

1. DIFFERENTIATE BETWEEN: 4

a. Anemochory and autochory

<i>Anemochory</i>	<i>Autochory</i>
<i>Seed dispersal by wind</i>	<i>Seed dispersal by an explosive mechanism</i>

b. Top senescence and progressive senescence

<i>Top senescence</i>	<i>Progressive senescence</i>
<i>In top senescence the aboveground part of the shoot dies each year after flowering and fruiting, but underground part survives which puts new shoots again next year.</i>	<i>In this, the oldest leaves senesce and die first. The senescence then moves from leaves to the stem to underground parts.</i>

c. Aeroponics and Hydroponics

<i>Aeroponics</i>	<i>Hydroponics</i>
<i>Growing of plants in the mist of minerals in air.</i>	<i>Growing of plants on liquid nutrient medium.</i>

d. Mesogamy and Porogamy

<i>Mesogamy</i>	<i>Porogamy</i>
<i>Pollen tube enters in the ovule through integument.</i>	<i>Pollen tube enters in the ovule through micropyle.</i>

2. Answer the following- 2

- a. What makes the apical meristem of the root sub-terminal?
Root cap
- b. Why do plant cell not burst when placed in water?
Due to presence of rigid cell wall.
- c. What happens if a flower bud is emasculated and auxin applied on the stigma?
a seedless fruit is formed
- d. Why is propagation through grafting not successful in monocot?
Absence of cambium.

3. NAME THE FOLLOWING- 4

- a. Non technical term for periderm
Bark
- b. The water present in the soil not available to plants
Echard
- c. The shape of guard cells in grasses
Dumb-bell shaped
- d. The sleep movements in leguminous plants.
Nyctinastic movement

PART 2- ANSWER THE FOLLOWING-

1. The overall rate of photosynthesis is higher per unit energy received in flashes than continuously. Justify the statement. 2

Light reaction faster than dark reaction.

Products of light reactions are not consumed at the same rate in light independent reaction.

In intermittent light the products of light are quickly utilized in the dark reactions.

Products of light reaction do not accumulate.

2. Give the difference in vascular bundle of monocot and dicot stem. 2

<i>Vascular bundles dicot stem</i>	<i>Vascular bundles dicot stem</i>
<i>Vascular bundles are arranged in ring.</i>	<i>Vascular bundles are scattered in ground tissues</i>
<i>Vascular bundles are uniform in size</i>	<i>Vascular bundles vary in their size.</i>
<i>Each Vascular bundle is conjoint, collateral or bicollateral and open</i>	<i>Each Vascular bundle is conjoint, collateral and closed.</i>
<i>Phloem peranchyma are present</i>	<i>Phloem parenchymas are absent</i>
<i>Bundle sheath is absent.</i>	<i>Bundle sheath is developed either partly or completely surrounding the vascular bundle</i>
<i>No water containing cavity is present.</i>	<i>Water containing cavity is present.</i>

3. Differentiate between dehiscent and non dehiscent fruits. 2

<i>Dehiscent fruits</i>	<i>Indehiscent fruits</i>
<i>The fruits which open at maturity by natural means to shed the seeds.</i>	<i>The fruits which do not open at maturity by natural means to shed the seeds.</i>

4. Differentiate between chlorophyll a and chlorophyll b 2

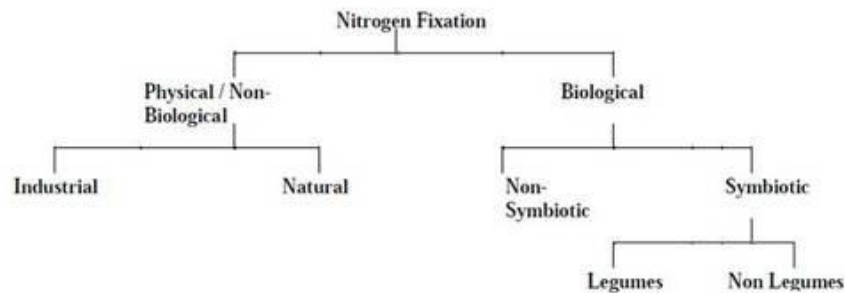
Chl a	Chl b
The empirical formula of Chl a is $C_{55}H_{72}O_5N_4Mg$	The empirical formula of Chl b is $C_{55}H_{70}O_6N_4Mg$
Blue green in colour	Yellow green in colour
Primary pigment	Accessory pigment
It has a methyl group attached to third carbon	It has a aldehyde group attached to third carbon
Soluble in petroleum ether.	Soluble in methyl alcohol

5. Describe the events taking place between pollination and fertilization.

- a) After pollination, stigma secretes sugar and malic acid.
- b) Pollen grain absorbs/swells up and exine ruptures.
- c) Intine forms pollen tube –penetrates stigma and pushes through style.
- d) It carries tube nucleus and generative nucleus.
- e) Generative nucleus divides mitotically to form two male gametes.
- f) Tube nucleus degenerates.
- g) Pollen tube enters in embryo sac through micropyle region of ovule.
- h) One male gamete fuses with egg cell to form zygote.
- i) Second male gamete fuses with secondary nucleus to form primary endosperm nucleus.

6. What is nitrogen fixation? Discuss the role of two nitrogen fixing organisms. 3

- Nitrogen fixation refers to the conversion of elementary dinitrogen into organic form to make it available for plants.



- Role of nitrogen fixing organisms

A) Species of *Rhizobium*: Make symbiotic relation with leguminous plants root and perform nitrogen fixation.

B) BGA: Symbiotically as well as free living forms show the process of nitrogen fixation.

Eg. *Anabaena*, *Nostoc*

7. Give the characters of meristematic tissues. 3

- a) Continuously dividing cells.
- b) Cells are small and isodiametric.
- c) The cell wall is thin and made up of cellulose.
- d) Cytoplasm is abundant.
- e) Nuclei are large.

f) *Vacuoles are absent and if present, very few.*

g) *Lack inter-cellular spaces.*

h) *Metabolic activities are at high rate.*

i) *Inorganic inclusion absent.*

j) *Simple tissue*

8. Give the significance of osmosis.

3

a) *Absorption of water by root hairs*

b) *Cell to cell movement of water*

c) *Induces turgidity helping in stretching of stem*

d) *Mechanical support in non-woody plants*

e) *Growing tips remain turgid can penetrate into soil.*

f) *Regulates opening and closing of stomata.*

g) *Resistance to drought and frost*

h) *Movement of plant parts (Mimosa pudica)*

9. Discuss the role of cork cambium in secondary growth. 3

a) *As secondary growth proceeds, the epidermis ruptures and a protective layer the periderm is formed.*

b) *For this the outermost layer of cortex becomes meristematic and begins to divide. This is known as Phellogen or cork cambium.*

c) *Phellogen or cork cambium: divides to produce outer cork (Phellum) and inner secondary cortex (phelloderm)*

d) *All the three tissues phellum, phellogen and phelloderm are together known as periderm.*

10. Give a brief account of turgor movements shown by *Mimosa pudica* 4

a) *The base of the petiole is swollen (Pulvinus) and similar but smaller pulvinus are present at the base of each leaflet.*

b) *Lower half thin walled and upper half thick walled.*

c) *If the terminal pinnule is struck a blow or touched, the stimulus is conducted to its base and then other pinnules.*

d) *This stimulus causes fall in turgor of lower cells due to loss of water.*

e) *Upper half retain turgidity.*

f) *Turgid half presses flaccid lower half lower half/ leaf droops.*

g) *When the touch stimulus is removed regains turgidity.*

11. What is the importance of the following elements in the life of a plant? In each case mention a deficiency symptom. 4

<i>Mineral</i>	<i>Role</i>	<i>Deficiency symptom</i>
<i>1. Nitrogen</i>	<i>Integral part of amino acids/ chlorophyll/DNA/ATP etc</i>	<i>Stunted growth and general yellowing</i>
<i>2. Magnesium</i>	<i>An integral part of chlorophyll molecule</i>	<i>Extensive interveinal chlorosis and necrotic spots</i>
<i>3. Chlorine</i>	<i>Maintain anion and cation balance, part of middle lamella</i>	<i>Stunted growth</i>

12. Describe the non-cyclic photophosphorylation . 4

- a) Occurs in green plants and involves both photosystems.*
- b) Here high energy electrons released from PS-II do not return to PS-II and ATP is produced.*
- c) Thus it is called non cyclic photophosphorylation.*
- d) Light excites electron of P700 in PS-I*
- e) Electrons do not return and are stored as high energy NADPH.*
- f) Oxidized chlorophyll has “holes” to fill.*
- g) PS-II supplies electron to P700*
- h) Electron passes through the chain, losing potential energy and generates ATP.*
- i) Non-cyclic electron flow thus restores electron to PS-I*
- j) Now, P680 has “hole” to fill.*
- k) It acquires this by the splitting of water.*
- l) Thus the non-cyclic photophosphorylation is a flow of electron from water (where electron have low potential energy) to NADPH, (where electron are stored at high state of potential energy)*