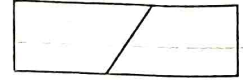




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Name / ಹೆಸರು: Shravan S. Naikar Roll No./ಸ್ಥಳಾಂಕ: 023 Date / ದಿನಾಂಕ: 11-7-2024Subject/ವಿಷಯ: Botany Semester/ಸೆಮಿಸ್ಟರ್: II Exam Seat No / ಪರೀಕ್ಷೆ ಸ್ಥಳಾಂಕ: U15KM2350024

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II Answer any Three of the following11x General Characteristics of Gymnosperms.

- * Gymnosperms are group of small seed plants with which are represented by only 900 living species ✓
- * Gymnosperms are ancient than angiosperms ✓
- * They formed dominant vegetation on earth about 200 million years ago. Today they are dominant only in cold areas where instead of rain, snow is source of water. ✓
- * All gymnosperms are perennial or wood either forming trees or bushes. Some of them are very large & live for thousand of years. ✓
- * Flowers are absent. ✓
- * They form two types of sporophylls - microsporophyll & megasporophyll aggregating to form two distinct cone or strobili ✓
- * Seed are not included in fruit. They are naked. ✓
- * The distinction of ovary, style, stigma is absent. ✓
- * Ovaries are orthotropous & sessile. Each ovary is covered by a layer of integument ✓
- * Pollination is direct as stigma is absent ✓
- * Pollination is accomplished by wind. ✓
- * Pollen grains reach the microphyllous ends of ovaries. ✓

* Female gametophyte consist archegonium
* Male gametophyte produces two male gametes or sperm. Either of them is functional.

* Phloem does not have companion cell or sieve tubes. Sieve tubes are not arranged end to end in rows.

13. Stelar Evolution

* Stele is defined as central vascular cylinder with or without pith.

* Endodermis is boundary between cortex & stele.

* Xylem & Phloem are the components of vasculature.

* There are 4 types of

1. Protostele

2. Siphonostele

3. Dictyostele

4. Eustele

1. Protostele → The vasculature consist centre core of xylem surrounded by phloem
↳ There are 5 types.

i. Haplostele — The central core of xylem is surrounded by a single layer of phloem.

ii. Actinostele — The xylem with radiating ribs appear in star shape & it is surrounded by phloem.

iii. Plectostele — In this the xylem appear in plate like structures, parallel to each other & each parallel plate is surrounded by phloem.

iv. Mixed Protostele — In this xylem is uniformly distributed into small groups & each group is surrounded by phloem.

1) Polystele - Each stele is protosteles is central ~~case~~ of xylem surrounded by phloem.

2) Siphanoste → The modified version of protosteles with pith or medullated protosteles.
↳ There are 2 types

i) Simple Siphanosteles - In this stele the xylem is surrounded by concentric rings of phloem

* There are 2 types

i) Ectopholic Siphanosteles & Amphipholic Siphanosteles
ii) Selenosteles - In this xylem is surrounded by phloem may or may not be ectopholic or Amphipholic.

* There are 2 types

i) Ectopholic Selenosteles ii) Amphipholic Selenosteles

3) Dictyosteles → The xylem has overlapping leaf gaps surrounded by phloem.

↳ There are 2 types.

i) Simple Dictyosteles

ii) Poly Dictyosteles.

4) Eustele → The vasculature consists of vascular bundles or rings of concentric vascular bundles or conjugation of phloem.

9) General Characteristics of Pteridophytes

- * Pteridophytes are the first plants to evolve on earth.
- * The plant body is sporophytic & can be div into stem, roots, leaves.
- * Majority of pteridophytes are herbaceous.
- * Stem is branched & branching is monopodial or dichotomous.
- * Microphylls → Small, simple, sessile.
- * Megaphylls → Large & Pinnately compound.
- * Sporophylls → Spore bearing leaves are sporophylls.
- * Sex organs are multicellular.
- * Male sex organ is Antheridium & female sex organ is Archegonium.
- * Vascular bundles are present.
- * Xylem consist tracheids & phloem consist sieve tubes.
- * Cambium is absent. Hence they don't show secondary growth.
- * Life cycle of pteridophytes show heteromorphic alternation of generation.
- * Water is required for fertilization.
- * Primary roots are replaced by adventitious roots.

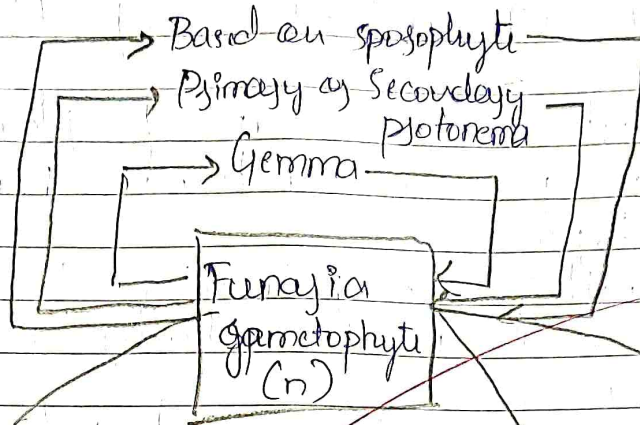
Two
III Answer any three of the following

14. General Characteristics of Bryophytes

- * Bryophytes are group of plants that occupy position between pteridophytes and algae.
- * Bryophytes are primitive land plants. They need moist, shady & cool places to grow.
- * Though they have adopted land life they need water for fertilisation.
- * Bryophytes are amphibious in nature hence known as amphibians of plant kingdom.
- * They show heteromorphic alternation of generation. The sporophytic & gametophytic plant body alternate in their life cycle repeatedly.
- * Bryophytes are autotrophic & lead autotrophic mode of nutrition.
- * They lack ~~to~~ true roots.
- * In primitive forms rhizoids are unicellular but while advanced are multicellular & branched.
- * Rhizoids help in anchorage & absorption.
- * Sexual Reproduction is oogamous type.
- * Vegetative reproduction by
 - i. > Bulbil
 - ii. > Tubey
 - iii. > Fragmentation
- * Male Sex Organ - Antheridium
Female Sex Organ - Archegonium
- * ~~The~~ Fertilisation is done in presence of water. The egg is fused by motile swimming antherozoid.
- * They show ~~sporophytic~~ haplodiplontic & heteromorphous alternation of generation.

172

Life Cycle of Funaria



Sporo

Anthredophore Archegoniophore

Sporophyte

Gametophytic phase

Anthredium

Archegonium

Meiosis

Anthroid

Egg

Sporophytic phase

Fertilization

Anthredium & mother cell

Zygote

Capsule
Seta
Capsule
Foot

Funaria
Sporophyte
(2n)

Sporo
gamete

Explanation?

Answer any Five of the following

1) Liverworts

↳ These resembles spherical colonial structures similar to human liver hence Liverworts.

↳ Rhizoids are smooth walled

↳ Sporophyte produce on epithecium

Ex: Anthoceros.

5) Gemma Cup

↳ These are cup like structures consisting Gemma.

↳ These are asexual reproductive structures vegetative

3) Smooth Walled Rhizoids

↳ Rhizoids are of two types

1) Smooth walled Rhizoid

2) Tuberculated Rhizoid.

↳ SWRhizoid help in absorption of water, nutrients & minerals from soil.

6) Megasporophylls [leaf which bears spores]

↳ There are two types of sporophyll

1) Microsporophyll

2) Megasporophyll.

↳ Megasporophyll are different in shape, size, structure & function.

4) Columella

↳ These are the internal structure of Anthoceros sporophyte

↳ They are present inside capsule of the sporophyte



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Date / ದಿನಾಂಕ : 9-7-2024

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Semester/ಸೆಮಿಸ್ಟರ್ : IV

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Q7

①

Habitat

Habitat is ecological and environment of area. Inhabitant that Particular species of plant, animal and other organism is called as habitat.

* Study about the reason.

ex:- Forest, desert, grassland - Habitat

②

Capillary water

* w. Rain fall dew snow, water droplet absorb the plant of root is called as capillary water

* water remain soil after gravitation of water

drop out the subject of laws capillary water movement.

③

Halophytes

* plant is grow the habitat is very rich in concn. of salt like NaCl, $MgSO_4$, $MgCl_2$, KCl etc.

* Halophytic plant found grow in saline or sea. cause the brackish water of estuarine and desert ecosystem.

ex:- westernghat in Karnataka, mangrove in India

④

Botanical garden

* Botanical garden is very exist in India china empty and the mesopotamia.

* The hanging garden of babil in mesopotamia.

* ex:- ① Acharya Jagadish Bose in Kolkata - largest garden
② the government botanical garden in ooty in Tamil Nadu, (874 sq km).

77 National Park

- * National Park is Natural Park used to the create, preservation of reason and Protection by national government.
- * National Park is established by protection of world life
ex:- dibru saikhowa, National Park in Assam.

Q27

97 ecological levels of organism

17 organism / species

- * It is the unite of ecology
- * This level deal with the distribution of pattern, metabolic activity, physiological adl, and growth.

04

27 Population

- * It is the group of interacting and interbreeding of indivible. of given area.

37 community

- * It is the group of population different species plant, animal and microorganism living together in common area.

47 ecosystem

- * It is integrated unit of living and non-living organism / components
- * These components interact each other
- * ex change the material themselves

57 biome

- * It is, comprises many ecosystem
- * It is giant ecosystem

105

Importance of light on plant.

1) Photosynthesis

- * Photosynthesis light depended process
- * CO_2 is presence of sunlight?
- * The plant green coloured photosynthesis food.
- * stop to absence of light.

2) Producing and Pigment

- * It is play very important to developed the plastide and pigment.
- * It is having very large number of chloroplast.
- * A liner manner arranged
- * It is, marktable effect to the number and position of chloroplast

04

3) Stomatal movement

- * opening and closed stomata regular by light
- * Stomata remain opening in light and closed in dark
- * It is increase the rate of transpiration
- * It is increase the exchange of gases.

4) Growth and development

- * The plant is having two group based on their light requirement that are 1) Helophyte, 2) sciophyte

5) Photoperiodism

- * It is considered the important factor the growth flower.

6) Photooxidation

- * high intensity consider the photooxidat enzymes

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morphological adaptation of hydrophytes

Root

(011)

- * Root are entirely absent ex- Wolffia
- * poorly developed ex- Hydrilla
- * Root hair absent.
- * Root system branched and unbranched
- * tap root cap is absent but floating water
- * Root are fibrous and adventitious

Stem

- * stem is long, flexible and spongy
- * stem modified in stolon
- * stolon is thick, short and spongy
- * In some species modified into runner, tuber and rhizome

Leaf / leaf

- * leaf are Aerial leaf, broad floating the surface of water
- * covering wax coated ~~ex- Heterophylli~~
- * leaf are long
- * leaf are long petiole.

92

147

biodiversity

- * biodiversity is the various among the living organism, different species such as including terrestrial, marine and desert ecosystem. is called as biodiversity.

- * 3 types - ① Habitat diversity
- ② Species diversity
- ③ Genetic diversity

① Habitat diversity:-

Habitat diversity is refer to the variety of different ecological and environmental and niches support to the wildlife. range of animal plant species, preservation of ecological complexity and diversity.
ex:- forest, desert, grassland

2nd Genetic diversity:-

It is refer to the range of different inheritance trait within species. and Biological sample variation of within species. variation of genetic information is containing the individual of plant species.

3rd Species diversity :-

It is type of group of number represented the different species in common area.
* different number of species are present.

1st economic and aesthetic values

* Biodiversity is the high meaning of area. that the high diversity of the high aesthetically in ecosystem

* In our planet become beauty because of the biodiversity.

* Biodiversity is responsible to the beauty of landscape.

* It is used to the medicinal, timber plant, of NTFP and the other threatened species.

* Biodiversity is also various among the different species of life on earth.

* It is most important of our planet.

- * biodiversity is science education holiday place and tourism of ecosystem
- * People can see the bird, zoo, wild life sanctuaries, and any other seen is including the biodiversity.
- * It is used to medicine and plant of NTFP.

16) biodiversity hot spot

- * biodiversity hot spot is the thing but the species build to back of earth like supported system.
- * 30% of less natural vegetation plant.
- * today the exist of forest most extinction of the dinosaur.
- * 1500 of vascular plant are growth.

17) western ghats

- * This hill is represent in the ocean.
- * western ghats is receive good amount because of rain fall
- * 1600 of vascular plant
- * 1200 of genus are present

18) Himalayan

- * It is highest mountain in the world
- * Himalayan is located in Indian, Eastern Indian, Southern center, South. Bhutan.

19) Indo barman

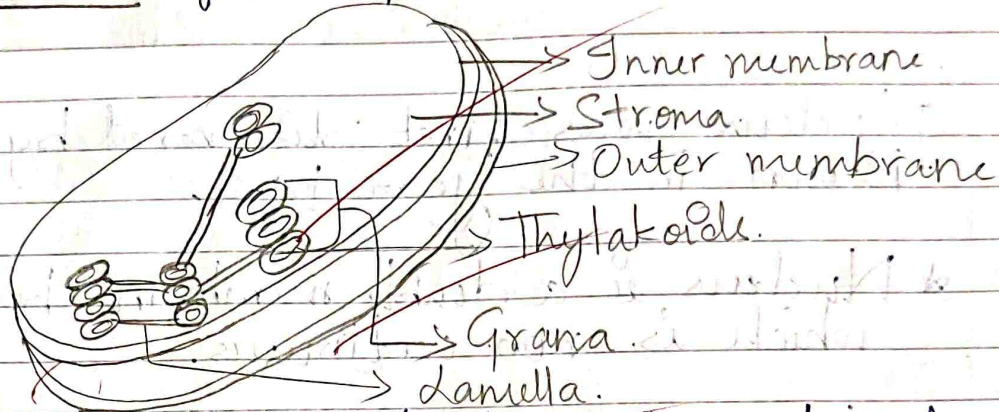
- * It is having numerous countries. India, North, South and China & yunnan provided the southern part.

20) Nicobar - Nicobar is lived the Thailand. Singapore.

- * It is having very terrestrial and marine organisms

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QIII) Answer any two.(18) Structure of chloroplast.

* Chloroplast is the double membrane bound organelle mostly present in higher plants.

* It is 4-6 μm in diameter & 1-3 μm in thickness.

* It has outer membrane & inner membrane composed of enzymes, proteins etc.

* It has two distinct region grana and stroma.

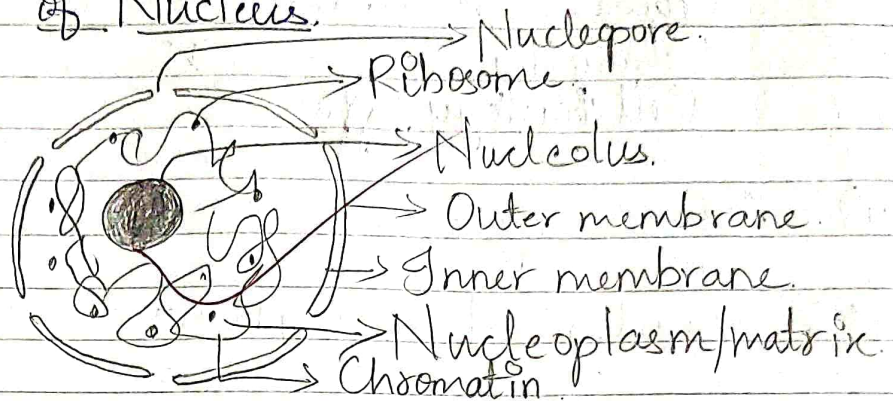
* Grana are the stack of disc-shaped structure known as thylakoids.

* Stroma - The stroma is homogenous matrix containing DNA, ribosomes and enzymes.

* Thylakoid system - Disc shaped structures, which are also double membrane organelles have chlorophyll pigment & other necessary pigments which are required for capturing sunlight to produce/process photosynthesis.

* It has its own circular small naked DNA which can produce its own proteins for functioning.

20) Structure of Nucleus.



Ans Nucleus was first discovered by Robert Brown in the year 1831.

* Nucleus is a double membrane bound organelle which is non-continuous.

* Nucleus has pores which involved in permeability of molecules/ion from cytoplasm to nucleus in and out.

✓ * Nucleus contain genetic material called chromatin.

* Nucleolus is small round organelle present inside nucleus which is involved in protein synthesis.

* Ribosomes are also present within nucleus responsible for protein synthesis.

* Nuclear matrix- It is jelly substance which maintains structure & shape of nucleus.

* Nucleus is also known as control centre of cell.

QII) Answer any three.

(14) Active transport through cell membrane.

⇒ Active transport is a type of transport which is mediated through energy molecule called ATP against concentration gradient.
It has two types -

i) Primary active transport - It uses ATP molecule directly to transport molecules against concentration gradient.

ex lipid soluble molecules, Na^+ , K^+ ions etc.

ii) Secondary active transport - It uses ATP molecules indirectly to transport against concentration gradient. If one ion/molecule moves along down hill along concentration gradient, ATP is used for other molecule to move inside or outside of cell.

In this 2 methods -

a) Symport - The ions or molecules move in same direction, but one of the molecule move along concⁿ gradient, using ATP for other molecule to move in same direction against concⁿ gradient.

b) Antiport - The ion/molecules move in opposite direction, but one move along concⁿ gradient & other moves against concentration gradient using ATP molecules.

ex Sodium-potassium pump, Carbohydrate etc.

①6) Exocytosis.

The release of materials/substance from vesicles to the outer environment.

It involves steps -

i) Vesicle formation - Formation of vesicles from golgi bodies stores proteins, RNA & neurotransmitters.

ii) Docking - The movement of vesicles to targetted cells of plasma membrane through communication between protein & cell membrane.

iii) Fusion - After reaching to targetted site, vesicles fuse with plasma membrane.

iv) Release of contents - The proteins, are released in to the plasma membrane by vesicles.

v) Recycling of plasma membrane - The plasma membrane after exocytosis is recycled to allow endocytosis.

①8) Passive transport.

⇒ Passive transport is type of transport which doesn't require ATP (energy) for transportat-
-ion of molecules & it is along concⁿ gradient.

It has 3 types.

i) Diffusion.

ii) Facilitated diffusion

iii) Osmosis.

i) Diffusion - The movement of molecules from (solid, liquid or gases) ^{area of} higher concⁿ. to ^{area of} lower concentration.
ex Smoke of agarbatti.

✓ ii) Facilitated diffusion - The movement of larger molecules from area of higher concⁿ. to area of lower concⁿ. through some protein channels / carrier. It has 2 facilitating barriers.
a) Channel proteins - Allow the larger molecules to move & are selective.

b) Carrier proteins - Allow smaller ions from one side of membrane to another.
ex Oxygen / Carbon etc.

QII) Nucleoid. Answer any five.

✓ 1) Nucleoid - It is genetic material present in prokaryotes which lack nuclear envelope and it has longer chromatin network than cell dimension, which can fit into nucleoid.
ex Bacteria, mycoplasma etc.

✓ 2) Plasma membrane - It is outermost layer which is semi-permeable in nature.
• It is bilayer, which allows for selected molecules to move in & out.
• It maintain cell turgidity.

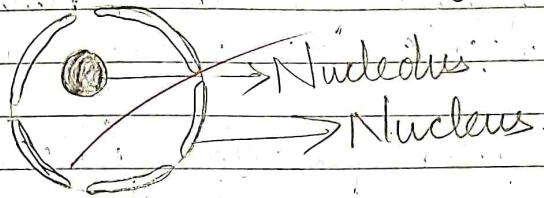
✓ 3) Marker enzymes - Marker enzymes are those which identifies / recognises the gene sequence ultimately differentiating organelles.
ex - Mitochondria - Succinate dehydrogenase.
Chloplast - RuBisCO.

⑤

Phagocytosis - The cell which engulf the food material from the outer environment. Also engulfs the foreign bodies & digests it.
ex Amoeba.

⑧

Nucleolus - It is organelle present in the nucleus, which is darkly stained and involved in protein synthesis.



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Q. II

Q1 * The water absorption is a complex process that include transporters & diffusion

* This was first discovered by Renner (1912-1915)

Water absorption are of 2 types-1] Active absorption2] Passive absorption1] Active absorption -

* It takes place when the transpiration rate is high.

* It requires energy for this process

* These are further divided into 2 types-

a] Osmotic absorptionb] Non-osmotic absorptiona] Osmotic - The absorption of the water takes place through osmosis along the conc gradient. It requires energy.b] Non-osmotic - The absorption of water takes place through Non-osmosis against the conc gradient. It also requires energy.2] Passive absorption

* It takes place when the transpiration rate

is low

* The energy is not required in this process.

* Depending on the transpiration of water the leaf pulls the water which is known as transpiration pull or suction.

10] * The excess amount of water is lost through the leaf opening called stomata that process is called transpiration.

* In other words, the loss of water from the plant body is called as transpiration.

* The excess amount of water is lost in the form of vapours.

* The mechanism of transpiration are of 2 types -

a] Diffusion of water from Mesophyll cells to the intracellular spaces.

b] Diffusion of water from intracellular spaces to the outside of environment.

04

Transpiration are of 3 types

1] Cuticular transpiration

2] Lenticular transpiration

3] Stomatal transpiration.

1] Cuticular -

* The loss of water through cuticle is known as cuticular transpiration.

* Cuticle is the waxy layer covering the leaf.

* About 5-10% of water is lost from the cuticle.

2] Lenticular -

* The loss of water through intracellular tissue or lenticells are known as lenticular transpiration.

* About 0.5% of water is lost from the lenticells.

3] Stomatal -

* The loss of water through the stomatal pores are known as stomatal transpiration.

* About 80-90% of water is lost from the stomata.

13] * The transfer of sap against the gravitation to the aerial part of the plant body is known as ascent of sap.

* Sap - The water fluid
Ascent - Ascending order.

* It includes 2 types of theories those are -

i] Vital theory

ii] Physical theory.

§] Physical theory - The physical theory suggests that, as the ascent of sap takes place through the dead xylem vessels, it is always physical & it does not involve the living cells.

* This physical theory is further divided into 3 theories those are -

a] Imbibition theory

b] Capillary force theory

c] Cohesive theory

a] Imbibition theory -

* It was first proposed by Unger & Sachs

* He believed that the absorption of water is done through cell wall material & translocated upwards.

* It is a rejected theory.

b] Capillary force theory -

* It was first proposed by Boehm.

* He believed that the capillarity of vessels & natural atmospheric pressure are responsible for ascent of sap.

* This is a rejected theory.

c] Cohesive theory

* It was first proposed by Dixon & Jolly.

* The same molecules of water are attached to each other, this phenomenon is called Cohesive theory.

* It was the accepted theory.

Q. III

14]

* Gibberellins are the plant growth regulators which include stem elongation, germination, flowering & enzyme induction etc.

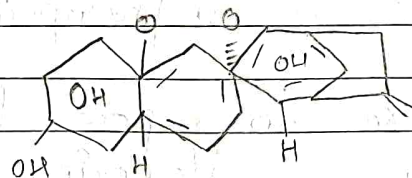
* Gibberellins show different affects on plants but the stem elongation is dramatic among all.

* There are more than 70 gibberellins ~~induced~~ are isolated.

* Those are GA1, GA2, GA3 & so on...

* GA3 is most studied plant growth hormone.

Structure of gibberellins-



* Gibberellin structure produce vit A & E.

* The structure is same in all gibberellins but the side group are attached.

Functions -

a) Seed germination - Gibberellic acid is used for better germination of the seed.

b) Dormancy of bud - Gibberellins helps to treat the dormancy of bud.

c) Elongation of internodes - Gibberellins also helps in the growth of internodes.

04

Uses -

* It is used as plant growth regulators.

* These are sprayed on the cucumber plant to produce more male flowers.

16] * The relative length of day & night is called photoperiod.

* The plants response to the length of day & night is called as photoperiodism.

* Some plants require to expose them to sunlight to induce the flowering.

* It was first discovered by Charles Darwin & Franchis.

* Most of the angiosperm use photoperiodism to decide when to flower.

* To do this they require photoreceptors

These are Cytochrome or phytochrome

* Depending on the duration of light it is further divided into 3 types-

- a] Long day plants
- b] Short day plants
- c] Day neutral plants

a] Long day plants -

The plants which require more exposure of sunlight is called long day plants

Ex - Spinach, Radish etc.

b] Short day plants -

The plants which require less exposure of sunlight is called short day plants.

Ex - Sunflower, Rice etc.

c] Day Neutral plants -

The plants which are irrespective of day lengths are called day neutral plants.

Ex - Tomato, Rose etc.

Q.1]

1] Imbibition -

* The water is absorbed ~~for~~ by the hydrophilic factors are known as imbibition.

(01)

* The scientists named Unger & Sachs states that the imbibition of water takes place by the cell wall materials, which is then translocated upwards.

2] Turgor pressure -

(02)

* When the water enters the cells, the cell gets swells up & create the pressure on cell sap & cell sap creates the pressure on cell wall is called turgor pressure.

* This type of cell is called turgor cell.

* And this condition is called cell turgidity.

3] Wall pressure -

(03)

* The cell wall puts reverse pressure on the cell sap i.e. against the turgor pressure is called wall pressure.

* The wall pressure is created by the cell wall.

* It is considered to be opposite of the turgor pressure.

6] Osmotic potential -

* Osmotic potential is also known as water potential.

8] Senescence -

02 * It is the ageing of the cell.

* It affects the complete plant or the part of plant

* It degrades the cell

* It is mostly occurs in the young leaves

7] Cytokinin -

02 * These are the growth regulators in plants.

* It is found in young leaf & shoots of the plant.

* Helps in seed germination & fruit development



30
30

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① Horse tail

- Equisetum is popular known as Horse tail because of its bushy Habitat.
- Equisetum are presented as 25 species all over the world except Austral. Zealand
- Equisetum is diploid Sporophytic plant
- Sporophyte is differentiated into Root, stem, leaves
- Leaves are non-photosynthesis
- Equisetum Species are perennial.

2) Gymnosperm

- The term Gymnosperm means Gymno - naked Sperm - seed.
- they are primitive group of Seed bearing plants
- Vascular tissue is present
- Gymnosperms has heteromorphic alternation of generation.
- Gymnosperms are Sporophytic
- they are differentiated into Root, stem, leaves
Ex pine, fir

3) Diatoms

- Diatoms are photosynthesis algal
- they are found in both aquatic habitat (both fresh water and marine water)
- Diatom have Silica Skeleton (Frustule)
- Diatom are used in skin medicines tooth paste
- the cell wall is made up of pectin

⑤ Siphonostele.

Pith region

- It is tele in which the central ^{pith region} xylem is surrounded by phloem
- The thick cell wall is made up of Sclerenchyma or paranechyma cells
- the pith region is surrounded by phloem
- there is two type of Siphonostele
- Ecto Siphonostele
- Amphio-Siphonostele

④ trabeaula

- the modified endodermis cell which posses Casparian strips

Casparian strips are present on the radially wall of endodermis cell.

the elongated radially extend endodermis cell is called trabeaula.

- It is present in T.S of Selaginella.

4 marks

② T.S of Selaginella. ~~consist~~

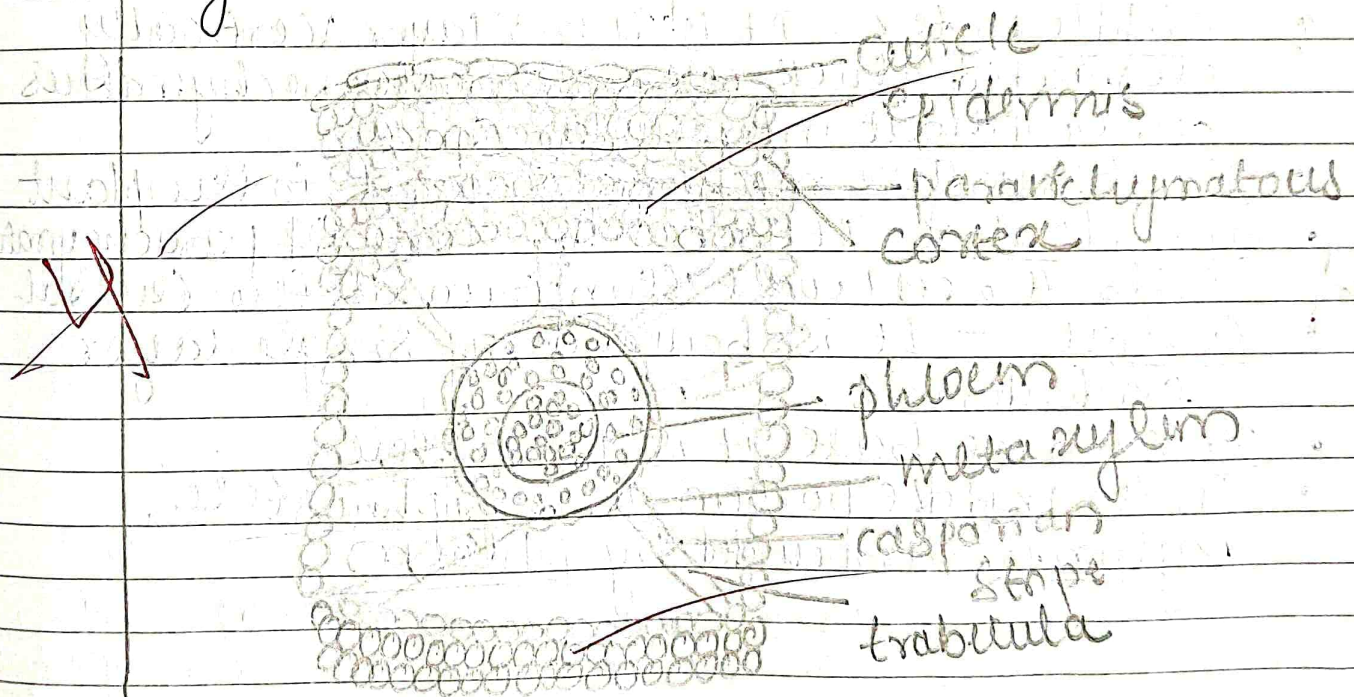
- the T.S of Selaginella consist of Epidermis, cortex, pericycle & Stele

- Epidermis - It is outermost layer. It is single layer made up of thick cells
- Stomata is absent. the outer layer is covered by cuticle.

- Cortex - It is lies below the epidermis cell
- cortex is made up of outer hypodermis and inner endodermis

- hypodermis is consist of Sclerenchymatous paranechymatous cells with intercellular space.

- Below the cortex their presence of large ^{number} air space. at the centre their the presence of stele.
- Trabecula is modified part of endodermis cell which posses casparian strips.
- casparian strips are present on the radial wall of endodermis cell.
- Pericycle - It lies below the endodermis cell encloses of xylem and phloem
- Stele - It is protostele xylem is surrounded by phloem
- xylem is protoxylem metaxylem
- ~~phloem~~ phloem is ~~phloem~~ & paracolumatous and sieve tube.
- xylem is exarch



T.S of Psilotum stem

It consist of epidermis, cortex, Cortical, endodermis

- Epidermis - It is outer layer. It is single layer
- the cell wall is covered by cuticle

- Cortex - It lies below the epidermis
Cortex is divided into three layers

- ① Outer cortex
- ② middle cortex
- ③ inner cortex

- ④ Outer cortex - It lies below the epidermis it consist of elongated lobed chlorophyll cells with intercellular space.

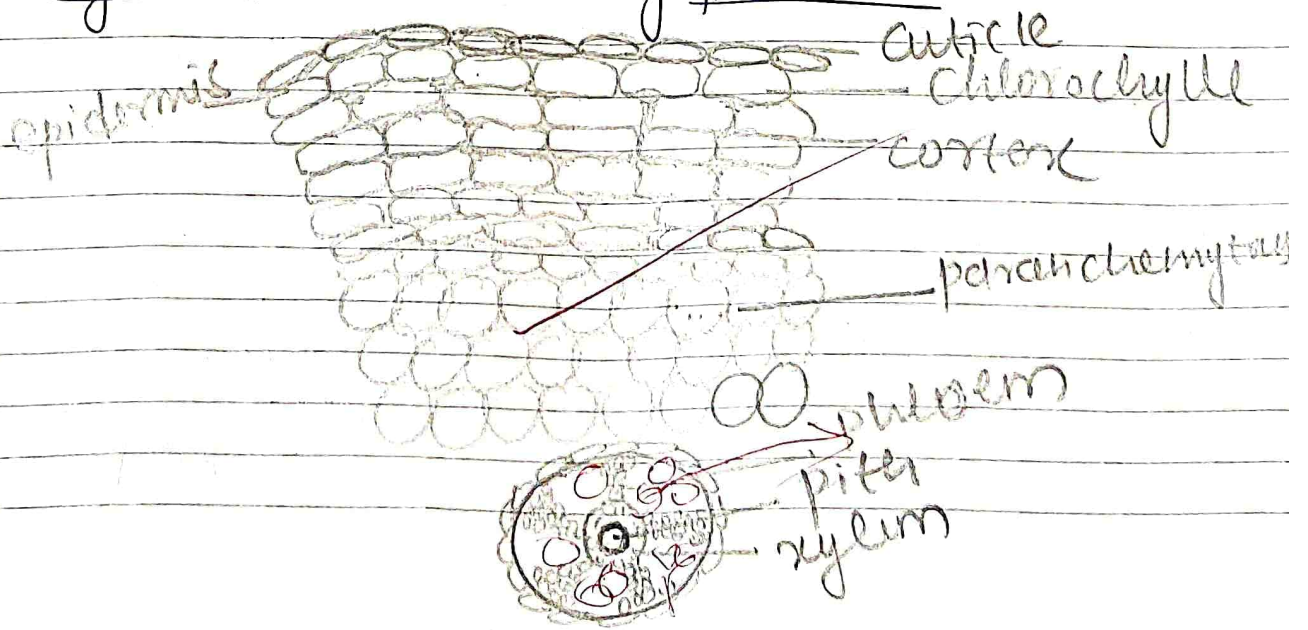
- middle cortex - It is 4 to 5 layer vertically elongated thick cell wall Sclerenchymatous cell without intercellular space.

- this tissues give mechanical support to the plant

- inner cortex - It is border zone of paracheymatous cells the cell wall thin towards the central cortical - It is bounded by single layer endodermis

- At extreme base it is protostele

- In the middle portion it is diptnostele,
xylem is surrounded by phloem



Classification of algae

In 1955 E. M. Smith classified algae into seven divisions

1) Cyanobacteria

- Cyanophyta they are found in fresh water
- It is also called blue green alga
- unicellular or colonial
- nucleus is primitive
- plastid is prominent
- Ex: Nostoc

2) Chlorophyta they are found in fresh water

- It is also called blue green alga.
- multicellular or colonial
- presence of chlorophyll, xanthophyll, carotenoids
- Ex: Spirogyra, Chara etc
- reserve food material is starch

3) Euglenophyta

- They are found in fresh water / stagnant water
- cells are flagellated or naked
- presence of prominent coloured plastid.
- Ex: Euglena

4) Pyrrophyta

- they are chiefly marine
- unicellular
- presence of yellowish green, yellowish brown pigments
- Sexual reproduction is rare
- Ex: Dinophysis

Chrysophyta

- they are Diatoms
- the cell wall is made up of pectin
- the silica is deposited on the surface
- ex Chromulina

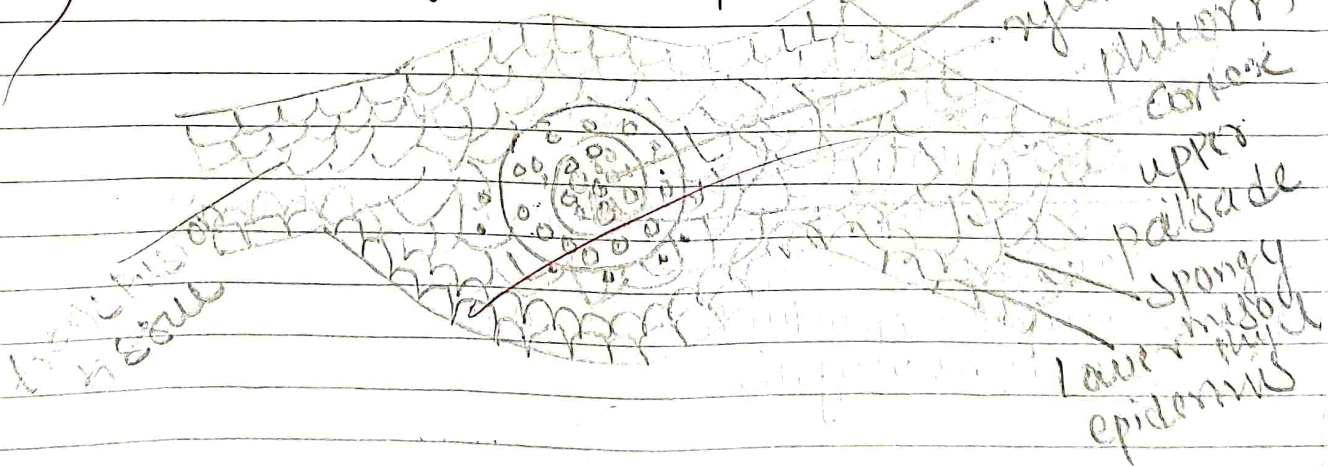
Phaeophyta

- they are brown algae
- they are large and complicated presence of fucoxanthin
- the reserve food material is carbohydrate
ex - Ectocarpus

Rhodophyta

- they are red algae
- the reserve food material is floride starch
- the sexual reproduction take place by oogamous
- ex - Ceratium

7) T.S of Cycas Leaflet



- epidermis ~~consists of~~

It is the outermost layer It is single layer
It is divided into upper epidermis and lower epidermis

- Cuticle is heavily deposited in upper epidermis

- towards the lower epidermis there is presence of large number of sunken stomata

- hypodermis - lies below the epidermis cell it is thick Sclerenchymatous
it is deposited in upper epidermis

- mesophyll - they are differentiated into upper palisade mesophyll
✓ lower spongy mesophyll

3/2 ✓ x transpiration tissue - they are colourless and long cells

- the main function of transpiration tissue is to conduction of water and food.

- Vascular bundles - they consist of xylem and phloem

- xylem is mesarch

- xylem and phloem surrounded by ring parenchymatous.

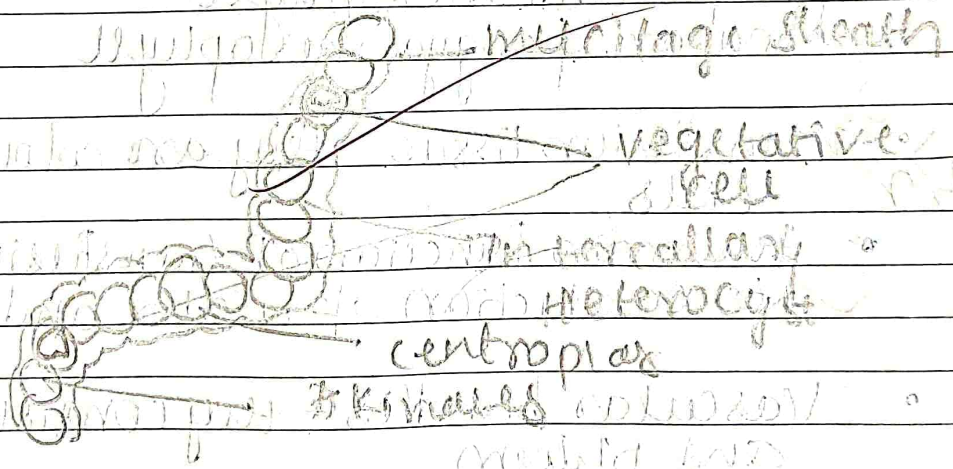
Xerophytic adaption

- thick epidermis ✓
- presence of transpiration
- poor developed spongy mesophyll

Morphology of Nostoc

- Nostoc is cyanobacteria
- It is photosynthetic organisms
- Nostoc is prokaryotic organisms
- Thalli is present in colonial
- unicellular colonial filamentous
- they reproduce by vegetative reproduction
- Akinetes
- Balls are greenish or blue in colour
- the filamentous are spherical, cylindrical,
- the heterocyst is present in between the vegetative cell and terminal cells
- heterocyst are thick walled presence of two polar nuclei
- some cell become enlarged & store the food material

4

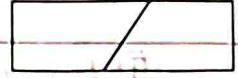


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Date / ದಿನಾಂಕ: 6-8-2024Subject/ವಿಷಯ: Ecology and to
Conservation Biology.Semester/ಸೆಮಿಸ್ಟರ್: IV Exam Seat No / ಪರೀಕ್ಷೆ ಸ್ಥಳಾಂಕ: VI6KM2250104

Invigilator's Signature / ಕೂರದ ಮೇಲ್ವಿಚಾರಕರ ಸಹಿ Signature of Evaluator / ಪರೀಕ್ಷಕರ ಸಹಿ Marks obtained/ಪಡೆದ ಅಂಕಗಳು



QNo - I

1]

Consumers are the organisms which cannot prepare their own food, they depend on other organisms for food and energy.

Ex - Carnivores, Omnivores.

2]

Food chain is

3]

Ecological hot spots are the area where the diversity of organisms (and plants (species) is found high in number. here endangered, rare species are found.

Ex - Himalayas, Western Ghate.

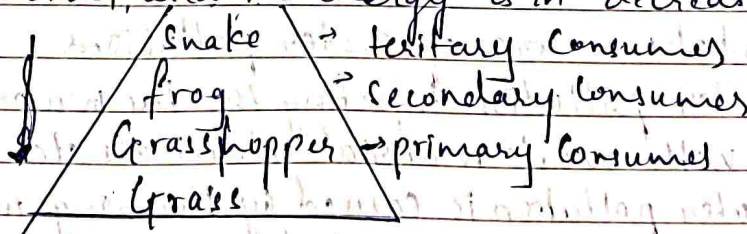
5]

Acid rain is the rain in which the pH of the water is less than the pH of water, which is less than 7.

Acid rain is caused by the pollution, industrial waste, smoke etc. It increases pH of soil and damages the building etc.

2]

Ecological pyramids is the pyramid, which is arrangement of tertiary, primary organism in the ascending order, and the energy is in decreasing order.



3]

Food chain is chain in which organisms are arrangement according to the consuming order (what consumes what), and energy flow in each order. Reduces are number increases.

Ex - grass → insects → frogs → Snake → eagle ..

Q No - 111

15] Air pollution is caused by releasing industrial waste indirectly into the air, by burning fossil fuel, by burning agricultural waste or household waste, by vehicles etc; or

Burning of fuels etc causes release of CO_2 gas, H_2S , Sulphur dioxide, Nitrogen etc harmful gases into the atmosphere which cause increase in gases (contaminants)

These gases are harmful to human, animals as well as to nature, like increase of CO_2 gas cause global warming, which causes melting of glaciers, and CO_2 is green house gas which traps the heat and increases the earth temperature.

The measure of to control air pollution are as follows:

- avoiding personal vehicle and using public transport.
- avoiding direct release of industrial waste, instead it should be ^{or} compacted
- avoiding burning of agricultural waste, instead using it as manure.
- using electric vehicles.
- plant more trees, should plants use CO_2 and release O_2 etc

16] Soil pollution is caused

14] Control measures of water pollution:

14] Water pollution infecting the water bodies by polluting it with waste material, chemicals etc.

Water pollution is caused by throwing industrial waste, sewage into the water bodies, throwing household, plastic etc waste. Water pollution should be control and following are

The control measures of water pollution:

- Avoiding the disposing industrial waste directly into the water bodies, instead it should be treated and then disposed
- Water treatment before disposing water such as removal of solid waste, etc.

Avoid throwing garbage into water, instead wet waste should be used as fertilizer/manure and solid waste should be recycled/reused.

In cities drainage system should be closed / covered so that solid waste cannot be mixed in water.

By putting net to avoid plastic waste entering into water bodies.

Avoid throwing dead bodies into water.

Reduce the use of pesticides etc in agriculture.

Q No - 11] Abiotic factors means the factors which are non-livings in an ecosystem.

Abiotic factors of ecosystem are as follows:

1] light

Light is the most important factor of ecosystem, every organism is dependent of light directly or indirectly, from microorganisms to large organisms. Light from the sun have visible spectrum, which is used by plant to prepare their own food with the help of photosynthesis. Light period of plant for which plant needs to its metabolic activity is known as photoperiodism.

2] climate

Atmosphere of the particular area for the particular time is known as climate. The atmosphere of surrounding very

important for the plant, some plants require low temperature,

some plant survive in high temperature xerophyte etc.

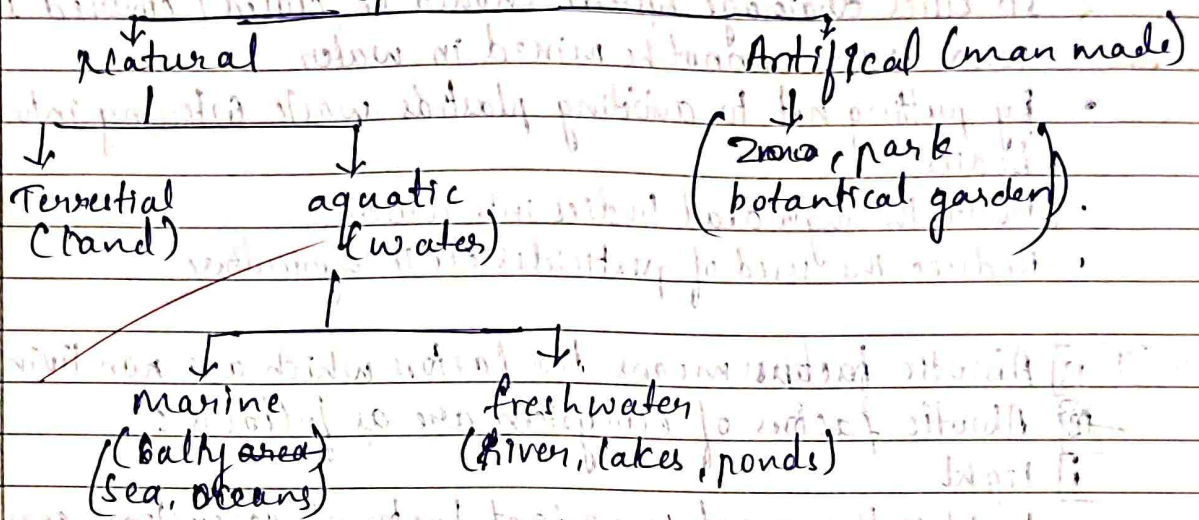
and some survive in low temperature Heterophytes.

3] Water & humidity

Water is another most important abiotic factor, which is most important to all organisms, from microorganism to larger ones. They dependant directly or indirectly.

Plants may take H_2O from ground either from roots or from the atmosphere with the help of atmosphere water in air humidity. Humidity is the water content present in the atmosphere.

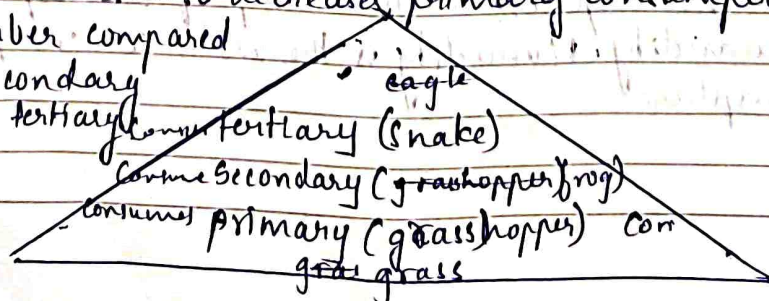
7] Ecosystem is the interact of biotic and abiotic component in a particular area. Ecosystem is further dividing in 2 types Ecosystems.



03] In natural ecosystem further it is classified into 2 types terrestrial and aquatic. The terrestrial ecosystem is ecosystem on the land, it includes forest, grassland, desert etc and aquatic ecosystem is present under water which is further classified into marine which is salty and includes sea, oceans, variety of organisms are more, as it is larger ecosystem and fresh water ecosystem consist of lakes, rivers ponds etc where variety of organisms is less compare to marine.

04] Ecological pyramid is pyramid, in which there is the arrangement of tertiary, primary, secondary and primary organism according to their consumption (what they eat) and it is in ascending order and the energy flow of energy in descending order (decreasing order).

In bottom tier the primary consumer and the at top tertiary consumers are placed. And energy in the bottom (primary consumers) is the highest and the top energy flow decreases and the energy is least. The number of consumers also decreases primary consumers are greater in number compared to secondary and tertiary.



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Subject :- Botany - I.

Cell Biology

Q.1

1 Ans :- Chromosomal puffs :-

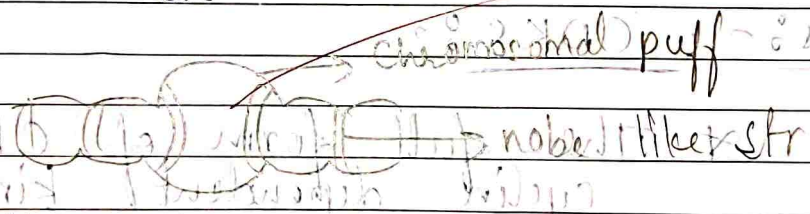
* These are also called as Balbian rings

* They are occurred in polytene chromosome

* Some times temporarily swelling of chromosome of dark bands is called Chromosomal puffs.

* The Chromosomal puffs are formed due to uncoiling of the chromatin

* Function :- Transcription, Gene expressing etc.



2 Ans :- Polytene chromosome

* It is a type of giant chromosome

* The Polytene chromosome are longer than the normal chromosome

* They are having dark band & Inter band

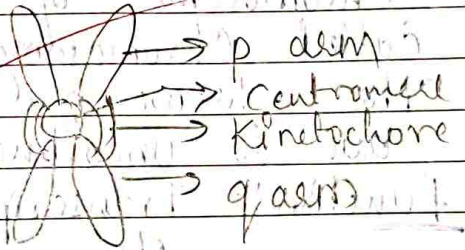
* The dark band having more DNA & less RNA whereas Inter band Chromosome having more RNA & less DNA

* The DNA in Inter Band is 0.8 to 25 μm .

* The dark band swells up & enlarge puff like loop is called Chromosomal puff & Balbian Ring

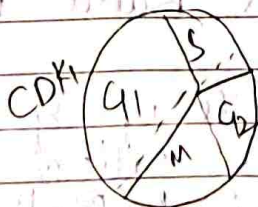
4 Ans :- Kinetochore

- * The Kinetochore is protein structure
- * It is formed side of the centromere.
- * The Kinetochore helps during the cell division
- * The Spindle fibre move ^{chromosome} correctly due Kinetochore.
- * Function:- Chromosome transfer equally Sister-Chromatids
- * Structure consist, Inner, Outer & Central plate



5 Ans :- CDKS :-

- * The full form of CDKS is cyclin dependent kinase
- * Cyclin dependent kinase is a family enzyme.
- * It is present in the cell cycle
- * It is present in cell cycle for transport of cell from one phase to another
- * Types :- CDK1, CDK2, CDK4, CDK6, CDK7
- * CDK4 & CDK6 in G₁/S phase.
- * It helps in cell cycle & checkpoint transcription



Q Ans 10

E.R. 9

E.R. :- Endoplasmic Reticulum.

* It is present in Eucaryotic cell

* It play crucial role in the formation of cellular activity

* Types

(1) SER

(2) RER

* SER $\rightarrow$ Not consist Ribosome
Lipid Synthesis
Detoxification

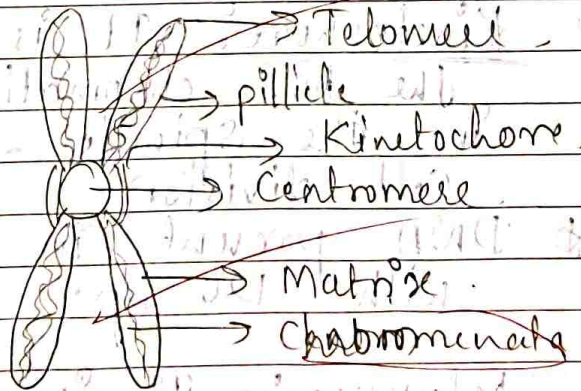
* RER $\rightarrow$ Ribosome present
Protein Synthesis

* Function :- produce Internal & External Protein Synthesis.

Q. II

8 Ans 9

Structure of Chromosome.



$\Rightarrow$ The Chromosome is made up of two chromatids which are attached at the centre small centromere.

$\Rightarrow$ The chromatids are made up of Chromatin fibres of 40% DNA & 60% of the histone protein.

→ Pelicle Each chromatid consist of 8 histone protein to form a Chromatid DNA complex know as nucleosome.

⇒ Pelicle :- It is outer most layer of chromosome.
* It is non-genetic (not coloured)

⇒ Matrix :- It is fluid like matrix present in the chromatid, formed by genetic chromosome.

⇒ Centromere :- It is gene sequence present & help in the structure & shape of chromosome.

⇒ Centromere :- At the centre the two sister chromatid joined to the centromere.

⇒ Kinetochores :- It is present at the two chromatids which helps in the spindle formation & cell division.
* DNA present in this CEN DNA with 120 bp.

⇒ Telomere :- It is the end of the chromatid, consist DNA.
* Helps in gene regulation & replicative gene formation.
* Not collide with the neighbouring chromosome.

Q. II

236.

Q. Ans:- Lampbrush Chromosomes

* It was studied by

Flemming

* Detailed Study of the Lampbrush by Ruckerts

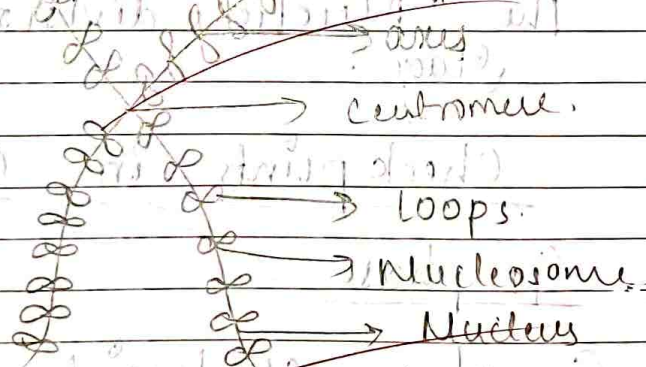
* Oocytes of the Egg.

* Lipid / Yolk Synthesis.

* The Chromosome which are present in Oocytes of amphibians & some of the Insects.

* The Lampbrush chromosome form the axis on which the loop formed at the opposite side and at centre the nucleosome.

Lamp brush Chromosome



M.S.C.2 → Maternal Sister

Chromatid

P.S.C.2 → Paternal Sister

Chromatid

* The Chromosome of which loop formed on the axis

* The Lamp brush axis transcriptionally form DNA & help in formation of RNA

for the synthesis of Yolk.

* The Lampbrush chromosome occurs in the diplotene stage of meiosis prophase I in the form of primary oocytes of animals of vertebrates or invertebrates.

✓ * The Lampbrush Chromosome is formed by the bivalent chromosome one of the maternal & paternal chromosome to form a chiasmata.

* The two chromatid formed by the homologous chromosomes the crossing over of the maternal & paternal.

* The loop of the chromosome can be studied by size, shape or morphological characters.

* The Meiotic division of Diplotene stage.

10 Ans:-

Check points in Cell cycle

G₁ phase

1. G₁ phase checkpoint

- * Protein Synthesis of the cell
- * It take place by the CDK enzymes. → Cyclin Dependent Kinase.
- * Function :- DNA damage + Cell Replication.

2. G₂ phase checkpoint

- * Protein Synthesis for transcription
- * Takes place in mitotic cell.

Helps in DNA Damage & cell Replication.

* cell transfer to the M phase consist of protein / enzyme / ATP.

3) S phase:-

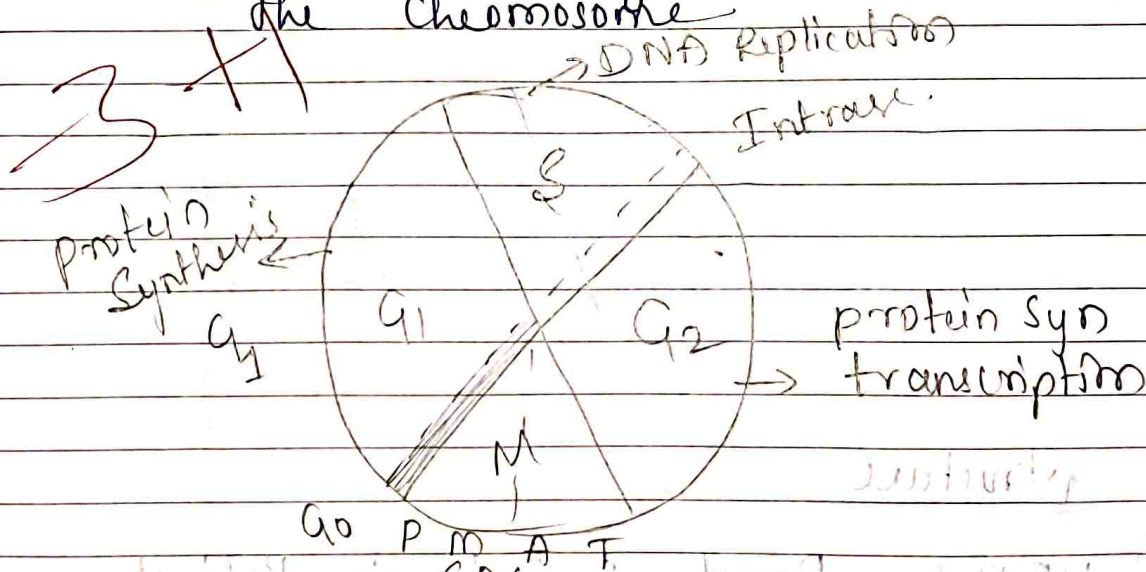
* It consist of DNA Replication site

* The cell transferred by G_1 phase.

* If some Damaged DNA present check out

4) M phase:-

* It consist of Microtubules into the Chromosome



Types of Check point

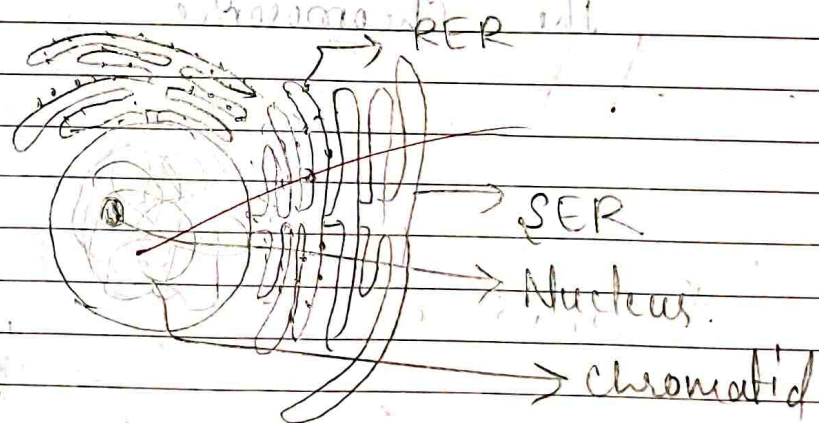
- 1) G_1 / S phase Check point
- 2) Intracell phase
- 3) G_2 / M phase
- 4) SAC phase

- 1) G_1/S phase $\Rightarrow$ $Pb\alpha_2$ / EaP_{α_2} $\Rightarrow$ $CDK4/CDK6$ / $CYCD$
- 2) Intracellular (ATM / ATR)
- 3) G_2/M phase $\Rightarrow$ Pb_2 , NDM_2 , PS_3
- 4) SAC phase (Securine, MCC, Separase)

Q. III.

13 Ans :-

Structure of SER & RER



Structure

- ① RER :- Rough Endoplasmic Reticulum is made up of many granule like structure.
 - * They are ribosome
 - * Most stable
 - * Formed by cisternae
 - * Width 400 - 500 $\text{\AA}$
 - * Helps in protein synthesis.

Structure

SER :- Smooth Endoplasmic Reticulum

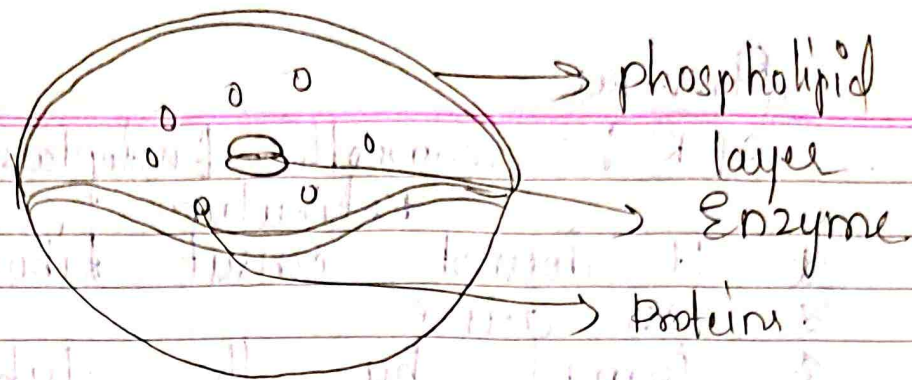
- * It does not consist Ribosome
- * less active
- * formed by the tubules
- * length 500 - 1000 Å
- * Helps in lipid or steroid synthesis

Function

- It helps in Mechanical Support
- It helps in secretory protein synthesis
- ⇒ Active transport of cellular material
- ⇒ Providing transcription for cellular action
- ⇒ Glycosylation of protein
- ⇒ Import & Export of Protein
- ⇒ Mechanical Support
- ✓ ⇒ Synthesis of lipoprotein & Glycolipids
- ⇒ Detoxification by the SER
- ⇒ Exchange & transport of cellular material
- ⇒ RER make contact with nuclear Membrane for DNA
- ⇒ SER make contact with plasma membrane

16 Ans :- Lysosome :-

The Lysosome was discovered by Christian de Vau in 1955.
Lycio - break up & some-body



Structure of Lysosome

* It is made up of uni layered outermost

* They are having pluinous size, shape varied

* They consist outer layer of lipoproteins

* They consist hydrolytic enzyme present in Matrix

* The Matrix consist of nucleosome, liposome, etc.

* They are two types
Primary :-

Secondary :-

* Primary Lysosome :- Formed in ER & Mitochondria of cell by hydrolyzed enzyme.

* Secondary Lysosome :-

① Phagosome :- The foreign particle entre in Cytoplasm & Plasma membrane form Sac like str & engulf phagosome

② Residue enzyme :- Lysome digested & some undigested food is called Residual. through out of cell by Exocytosis.

③ Autophagosome :- The cell particulary Mitochondria & Endoplasmic Reticulum are engulf by Lysome with disturbing the cell

==> Function of Lysosome :-

- * Digestion of Intra cellular Material
- * Digestion of Extra cellular Material
- * Cellular Digestion (When cell die, cell debris cell wall & enzymes are engulfed by the Lysosome)



II- Internal Test

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Q. II)

10] C-3 pathway

C-3 pathway is also called as Dark reaction or Calvin-Benson-Bassham cycle. C-3 pathway or C-3 cycle occurs in light independent reaction plants in the stroma of the chloroplast.

Process of C-3 cycle

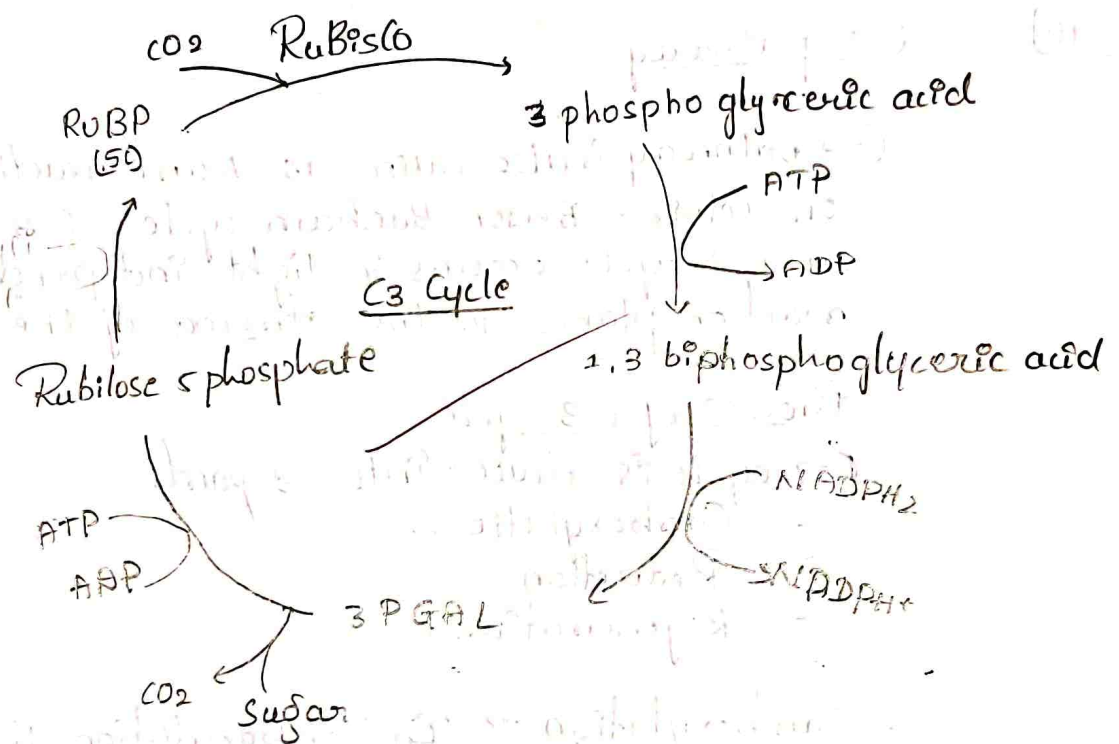
C-3 cycle is divide into 3 parts.

- Carboxylation.
- Reduction.
- Regeneration.

- Carboxylation → In carboxylation the CO_2 molecules are added to the RuBP [Ribulose biphosphate], which is five carbon compound. undergo carboxylation. to form the 3PGA [2 molecules of PGA]. due to 6 carbon is not stable so it is splitted. into 2 molecules of PGA. (phospho-glyceric acid).

- Reduction → In Reduction the PGA undergo phosphorylated in the presence of the ATP to form 1,3 biphosphoglyceric acid. Then the Biphosphoglyceric acid is reduced with the help of NADPH_2 to form the 3PGAL that is phosphoglyceraldehyde.

* Regeneration → The PGA1 phosphoglyceric acid is reacted with 1.7 phosphate and sedoheptulose to produce the Rubilose 5 phosphate then this Rubilose 5 phosphate is phosphorylated in the presence of ATP to form or regenerate the ^{RuBP} Rubisco that is Rubilose bP phosphate.



ii)

C₄ cycle

- C₄ cycle occurs in certain plants having high temperature and intense sunlight and which are enable to fix the carbon dioxide. C₄ cycle is light dependent reaction so the light dependent and Calvin cycle are physically separated.
- Calvin cycle occurs in Bundle sheath
 - Light reaction occurs in Mesophyll cells.

C₄ cycle is divided into 3 steps

1) Carbon fixation.

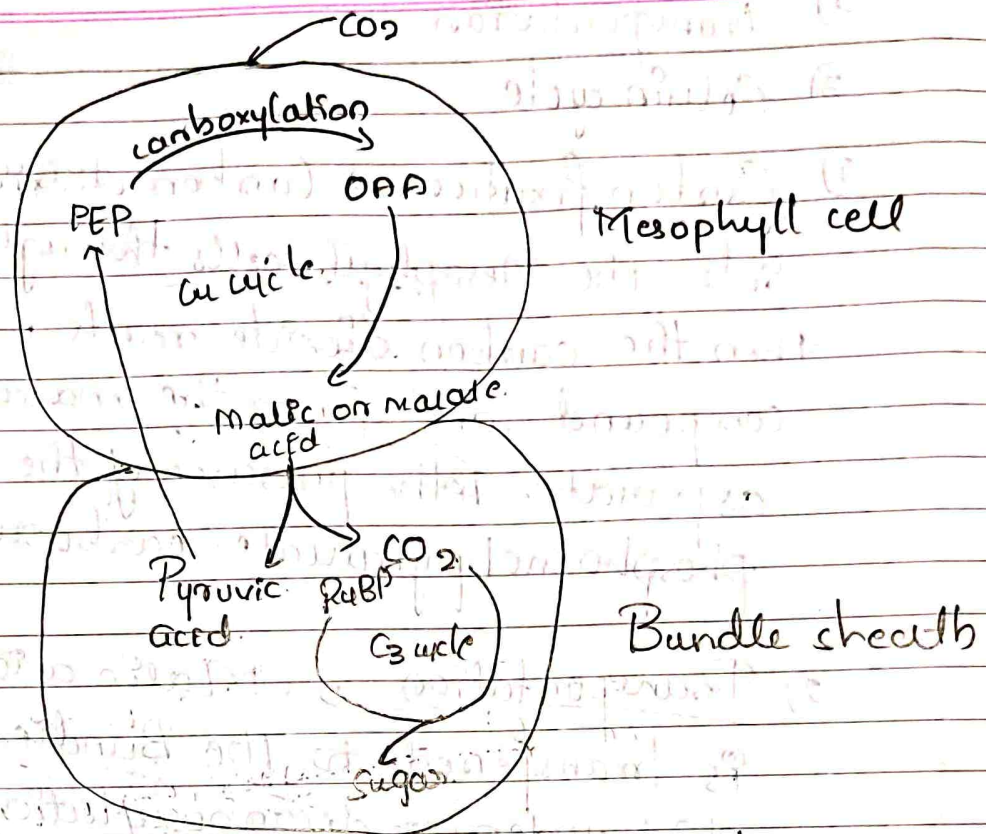
2) Transportation

3) Calvin cycle

1) Carbon fixation → Carbon dioxide enters into the mesophyll cells through the pores then the carbon dioxide reacts with a 4 carbon compound and forms the malate or the aspartate. In the presence of the PEPcase. phosphoenolpyruvate. carboxylase enzyme.

2) Transportation → Malic acid or Malate is transferred to the Bundle sheath. which undergo decarboxylation and then form the carbon dioxide and Pyruvate or Pyruvic acid in the Bundle sheath.

3) Calvin cycle → Carbon dioxide that formed in the bundle sheath again goes to the Calvin cycle with RuBb and Pyruvic acid again transferred to mesophyll cells to regenerate the PEP. [Phosphoenolpyruvate]



12) Photorespiration

Photorespiration is the biological process which occurs along side of photosynthesis. This is said wasteful and countersynthesis because in this process the oxygen is taken up by the plant and carbon dioxide is released, which is opposite to the main goal of the photosynthesis.

Process of photorespiration

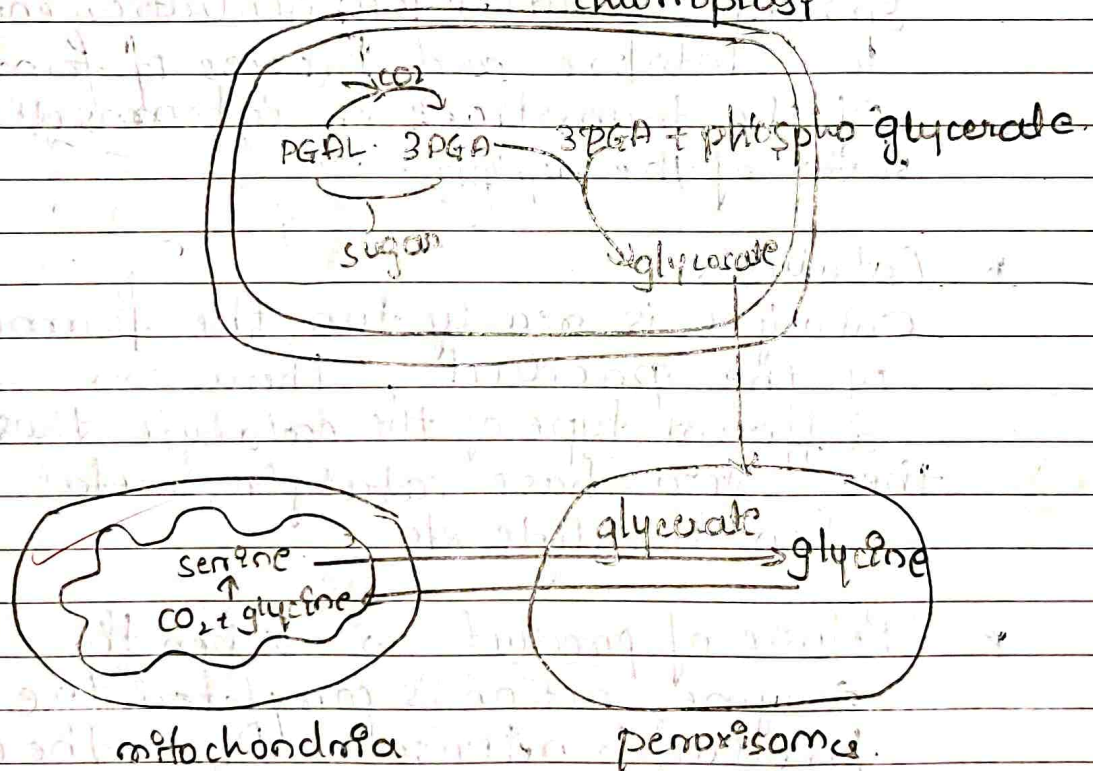
- Plants take up the oxygen and release the carbon dioxide.
- Oxygenation of the Ribulose 5-bi phosphate take place which is 5 carbon compound to form the glyoxylate.

- Then the glycosate is further converted into the glyoxate in the peroxisomes.

- The Glyoxate is converted ~~to~~ into the glycine in the mitochondria.

- Some of the Glycine is transferred back to the peroxisomes.

- Some of the Glycine is transferred as the serine in the mitochondria, and form the carbon dioxide.



Hence the the plant receives the oxygen and release the CO_2 by the process called photorespiration.

III)

iv) Mechanism of Enzyme action

* Binding →

Enzyme will binds to the specific substrate at the active site. Active site is present on the surface of the enzyme with having some shape and chemical property.

* Enzyme-Substrate Complex

When enzyme binds to the specific substrate formation of complex of enzyme-substrate take place.

* Transition state

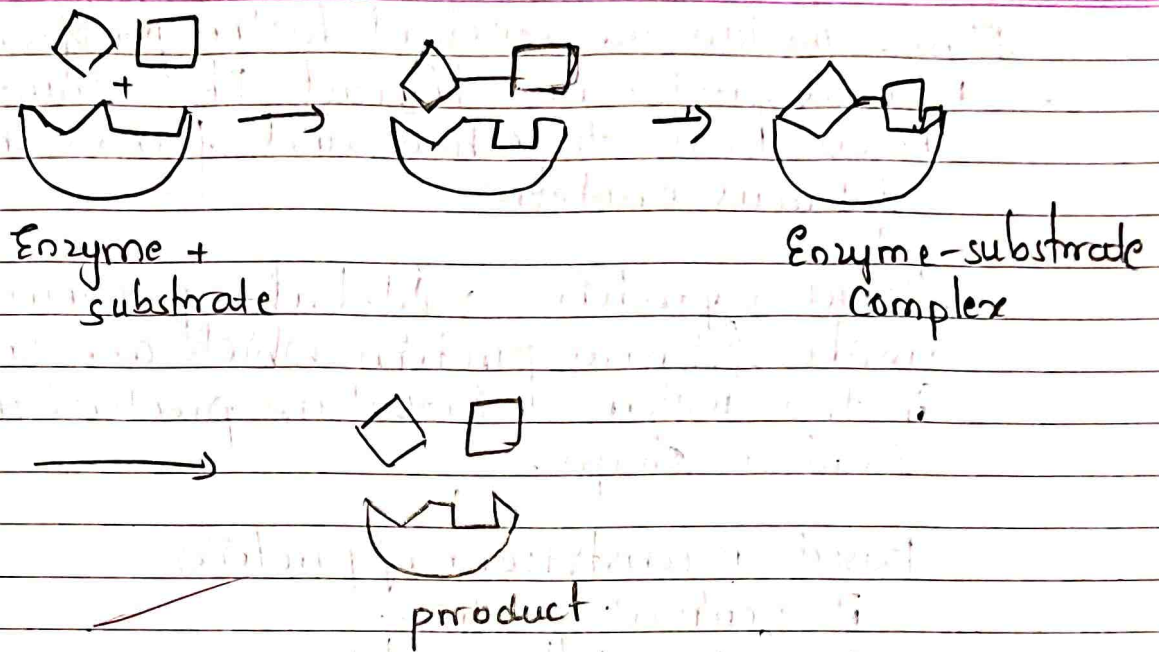
Enzyme requires low activation energy to stabilize and process of formation of the transition or intermediate state of the complex.

* Catalysis

Catalyte is ready for the formation of the product. There are different type of the catalyte those are the. acid-base catalyte, metal-ion catalyte etc.

* Release of product → When the enzyme action is completed the product is released. Again the enzyme is ready to bind with the another reaction.

Enzyme have high specificity so that it can undergo many reaction millions of reaction and catalys the reaction.



15) Proteins → Proteins are the complex biomolecules which play vital role in the bodily function. Proteins are made up of the Amino acids.

- Amino acids are the building block for the protein
- Protein helps in cell repair, regulating metabolism
- Protein helps in the energy production
- Helps in balancing the fluids and pH of the body.

Classification of proteins are based on

- Shape
- Constituent of protein
- Nature of molecule

1) Based on shape of molecule protein

- 1) Fibrous protein.
- 2) Globular protein

1) Fibrous protein → Fibrous protein are insoluble in water And the

fibrous protein are resistant to the proteolysis.
- Fibrous protein are thread-like structure which binds together and forms the fibrous protein.

- Globular protein → Globular protein are unlike fibrous protein which are soluble in the water. Globular protein are oval in shape.

Based on constituent of protein

1) Derived protein.

2) Conjugated protein

1) ~~Derived~~ ^{Conjugated} protein → This are the protein which are formed by the non-characteristic of amino acids.

↳ Lipo protein → which are made up of the lipid and protein.

- Muco protein → which are made up of the carbohydrate and the protein.

2) Derived protein → This are the protein formed by the hydrolysis of the alkali, acid and etc. the obtained product is called the derived protein.

Based on Nature of protein molecule

1) Acidic protein

2) Basic protein.

1) Acidic protein → Acidic protein consist of anion. due to the presence of anion it becomes the acids.



Basic protein → Basic protein consist of the cation in it so that due to the presence of these ions protein is called basic protein.

[D.T.]

Q) Proteins are the complex biomolecules which play vital role in the bodily function. Proteins are made up of the amino acids.

- Amino acids are the building block for the protein.
- Protein help in repair mechanism.
- Regulating metabolism.
- Protein helps in the energy production.
- Helps in balancing the fluids and pH.

Q) Different type of protein based on shape constituent and Nature.

- Globular protein
- Fibrous protein
- Derived protein
- Conjugated protein

3) Amino acids → Amino acids are building block of the protein which play imp role in bodily function.

Types

- Essential Amino acid
- Non-Essential Amino acids

1) Essential Amino acids → Amino acids that are not produced by the human body they should be taken from the diet
Ex → lysine.

Non-Essential Amino acids are produced by the human body.
Ex Glutamic.

7) Xanthophyll → Xanthophyll are the yellow to orange pigments present in the plant which helps in the absorption of the light and transfer it to the chlorophyll during the photosynthesis.

- Xanthophyll provide yellow or orange colour to the fruit and plants.
- xanthophyll are antioxidant in nature.

5) Vitamins → Vitamins are biomolecules play important role in bodily functions.
Classification

Water soluble vitamin

- Vitamin C
- Vitamin B6 - B12

Fat-soluble vitamin

- Vitamin K
- Vitamin C
- Vitamin A
- Vitamin D

- Deficiency of Vitamin A causes a night blindness.
- Deficiency of Vitamin K causes the problem in blood clotting.
- Helps in energy production.
- Helps in immune function.



2)

Enzymes

Enzymes are the molecules which helps in the speeding up the chemical reaction.

Enzymes are of different type

- Hydrolyases
- Lipase.

Enzymes function

- Energy production
- Detoxification
-
- Enzyme binds to the specific substrate to catalyse the chemical reaction
- Enzymes are highly specific to the temperature and pH of the reaction



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INTERNAL TEST 2023 - 2024

015KMD350000

Name / ಹೆಸರು: Shilpa. y. kure

Roll No./ಸ್ಥಳಾಂಕ: _____

Date/ದಿನಾಂಕ: 3-1-2024Subject/ವಿಷಯ: BotanySemester/ಸೆಮಿಸ್ಟರ್: 1st

Exam Seat No./ಪರೀಕ್ಷೆ ಸ್ಥಳಾಂಕ: _____

1st Internal

Invigilator's Signature / ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರ ಸಹಿ

Signature of Evaluator / ಪರೀಕ್ಷಕರ ಸಹಿ

Marks obtained/ ಪಡೆದ ಅಂಕಗಳು

28 / 30

Q. I

1. Rhizobium

- * Symbiotic association with root nodules of leguminous plants.
- * They convert dinitrogen into Ammonia.
- * These are the source of nitrogen in Agriculture soil.
- * diazotrophic in nature.

2. significance of microorganisms.

- 1. microorganisms are used in production of Antibiotics.
 - * penicillium notatum - penicillin
 - * streptomyces erythraeus - erythromycin.

3. used in Bakery production

- * Yeast is used in the production Bakery items.
- * penicillium roqueforti used in production of cheese.

4. Vitamin production

- * vitamin A, C, D are produced by Algae.
- * vitamin B₁₂ in curd.

5. Bacteriorhodospin

- * Halophiles produce a bacteria called Bacteriorhodospin
- * it contains red carotenoid as a pigment.

6. Axenic culture

- * it describes the state of organisms, single species or variety of organisms are present, and contaminated from all other organisms.
- * Axenic culture microorganisms are prepared by subculture of an existing mixed culture.

* Axenic culture is used study symbiotic and parasitic organisms in controlled condition.

6. Lyophilisation.

* cells are die. If they are allowed to drying.

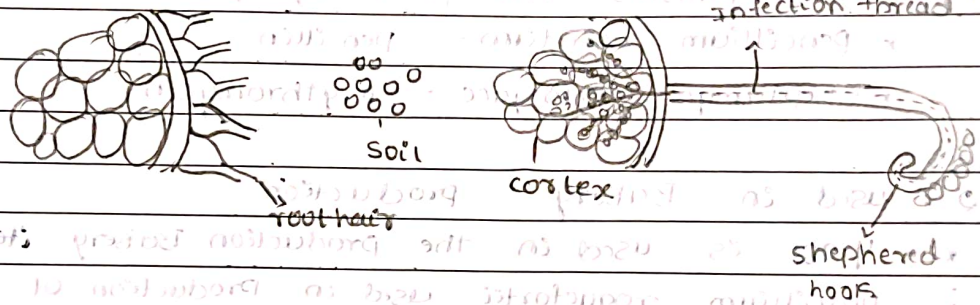
* number of micro-organisms are preserved by this method they are killed by ordinary drying.

* cell suspension is frozen at -40 to -60°C in vials. Then the vials connected to high vacuum.

* micro-organisms are preserved more than 30 years.

Q. 11.

1.



* R Rhizobium, is ρ l symbiotic association with root nodules of leguminaceous plant. They convert N_2 into ammonia. leguminaceous plant cannot absorb directly N_2 from atmosphere.

Root hair releases the sugars & amino acids to attract the host bacteria Rhizobium.

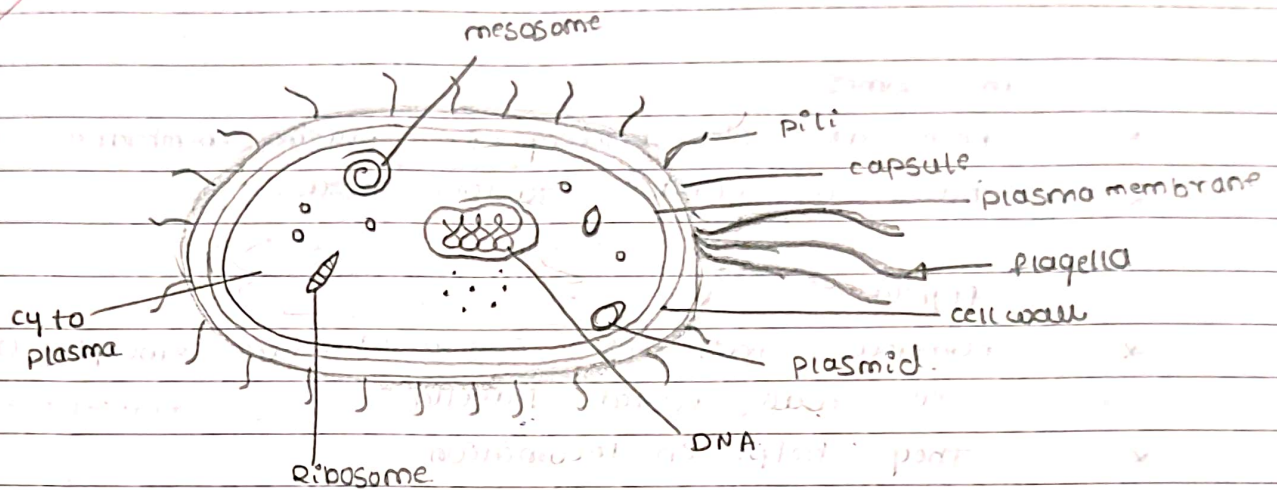
Rhizobium come towards the root hair adsorb.

Host bacteria undergo rapid multiplication to form more no. of sugars & amino acids.

At the same time there is formation of curve called shepherd's hook.

Bacterial cells present at the tip of root hair, they move towards the plasma membrane.

- * there is a formation of infection thread.
- * Bacterial cells move towards the cortex cells and undergo rapid multiplication to form more no. of bacterial cells.
- * Bacterial cells present in cortical cells, each cortical cell contain number of bacterial cells.
- * after the nodule formation they are surrounded by a membrane called peptidoglycan.



Bacterial cell consist 3 layer

- 1> capsule
- 2> cell wall
- 3> plasma membrane.

capsule:

- * It is gelatinous substance.
- * made up of poly saccharide & poly peptide.
- * sticky nature of these substance helps to attach the substrate like root hair surface, human teeth.

cell wall.

- * It is made up of mureopeptide and peptidoglycan.
- * It protects the bacteria from harmful micro-organisms.
- * porous helps in diffusion.

Plasma membrane.

- * made up of lipoproteins
- * control the entry & exist of ions
- * photosystems are present.

Bacterial Genome

* Bacterial genome is double stranded DNA molecule.

* genes in Bacteria are called chromophore.

plasmids

* plasmids are extra chromosomal, self-replicating, autosomal element.

mesosomes

* these are inward folding of plasma membrane.

* helps to increase surface area.

flagella

* numerous hair like emergent structure emerging out from cell wall called flagella.

* They help in locomotion.

Pili

* pili helps in contraction during reproduction.

5.

Archeobacteria

Eubacteria

* These are oldest, primitive bacteria.

These are true bacteria.

* They can survive in extreme condition like high temp, salty area.

They cannot survive in high temperature & salty area.

* undergo methanogenesis

do not undergo methanogenesis.

* do not synthesize cholesterol

synthesize cholesterol

do not have flagella for their movement

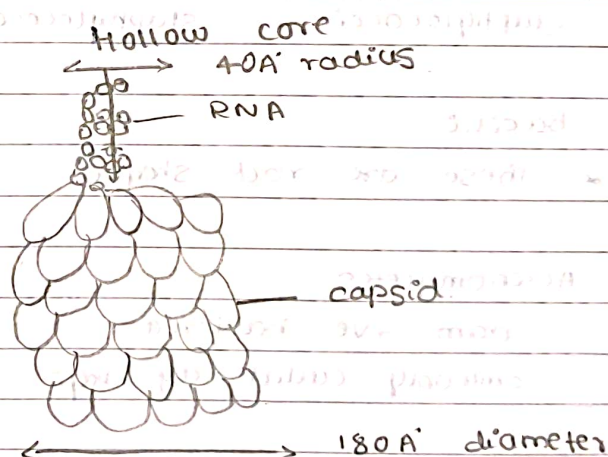
have flagella for movement.

* do not become endospore

become endospore.

Q. III.

3. characters of virus.
- * viruses are non cellular, self-replicating
 - * These are obligate, intracellular, parasitic organisms.
 - * They cause disease to both plants and animals and man.
 - * The small virus is often called virion
 - * They can survive without host bacteria
 - * They cannot grow in nutrient medium
 - * depending upon symmetry they are classified into cubical, helical, complex.
 - * Viral genome is either DNA or RNA.
 - * genome is single stranded or double stranded
 - * viruses do not have photosynthetic agent. Hence they use host bacteria for synthesis.
 - * virus infected bacteria called bacteriophage.
 - * viruses are surrounded by protein coat called capsid
 - * capsid is made up of capsomers.



- * TMV is rod like structure.
- * about 180A in diameter and 3000 A in long.
- * it is covered by protein shell called capsid that encloses the viral RNA

- * Virus genome is single stranded RNA molecule
- * RNA is present in capsid, in coiled manner
- * capsid is a protein coat made up of capsomers.
- * Each capsid is made up of 2130 molecules of capsomers
- * ~~Each capsomer is made up of 158 amino acids~~
- * Each capsomer is coiled with 3 nucleotides of RNA.

Q. II.

4. bacteria are classified based on morphology.

1) True bacteria.

* cocci

I

based on number of cocci they are classified into

monococci - monococcus species

diplococci - streptococcus pneumoniae

staphylococci - staphylococcus aureus

* bacilli

* These are rod shaped.

2) Actinomyces

* gram +ve bacteria

* commonly called ray fungi

3) mycoplasma

* do not have cell wall & indefinite shape.

4) Ricketts

* obligate parasitic organisms.

II Based on Anatomy.

* capsule

capsulate

non capsulate.

* flagella

based on no. of flagella they are classified as

monotrichous - single flagella present

lophotrichous - only one side flagella is present

amphitrichous - both side flagella present.

* spore

spore forming - Eubacteria

non spore forming - Archaeobacteria

III Based on pathogenicity.

pathogen

which spread disease & cause disease

ex: Streptococcus pneumoniae

non-pathogen

which does not cause pathogen

ex: Bacilli species

commensals

they don't cause disease, but cause disease when the immune system is impaired

IV Based on nutrition

Autotrophs

prepared their own food.

ex: Algae.

Heterotrophs

depend on others for food

ex: mammals



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IInd

INTERNAL TEST 20 -20

Name / ಹೆಸರು: Sahana S. Vaddana

Roll No./ಸ್ಥಳಾಂಕ: 200¹⁴⁶

Date / ದಿನಾಂಕ: 10-12-2024

Subject/ವಿಷಯ: Biology

Semester/ಸೆಮಿಸ್ಟರ್: 1

Exam Seat No / ಪರೀಕ್ಷೆ ಸ್ಥಳಾಂಕ: 200

30/30

Invigilator's Signature / ಕೋಶದಿ ಮೇಲ್ವಿಚಾರಕರ ಸಹಿ, Signature of Evaluator / ಪರೀಕ್ಷಕರ ಸಹಿ, Marks obtained / ಪಡೆದ ಅಂಕಗಳು

Q II

1]

Lichens

→ Lichens are Symbiotic organisms association with with. organisms fungus and algae.

→ They intimate association with two microorganisms result in formation of macro organisms, lichens.

→ Lichens differentiated as 3 types on morphology, crustose, foliose, fruticose.

2]

Pencilium

→ It is saprophytic feeding on dead decaying organisms.

→ They are found in soil, air, dead organism

→ penicillin is most important antibiotic extracted from pencilium.

→ use in food production cheese, curd.

3]

Capsid

→ The capsid of virus varies according to the organism in living on it.

→ capsid changes shape as per virus.

→ The important role of capsid is protection.

→ capsid is made up of capsomers.

7]

VIRIIDS

- Viriids are infectious agents, with single stranded circular RNA molecule.
- Viriids are obligate intracellular parasite.
- They do not have protein coat.
- They do not have capsid.
- Viriids RNA is 246-400 nucleotides long.
- Ex:- Peptone water, Nutriton agar.

8]

SARS COV2

→

2]

ISOGAMY

- Isogamy is a form of sexual reproduction.
- The male and female gametes are called isogametes. When they fusion each other called isogamy.
- gametes produced from different parents.

Q II

1]

NUTRITION IN FUNGI

→

Fungi are heterotrophic in nutrition.

x

They are four types of nutrition

1]

Saprophytic

→

Saprophytic nutrition. Take nutrition from dead and decaying organisms.

Ex:- Rhizopus.

Types. Ectophytic Saprophytes.

1]

Ectophytic Saprophytes.

2]

Endophytic Saprophytes.

2] parasites.

→ parasites take food from living organisms plant and animals.

3 types.

1] obligate parasite ex:- Puccinia.

2] facultative saprophytes ex:- Taphrina.

3] facultative parasite ex:- Pythium.

3] Symbiont

→ They grow on the living organisms. both are mutually benefited.

ex:- lichens.

2 types.

1] Ectophytic mycorrhiza

2] Endophytic mycorrhiza.

4] Parasitic fungi.

→ They are animal capturing organisms.

→ They capture animals like nematodes, protozoa. ex:- Dictyella.

3] Cyanobacteria

→ They represent a major group of photosynthetic bacteria. they carry out oxygenic photosynthesis.

* classification of cyanobacteria.

→ kingdom = monera

→ division = Eubacteria.

→ class = Cyanobacteria.

* characteristics of cyanobacteria.

→ They are prokaryotic, aerobic, photoautotrophic bacteria.

→ They are also called blue green algae.

* Habitat

- they live in fresh water marine water etc.
- 3 types
- unicellular Ex:- *Gleocapsa* sp.
- colonial Ex:- *Myxocapsa* sp.
- filamentous Ex:- *Anabaena* sp.

* Reproduction in cyanobacteria.

- asexual reproduction → by fission, by akinetes
Ex:- *Nostoc*.
- vegetative reproduction → by fragmentation.

* Importance of cyanobacteria.

- used as food
- nitrogen fixation.
- pollute water source.

4) Economic importance of bacteria.

- There are both harmful & useful aspects.

* Role of bacteria in soil.

- certain bacteria play important role in
nitrogen fixation, ammonification, nitrification
Ex:- *Rhizobium*.

* Role of bacteria in food

- They production of cheese, curd, butter
Ex:- *Lactobacillus*.

* Role of bacteria in antibiotics

- Antibiotic Bacitracin & Polymyxin used are
produced from *Bacillus* species.

* In production of Butanol & Propionic acid.

- Industrial production of Butanol by
fermentation of a bacterium *Clostridium*
acetobutylicum.

* Bacteria in the production of medically useful enzymes:

→ Ex: *Staphylococcus*.

→ thrombolytic enzyme used in dissolving of blood clots.

* Bacteria as Bioremediation.

→ Ex: *Sphorotilus natants*.

* Bacteria as Biocontrol agents.

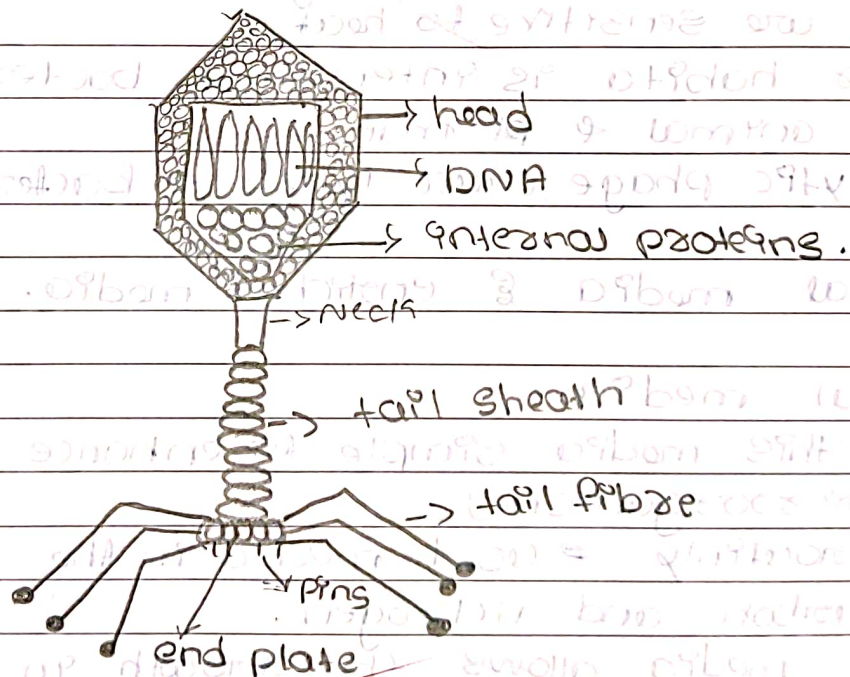
→ *Bacillus thuringiensis*.

* Production of Biogas.

→ Ex: cow dung, animal waste.

III

T4 Bacteriophage.



* Phage head :- hexonal in shape, composed of coat protein, genome in core.

* genome $\Rightarrow$ ds DNA codes for enzyme and proteins necessary for replication to more viruses

* Tail sheath $\Rightarrow$ hollow core covered with contractile sheath, DNA helps to travel from head to bacteria through sheath.

* Tail fibre $\Rightarrow$ help to anchor the phage on cell membrane.

Ex:- T₄, T₁ Phage.

Characteristics of bacteriophage.

↳ host specificity $\rightarrow$ they have high host specificity.

$\rightarrow$ They are filterable through filter.

$\rightarrow$ They are sensitive to heat

$\rightarrow$ Their habitat is intestinal bacteria flora of animal & human.

$\rightarrow$ The lytic phage cause lysis of bacteria.

4) Basal media & enriched media.

3) Basal media.

$\rightarrow$ In this media simple to enhance many microorganisms.

$\rightarrow$ it routinely used media in the lab having carbon and nitrogen.

$\rightarrow$ This media allows the growth of the non fastidious bacteria without enrichment of any source. It is non selective media.

→ Streptococcus and Enterobacteriaceae also grow in this media.

Ex:- Nutrient agar, peptone water.

3] Enriched media.

→ This media require other substance for the like blood, egg or serum.

→ This media grow with diverse microorganisms. but inhibits growth and fastidious ~~be~~ microbe grow as they require nutrients vitamin, growth promoting substances

Ex:- blood agar, chocolate agar.



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II INTERNAL TEST 2023 -2024

Name / ಹೆಸರು: Vaishnavi. Patil Roll No./ಸ್ಥಳಾಂಕ: 98 Date/ದಿನಾಂಕ: 13/12/2024

Subject/ವಿಷಯ: Plant Anatomy Semester/ಸೆಮಿಸ್ಟರ್: III Exam Seat No / ಪರೀಕ್ಷೆ ಸ್ಥಳಾಂಕ: U156M22SD122

And Developmental Biology

Invigilator's Signature / ಕೊಠಡಿ ಮೇಲ್ವಿಚಾರಕರ ಸಹಿ Signature of Evaluator / ಪರೀಕ್ಷಕರ ಸಹಿ Marks obtained/ ಪಡೆದ ಅಂಕಗಳು

29/30

Q.1.

1> Stamen

→ Stamen are the male reproductive organ in the flowers.

→ It is located in centre of the flower and produces pollen grains.

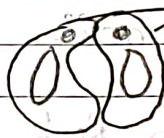
4> Stomata

→ Stomata are the small pore or opening in epidermal region.

→ It helps in gaseous exchange and water intake.

→ It surrounds two cells which is made up of parenchymatous cells known as Guard cells.

Stomata →



Guard cell

5> Secretory tissue

→ A tissue which secretes the gums, resins, latex etc are called as Secretory tissue.

→ It has two types.

i> Lactiferous secretory tissue

ii> Glandular secretory tissue.

7> Leptocentric Vascular bundles.

→ The xylem which completely surrounds the phloem is called as leptocentric VB.

→ This is commonly seen in Dracaena stem after secondary growth.



81

Bulliform cells.

- These are bubble shaped cells present on the epidermal cell.
- It stores the water
- It functions as rolling during loss of water.

Bulliform cell →



Q.2

Types of Vascular bundles

3 Types

- i) Radial vascular bundle
- ii) Conjoint vascular bundle.
- iii) Concentric vascular bundle.

i) Radial vascular bundle

These are radially arranged vascular bundles or the vascular bundles are arranged in different radii.

It is commonly seen in roots.



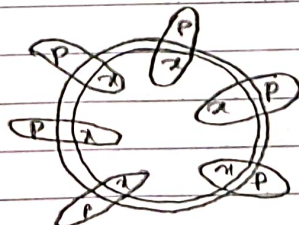
ii) Conjoint vascular bundle

→ The vascular bundles are arranged in same radii.

→ It has two types

a) Collateral

b) Bi-collateral



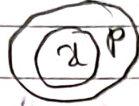
iii) Concentric Vascular bundle

→ This type of vascular bundle either surrounds the xylem or phloem.

→ It has two types

a) Amphicribal Vascular bundle

→ The xylem is surrounded by phloem

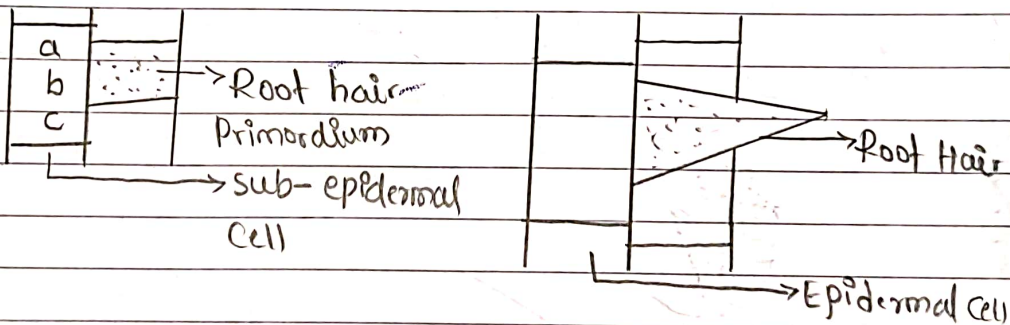


b) Amphivasal bundle

→ The phloem is surrounded by xylem.



> Root Hair formation



→ The root hairs tubular in structure and in epidermal cell.

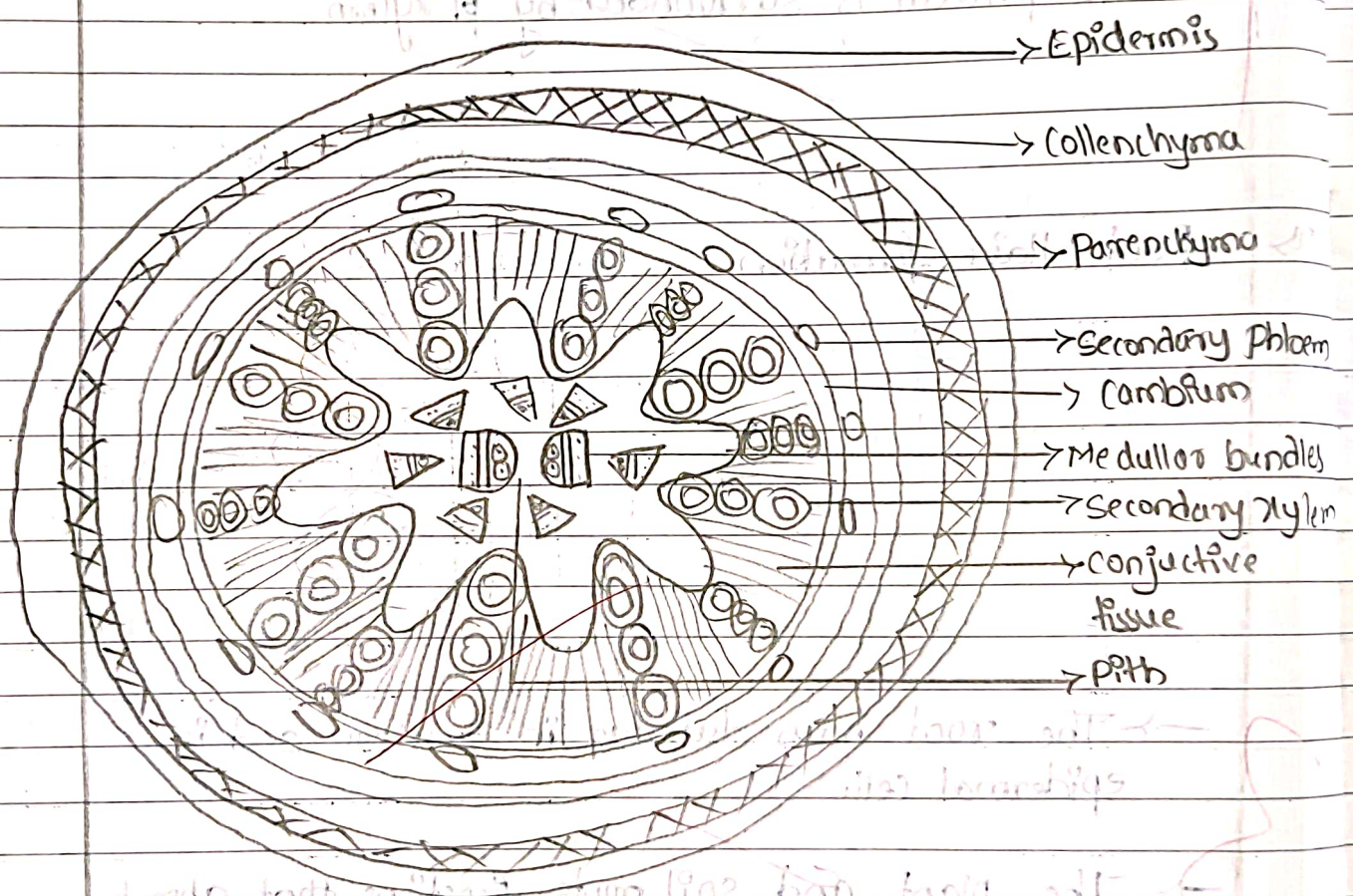
→ The plant and soil, roots functions that absorb the nutrients and water uptake.

→ Mineral weathering, Organic acid secretion, anchorage all are interaction with soil microbials.

→ Differentiation of root young roots.

- Different daughter cell unequally divide.
- The unequal division depends on polarization of cytoplasm.
- It is at the apical and nucleus is migrates to this direction.

5) Anamolous secondary growth of Boerhaavia stem.



Ground Plan OF Boerhaavia stem

The Boerhaavia stem differentiated into following regions.

→ Epidermis : It is single layered cortex collenchymatous, hypodermis 3-4 layered.

→ Endodermis and pericycle are not distinct.

→ The vascular bundle has 3 rings.

i) 2 large vascular bundles in inner ring.

ii) 4-6 vascular bundles in middle ring.

→ They both are conjoint, collateral open type of VB.

→ They increase due to the formation of interfascicular cambium.

iii) 15-20 vascular bundles in outer ring.

→ Intra and Inter fascicular cambium forms the Complete ring and 2^o xylem.

Anomaly

1) 112 rings of inner rings.

2) 3rd ring of vascular bundle.

3) Successive ring accessory cambium are produced.

Q.3)

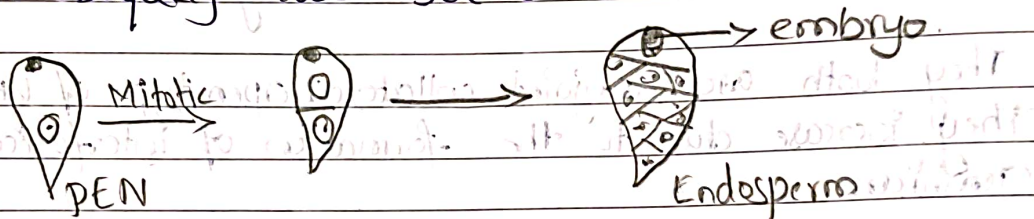
1)

Types of endosperm

3 types of endosperm

i) Cellular type

- The primary endosperm nucleus divides into two nuclei and it is followed by wall formation.
- It undergoes mitotic division followed by cytokinesis.
- The wall divides transversely sometimes vertically or obliquely. Later sac is divided into several walls.



Exp: Cucumis Sativus

ii) Helobial type



- It belongs to the order helobiales
- It is the intermediate between cellular and nuclear type.
- It first divides transversely.
- Sometimes remained as nuclear.
- If the chalazal region has 4 nuclei then the micropylar region has 8 nuclei.

Exp: Erenurus

iii) Nuclear type



→ This unaccompanied by the wall formation.

→ The nuclei is pushed towards the periphery then vacuole is formed.

Exp: Maize, Rice and Sunflower etc.

3)	Character	Monocot stem	Dicot stem
i)	Hairs	Multicellular	Multicellular
ii)	Hypodermis	Sclerenchymatous	Collenchymatous
iii)	Vascular bundles	a) Numerous b) Scattered c) closed d) Xylem endarch e) Water cavity is present f) Phloem parenchyma absent	a) not large numbers b) arranged in ring c) closed d) Xylem endarch e) absent f) Present.
iv)	Secondary Growth	Absent	Present



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Ist

INTERNAL TEST 2023 -2024

Name / ಹೆಸರು: Deepak. Pahi Roll No./ಸ್ಥಳಾಂಕ: 16 Date / ದಿನಾಂಕ: 11-1-2024

Subject/ವಿಷಯ: Plant Anatomy and Reproductive Biology. Semester/ಸೆಮಿಸ್ಟರ್: 3rd Exam Seat No / ಪರೀಕ್ಷೆ ಸ್ಥಳಾಂಕ: VISKM2250272

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30/30

Qm I: Any five $2 \times 5 = 10m$

- 01/ Endothecium
- 02/ Synergids
- 03/ Anemophili.
- 04/ Sclerenchyma.
- 05/ cambium.
- 06/ paliside parenchyma.
- 07/ Radial vascular Bundle.

Qm II: Any Three $4 \times 3 = 12m$

- 01/ Describe the structure and function of food conducting tissue.
- 02/ what are meristems? classify based on their position.
- 03/ Describe the entry of type of pollen tube into embryo sac.
- 04/ give a brief account on endosperm.
- 05/ Define pollination; types of pollination.

III. Any two $4 \times 2 = 8m$

- 01/ what is fertilization? Describe the process of double fertilization.
- 02/ Describe the structure and types of parenchyma.
- 03/ Explain the characteristics of meristematic tissue
- 04/ types of ovules:-

III.

or

=>

Fertilization: The fertilization can be defined as
→ The process of formation of

The one male gamete fuses with the female gamete or polar nuclei to form the zygote. It's known as the fertilization.
→ It is physicochemical process of pollination in apcell.

process of double fertilization:-

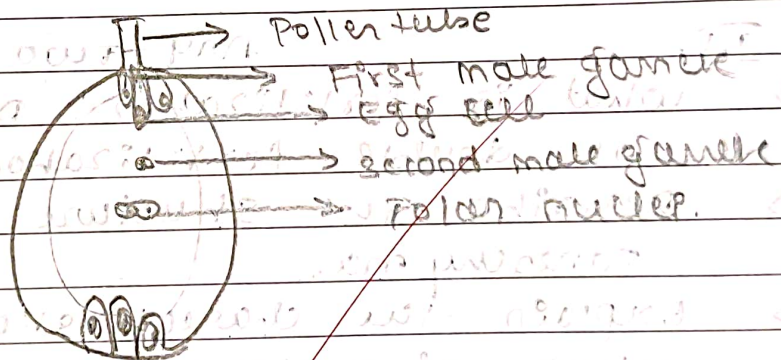
→ The one male gamete fuses with the zygote Embryo sac and another one gamete fuses with the polar nuclei to form the process known as the double fertilization.

Three steps of double fertilization:-

1> Growing pollen grains.

2> Pollen grains into pollen tube.

3> Double fertilization & triple fusion.



→ The double fertilization First step is the pollen grains are entry to the pollen tube

→ Later the pollen grains are develop through the pollen tube

→ The pollen grains are formed / contain the one pollen tube known as the monosiphonous.

→ The pollen grains are contain more than one pollen tube it's a polysiphonous.

ex: malva.

* The one male gamete fuses with zygote later it converts / involved / develop of an embryo sac. and the second male gamete is fuses with pollen endosperm nucleus. These two fertilization, one is embryo sac with zygote / ^{1st male gamete} and pollen endosperm nucleus with second male gamete. This process known as the double fertilization.

* The male gamete contains embryo sac and the second male gamete contain pollen nucleus endosperm nucleus. These are triploid. These three in one layer (2 polar nuclei + 1 male gamete) is called triple fusion.

II.

=> Meristems :-

* The meristematic tissue commonly known as the meristem.

* These are the give mechanical strength, and provide the support of the overall plant.

* It's mechanical & supporting tissues.

It's classify based on their position :-

1) Apical meristem

2) Lateral meristem.

3) Intercalary meristem.

o/y Apical meristem :-

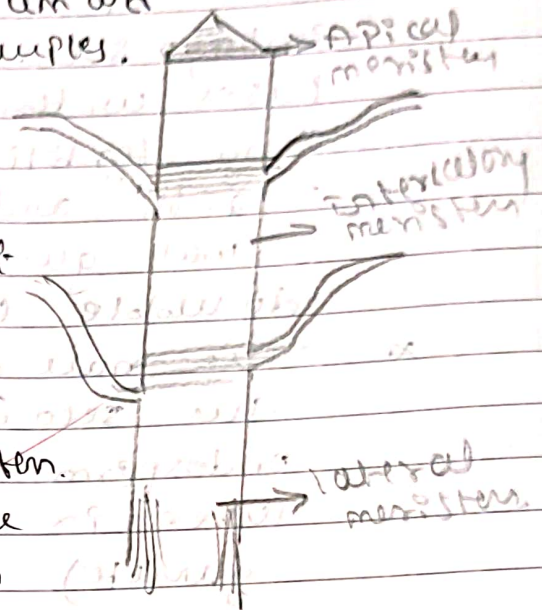
* These are the occur at the tip of the vascular bundle or the plant.

* It's also called the growing points.

* It's increase this part of height of the body.

025 Lateral meristem:

- These are vascular cambium and cork cambium of two examples.
- Along the side of the outer longitudinally divided of the plant.
- The plant contains growth of the plant by producing secondary connective tissue.
- The cork / phelllogen can divided in the lateral meristem.
- These the cork / phelllogen are divided in periclinally to form the sides of cells.
- Those cells are towards outside called cork / phellum. It's the cells are inside known phelloderm. These all are in one cell known as periderm.



031 Intercalary meristem:

- These meristems are parts of the Apices.
- It's occurring the Apex region.
- These are the short living one.

II.

ous

=>

Endosperm:-

- The endosperm is the are the very vital parts of the fertilized embryo. An endosperm for on the surrounding tissue of growing embryo. These are proving starch tissue. and their main function is to provide the starch and nutrition to the growing embryo.

The endosperms are three types:-

01) cellular type.

02) Halobial type.

03) Nuclear type.

01) cellular type:-

↳ It is the first type of endosperm.

↳ It's wall are formed by the longitudinally.

↳ The sections are takes in the longitudinally sometimes it take place by the vertically.



02) Halobial type:-

↳ The halobial type is the intermediate between the cellular type and nuclear type.

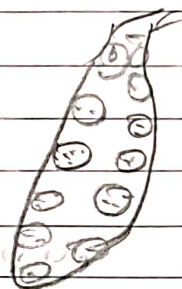
↳ It's formed the after division.

↳ Micropylan and chalazal chambers.

↳ The micropylan chamber consist 8 nuclei.

The chalazal consist 16 nuclei. In the

first step the micropylan consist of the 30 to 36 nuclei in micropylan chamber.



on the Base of ^{Food} origin it consist 3 types:-

1) starch endosperm

2) oil endosperm

3) honey endosperm



↳ These all consist of oil nutrition, and mechanical strength to the embryo sac.

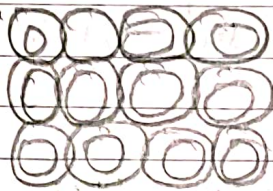
03) Nuclear type:- It consist of the both cell division micropylan & chalazal. after division the capsell will present in this type. It consist free nuclear types.

III.

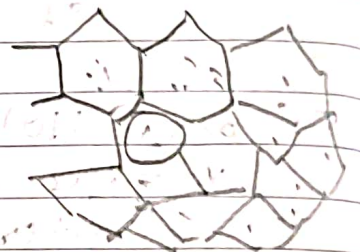
Q23

=> parenchyma :-

- The parenchyma cells are simple thin walled.
- It consists of many organelles.
- It's oval in shape.
- It's isodiametric, means equal diameter of all parts of the plants.
- It's a thin walled layer.
- It's consists of fibrous cellulose and hemicellulose composed substance.
- It's round in structure and elongated.



parenchyma



chlorenchyma

Types of parenchyma cells :-

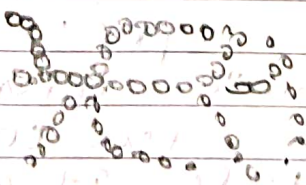
1. Chlorenchyma :-

- These are parenchyma cells consist the chloroplast. These are helps in photosynthesis.
- It's contains the heavy lignin and pectin.
- These contains the spongy side parenchyma Palisade parenchyma.

Q24 Aerenchyma :-

- These are the parenchyma cells + the intercellular spaces or air cavity present in aquatic / aquatic plants. is known are called the Aerenchyma.

- These are helps in the photosynthesis.
- To gives the proteins starch fats to the plants.
- Spongy side helps of gaseous exchange as well as photosynthesis.



Aerenchyma

02) Synergids :-

Synergids cells are two specialised cells which are located into the embryonal of female gametophyte beside the egg cells.

03) Animophily :-

Animophily is the ^{transfer} pollination of the pollen grains from stigma to the anther of the flowering plants.

The insect or birds played crucial role in the transfer pollen grains into anther.

04) Endothecium :-

* It is the second layer of anther wall.

* It also known as ~~Fiber~~ Fibrous Band. due to presence of fibrous cells. It's

* It's formed a single cell. known parietal cells.

* It's lying in ^{below} between the epidermis.

05) Cambium :-

* It is present in between the phloem and xylem of the vascular tissue.

* It is the specialized tissue found on the vascular bundle in the roots, stem and leaves.

* It's responsible for secondary growth.

06) Radial vascular bundle :-

It is the arrangement of xylem and phloem in the alternate manner.

* It's are found in roots only.

* It's types of tissue system present in the xylem and phloem.

11.
013

⇒ Food conducting tissue:-

1) The food conducting tissue nothing but phloem.

2) The phloem is a complex tissue. Its function is food and nutrients contain from root to leaves.

3) These helps for the conduction of food.

These 4 type:-

1) The phloem is made up of four cells.

1) phloem parenchyma,

2) phloem fiber.

3) sieve tubes.

4) companion cells

1) sieve tube elements:- These are the main conducting cells of the phloem. These help in conducting of metabolic activities.

2) phloem parenchyma:- This is a living one. These are food conduct by form of starch, oil & fat.

3) sieve tube fiber:- provide the mechanical strength to the plant.

4) companion cells:- These cells are dead cells to give the mechanical strength and conducting the food.



phloem parenchyma



Fiber



companion cells



sieve tubes

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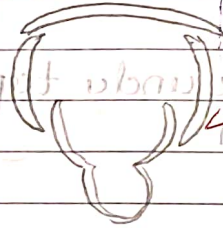
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Q.I.

3. Vexillary aestivation:

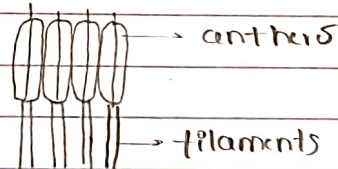
It is a type of imbricate aestivation. here out of five petals a odd one petal is largest and outermost layer. It is covered / overlap the two layer carpels (wing petals) and these two wing petals are again top + overlap the inner two petals they are smallest and innermost layers. this condition is called Vexillary aestivation.

Eq: Bean flower

5. Syngeneous anther:

In Syngeneous anther filaments are free and anthers are united or fused this condition is called Syngeneous anther.

Eq: Sunflower.

7. Axile placentation:

The ovary is partitioned and it is divided into number of segments or locules. The placentae is borne along the septa with the ovary. This condition is called Axile placentation.

Eq: Tomato



6. Verticillaster:

It is a compound cyme. The axis part of the leaves are Diachaisal first produced and the branches or diachaisal are subsequently becoming a monochaisal through the scorpioid fashion. This condition is called Verticillaster cymose. This is a type of special type of cymose.

Eq: Osimum sp.

1. Fusiform root:

Fusiform roots are swollen at the middle and tapering at the both end.

* It is come under tap root system type.

Eq: Radish



Q.2. Salient features of apocynaceae.

- * having tap root system and branched.
- * Stem is branched, erect, herbaceous, green, flexible, glabrous, and cylindrical solid.
- * Produce milky latex.

* leaf having cauline or ramal, pedicellate, unicostate reticulate venation, entirely margin, obovate apex.

* phyllotaxy is solitary axillary cyme.

* Flowers: Ebracteate, Bisexual, complete, actinomorphic, hypogynous, superior ovary, poly petalous, Pentamerous.

* Calyx: Sepals are 5 polysepalous, valvate aestivation.

* Corona.

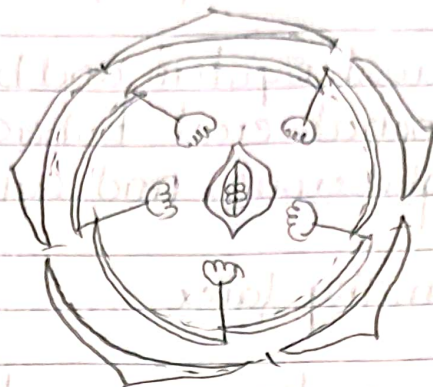
* Corolla: petals are 5 gamopetalous, twisted aestivation, epipetalous.

* Androecium: stamens are 5, epipetalous, style is long, hypogynous, superior ovary.

* Gynoecium: Bicarpellary, axile placentation, syncarpous, superior ovary.

* Floral formula: $Ebr. \odot. \checkmark, K_5, C_{(5)}, A_5, \underline{G}_{(2)}$

Floral diagram:



2. Bentham and Hooker classification.

Dicotyledon	Angiosperm	monocotyledon
polypetalae	Gamopetalae	monochlamydae
Series	Series	Series
1. Thalamiflorae	1. Infrae	1. Microspermae
2. Diskiflorae	2. Heteromerae	2. Euligynae
3. Calcyflorae	3. Bicarpillate	3. Coronariae
	4. multicoctale	4. Cyaleinnae
	5. microembryae	5. Nudiflorae
	6. Depanicales	6. apoccarceae
	7. Achlamydoiflorae	7. Culmaaceae
	8. Unisexuals	
	9. Ordinaecanomoly	

→ Dicotyledon

- * having two cotyledon
- * shows Reticulate Venation.

3 Subclasses

1. polypetalae -

- * petals are free
- In that 3 Series
- 1. Thalamiflorae
- * 8 Orders 34 family

2. Dischiflorae → 4 orders, 22 family

3. Cylertiflorae → 5 orders, 27 family

Subclass II → Gamopetalae → petals are fused

Series → 1. Infrae - 3 orders, 9 family

2. Flatromerae → 3 orders, 12 family

3. bicarpellate → 4 orders, 23 family

monochlamydae → Series

1. Curvembryae → 6 family

2. multiovulate equatacea - 1 family

3. multiovulate terrastris - 3 family

4. Depanailis → 4 family

5. Achlymadoflorae → 3 family

6. Asexuales → 5

7. Ordinanmoly - 9 family

8. Nudiflorae → 9 family

merits →

* The morphology and floral character accurate.

* The order of the radiales is the first arrangement of the order.

* It is most important to basic information and examination.

Demerits

→ most of the same families are rejected

→ most of morphology + floral characters are rejected.

5. Inflorescence -

The arrangement of the flower on the floral axis is called Inflorescence.

* In Inflorescence there are three types of inflorescence

1. Racemose
2. Cymose
3. Special type

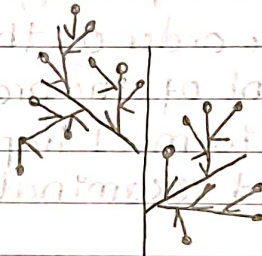
1. Racemose Inflorescence:

The main axis is continuous to grow and flower produces at the lateral side.

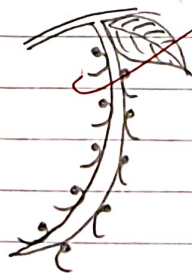
* In Racemose Inflorescence there again differentiated into a types mainly -

1. Raceme
2. Compound Raceme
3. Spike
4. Spiklet
5. Spadix
6. Catkin
7. Capitulum
8. Corymb
9. Umbel

1. Compound Raceme → Peduncle is branched
Eq: Gulmohar.



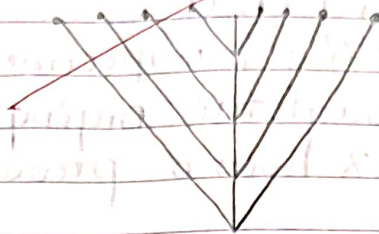
2. Catkin → pedicel is elongated, flat and having unisexual flower and sessile flowers.



3. Corymb : flat pedicel, topped and pedicel reach all the petals are same level.

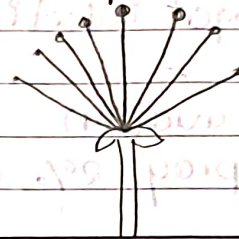
Eg: Candytuft

Cauliflower



4. Umbel : pedicel is flat-topped or rounded. having umbel in look like.

Eg: * The all the pedicel are originating from the common point.



9.3

3. techniques of herbarium preparation.
Herbarium → It is a collection of Dried plants it permanently glued or Strapped to a blotting paper along with documentation labeling.

Steps →

1. field visit and collection of specimens
2. Pressing + Drying
3. mounting
4. preservation
5. labelling
6. Storage
7. Maintenance.

1. Field visit & collection of specimens

- * collect all the complete specimen.
- * and transfer the specimens in c
- * tag with field number
- * Record some basic information in field notebook.

2. ^{Drying} Mounting and pressing:
- * Spread out all the in the fold out of old news paper or blotting sheet.
 - * avoid overlapping the specimen.
 - * and go through the drying.
 - * after 24 to 48 hours pressing is opened.

3. Mounting on herbarium sheet.

- * mount specimen in herbarium sheet.
- * using glue or shell tape.
- * collect the fungicides or chemicals to avoid the fungal infection.

4. Preservation

→ spray 2% of mercuric chloride

5. Labelling — printed on the lower side of the right hand corner.

6. Storage — according to bentham & Hooker system of classification

7. Maintenance → 1. fumigation 2. Chemical

4.

a) Castor → Euphorbiaceae family

b) Annona squamosa → Annonaceae family

c) legume → Fabaceae family

d) Cotton → Malvaceae family



B. L. D. E. Association's

S. B. ARTS & K. C. P. SCIENCE COLLEGE, VIJAYAPUR

2nd

INTERNAL TEST 2023 -2024

Name / ಹೆಸರು: Bhagyashree S. Masabelli Roll No./ಸ್ಥಳಾಂಕ: 29 Date/ದಿನಾಂಕ: 12-7-2024

Subject/ವಿಷಯ: Botany Paper Semester/ಸೆಮಿಸ್ಟರ್: Vth Exam Seat No / ಪರೀಕ್ಷೆ ಸ್ಥಳಾಂಕ: _____

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Q.No.-I

5x2=10

1 " Taxonomy hierarchy is the process of arrangement of various organism on the successive level of biological classification. They are increasing or decreasing order Kingdom, to species or vice versa "

4 " Typification is a naming of taxonomy group is determined by its means numerical taxonomy. It is called type a specific / chosen member are autotyping designation & herbarium. "

3 " Genus is the level of classification. group of multi species are the called Genus it show less similarity of classification. Ex:- Mangifera

6 Clade is also called Branch. Clade is a evolutionary tree of a ancestor relationships of organism. it is a look like tree and their branches. is called clade.

7 Homology is a sameness in a or more different traits & different individual organism or same individuals of different species. It show the similar character.

I Mode of speciation

Speciation - The formation of new species by from existing species or parents by regular modification is called speciation

① Allopatric speciation

⇒ Allopatric speciation a geographical speciation

* Geographical area separated & bearing 2 or more indivd speciation is called Allopatric speciation

② Parapatric speciation

> The pollute the one part of environ - men

= The presence of edges of species, near physical barrier in the geographical speciation.

③ Peripatatic speciation

1. The smaller group of individual are broken up of larger group of individual forming new species is called Peripatatic

④ Sympatric speciation

= The it occur within the geograp - hical area, formation of new species

⑤ Artificial speciation

= The speciation is made from human only forming differ spec

Broccoli - Cabbage Cauliflower

5 Taxonomic hierarchy

The process of arrangement of various organisms by successive level of biological classification or taxa is called taxonomic hierarchy.

* They are arranged increasing or decreasing order, kingdom to species or vice versa.

In taxonomic hierarchy some levels

(1) Kingdom → This is the first level of classification.

Ex. Plantae

(2) Division → This is the second level of classification.

Ex. Angiospermae

(3) Class → This is a group of organisms showing similarity. group of order.

Ex. - fabiales dicotyledon

(4) Order → This is a group of families called order. It shows some similarity.

Ex - sapindales

(5) Family → This is grouping of genus called family. It shows similarity.

Ex. Fabaceae

(6) Genus → This is made from grouping of species. It shows similarity.

Ex. Mangifera

(7) Species → This is the lowest level of classification.

Ex. Mangifera indica

28

Poaceae Family

Habitat → mesophytic

Habit → herb or shrub

Root → Fibrous roots are present & branched.

Stem → is herbaceous, has nodes & internodes, exstipulate sessile, branched or unbranched

Leaves → Simple, Bracteate, lanceolate

Shape apex is acute or acuminate

2 tepals are arranged is called lodicules

Inflorescence → cymose or spike or spikelet inflorescence

Flower → Zygomorphic, Bisexual.

Pedicellate, exstipulate, poly

Petalous, hypogynous

Perianth → 2 tepals are present. Calyx

corolla not differentiated.

the perianth is made of 2 tepals

2 tepals called lodicules

Androecium → 3 stamens are present. Poly

- androecium bitheous introrse

Gynoecium - monocarpellary apocarpous

unicaral Paraxial ventral axis

Placentation, Superior ovary

FF →

Br. % ♀ P 2 A 3 G 1

Economic Imp

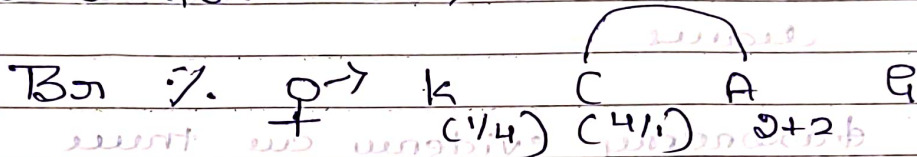
- ★ Triticum aestivum - used as food. Powder
bar of flour
- ★ Sorghum - used for food purpose
- ★ Bajra - Used as cereals. food grains.

3 No. 3

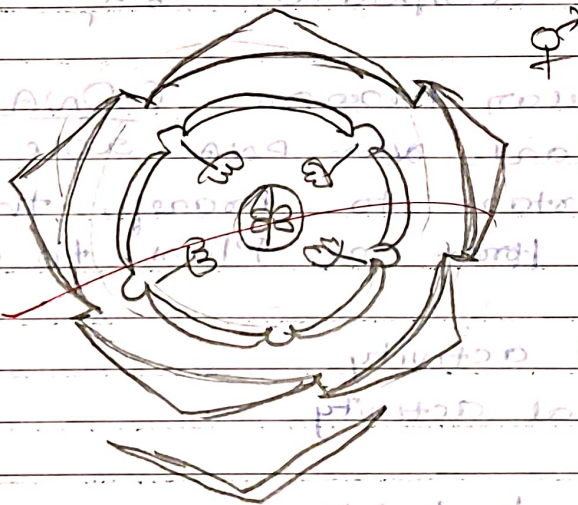
$$2 \times 4 = 8$$

3 Lamiaceae family

Floral formula $\rightarrow$



Floral Diagram



Economic importance

- ① Osimum Santum - it has aromatic
Smell.

It is widely used for
Pooja Purpose.

It is also used than tulsi.

- ② Mint - mint also used for preparation
of delicious food.

It is also economical importance

2

Taxonomic evidence of photochemistry

In angiosperms

Photochemistry taxonomy

The plants consist of rank of chemicals for molecular character shows that in plants.

* The investigation chemicals as per the part of plants

* That Parts are bark, root, leaves.

* The taxonomy evidence are three are Flavonoids, carotenoids, Polysaccharides, amino acids, fatty acids, aromatic compound, etc., Photosynthesis

* The molecular taxonomy (DNA or RNA) - In the plant RNA role is also very important to transfer the genetic characters from one plant to another.

* Biological activity

* Insecticidal activity

* Nucleotide hybridisation method design

* The Plant contains chemicals that are very useful to plants to grow abundant by photosynthesis.

The evidence increase relationship of genetic relationship from one plant to another.

Genetically variation is also occure in the plants by chemicals only.