B shows two different types of phyllotaxy.



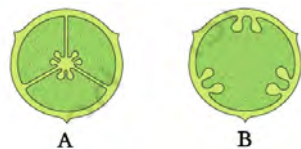
Identify the phyllotaxy A, B and explain them.

2018 Imp.

10. Write any two major difference between racemose and cymose inflorescence.

2018 2nd term

11. The following figures A and B shows two different types of placentation. Identify the placentation and explain.



2019 Model

12. Identify the type of compound leaves. Give one example for each.



2019 1st term

13. Root is covered at the apex by a thimble like structure. Name the structure and write its major function.

2019 1st term

14. What type of modifications of root is found in-

- a) Banyan tree
- b) Rhizophora
- c) Sugarcane
- d) Turnip

2019 1st term

15. Salient features of angiosperms are given below. Select the features of dicotyledons.

- a) Seeds having two Cotyledons
- b) Parallel venation in leaves
- c) Single cotyledon in seeds
- d) Reticulate venation in leaves

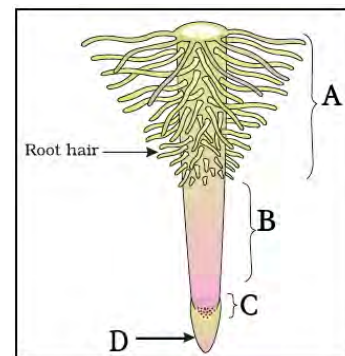
2019 1st term

16. Match the following:

Root modification	Example
a) Stilt root	i) Rhizophora
b) Storage root	ii) Banyan tree
c) Pneumatophore	iii) Carrot
d) Prop root	iv) Sugarcane

2019 2nd term

17. Observe the diagram and label the parts noted as A, B, C and D.



2020 Model

18. Define the following terms:

- (a) Aestivation
- (b) Placentation

2020 Imp.

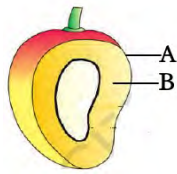
19. Phyllotaxy is the pattern of arrangement of leaves on stem of branch. Write the name of any two types of Phyllotaxy.

2021 Model



**2<sup>1</sup>/<sub>2</sub> Marks Questions**

1. The diagram given below shows the parts of a true fruit.



- Write the technical name of this fruit developed from a monocarpellary superior ovary.
- Label parts A and B
- Can you distinguish a parthenocarpic fruit from the given fruit? 2013 March

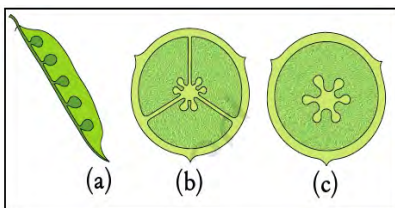
**3 Marks Questions**

1. Given below is the floral diagram of a family you have studied.



- Identify the family and aestivation of corolla.
- Describe three other floral characters from the floral diagram using technical terms. 2012 March

2. The arrangement of ovules in the ovary is known as placentation. Given below are different types of placentations.

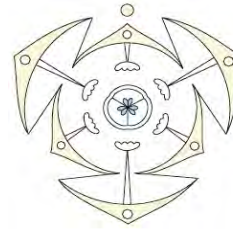


- Identify (a), (b) and (c).
- Briefly explain (a), (b) and (c) in one or two sentences. 2014 Imp.

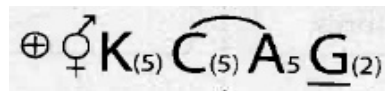
3. In most of the plants, roots are meant for absorption and fixation. But there are exceptions to these functions. Justify the statement citing atleast three examples. 2015 March

4. The main function of most of the stems is spreading out branches, bearing leaves, flowers and fruits and the conduction of materials. But there are exceptions to this. Justify the statement citing atleast three examples. 2015 March

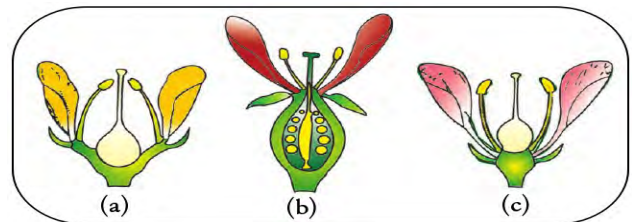
5. Observe the given floral diagram.



- Identify the family.
  - Write any four floral characters of the identified family. 2016 March
6. a) The arrangement of flowers on the floral axis is called.....
- Aestivation
  - Phyllotaxy
  - Placentation
  - Inflorescence
- b) How can you differentiate an actinomorphic flower from a zygomorphic flower? 2017 March
7. Observe the floral formula given below.



- Identify the family
  - Write any three peculiarities of gynoecium. Name a plant belonging to this family. 2017 2nd term
8. Observe the figures a, b and c. Identify the position of ovary of each flower and name the flowers accordingly.

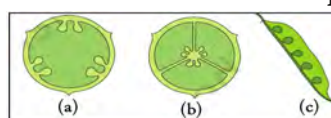


2017 2nd term

9. Observe the terms given below:  
**Vexillary, Axile, Marginal, Imbricate, Basal, Valvate.**  
 Identify the three kinds of placentation from the above. Explain them. 2018 Model

10. Based on the symmetry, the flowers can be classified into three types. Name and explain them. 2018 Imp.

11. Observe the diagram. Identify the type of placentations. Give one example for each type.



2018 2nd term

12. Write three peculiarities of gynoecium seen in Solanaceae and Fabaceae. 2019 March

13. Names of three plants are given below.

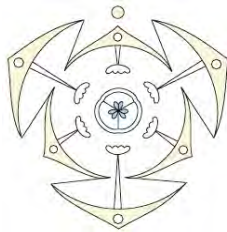
- a) Rhizophora
- b) Bougainvillea
- c) Pea

Name the modifications seen in these plants.

Write functions. 2019 March

14. Observe the given floral diagram:

- (a) Identify the family.
- (b) Write down any two distinguishing features of gynoecium.
- (c) Write any two economically useful plants belonging to this family.



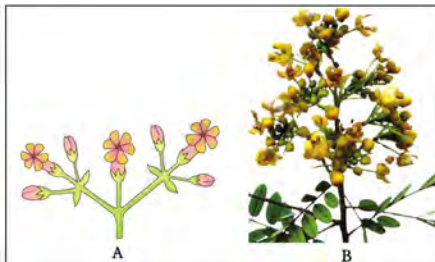
2019 Imp.

15. The pattern of arrangement of leaves on stem is called phyllotaxy.

- a) Name three types of Phyllotaxy.
- b) Give one example for each type. 2019 1st term

16. Observe the figures A and B

- a) Identify the type of inflorescence.
- b) Write any two differences between them.



2019 1st term

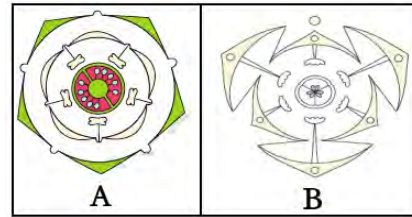
17. Floral formulae of an angiosperm plant is given below.

$$\% \text{ } \overset{\text{♂}}{\text{K}}_{(5)} \text{ } \overset{\text{♀}}{\text{C}}_{1+2+(2)} \text{ } \overset{\text{♂}}{\text{A}}_{(9)+1} \text{ } \overset{\text{♀}}{\text{G}}_1$$

- a) Identify the family.
- b) Write the characteristic feature of corolla and androecium of flowers of this family.
- c) Write one economically important plant of this family. 2019 2nd term

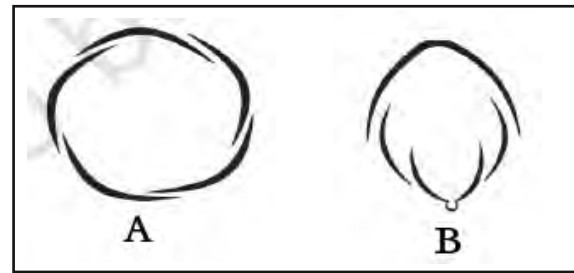
18. A and B are floral diagrams of two angiosperm families.

- (a) Identify the families of A and B.
- (b) Write the characters of gynoecium of A and B.



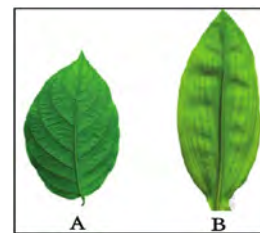
2020 Model

19. Observe the figures A and B.



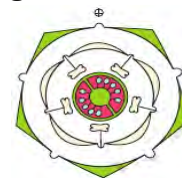
- (a) Identify the aestivation A and B.
- (b) Write one peculiarity of A.
- (c) Name the three kinds of petals in B. 2020 March

20. Observe the figures A and B given below.



- (a) Name the type of venation in A and B.
- (b) Define venation. 2020 March

21. Observe the given floral diagram.



- (a) Identify the family.
- (b) Write any two floral characters of this family.
- (c) Write the name of two economically important plants of this family. 2020 Imp.

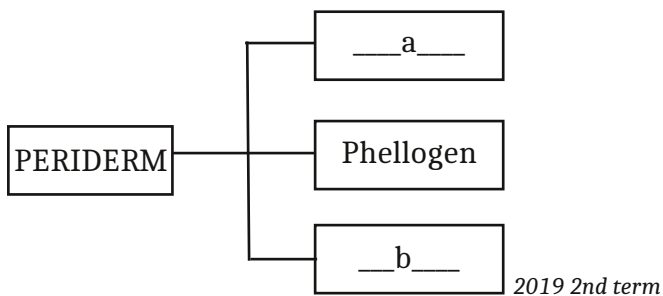
22. Flowers are classified into three types based on the position of floral parts on thalamus.

- (a) Which are they?
- (b) Write the position of ovary in each one of them. 2021 Model

**1Mark Questions**

- Analyse the given statements and correct the false statements with respect to the underlined word.
  - In roots, vascular tissues are conjoint.
  - Cork cambium is otherwise called phelloderm. 2012 March
- Imagine that you and your father is visiting a timbershop to buy wood for making furniture. Timbershop owner suggested rosewood. Father seeks your help to determine the age of the wood.
  - As a botany student, can you help your father? 2013 Imp.
  - Justify your answer. 2013 Imp.
- In timber yielding plants, only the central part of the wood is used to make furniture. Name this part and justify your answer. 2016 Imp.
- Parenchyma is a tissue for storage, sclerenchyma is a tissue for ..... 2017 Imp.
- Fill in the blank.  
Epidermal hairs on the stem of certain plants are called..... 2017 2nd term
- Choose the CORRECT answer.  
All tissues on the innerside of the endodermis together constitute....
  - Conjunctive tissue
  - Stele
  - Pericycle
  - Vascular bundle 2018 Imp.
- Which among the following is a correct statement?
  - Lenticels permit exchange of gases.
  - Phelloderm is a secondary meristem.
  - Bulliform cells are present in roots.
  - In stem, the xylem is exarch. 2018 2nd term

- Complete the table with appropriate words.



- Select the statement which is not applicable to sclerenchyma.
  - Consists of long narrow cells
  - The cells are living
  - The cell wall is lignified
  - Provides mechanical support to organs 2019 2nd term

- Choose the correct answer.  
Casparian strips are present in ...
  - Dicot root
  - Dicot leaf
  - Dicot stem
  - Monocot stem 2020 March

- Choose the correct answer.  
Vascular bundles which have cambium between xylem and phloem is called \_\_\_\_
  - Open vascular bundle
  - Closed vascular bundle
  - Radial vascular bundle
  - Peripheral vascular bundle 2020 Imp.

**2 Marks Questions**

- 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.

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.

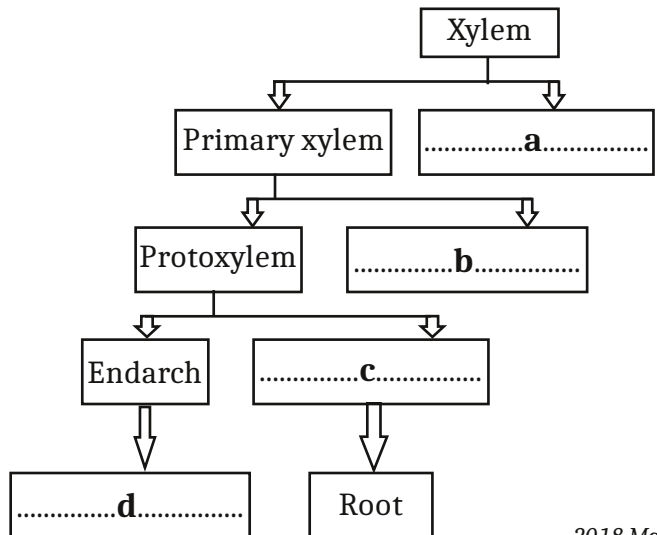
- a) Sclerenchymatous hypodermis
- b) Collenchymatous hypodermis
- c) Vascular bundles are conjoint, closed
- d) Vascular bundles are arranged in a ring 2017 Imp.

6. Anatomical features of a plant part are given below.

- Collenchymatous hypodermis
- Open vascular bundles

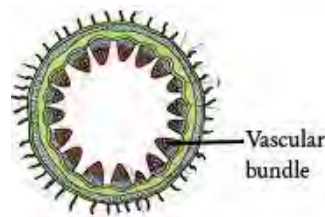
Identify the plant part and write other three features of the identified plant part. 2017 2nd term

7. Complete the flowchart given below:



2018 March

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

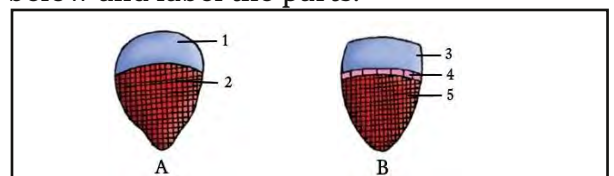


Identify the plant part and explain any two features of its vascular bundles. 2018 Imp.

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

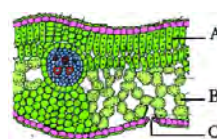
10. Which are the different types of cells present in xylem tissue? 2018 2nd term

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



2018 2nd term

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



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

2019 Model

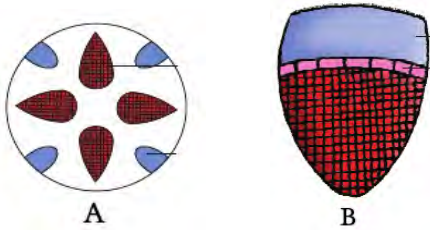
13. Notice the three simple tissues given below.

- a) Sclerenchyma
- b) Parenchyma
- c) Collenchyma

Identify and write the tissue that consists of cells that are thickened at the corners. Write the function of this tissue. 2019 March



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



2019 2nd term

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

16. Write the difference between spring wood and autumn wood. 2021 Model

17. Xylem is a conducting tissue seen in higher plants. Write the names of four elements of Xylem. 2021 Model

**3 Marks Questions**

1. Dicot plants show secondary growth in their stem and root.  
 a) Name the meristems that causes secondary growth in vascular region and cortex  
 b) Comment on the activity of this meristem 2012 Imp.

2. Some tissues in plants are not able to divide further.  
 a) Suggest name of such tissues  
 b) Give any three examples  
 c) List the difference between epidermal tissue system of roots and leaves. 2012 Imp.

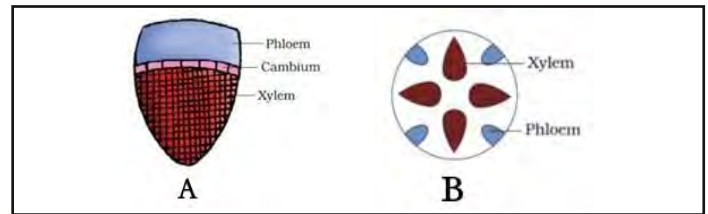
3. In the anatomy lab, Eugin observed the following features in the T.S. of a plant part.  
 a) Radial and polyarch xylem bundles  
 b) Parenchymatous (homogenous) cortex  
 c) Large pith  
 d) Epidermis with epidermal hairs  
 e) Pericycle  
 f) Endodermis with casparian strips  
 i) Identify the plant. (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.

4. 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

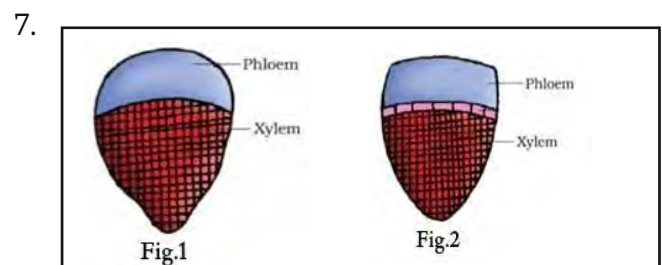
2014 March

5. 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.

6. In a dicotyledonous stem, secondary growth takes place at two regions by the activity of two lateral meristems.  
 a) Identify the two lateral meristems.  
 b) List the new tissues formed from each of these meristems. 2015 March



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.

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

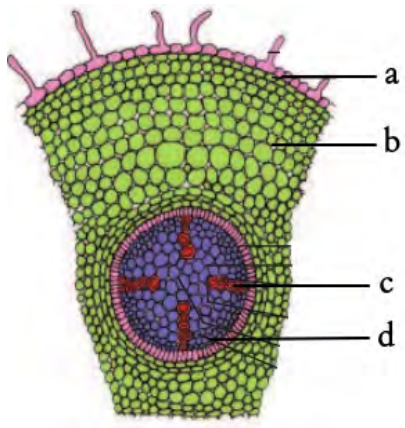


9. How does periderm develop in dicot stem and replace the outer broken cortical and epidermal layers? 2016 March

10. In dicot stem, both intrafascicular and interfascicular cambium form a ring of vascular cambium. Explain the activity of this cambial ring. 2016 March

11. a) The tissues involved in secondary growth of dicot plants are vascular cambium and.....  
 b) Compare the formation of vascular cambia in dicot stem and dicot root. 2017 March

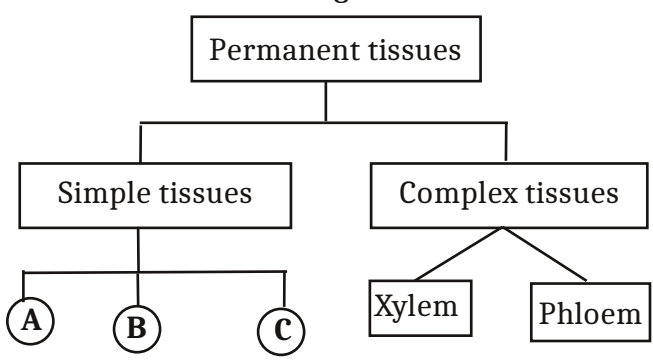
12. Observe the diagram given below.



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

13. Girth of a stem increases due to the activity of cambial ring. Explain the process of formation of cambial ring and its activity. 2017 2nd term

14. Observe the flow chart given below:

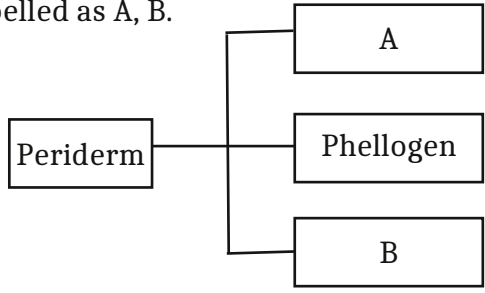


a) Identify A, B, C. Write the function of B.  
 b) Differentiate endarch and exarch xylem. 2018 Model

15. Periderm is constituted by three kinds of tissues. Name them. Write one peculiarity of each of them. 2018 Model

16. 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

17. (a) A flow chart showing different layers of periderm is given below. Identify the layers labelled as A, B.



(b) Write down two peculiarities of phellogen. 2019 Model

18. 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. 2019 March

(Hint : 3 structures)

19. 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.

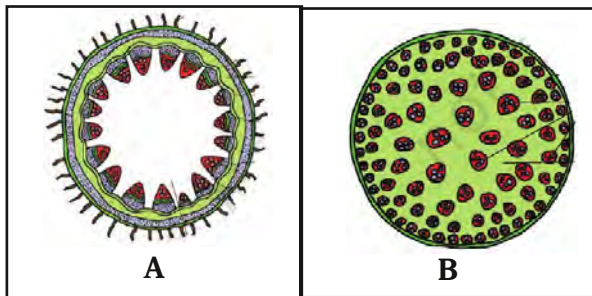
20. Anatomical features of two plant specimens are given below:

- Name the two specimens.
- 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

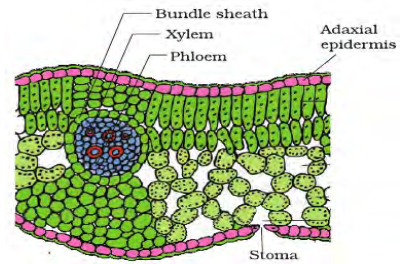
2019 2nd term

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



2020 Model

22. Observe the figure given below:



Write any three features on mesophyll cells from the figure.

2020 March

23. 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.

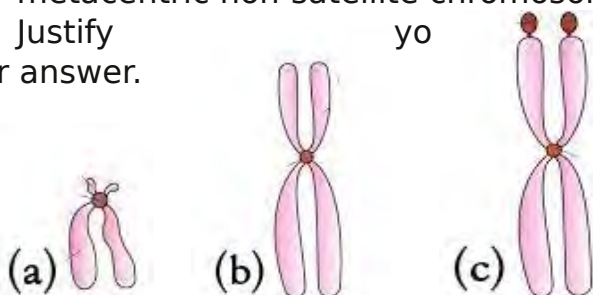
Chapter 5 -Cell:Structure and Functions

1Mark Questions

- (a) Identify the cell organelle found both in eukaryotic and prokaryotic cells.  
(b) Justify its presence in both types of cells.

2012 March

2. The diagrams a,b,c given below show three kinds of chromosomes. Of these, which is metacentric non-satellite chromosome? Justify your answer.



2013 Imp.

- Prokaryotic cells possess a special membranous structure which is formed by the extensions of the plasma membrane in the form of vesicles, tubules and lamellae. Identify this structure and write any one of its functions.

2014 March.

- In which hydrolyses, the membrane bound vesicles are present?
- Several ribosomes may attach to a single mRNA and form a chain called.....

2014 Imp.

2015 Imp.

- Identify the organelle known as 'powerhouse' of the cell from those given below.
  - Lysosome
  - Centrosome
  - Mitochondria
  - Plastid

2016 Imp.

2 Marks Questions

7. Choose the correctly matched pair.  
 a) Telocentric chromosome - Middle centromere  
 b) Metacentric chromosome - Centromere slightly away from the middle  
 c) Acrocentric chromosome - Centromere close to its end  
 2018 Model
8. There are different types of leucoplasts in plant cells. Name the leucoplast that store proteins.  
 2018 March
9. Fill in the blank.  
 Small disc-shaped structures at the surface of the centromere are called.....  
 2018 Imp.
10. The non - membrane bound organelle found in all cells is....  
 a) ER  
 b) Centriole  
 c) Ribosome  
 d) Vacuole  
 2018 2nd term
11. Fill in the blank.  
 Vacuole is bound by a single membrane called...  
 2019 Model
12. Choose the CORRECT answer.  
 A structure seen in bacterial cell is.....  
 a) Nucleus  
 b) Lysosome  
 c) Plastid  
 d) Mesosome  
 2019 March
13. Who proposed the fluid mosaic model of plasma membrane ?  
 a) Camillo Golgi  
 b) Schleiden and Schwann  
 c) Singer and Nicolson  
 d) Robert Brown  
 2019 2nd term
14. Choose the correct answer. The organelle known as power house of the cell is .....  
 (a) Ribosome  
 (b) Vacuole  
 (c) Mitochondrion  
 (d) Chloroplast  
 2020 March
15. Who discovered Golgi apparatus?  
 (a) George Palade (b) Robert Brown  
 (c) Camillo Golgi (d) Robert Hooke  
 2020 Imp.

1. Match the following:

a) Synthesis and storage of energy	i) Golgi apparatus
b) Packaging and delivery of materials	ii) Mitochondria
c) Digestion of inter-cellular materials	iii) Centriole
d) Formation of basal body of cilia and flagella	iv) Lysosome
	v) Chloroplast

2012 March

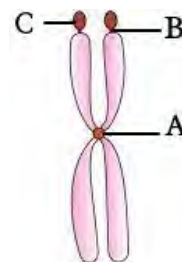
2. State whether the statements are 'true' or 'false'. If 'false' correct the statements by changing the underlined words.  
 a) Aleuroplasts store carbohydrates.  
 b) The centrioles form the basal body of cilia and flagella.  
 c) Ribosomes are not surrounded by membranes.  
 d) RER is the major site for synthesis of lipids.  
 2014 March.

3. Distinguish between the characters of chloroplast and ribosomes from the given list and write them in appropriate columns.  
**(Double membrane, George Palade, sac-like thylakoid, 70S and 80S)**

Chloroplast	Ribosome

2014 Imp.

4. Name the type of chromosome based on the position of centromere in the figure and label the parts A, B and C



2015 Imp.

5. Ribosome is the cell organelle seen in both prokaryotes and eukaryotes. Mention how ribosomes differ in prokaryotes and eukaryotes. Also mention the function of ribosome. 2016 Imp.

6. Endoplasmic reticulum is of two types. Write their structural and functional differences. 2017 2nd term

7. Observe the figure given below. Identify the organelle and write its two functions.



2017 2nd term

8. Pili and fimbriae are surface structures seen in bacterial cells. Differentiate these structures. 2018 Model

9. Analyse the table and fill in the blanks.

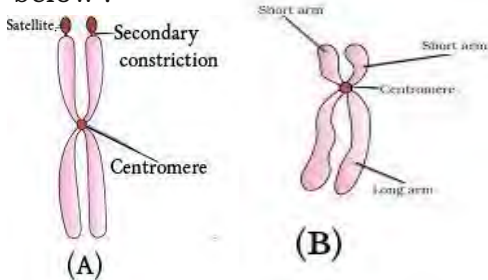
Organelles	Functions
-----a-----	Packaging of materials
Centriole	-----b-----
Ribosome	-----c-----
-----d-----	Production of ATP

2018 Model

10. Ribosomes are organelles without a membrane found in all cells. Name another organelle devoid of membrane, seen in animal cells. Write its function. 2018 March

11. Write any four functions of mesosomes present in prokaryotic cells. 2018 2nd term

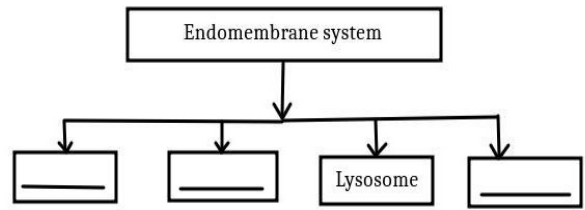
12. Observe the figures of chromosomes given below :



a) Identify the types of chromosomes labelled as A, B.

b) Name the chromosome which has a terminal centromere. 2019 Model

13. Fill in the blanks in the flowchart given below. Which organelle possesses hydrolytic enzymes.



2019 Imp.

14.a) Select the organelles which are included in endomembrane system.

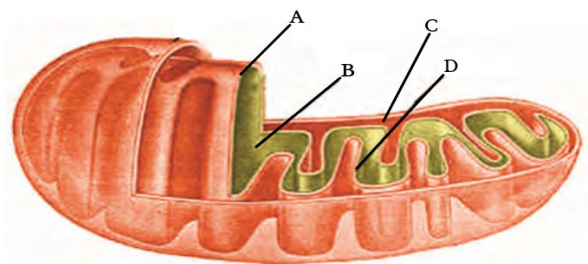
- Lysosome, Vacuole
  - Nucleus, Ribosome
  - Endoplasmic reticulum,
  - Mitochondria plastids,
  - Golgi complex

b) Why these organelles are called endomembrane system 2019 2nd term

15. Special membranous structure formed by the membrane extension of plasma membrane into prokaryotic cell.

- a) Write the different forms of mesosome.
- b) Write one function of mesosome. 2019 2nd term

16. Identify the organelle and mark the parts labelled as A, B, C, D.



2019 2nd term

17. Cell theory was formulated by two scientists.

- (a) Name the scientists.
- (b) Write the two main points in cell theory. 2020 March



18. Peculiarities of certain cell organelles are given below.

- a. Involved in protein synthesis
- b. Made up of many flat, disc shaped sacs or cisternae
- c. Bear ribosomes on their surface
- d. Rich in hydrolytic enzymes
- e. Membrane is absent

Copy the table given below and write the above peculiarities in appropriate column.

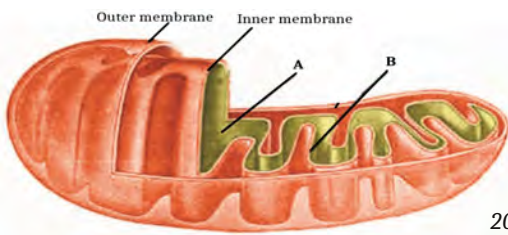
Lysosome	Golgi apparatus	Ribosome

2020 March

19. Based on the position of centromere classify chromosomes and write their name. 2020 Imp.

20. (a) What is the name of the model of Plasma membrane proposed by Singer and Nicolson.   
 (b) Write any one function of Plasma membrane. 2021 Model

21. (a) Identify and write the name of the organelle given in the figure.   
 (b) Label the parts marked as A, B.



2021 Model

22. Match the following :

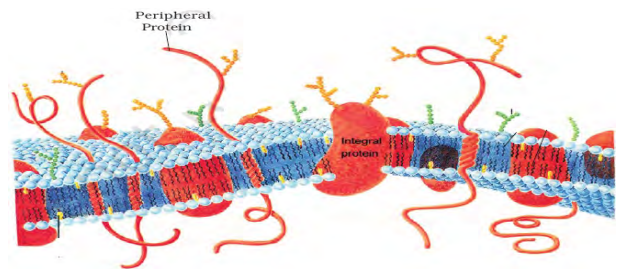
Cell Organelle	Function
(a) Lysosomes	Lipid Synthesis
(b) Golgi apparatus	Store excretory products
(c) Endoplasmic reticulum	Store hydrolytic enzymes
(d) Vacuoles	Packaging of materials

2021 Model

**2 1/2 Marks Questions**

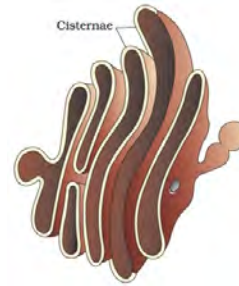
1. An accepted model of the structure of a cell membrane was proposed by Singer and Nicolson.   
 a) Name the model.   
 b) List the 2 major biomolecules which this membrane is composed of.   
 c) Mention two important points of this model from the point of view of function 2013 March

**3 Marks Questions**

1. The following is a list of cell organelles (**nucleus, endoplasmic reticulum, lysosomes, chloroplast, Golgi complex, mitochondria, ribosome**)   
 a) Identify the organelles with double membrane envelope.   
 b) Mention the functions of these organelles. 2012 Imp.
2. a) Due to the presence of a secondary-constriction a knob-like small fragment appears in some chromosomes called .....   
 i) Kinetochore   
 ii) Histone   
 iii) Satellite   
 iv) Chiasmata   
 b) Classify chromosomes based on the position of centromere. 2015 March
3. Observe the given diagram. Analyze this diagram and explain the structure of plasma membrane.   
  2016 March
4. a) Identify a cell organelle which contains hydrolytic enzymes.   
 b) Rough Endoplasmic Reticulum (RER) and Smooth Endoplasmic Reticulum (SER) are morphologically and functionally different. Justify this statement. 2017 March



- Position of centromere determine the shape of the chromosomes.
  - Name the different types of chromosomes based on the position of the centromere.
  - Draw any one chromosome among them. 2017 Imp.
- The nucleoplasm contains small spherical shaped structures
  - Name the structures
  - Name the openings seen in nuclear envelope and state their fuunction. 2018 Imp.
- Cell theory is the fundamental concept in cell biology.
  - Who proposed cell theory?
  - Write the two basic concepts in cell theory. 2018 2nd term
- An improved model of the structure of plasma-membrane was proposed by Singer and Nicolson.
  - What is this model called?
  - Which component forms bilayer?
  - Identify two types of proteins present in cell membrane 2019 Imp.
- Given below is the diagram of a cell organelle.
  - Identify the organelle.
  - Write any two functions of this organelle.

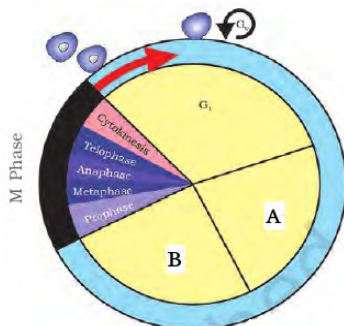


2020 Model

Chapter 6 -Cell Cycle and Cell division

1Mark Questions

- Observe the given relation and fill in the blanks.  
 Meiosis : reduction division  
 Mitosis : ..... 2012 March
- Give the scientific term of the following.  
 Interchange of genetic material between non-sister chromatids of homologous chromosomes. 2017 Imp.
- Fill in the blank.  
 Cytokinesis in animal cell takes place by the appearance of a \_\_\_\_\_ in the plasma membrane. 2019 March
- Crossing over occurs in \_\_\_\_\_substage of Prophase-I. 2019 Imp.
- Observe the diagram related with cell cycle. Identify A and B.
- The stage between Meiosis I and Meiosis II is called \_\_\_\_\_.
  - Diakinesis
  - Interkinesis
  - Pachytene
  - Diplotene 2020 Model
- Observe the relationship between the first two terms and fill in the blank.  
 Metaphase : Spindle fibres attach to kinetochores.  
 \_\_\_\_\_: Chromatids move to opposite poles. 2020 March
- Name the following:  
 The stage at which synapsis occurs during prophase I 2020 Imp.
- Fill in the blank :  
 Exchange of genetic materials between homologous chromosomes during Pachytene stage of Meiosis-I is called \_\_\_\_\_. 2021 Model



2019 2nd term.

2 Marks Questions

- "Meiosis is highly significant in sexually reproducing organisms" Justify. 2017 Imp.
- Give the scientific term of the following.
  - Interchange of genetic materials between non sister chromatids of homologous chromosomes.
  - Internode elongation just prior to flowering. (Chapter 11) 2017 Imp.

3. Four stages of mitotic karyokinesis are given below in incorrect order.

**Cell cycle, Anaphase, Prophase, Telophase, Metaphase.**

Identify the third stage in the order of occurrence and write its two features.

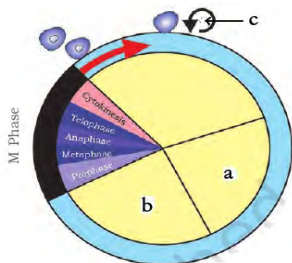
2017 2nd term

4. Match the items of column A with B

A		B	
a	Recombination nodules	i	X shaped structure formed during diplotene
b	Chiasmata	ii	Sites at which crossing over occurs
c	Metaphase plate	iii	Place from where the formation of new cells begins
d	Kinetochores	iv	Plane of alignment of chromosomes
		v	Site of attachment of spindle fibres

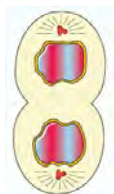
2017 2nd term

5. Observe the diagrammatic representation of cell cycle. Identify the stages 'a' and 'b'. Write the peculiarity of the stage noted as 'c'.



2017 2nd term

6. Observe the given stage of mitosis.



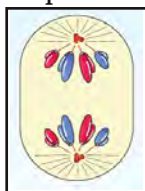
Identify the stage and write any two features of it.

2018 Imp.

7. Karyokinesis of mitosis is divided into four stages. Name the second and third stage. Write any two features of second stage.

2019 March

8. Given below is the diagrammatic representation of a particular stage of mitosis.



- Identify the stage.
- Write any two features of this stage.

2019 Imp.

9. Characteristic features of five phases of prophase I of meiosis I is given below. Arrange them under appropriate heading.

Formation of synaptonemal complex

'X' shaped chiasmata are formed

Chromosomes become gradually visible

Appearance of recombination nodule

Leptotene	Zygotene	Pachytene	Diplotene

2019 2nd term.

10. Column A represents chromosomal behaviour during different sub-stages of Prophase I of Meiosis I. Fill up the blanks in Column B.

Chromosomal behaviour (A)	Sub-stages (B)
(a) Crossing over occurs	(i) _____
(b) Formation of Chiasmata	(ii) _____
(c) Pairing of homologous chromosomes	(iii) _____
(d) Chromosomes visible under light microscope	(iv) Leptotene
(e) Terminalisation of Chiasmata	(v) _____

2020 Model

11. Analyse the table given below and fill in the blanks.

(A)	(B)
Zygotene	_____ (a) _____
__ (b) __	Crossing over
__ (c) __	Dissolution of synaptonemal complex
Diakinesis	_____ (d) _____

2020 March

12. During interphase, cells prepare for cell division.

(a) Write three phases of interphase.

(b) Write the peculiarity of quiescent stage ( $G_0$ )

2020 Imp.

13. (a) Write the name of the stage of Mitosis in the given figure.

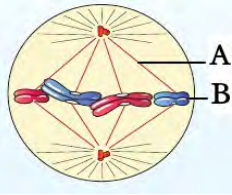
(b) Write one main event occurring in this stage.



2021 Model

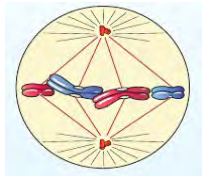
**3 Marks Questions**

1. Observe the given diagram of cell division.



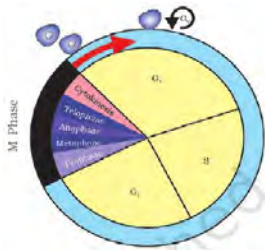
- Identify the stage.
- Label the parts A and B.
- Mention any one peculiarity of the pachytene stage of mitosis. *2012 March*

2. Observe the diagram given below representing a stage of mitosis.



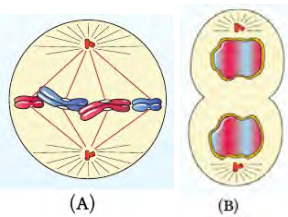
- Identify the stage.
- Distinguish it from corresponding stage of meiosis-I
- Mention the role of spindle fibres in Mitosis. *2012 Imp.*

3. A diagrammatic view of a cell cycle is given below.



- Identify the phase in which;
  - DNA synthesis takes place
  - Chromosomes are arranged at the equator of the spindle
- Mention two significant points of mitosis in the life of an organism. *2013 March.*

4. Observe the following phases of nuclear division during mitosis and answer the following questions.

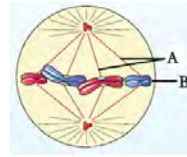


- Name the two phases of A and B
- What are the main events occurring in these two stages? *2013 Imp.*

5. Prophase of the first meiotic division is typically longer and complex. It has been further subdivided into five phases. The major events of these sub-phases are given below.

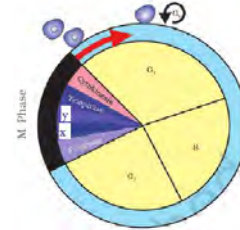
- Pairing of homologous chromosomes
  - Terminalization of chiasmata
  - Crossing over occurs
  - Chromosomes are visible under a light microscope.
  - Formation of chiasmata
- Identify the stages a,b, c, d and e
  - Arrange these stages in correct order of occurrence *2014 March*

6. The diagram shown below represents a stage in mitosis.



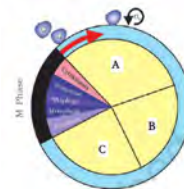
- Label the parts A and B
- Identify the stage
- Mention any two events occurring in this stage *2014 Imp.*

7. Observe the diagrammatic view of a cell cycle and answer the questions.



- Identify the phase in which DNA synthesis takes place
- Mention any one event that takes place in the stages marked as 'x' and 'y' *2015 March*

8. Observe the diagram related with cell cycle. Identify and describe A, B and C in the diagram (**Hint** : Description of one point each from A,B and C)



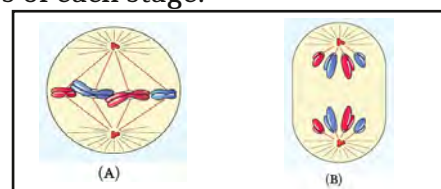
**OR**  
Write five sub-stages in prophase-I of meiosis. Point out in which sub-stage crossing over occurs. *2015 Imp.*

- Identify the substage of meiosis in which crossing over occurs
  - Leptotene
  - Zygotene
  - Pachytene
  - Diplotene
- Summarise the significance of meiosis in sexually reproducing organisms. *2016 March*

10. Identify the substages of Prophase I of meiosis in which the following events takes place. Mention any two significance of meiosis.

- Dissolution of the synaptonemal complex
- Crossing over
- Pairing of homologous chromosomes
- Terminalization of chiasma *2016 Imp.*

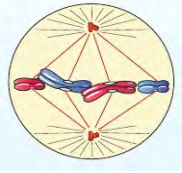
11.Observe the diagrams. Identify the A and B stages of mitosis. Write any two identifying features of each stage.



*2016 Imp.*

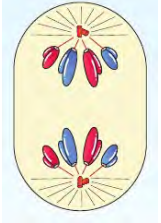


12. Given below is the metaphase of mitosis. Analyse the diagram and draw a sketch of anaphase. Write any two events of anaphase.



2017 March

13. Observe the figure.



- Identify the above stage of mitosis.
- Name the preceding stage of the above stage. Write its main events.

2018 Model

14. First phase of meiosis I is typically longer and complex one. Name it. Mention the five subdivisions of this phase.

2018 March

15. Certain stages in cell cycle are given below.

**Karyokinesis, Prophase, Cytokinesis, Metaphase, Anaphase, Telophase.**

Choose the statements (from those given below) that match with these stages and prepare a table.

- Centromere split and chromosomes move to opposite poles.
- Chromosomes cluster at opposite poles and nuclear envelope assembles around.
- Chromosomes seem to be with two chromatids attached at centromere.
- Chromosomes arranged at spindle equator.
- Separation of daughter chromosomes.
- Division of cytoplasm.

2018 March

16. Meiosis ensures the production of haploid gametes in diploid organisms.

- Why is meiosis called reduction division?
- Write any two major significance of meiosis.

2018 2nd term

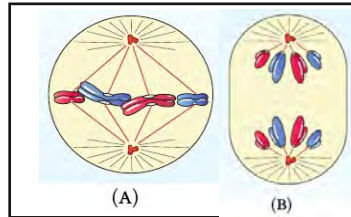
17. The five phases of Prophase I of Meiosis I are given in the box. Select the correct phase and place them suitably in the column B.

Zygotene, Leptotene, Diplotene, Diakinesis, Pachytene

A	B
Synapsis Occur	i
Appearance of recombination nodule	ii
Terminalization of Chiasma	iii

2019 Model

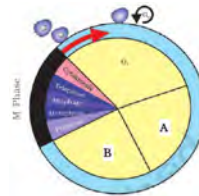
18. Analyse the diagrams given below representing two stages of mitosis.



- Identify the stages A and B.
- Write two key features of each stages A and B.

2019 2nd term.

19. Observe the given figure of cell cycle :



- Write the name of phases marked as A and B.
- Write one important event in A and B.

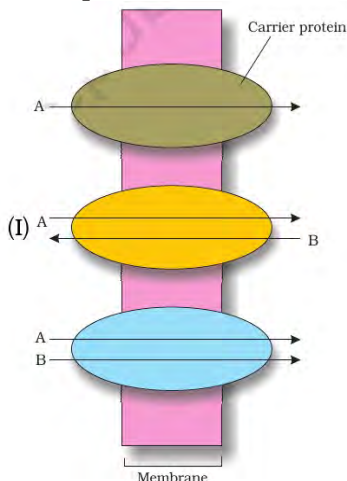
2021 Model

Chapter 7 - Transport in plants

1Mark Questions

1. Observe the figure given below:

Write the process labelled as 'T'

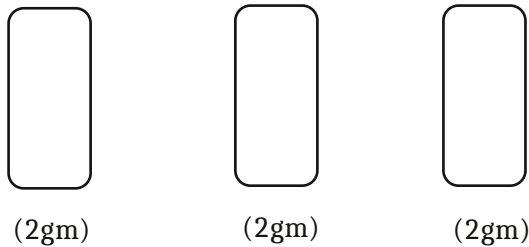


2020 Imp.

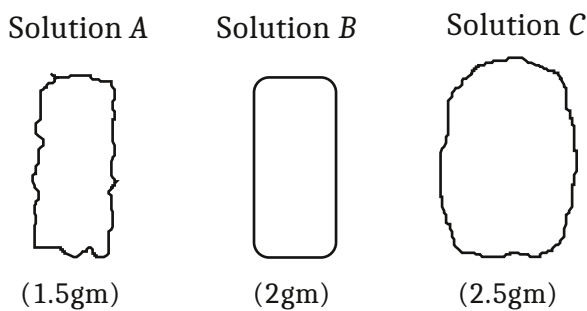
**2 Marks Questions**

1. Three potato pieces of equal weight (2 gm) were left in three types of solutions (A, B and C) overnight. The weight change of potato pieces are as shown in the figure.

**Before putting in the solution:**



**After putting in the solution:**



- a) Identify the solutions A and C.
- b) Discuss the reason for not having any change in the piece put in solution B. 2012 March

2. Suggest reason for the following:
  - a) In tomato plants drops of water are seen along leaf margins in the morning.
  - b) Farmers remove leaves of banana plants before planting. 2012 Imp.

3. 'Unlike water, all minerals cannot be passively absorbed by roots'.  
Write any two reasons to justify the above statement. 2013 March

4. Proteins in the membrane are responsible for facilitated diffusion and active transport and hence both show common characteristics. List any two such characteristics. 2013 March

5. Match the following:

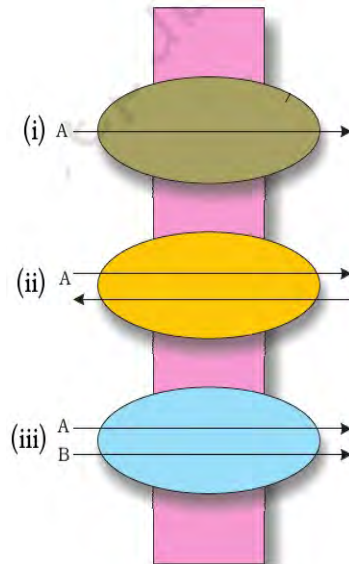
- | A                       | B                      |
|-------------------------|------------------------|
| a) Apoplast             | Phloem transport       |
| b) Transpiration        | Semipermeable-membrane |
| c) Mass flow-hypothesis | Cell wall              |
| d) Osmosis              | Stomata                |
- 2013 Imp.

6. Transpiration has more than one purpose in plants. Write any one purpose of transpiration in plants and list any two factors that affect this process. 2015 March

7. Define imbibition and give one example studied by you. 2015 Imp.

8. How can you differentiate active transport from facilitated diffusion? 2016 March

9. Observe the diagram and identify the phenomenon that helps in the transport of molecules in plants. Also mention the three types of movement of molecules shown in the diagram as (i), (ii) and (iii).

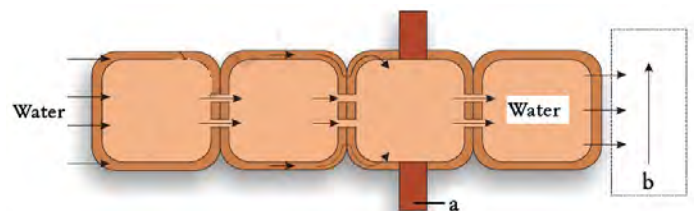


2016 Imp.

10. The movement of water through the root layers is ultimately symplastic in the endodermis. Give reason. 2017 March

11. A cell when placed in a concentrated sucrose solution, shrink after a few hours. Identify the physical phenomenon that leads to the shrinkage of cell and justify your answer. 2017 Imp.

12. Observe the figure given below:

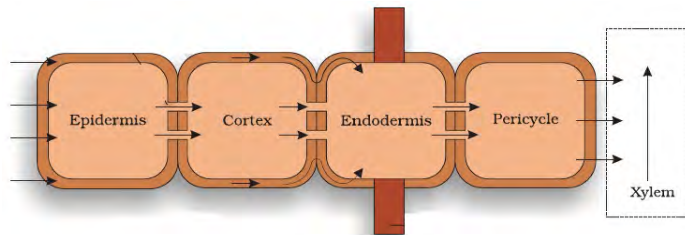


- (i) Identify the parts (a) and (b)
- (ii) The movement of water through the root is ultimately symplastic in the endodermis. Give reason. 2017 2nd term

13. Water from the root hairs move deeper into the root layers by two pathways. Name the two pathways. Which pathway is blocked in the endodermis? Give reason. 2018 Model

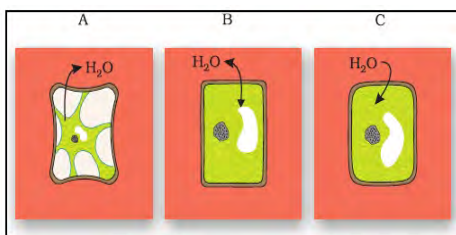


14. State any four features of facilitated diffusion. 2018 March
15. How can you differentiate guttation from transpiration? 2018 2nd term
16. "Unlike water, all minerals cannot be passively absorbed by the roots" Justify this statement with two reasons. 2018 2nd term
17. Given below is the diagram showing pathways of water movement in roots. Identify the pathways.



2018 2nd term

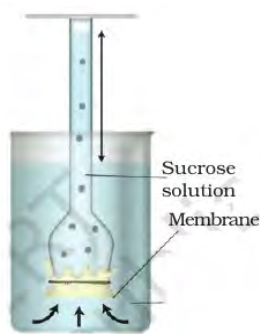
18. Observe the given plant cells A, B, and C. Briefly explain the physiological processes which occur in all these cells.



2018 2nd term

19. Write down the physiological phenomenon behind Guttation. Differentiate Guttation and Transpiration. 2019 Model

20. Observe the figure given below:



Identify the process demonstrated in the figure.

Write the role of membrane in this process.

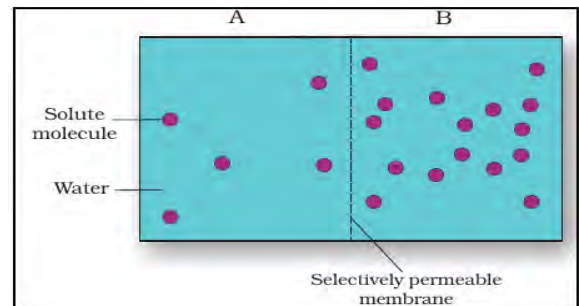
2019 March

21. Though transpiration results in loss of water, it has many purposes. List out any four advantages of transpiration. 2019 Imp.

22. Differentiate between Apoplastic and Symplastic pathways of movement of water in plants. 2019 2nd term

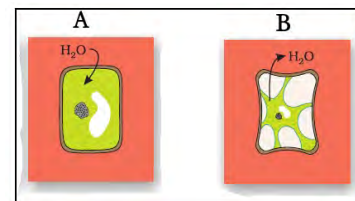
23. Transpiration has more than one purpose in plants. Write any two purposes of transpiration. 2019 2nd term

24. Analyse the figure given below and answer the following questions.



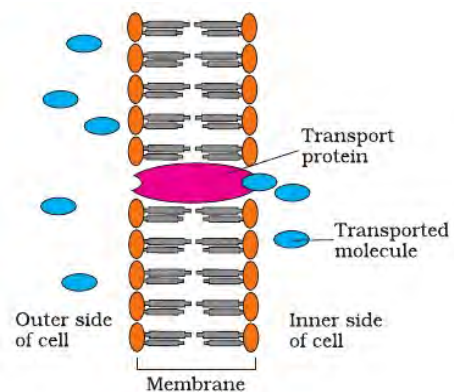
- a) Solution of which chamber has a lower water potential.
- b) Solution of which chamber has a lower solute potential.
- c) In which direction will osmosis occur?
- d) What is osmosis? 2019 2nd term

25. The behaviour of plant cells with regard to water movement depends on the surrounding solution. Explain the changes occur in cells A and B.



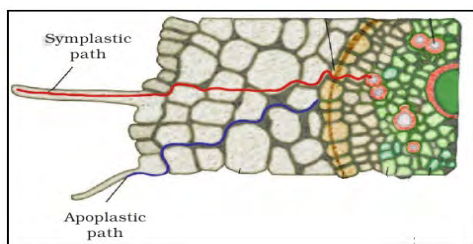
2020 Model

26. Observe the figure given below:



- (a) Name the process.
- (b) Define the above identified process. 2020 March

27. Observe the figure illustrating the pathway of water movement in root. Differentiate apoplastic and symplastic pathways.



2020 Imp.

- 28.(a) Define imbibition.

(b) Write one benefit of imbibition to plants.

2021 Model

29. Write any two purposes of transpiration.

2021 Model

## Chapter 8 - Mineral Nutrition

## 1 Mark Questions

1. Nitrogen in the atmosphere exist as  $N_2$  ( $N = N$ ). But it cannot be absorbed by plants as such. So it is converted into ammonia ( $NH_3$ ) by microorganisms and get fixed in the soil.

a) Name the enzyme in the microorganisms which helps to convert nitrogen into ammonia.

b) What is the role of leg-haemoglobin in this process? 2013 Imp.

2. Chlorophyll contain a metallic element.

a) Name the metallic element.

b) Mention any one deficiency symptom of that element. 2013 Imp.

3. The deficiency symptoms of macroelements like calcium tend to appear first in young tissues. Why? 2014 March

4. 'Ammonia is first oxidized to nitrite and the nitrite is further oxidized to nitrate'. Name the process. Give any one example of a bacterium which is involved in this process. 2014 March

5. The process of conversion of molecular nitrogen to ammonia is termed as..... 2020 Model

6. Name the Pigment that gives pink colour to root nodules of Leguminous plants. 2021 Model

2. The biochemical assay of some plants indicates the presence of Gold, Vanadium, Silicon etc. But these elements are not considered as essential elements. Comment. 2012 Imp.

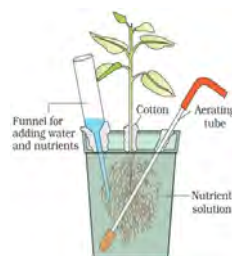
3. 'In a plant, deficiency of  $N_2$  is visible in older parts and that of  $Ca$  is visible in younger parts'. Critically evaluate the statement. 2013 March

4. If you cut through the root nodules of a pea plant, you will notice that the central portion is red or pink.

a) What makes the nodule pink?

b) Mention the role of this pink pigment 2014 March

5. Observe the diagram given below.



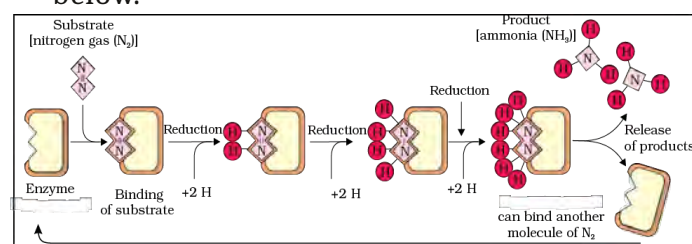
a) Name the technique.

b) Write two advantages of this technique.

2014 Impr.

6. Eventhough more than sixty elements are seen in different plants, all are not essential. Write any two criteria for the essentiality of an element. 2015 March

7. Steps of conversion of atmospheric Nitrogen to Ammonia by Nitrogen fixing bacteria are given below.



Name the key enzyme in that reaction and point out the relationship between the key enzyme and leg-haemoglobin. 2015 Imp.

## 2 Marks Questions

1. a) Carotenoids are responsible for the pink colour of root nodule in pea plant. Correct this false statement.  
b) The pigment present in root nodule is called "Oxygen scavenger" Justify. 2012 March

8. The plants show deficiency symptoms when the concentration of an essential element is below the critical concentration. Write any four deficiency symptoms shown by plants.

2016 March

9. About 16 elements are found to be needed for the normal growth and development in plants.. Mention the three important criteria for the essentiality of an element and name the element forming the structural component of chlorophyll molecule.

2016 Imp.

10.The root nodules of leguminous plants contain two necessary biochemical compounds of  $N_2$  fixation. Identify these compounds.

2017 March

11.Ammonia is used to synthesise amino acids in plants in two ways. Name the two ways of synthesis of amino acids.

2017 Imp.

12.Names of certain essential elements are given below:

**Potassium, Manganese, Molybdenum, Copper, Magnesium**

Choose the macro nutrients and write one function of each of them

2018 Model

13.Plants are adversely affected by manganese toxicity. Mention the effects of manganese toxicity in plants.

2018 March

14.The element is said to be deficient when present below the critical concentration. What is critical concentration? State any two kinds of deficiency symptoms shown by plants.

2018 Imp.

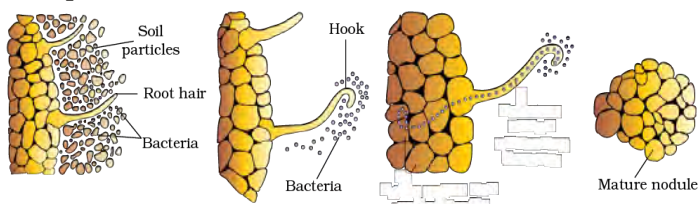
15.Amides contain more nitrogen than the amino acids. Name two important amides found in plants and explain their formation.

2018 Imp.

16.How can we classify essential elements on the basis of their diverse functions?

2018 2nd term

17.Diagrammatic representation of development of root nodules in pea plant is given below. Observe the figure and write down the different steps involved.



2019 Model

18.Observe the elements given below:

Copper, Phosphorus, Boron,  
Magnesium, Potassium,  
Manganese, Chlorine

Choose microelements from the above.

2019 March

19.Observe the diagram given below.

a) Identify the type of plant culture.

b) Write any two uses of this culture.



2019 Imp.

20.Ammonium ions are quite toxic to plants, so ammonium ions are used to synthesise amino acid. Describe the main two ways of amino acid synthesis in plants.

2019 2nd term

21.What is the difference between nitrification and denitrification in Nitrogen cycle

2020 Model

22.Define hydroponics. Write one advantage of it.

2020 March

23.Match Column-A with Column-B:

Column-A Element	Column-B Function
(i) Phosphorus	(a) Nitrogen metabolism
(ii) Potassium	(b) Synthesis of auxin
(iii) Molybdenum	(c) Opening and closing of stomata
(iv) Zinc	(d) Phosphorylation reaction

2020 Imp.

24.Nodules present in the roots of leguminous plants contain special pigment.

(a) Name the pigment.

(b) Write the function of that pigment.

2020 Imp.

**3 Marks Questions**

- Essentiality of an element is determined through certain criteria.
  - Write any two criteria determining the essentiality of elements.
  - Name the technique of growing plants in a nutrient solution. *2017 2nd term*
- Write the three criteria for essentiality of an element. *2019 2nd term*
- The essentiality of an element to plants is determined by three criteria. Which are they? *2021 Model*

**Chapter 9 - Photosynthesis in Higher Plants****1 Mark Questions**

- C<sub>4</sub> cycle is so called because of the presence of a C<sub>4</sub> acid.
  - Name the C<sub>4</sub> acid.
  - Name the leaf anatomy present in C<sub>4</sub> plants. *2014 Imp.*
- The reaction centre of photosystems in green plants during light reaction is.....
  - Xanthophyll
  - Carotenoids
  - Chlorophyll *b*
  - Chlorophyll *a* *2016 March*
- An enzyme present in plants, which shows carboxylation and oxygenation activity. Identify the enzyme. *2017 Imp.*
- Choose the correct answer.  
Law of limiting factors is proposed by,
  - Cornelius Van Niel
  - Blackman
  - Joseph Priestley
  - Engelmann *2018 Model*
- Choose the correct answer from the bracket.  
First stable product of carbondioxide fixation in C<sub>4</sub> plant is...  
**(PGA, OAA, PEP, RUBP)** *2018 March*
- Observe the relationship between first two terms and fill in the blank.
 

C <sub>4</sub> plants	:	PEPcase	
C <sub>3</sub> plants	:	.....	<i>2018 Imp.</i>
- Choose the correct answer.  
The primary acceptor of carbon dioxide(CO<sub>2</sub>) in C<sub>3</sub> plants :
  - PEP
  - RuBP
  - PGA
  - OAA *2019 Model*

**2 Marks Questions**

- An anatomist observed a peculiar type of large spherical bundle sheath cells in sugarcane leaf and a physiologist identified the presence of PEP carboxylase in that leaf mesophyll.
  - Name the peculiar leaf anatomy.
  - Explain the physiological advantages of such type of plants. *2012 March*
- 'Photorespiration is a curse to plants'
  - Evaluate this statement.
  - Find the reason for this event to takeplace. *2012 March*
- 'There is a clear division of labour within the chloroplast.'  
Substantiate the given statement with an explanation stating two points. *2015 March*
- Photosynthesis can be considered as the most significant physicochemical process on earth. Evaluate this statement citing any two significances. *2015 March*
- C<sub>4</sub> plants have special features. List out any four specialities of C<sub>4</sub> plants compared to C<sub>3</sub> plants. *2015 March*
- Write any four peculiarities of 'Z scheme' electron transport in light reaction. *2015 Imp.*
- Name the following in C<sub>4</sub> pathway in C<sub>4</sub> plants:
  - Leaf anatomy,
  - Primary CO<sub>2</sub> acceptor,
  - Enzyme responsible for primary CO<sub>2</sub> - fixation,
  - First C<sub>4</sub> acid formed in mesophyll cells. *2015 Imp.*



8. Light reaction involve cyclic and non-cyclic electron transport. Classify the features given below under the above stages of light reaction.

- a) Only pigment system I is involved
- b) ATP and NADPH are formed
- c) Splitting of water occurs
- d) Only ATP is formed

Cyclic electron transport	Non-cyclic electron transport

2016 Imp.

9. Chemiosmosis theory of photosynthesis requires a proton gradient for ATP synthesis to occur. Explain any two events that causes proton gradient.

2016 Imp.

10. An important difference between  $C_3$  and  $C_4$  plants is photorespiration. Explain how photorespiration occurs in  $C_3$  plants.

2017 March

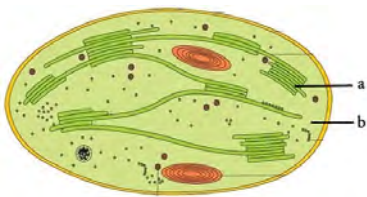
11. Define Blackman's law of limiting factors and identify any two important factors which influence the rate of photosynthesis in plants.

2017 March

12. Certain thylakoid pigments are called accessory pigments. Name them. Write their significance.

2019 March

13. Observe the figure given below.



Identify the parts a, b. Write their functions.

2019 March

14.  $C_4$  plants have a special leaf anatomy. Name that anatomy. Write three peculiarities of this kind of anatomy.

2019 March

15. Plants that are adapted to dry tropical regions have the  $C_4$  pathway. Write any two advantages of  $C_4$  plants over  $C_3$  plants.

2019 Imp.

16. RuBisCO is the most abundant enzyme in the plant world. How does RuBisCO involve in photorespiration?

2019 Imp.

17. Plants that are adapted to dry tropical regions have the  $C_4$  pathway. Write any two advantages of  $C_4$  plants.

2020 Model

18. Define "The law of limiting factors". Write any two external factors which directly affect the rate of photosynthesis.

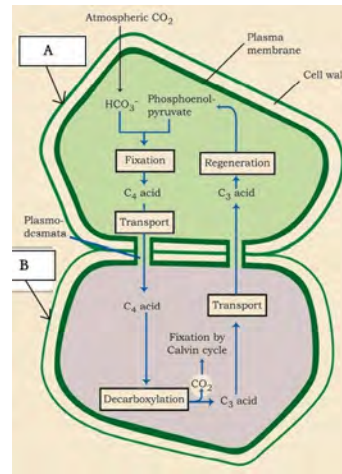
2020 Model

19. Analyse the table given below and fill in the blanks a, b, c, d.

Process	Cyclic photophosphorylation	Non-cyclic photophosphorylation
Movement of electrons	Cyclic	_____ (a) _____
Number of photosystems	_____ (b) _____	_____ (c) _____
Splitting of water	_____ (d) _____	Absent

2020 March

20. Observe the given figure showing  $C_4$  pathway.



- (a) Identify the cells A and B.
- (b) Name the  $C_4$  acid formed through this pathway.
- (c) Name the enzyme involved in the formation of  $C_4$  acid.

2020 March

21. Notice the three stages of Calvin cycle given below.

**Reduction, Regeneration, Carboxylation**

- (a) Arrange the above stages in correct order.
- (b) Calvin cycle is also known as  $C_3$  cycle (pathway). Give reason.

2020 March

22. Light reaction and dark reaction are the two stages of photosynthesis. Write the differences between light reaction and dark reaction.

2020 Imp.

23. Analyse the table and fill in the blanks.

Characteristics	C <sub>3</sub> Plants	C <sub>4</sub> Plants
Primary CO <sub>2</sub> acceptor	_____ (a) _____	PEP
Primary CO <sub>2</sub> fixation product	_____ (b) _____	OAA
Leaf anatomy	Normal anatomy	_____ (c) _____
Example	Hibiscus	_____ (d) _____

2020 Imp.

24. Write any two differences between Cyclic and Non-cyclic photophosphorylation.

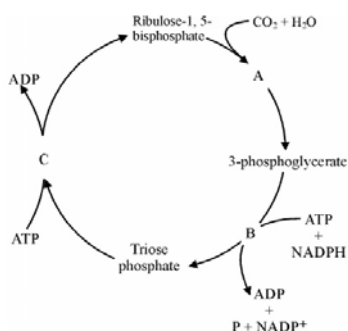
2021 Model

25. (a) Write the name of two phases of Photosynthesis.

(b) Which are the sites of these phases in chloroplast?

2021 Model

26. Observe the figure of Calvin cycle given below:



(a) Write the name of three major events marked as A, B and C.

(b) Find out the name of first CO<sub>2</sub> acceptor given in the figure.

2021 Model

27. (a) What is 'Kranz' anatomy?

(b) Write two examples of plants that exhibit 'Kranz' anatomy.

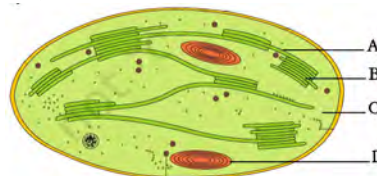
2021 Model

2. RuBisCo is an enzyme that catalyse two entirely different processes.

a) Which are the processes?

b) In which process, chloroplast alone is used as cell organelle?

c) Label the parts A, B, C, D in the given diagram.



2013 Imp.

3. The light reaction of photosynthesis is divided into two reactions. They are cyclic and non-cyclic photophosphorylation. Mention any three difference between cyclic and non-cyclic reactions.

2014 Imp.

4. a) Name the special type of leaf anatomy shown by C<sub>4</sub> plants.

b) Illustrate the major advantages of C<sub>4</sub> plants over C<sub>3</sub> plants.

2016 March

5. Photophosphorylation takes place during photosynthesis.

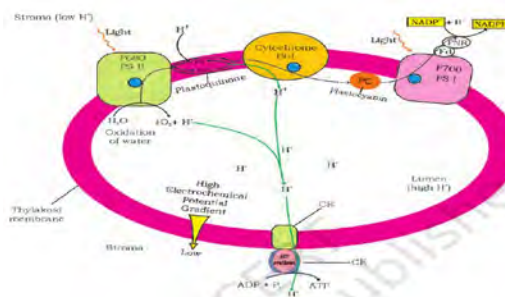
a) Name the types of photophosphorylation.

b) Distinguish between them.

(Hint: Any two differences)

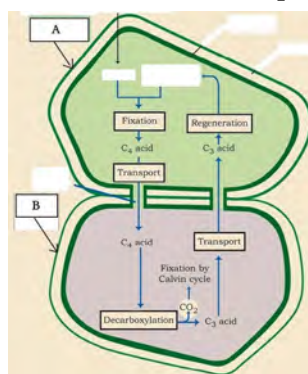
2017 Imp.

6. Observe the given figure and describe the process of ATP synthesis



2017 Imp.

7. Observe the diagrammatic representation of Hatch and Slack pathway given below.



Identify the cells A and B. Explain the process of formation of C<sub>4</sub> acid specifying the enzyme involved.

2018 Model

3 Marks Questions

1. Light reaction of photosynthesis is divided into two processes. In one process the electrons emitted will return to the place from where it is emitted.

a) What are the names of these two processes?

b) What happens to the electrons in the second phase?

c) Explain it with schematic representation.

2013 Imp.

8. Photosynthesis is a process influenced by environmental factors as well as plant factors. Mention three factors under each category.

2018 March

9. Arrange the following events in the appropriate boxes.

- a) Formation of ATP and NADPH<sub>2</sub>.
- b) Only photosystem I is functional.
- c) Formation of ATP only.
- d) Both photosystem I and photosystem II are involved.
- e) Splitting of water.
- f) No oxygen release.

Cyclic photophosphorylation	Non-cyclic photophosphorylation

2018 Imp.

10. Name and explain the structure of cell organelle that is involved in photosynthesis.

(Hint : Write four structural features)

2018 Imp.

11. Salient features of light reaction and dark reaction of photosynthesis are given below.

Arrange them in corresponding columns.

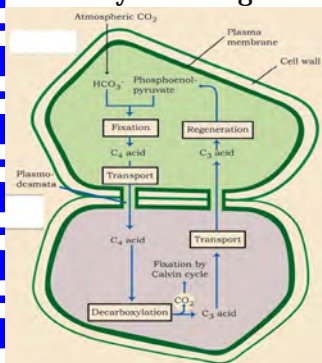
- Take place in Stroma.
- Photochemical phase.
- ATP and NADPH are utilised.
- Biosynthetic phase.
- ATP and NADPH are produced.
- Take place in Grana.

Light reaction	Dark reaction

2019 Model

12. Diagrammatic representation of Hatch and Slack pathway is shown below.

Analyse the figure.



- (a) Name the cells involved in this pathway.
- (b) Identify the special type of anatomy present in the leaves of C<sub>4</sub> plants.
- (c) Name two plants which show Hatch and Slack pathway

2019 Model

13. Transport of electrons through ETS of the chloroplast results photophosphorylation. Write any three differences between cyclic and non-cyclic photophosphorylations.

2019 Imp.

14. C<sub>4</sub> plants have large cells around the vascular bundles of leaves called bundle sheath cells.

- (a) What is this anatomy called?
- (b) Write any two features of bundle-sheath cells.

2020 Model

15. Melvin Calvin discovered CO<sub>2</sub> fixation in green plants.

- (a) Which are the three main stages of Calvin cycle?
- (b) Name the enzyme catalysing first stage of this cycle.
- (c) What is the peculiarity of this enzyme?

2020 Imp.

**4 Marks Questions**

1. Light reaction and dark reaction are the two stages of photosynthesis.

- a) Where does light reaction occurs?
- b) What are its end products?
- c) Comment on their roles in dark reaction.

2012 Imp.

2. C<sub>4</sub> plants are adapted to overcome a wasteful process found in C<sub>3</sub> plants and hence productivity and yields are better in these plants.

- a) Name the wasteful process found in C<sub>3</sub> plants.
- b) Identify the cells involved in C<sub>4</sub> pathway.
- c) Write any two differences between C<sub>3</sub> plants and C<sub>4</sub> plants.

2013 March

3. Light reaction is otherwise called photophosphorylation.

- a) Justify the statement.
- b) Locate the site of this reaction.
- c) Write any two differences between cyclic photophosphorylation and non-cyclic photophosphorylation.

2013 March

4. Plants that are adapted to dry tropical regions have a special type of  $\text{CO}_2$  fixation in addition to  $\text{C}_3$  cycle.
- Name this pathway.
  - Can you identify any speciality in the leaf anatomy of such plants? If so, what is this anatomy called?
  - Which is the primary  $\text{CO}_2$  acceptor in this pathway?
  - Write any one advantage of such plants over  $\text{C}_3$  plants.
- 2014 March
5. The use of radioactive  $\text{C}^{14}$  by Melvin Calvin in algal photosynthesis studies led to the discovery of  $\text{CO}_2$  fixation in green plants.
- Identify the first stable product in this  $\text{CO}_2$  fixation cycle.
  - Which are the three main stages of this cycle?
  - Workout how many ATP and NADPH molecules will be required to make one molecule of glucose.
- 2014 March

## Chapter 10 - Respiration in Plants

## 1 Mark Questions

- Aerobic respiration and anaerobic respiration starts with a common pathway. Identify the pathway and its end product. 2012 Imp.
- Anaerobic respiration is also occurs in animal cells. Suggest an occasion for this. 2014 March
- Out of the four statements given below related to respiration, the correct statements are;
  - Though respiration has traditionally been considered as a catabolic process, it would be better to consider it as an amphibolic pathway.
  - In muscles when oxygen is inadequate, lactic acid is reduced to pyruvic acid.
  - When fats are used in respiration, the RQ is greater than one.
  - In respiration, the energy of oxydation-reduction is utilised for phosphorylation.
  - i) and ii)
  - ii) and iii)
  - iii) and iv)
  - i) and iv)2015 March
- Fill in the blank.  
The number of carbon atoms in Acetyl co-enzyme A, which take part in Krebs's cycle is \_\_\_\_\_.  
2020 March

## 2 Marks Questions

- Analyze the given statements and correct them with respect to the underlined words.
  - Respiration is an anabolic pathway.
  - The site of percepton of light by a plant for a photoperodic response is a flower.(Chapter 11)  
2013 March
- Mention the fate of pyruvic acid in respiration. (Hint : Any two points) 2015 Imp.
- The following compounds are intermediates in Glycolysis or in Krebs's cycle. Write them in the proper column of the table.  
**Fructose - 6 - phosphate, Citric acid, Phospho enol pyruvate, Malic acid.**

Glycolysis	Krebs's cycle

2015 Imp.
- "Respiration is an amphiboic pathway". Evaluate the statement. 2016 March
- Fermentation is the incomplete oxidation of pyruvic acid. Find the difference between two types of fermentations in microorganisms. 2016 March
- Match the following.
 

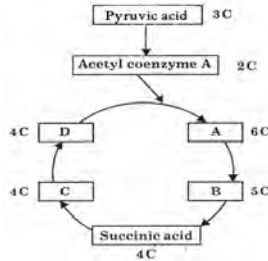
A		B	
a)	Somatal closure	i)	Cytoplasm
b)	Citric acid	ii)	Plasticity
c)	Glycolysis	iii)	Ethylene
d)	Heterophilly	iv)	Krebs's cycle
		v)	ABA

2016 Imp.



7. Glycolysis is the common phase in both aerobic and anaerobic respiration. Where does it take place and what is the end product of glycolysis?  
2017 Imp.

8. The figure showing the pathway of Tricarboxylic acid cycle is given below. Name the compound present in the position of A, B, C and D.



2017 Imp.

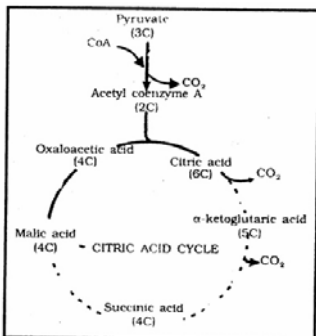
9. Certain compounds formed during Kreb's cycle are given below. Draw Kreb's cycle using the compounds.

Succinic acid, Acetyl CoA,  $\alpha$ -Ketoglutaric acid, Oxaloacetic acid, Malic acid, Citric acid

2018 Model

10. Carbohydrates and fats are respiratory substrates. But their RQ is different. Define RQ. Write the RQ of these substrates.  
2018 Model

11. Following figure shows the citric acid cycle.

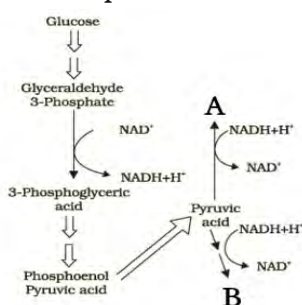


Identify the steps where FADH and GTP are synthesized.

2018 March

12. The breakdown of glucose to pyruvic acid is called glycolysis. Where does it occur in a cell? How many ATP molecules are directly synthesized during this process?  
2018 March

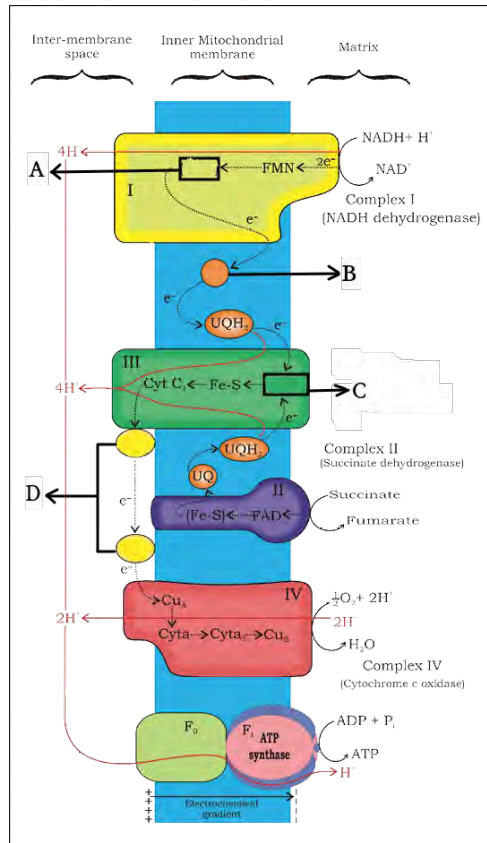
13. Observe the following pathways of anaerobic respiration.



Identify the products A and B. Give an example of organism in which any of these products are formed.

2018 Imp.

14. Observe the figure given below.

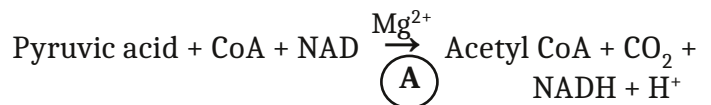


Fill in the blanks A, B, C and D with appropriate terms from the box given below.

Cyt c, Cyt b, FeS, UQ

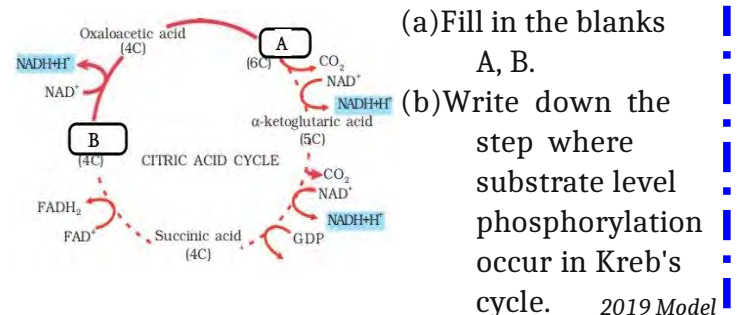
2018 Imp.

15. Observe the equation showing oxidative decarboxylation of pyruvic acid.

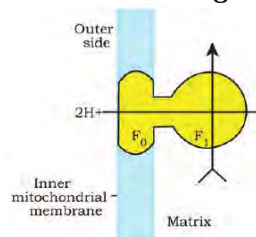


- (a) Name the enzyme labelled as "A"  
(b) Where does this reaction take place in cells?  
2019 Model

16. Observe the schematic representation of Kreb's cycle given below.



17. Observe the figure given below.



Name the complex. Write its function.

2019 March

18. Write any two differences between aerobic respiration and anaerobic respiration. *2019 March*

19. Match the items of column A with B.

A		B	
a)	Reduction	i)	Formation of oxygen
b)	Photolysis	ii)	Formation of 3-PGA
c)	Photorespiration	iii)	Formation of PEP
d)	Carboxylation	iv)	Formation of glucose
		v)	Formation of phosphoglycolate

*2019 March*

20. "There are several reasons why plants can get along without respiratory organs." Justify the above statement by citing two reasons. *2019 Imp.*

21. Glycolysis is the breakdown of glucose into pyruvic acid.  
 (a) Where does glycolysis occur in a cell?  
 (b) Why is glycolysis a partial oxidation? *2019 Imp.*

22. Differentiate lactic acid fermentation from alcohol fermentation. *2020 Model*

23. In glycolysis, ATP is utilized at two steps only. Write down these two steps. *2020 Model*

24. The first step in respiration is glycolysis.  
 (a) Define glycolysis.  
 (b) Write the site of glycolysis. *2020 March*

25. Aerobic respiration and anaerobic respiration are two types of respiration.  
 (a) What is anaerobic respiration?  
 (b) Write the change that occurs to pyruvic acid in yeast cells. *2020 March*

26. Observe the equation given below:



(a) Calculate the respiratory quotient of Glucose from the equation.  
 (b) What is respiratory substrate? *2020 March*

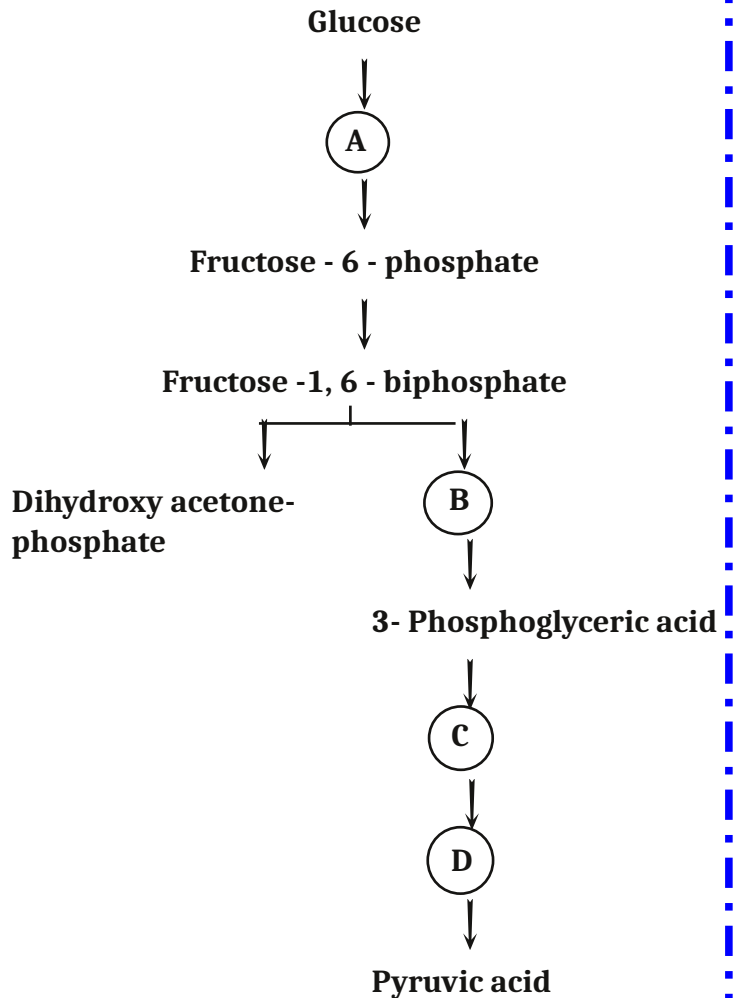
27. Observe the illustration given below and answer the following questions.  
 (a) Identify the cyclic pathway.  
 (b) Write the name of intermediate compounds marked as A, B & C. *2020 Imp.*



28. (a) What is fermentation?  
 (b) Which are the main products produced as a result of fermentation in (i) Yeast, (ii) Muscles? *2021 Model*

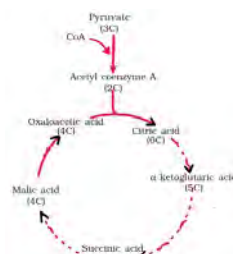
**3 Marks Questions**

1. Observe the incomplete schematic representation given below and answer the questions.



a) Identify this pathway common for both aerobic and anaerobic respiration  
 b) Complete the scheme by filling the boxes A, B, C and D  
 c) Mention the three ways in which different cells handle pyruvic acid produced by this pathway *2012 March*

2. Observe the illustration given below and answer the following questions.

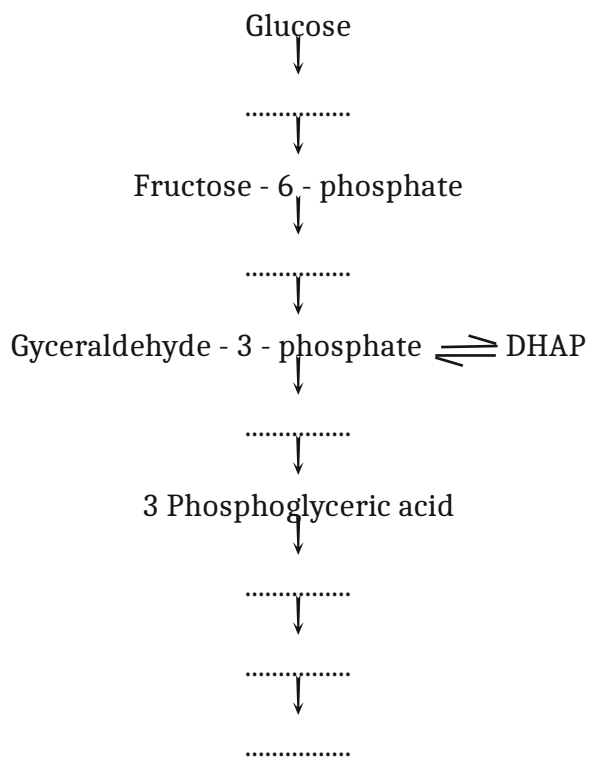


a) Identify the cyclic pathway.  
 b) Where does it occur?  
 c) Identify the steps of this pathway in which decarboxylation takes place. *2012 Imp.*

3. Breakdown of glucose in respiration is listed under glycolysis and Kreb's cycle.  
 a) Locate the site of glycolysis and Kreb's cycle in the cell.  
 b) Glycolysis is a partial oxidation process. Justify. 2013 March
4. Glycolysis is present in all organisms and it is the only process of respiration in anaerobic organisms.  
 a) What is glycolysis?  
 b) Where does glycolysis occur?  
 c) Glycolysis is a partial oxidation. Justify.  
 d) Calculate the total number of ATP molecules synthesised in glycolysis by the partial oxidation of one molecule of glucose. 2014 March

5. Two crucial events of aerobic respiration takes place in two parts of mitochondria. Locate the two parts and mention the two events in one or two sentences each. 2015 March
6. "There are several reasons why plants can get along without respiratory organs" Justify the statement giving three reasons. 2016 Imp.

7. Fill up the flow chart of glycolysis given below using the list of intermediary compounds given in the bracket.

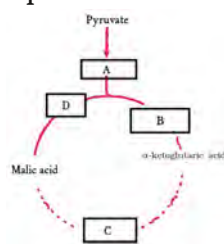


(Phosphoenol pyruvic acid,  
 Glucose - 6 - phosphate, Pyruvic acid,  
 Fructose -1,6 - biphosphate, 2 Phosphoglyceric acid, 1,3 Biphosphoglyceric acid) 2016 Imp.

8. (a) What is Respiratory Quotient (RQ) ?  
 (b) Write the RQ of (i) Carbohydrate,  
 (ii) Fat. 2021 Model
9. (a) Name the process which is common for Aerobic and Anaerobic respiration.  
 (b) Write the site of this process in cell.  
 (c) Write the name of the end product of this process. 2021 Model

#### 4 Marks Questions

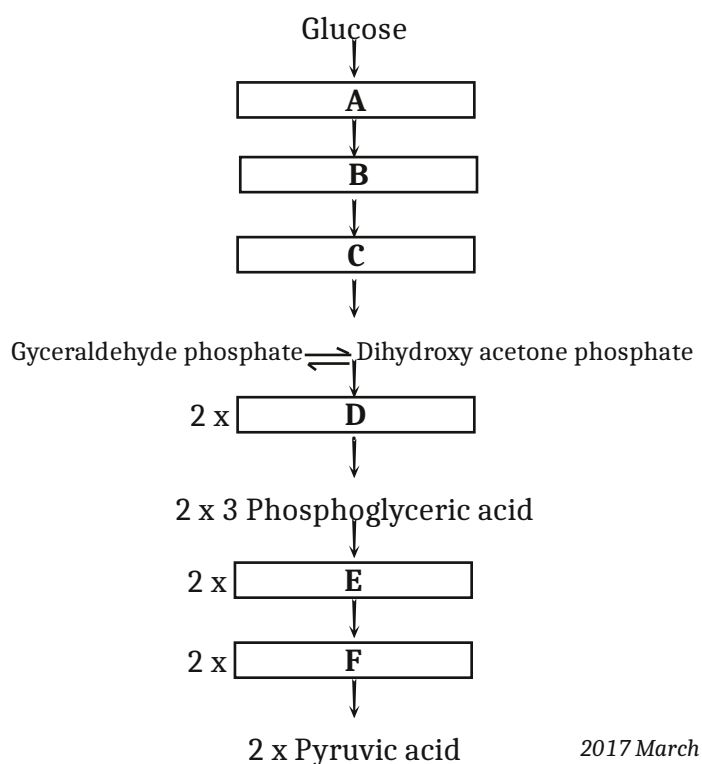
1. Observe the given figure and answer the questions.



- a) Identify the cycle and name the scientist who traced the pathway.  
 b) Complete the cycle by filling A, B, C & D in the boxes.  
 c) How many NADH and FADH<sub>2</sub> are yielded during the complete oxidation of one molecule of pyruvate by this pathway? 2012 March
2. Oxidative phosphorylation is an important event in cellular respiration.  
 a) Which organelle is associated with this process?  
 b) Name the phase of cellular respiration that is common to both aerobic and anaerobic condition  
 c) Draw the schematic representation of that phase. 2013 March

3. During terminal oxidation, electrons in the hydrogen atoms are transported to the oxygen through a series of electron carriers in ETS. The electron carriers are given below;  
**FMN, FAD, Ubiquinone, FeS, cyt a, cyt b, cyt c, cyt a<sub>3</sub> etc.**  
 a) Briefly explain ETS with schematic representation.  
 b) Where does ETS occur? 2013 March
4. Various compounds in the citric acid cycle are given below:  
 (Oxaloacetic acid, Citric acid, Succinyl CoA, Pyruvate, Acetyl CoA, Malic acid,  $\alpha$ -ketoglutaric acid, Succinic acid)  
 a) Arrange them in order and draw a complete cycle  
 b) Who traced this cycle?  
 c) Where does it take place? 2014 Imp.

5. The metabolic pathway through which electrons pass from one electron carrier to another is called electron transport system. Some electron acceptors are given below:  
(FeS, Cyt b, FMN, FAD, Cyt a, NADH, Ubiquinone, Cyt c, Cyt c<sub>3</sub>, H<sub>2</sub>O)
- Arrange them in the correct order
  - Name the site of ETS
  - What is the role of O<sub>2</sub> in ETS? 2014 Imp.
6. Glycolysis is the partial oxidation of glucose to produce two molecules of pyruvic acid.
- Where does glycolysis occur?
  - Steps of glycolysis are given below. Fill up the blank boxes.



## Chapter 11 - Plant growth and development

## 1 Mark Questions

- Based on the relationship fill in the blanks.
  - Cell division : Cytokinin  
Bolting : \_\_\_\_\_
  - Euglena : Protista  
Mycoplasma : \_\_\_\_\_ (Chapter 1)  
2012 Imp.
- Suggest the correct scientific term for the following:
  - Flowering on exposure to low temperature
  - Algal partner in lichens 2012 Imp.
- By observing the relationship of the first pair, fill in the blanks of the second pair.
  - F.W.Went : Auxins : :  
E.Kurosawa : .....
  - Auxins : Apical dominance : :  
.....: Overcome apical dominance. 2014 March
- In certain plants, a tolerance to various kinds of stresses such as severe drought can be overcome by the production of a hormone. Name this hormone. 2014 Imp.



- Who among the following scientists is related with the identification of cytokinins?  
 a) E.Kurosawa      b) F.Skoog  
 c) C.Darwin        d) F.W.Went      *2017 March*
- A simple gaseous Plant Growth Regulator (PGR) is.....  
*2019 Imp.*
- Choose the only one growth inhibiting plant hormone among the following options:  
 (a) ABA              (b) NAA  
 (c) IAA              (d) 2,4-D      *2020 Model*
- Name the plant hormone known as 'Stress hormone'.  
*2021 Model*

- Auxin and Gibberellins are two important growth hormones that control plant growth. Write any two important functions of each of these hormones.  
*2016 Imp.*
- Write any four agricultural applications of ethylene.  
*2017 March*
- Ethylene is a gaseous hormone. Describe its four different actions in plants.  
*2017 Imp.*
- Write a note on the phenomenon plasticity exhibited by plants with an example.  
*2018 March*
- Analyse the table and fill in the blanks labelled as A and B.

**2 Marks Questions**

- Artificial phytohormones are widely used in agriculture.  
 a) Name any two artificial phytohormones  
 b) Mention their importance in agriculture  
*2012 Imp.*

Differentiation	_____ A _____
_____ B _____	Differentiated cell which have lost capacity to divide, regain the capacity of division

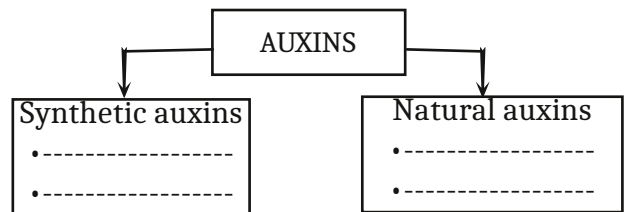
- Match the following:

a) Auxin	i) Fruit ripening
b) Gibberellins	ii) Stomatal closure
c) Cytokinins	iii) Root initiation
d) Ethylene	iv) Bolting
	v) Overcome apical dominance

*2013 March*

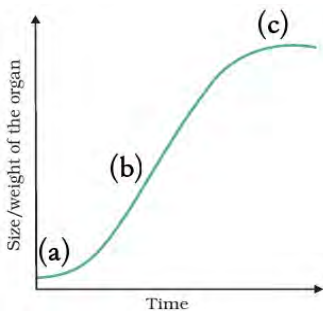
- Which one of the plant growth regulators would you use if you are asked to do the following processes?  
 a) Induce parthenocarpy  
 b) Quickly ripen a fruit  
 c) Induce immediate stomatal closure in leaves  
 d) To increase the length of grape stalks  
*2014 March*

- Draw the given flow chart in your answer sheet. Fill the blank columns.



*2019 Imp.*

- Observe the graph:



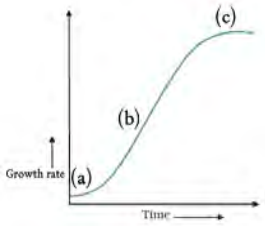
The graph represents the different phases of growth. Name the growth curve and identify the different phases of growth represented in the diagram as (a), (b) and (c)

*2014 Imp.*

- Many plants show plasticity during their lifespan.  
 (a) What is plasticity?  
 (b) Give one example.  
*2019 Imp.*
- Ethylene is one of the most widely used Plant Growth Regulator in Agriculture. Write any two agricultural applications of ethylene.  
*2020 Model*
- (a) Write the name of the growth curve seen in the given figure.  
 (b) Write the name of phases marked as A and B.  
*2021 Model*

## 3 Marks Questions

1. Given below is the growth curve of a plant. Observe it and answer the questions.



- a) Name the growth curve  
b) Label (a) and (c) phases of growth in the growth curve  
c) When the tip of cassava plant is lost, a number of lateral branches grow from the nodes below. Explain this phenomenon and specify the hormone responsible for this.

2012 March

2. Given are certain physiological effects. Name the plant hormones responsible for them.

- a) Increase in stem length  
b) Apical dominance  
c) Closure of stomata  
d) Ripening of fruits  
e) Bolting  
f) Active cell division

2013 Imp.

3. Apical dominance and bolting are two physiological phenomena shown by the plants due to the activity of two growth regulators.

- i) The growth regulators concerned are;  
a) Apical dominance : .....  
b) Bolting : .....

- ii) Distinguish between the two phenomena.

2015 March

4. Match the following:

A	B
a) Auxin	i) Delay of leaf senescence
b) Gibberellin	ii) Promotes senescence
c) Cytokinins	iii) Promotes bolting
	iv) Apical dominance

2015 Imp.

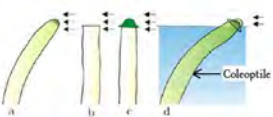
5. a) Identify the odd one from the given list of plant growth regulators.

- i) ABA      ii) NAA  
iii) IAA      iv) IBA

- b) List some physiological responses of gibberellins in plants.

2016 March

6. Observe the figure given below:



- a) Source of which plant hormone is indicated in the figure?

- b) Write four roles of above identified hormone.

7. Plant growth regulators can be employed for various agricultural and horticultural practices. Identify the growth regulators that can be used for the following purposes.

- a) To have weedfree lawns  
b) To increase sugarcane length  
c) Fruitset in pineapples  
d) Rooting in stem cuttings  
e) Inhibiting seed germination  
f) To promote female flowers in cucumber

2018 March

8. There are certain seeds which fails to germinate even under favourable external conditions. This is called seed dormancy.

- a) State any two reasons for seed dormancy.  
b) Suggest two manmade measures for breaking seed dormancy.

2018 Imp.

9. Plant growth regulators perform various functions in plant body.

- a) Name the hormones responsible for apical dominance and bolting. Define the phenomena.  
b) Which plant hormone is referred to as an antagonist to gibberellic acid.

2019 March

10. Some plants require a periodic exposure to light to induce flowering :

- (a) Name the phenomenon.  
(b) How can we classify plants on the basis of this phenomenon ?  
(c) The site of perception of light/dark duration for flowering in plants is .....

2019 Model

11. The plant growth regulators are divided into growth promoters and growth inhibitors

- (a) Name the three hormones, which are known as plant growth promoters.  
(b) Name the growth inhibitor which is known as stress hormone.  
(c) Write any two roles of the above identified stress hormone.

2020 March

12. Given below are the names of three plant growth promoters. Write their main functions.

- (a) Auxin  
(b) Gibberellin  
(c) Cytokinin

2020 Imp.

13. (a) Write the name of plant hormone responsible for ripening of fruits.

- (b) Write any two other functions of this hormone.

2021 Model