Date 11-02-2026

Expt. No. _____ Page No. 02

Practical 1

Aim :- To identify leay based on his morphology

A Leaf type

1 Seed leawes :- These are the catcedoms present on the seed.

2 Faliage leawes :- Flat green leateral appendix Devloping on stem stakless non-green leaves. These are also called catophyles.

3 Scaly leaves :- Scaly like small stalkless. non-green leaves

4 Bract leaves :- These are present at the base of flower or onyloxence

5 Prophyll :- These are Bractales
These are finger like small part present at the finger like small part upper end of sheating

6 Flowal leaves :- cylycx coralla stemen carpales.

7 Sporophylles :- spore Bearing leaves of pteridophytes gymnosperms and angiosperm.

Teacher's Signature : _____

Some other term related to leaf :

Radial :- The leaves arising from the modified underground stem such as bulb

E.g Onion.

Cauline :- The leaves arising only on the stem are called cauline E.g.- phoenix

Caline and romal :- The leaves arising on main steam as well as on the tairal branches cauline

E.g Dalbergia sissoo (sheesam)

Parts of leaf :- leaf base It is of following categories.

Alternate :- Where only one leaf develop at each nodes

E.g Brassid comperis.

Distichouse :- When 3rd leaf come over the first one.

Tristribous :- When 4th leaf come over the first one.

Opposit :- When a pair of leaves are present first opposite to each other at each nodes

E.g Calotropis.

Simple leaf :- A leaf consisiting of single cudits or divided but the division of the blade are not so deep as to reach down upto the midrib.

Teacher's Signature : _____

Expt. No. _____ Date _____

Page No. 04

Compound leaf :- When the division of the leaf blode or lamina are so deep so as to reach upto the midrib and thus leaf is divisible into many segment or leaflets. It is called leg. It is of 2 Types.

1 **Pinnately compound** : When the seafer are the side the midrib or rachis. It is of following type.

(i) Unipinnatt
(ii) Bipinnatt
(iii) Tripinnatt
(iv) Decompound.

2. **Paemately compound leaf** : When the leaflet of the leaf are attached in one pone just at the appear of the petiole giving the appearince of palon of a hand. It is a following types.

(i) Onifoliate
(ii) bifoliate
(iii) Bi-foliate
(iv) oodrifoliate.
(v) Multifoliate

Leaf shape :-

Bicular :- Long and riddle like eg. onion
obcardate :- Inversely cardate
Hineas :- Long flat and narrovo eg. gresses.
Lanceolate :- Lance shaped, breed and iapiring either at both the end as genetly toward the apex
Sublate :- It is an owl-shaped leaf
Ovate :- Egg shaped i.e boad at the base & the narrowing toward apex Eg Hibiscus.

Teacher's Signature : _____

Expt. No. _____ Date _____

Page No. 05

Oblong :- Long wide with parallel running mergim
Eg. Banana.

Reniform :- Kidney shaped eg. sentella or hydro.

Apex of leaf :-

Acute : Ending into a sharp point in the from of an acute angle e.g mangifera sheluco

Acuminate : Cohan apon is drawn out in the forom of a long ssendes teil

Obtuse : Ending into a bunt rounded end eg - cossid oftusifom.

Retuse :- It is obtuse leaf with a shallow mouth

Leaf Margins :-

Entire :- Even and smooth eg ficus

Repond :- wavy in appearance eg - Polyelthia

serrulata :- When the teath project outward at light angle to the edge eg - croton.

Dentrate : When teath project cutward at rigth angle to the edge.

Genate :- When teath are rounded

Citiate :- Provided with fine projecting hans.

Cabed :- Provided with many lobes e.g Raneem - culus.

Veration :- Arrangement of veins and veinsts in the kimina is called veration it is of tube main types.

Teacher's Signature : _____

Expt. No. _____ Date _____

Page No. 06

1 Reticulate venation :- When the veins & veither are distributed proreggclary in the lamina and form a sort of net. It is of two types.

1 Unicostate :- Single mid - rib. Irrigular ueins and ueinlets
2 Multicostate :- Many strong ribs are present.

Parallel venation :- When the vein run poralles to each others it is called parallel ventions as in all monocotyledons at is of two types.

i Unicostate :- Single thich mid -rib is present with parallel veins.
ii Multicostate :- Several mid - rib running parallel.

Stipule :- A small leaf origin which gave at the base of a petiole. often protecting on assmillery bud.

Latteral :- Present catterally or at the side of the buse of petiole often e.g - Hibiscus.

Adonate :- Present at wings due to this fusion the petiole e.g Rose.

Teacher's Signature : _____


Palmately compound leaf
Pinnately compound leaf
Radial leaf
Alternate leaf
Parallel venation leaf
Opposite leaf
Simple leaf
Lateral leaf

Date

Expt. No. _____ Page No. 07

Observation

	Plantname	Venation	Arrangement	Stone	Riargin
1	Sagwan	Pinnate	Simple	Obvate	Lobed
2	Hibiseus	Pinnate	simple	lanealate	serrate
3	Ashoka	Pinnate	Pinately compound	Linear	Dentrate
4	Jack fruit	Pinnate	Simple	ovate	Entire
5	croton	Pinnate	simple	Pinnately ided	lobed
6	Alstonis	Pinnate	simple	ovate	entire
7	Mango	Pinnate	simple	ovate	Dentrate
8	Knacla Bachol	Pinnate Pinnate	Simple	ovate	Entire
9	Excas	Pinnate	Simple dopemtely compound	ovate	entire
10	Rose	Pinnate	Pinnately comp-ound.	Lancelate	serrate

Teacher's Signature : _____

Date 18-02-2026

Expt. No. _____ Page No. 08

Practicle : 02

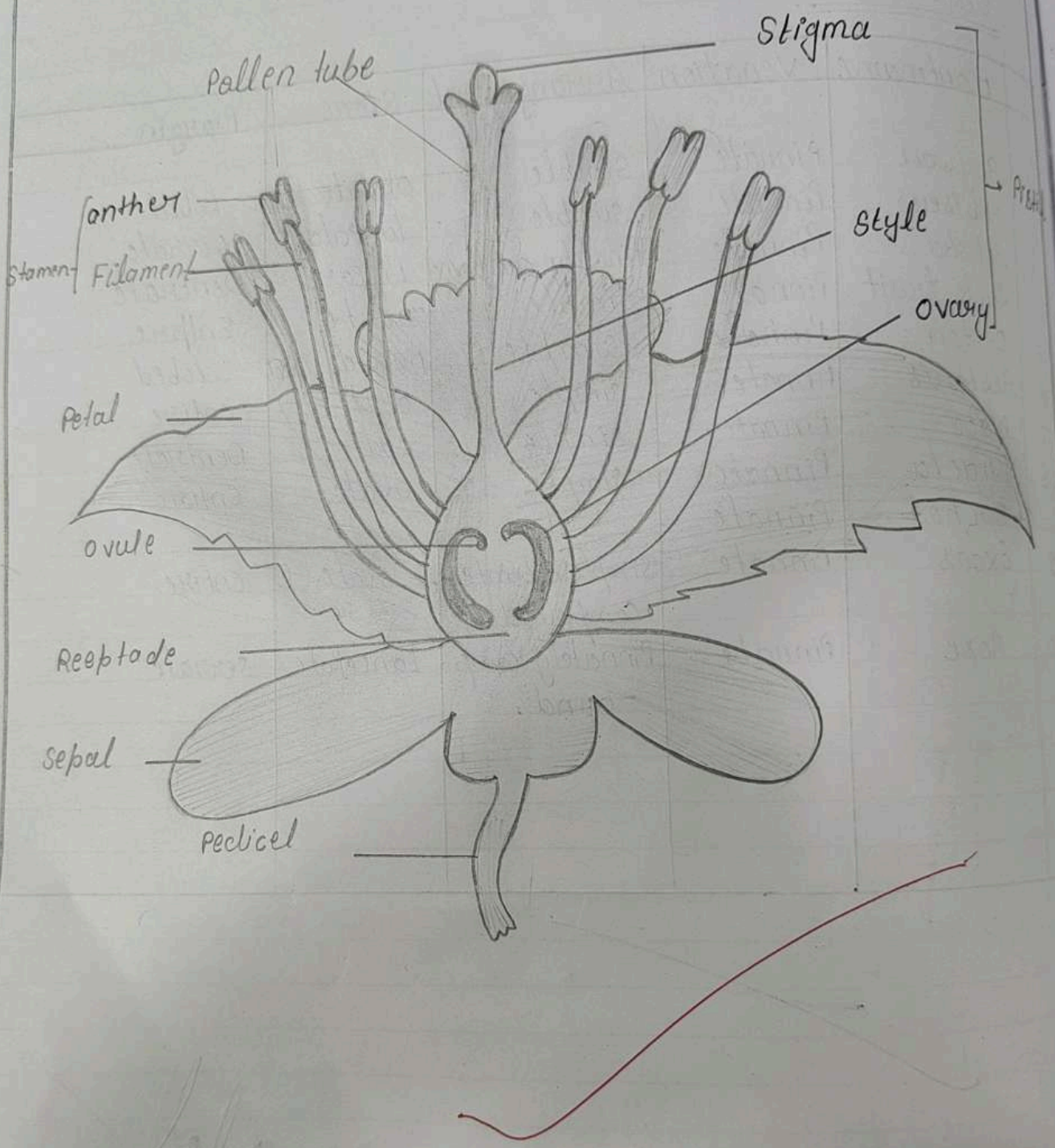
Aim :- To identify flower based on its morphology

Flower :- A plant of the which as capable of Producing either male or female of both the reproductive element is called flower.

Terms related to flower :-

Accessary wholes of flower - Calyx of coralla
Fassential wheats of flower - Androceum of Gynonium
Sepal - Individual unit of calyx
Patel - Individual unit of coralla
parinth - where there is differitation b/w Calyx & coralla
Stamen - Individual unit of andricium
Tepal - Individual unit of perinath.
Thalamus or Receptacle :- Tip of the axis passing the flowal appendages.
Poract - A leaf structure from the axil of which develop. Their four and we are called di try tetra phonomerous
Hypogynous :- flower in which floral planted part are situated below the ovary of make the ovary half superior. are called hypogenous.
Achlangdous :- flower without Calyx and corolla.
Monochlamydous :- Flower with only on whots.
Anthopora :- Elongated Intemodal part b/w calyx &

Teacher's Signature : _____


Stigma
Pollen tube
anther
Stamen
Filament
Style
Pistil
Ovary
Petal
Ovule
Receptade
Sepal
Pedicel

Date

Expt. No. _____ Page No. 09

Coralla.

Cynophore :- Elongated axis b/w androcium and gymnocium

Anthrogynosphare :- At both androphore and gymnophare develop together in the flower is called androgynosphre which develops the flower

- Brocbeate :- Flower with boract.
- Ebracteate :- Flower without bract.
- Bracetate :- Leaf lence structures borne on the pedicle
- Sessile :- Flower without stalk.
- complete :- Having all the four flower parth
  Eg - pepal, Petal, andoceium and gymnosperm
- Unisexual :- Flower with only are sexiue. either male or female. Male flower are causes staminate of the female flower are caused pisillate.

- Bisexual :- Flower having both the sex organ
- Dioecious :- When male and female flower are borne on the same plant.
- Monoecious :- When male & female flower are bone on the same plant.
- Actinomorphic :- Flower which can be bisected into similar haves along two or more plant.
- Zygonorphic :- Flower can be bisected into simila haves only in one plant.

Teacher's Signature : _____

Date

Expt. No. _____ Page No. 10

Di, Tri, tetra or pentamerous:- Flower in which various floral part are arranged in which group of three, four & five are called Di, Tri tetra or pentamerous.

- **Hypogynous:-** Flower in which floral plants parts are situated below the ovary of and make every half - superior are called hypogynous.
- **Epigynous -** Flower in which floral part are situated above the ovary and thus making the ovary infection.
- Achlamyclous - Flower without calyx & corolla.
- Monoclamyclous:- Flower with only one whorls.
- **Anthophore -** Elongated internodal part blw the calyx & corolla.
- **Gymnophore:-** Elangated axis blw androecium & gymnosecium.
- **Androgynophore:-** If both androphore & Gymnophore develop together in the flower is called androgynosphore.

Teacher's Signature : _____

Date 25/02/2026

Expt. No. _____ Page No. 11

Practical : 03

Aim :- Study of palatobotany and fossils.

Since the origin of earth, the earth has undergone large climatic change billions of years have passed the periods has undergone vast and drovic weather changes. Due to this, Many plants dried and were decomposed. The part of the plants were preserved, and were discovered independenty. Each plant part is given the status of genes. They represent from genus, All thus parts of the plants planned together and is visualised. "The preseved specimen are call plant fossils". Th constructed plants are called fossils plants.

Fossil study :- Includes.

1 **Objective of fossils study :-**

- Study of external structure of fossil plants
- study of internal structure of fossil plants
- Study of distribution of fossil plants
- To provide evolution of various plant groups.

(ii) **Techniques for fossil study :-** Several technique are as follow.

(iii) **Ground this section :-** The technique is suiteble for study of perifications.

Teacher's Signature : _____

Date

Expt. No. Page No. 12

Method :- The specimen is cut to a suitable size. the surface to be studied is smoothed with 300 carborundum the smooth surface is now mouted on a glass slide by a special resin. The section is now mounted an a go coverslip using suitable mounting resin, The slide can now be studied under a microscope.

Disadvantage :- The disadvantage of the technique is that a lot of material is wasted.

(iii) Film or peal technique :- The technique is suitable for study of well preserved petrifications.

Methods :- The specimen is ground and smoothened. It is now etched with hydrofluoric acid [HF] and hydrochlosic acid [HCl]. The surface is gently washed in running waste to remove acid. It is then air dried. It is now dried in air for 6 hours.

Advantage :- The advantages this technique is. It is less expressive.

(iii) Microtomy :- It is useful for fossil woods.

Methods :- The specimen is treated with HF (Hydro-furic acid) and potassium chloride (xelen) to soften the tissue it is now treated with equal parts of phenol and sec. alchol.

Teacher's Signature :

iv Equation Technique :- It is useful for the study of minute leaves & sporangia spoor.
Method :- The specimen is removed with the help of micralrophy machine on a smalls however & steel needles.

Types of fossils :- Fossils are of various types. These are classified into following types.

Compersion fissils – Birial of Plant and its parts in sediments resues in formation of these fossils. The perrid parts become plat due to compression or overlying pressure of the sediment for comperession sond stone, volonnic are etc are used such fossil occur in the from of carboniferous large in b/w sediment.

(iv) Petrified fossil - Fossils that preserve :- form and internal structure called petrified. In such fossil belong of the Plants tissue is preserved & distanted as of it is living.
(v) Mummified plants :- Plant part are compressed by the vertical pressserve of the against another the such as fossils intervening materis is not found in b/w plant parts some plant structure are stored mummfied form They are fit for Microscopic observations.
(vi) Amber :- Amber is a resin exsrated from cerimal are fossil Carboniferous plants several or animal are found present in this resin, so unber is condereved as a type of resin.

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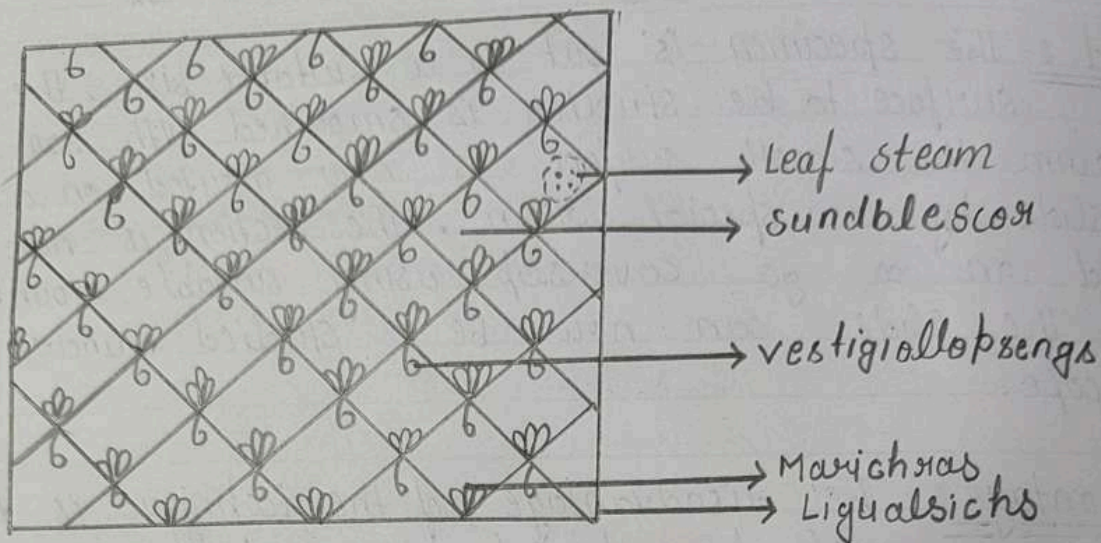
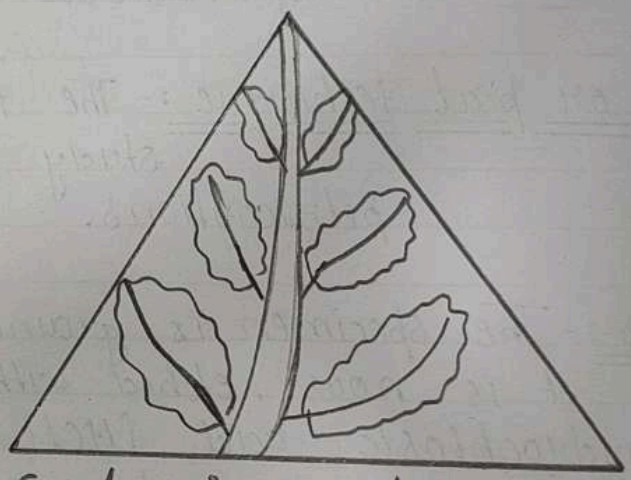
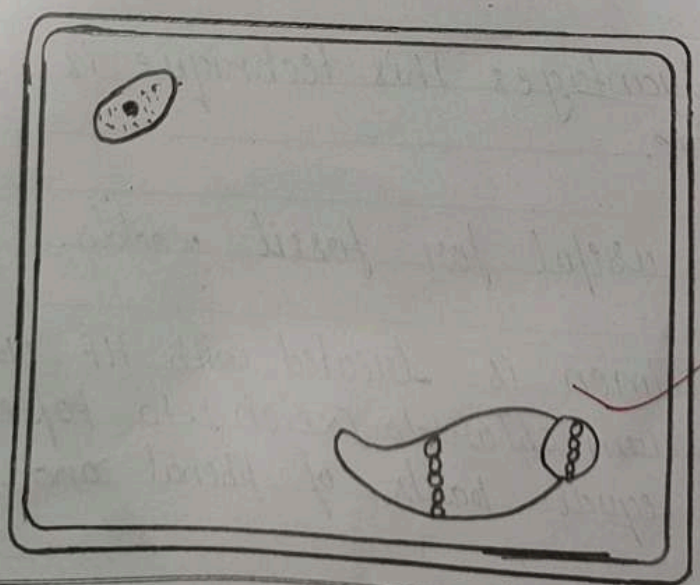




Compervission fossil in split rock.



Manification - pressed in coal

Expt. No. _____ Date 25/02/2025

Page No. 14

Practical : 04

Aim :- To study of normal moncot stem (zea mays)

Requirement :- Razor, fresh section of mouize stem, stain with safronnin fast green and mount on slide in T.S of the material shows following tissue from and slide towards inside as following.

Epidermis :- It is a outermost layer and made of rectangular cells. The outer wall of cells covered by a thick sutic.

- Epidermal hair are absent.

Hypodermis :- Next to epidermis two to there calleal thick Sclendy mobur present cells are polygonal.

Ground tissue :- Ground tissue is not differential into cortex endeclerms perifycle and pith.

- Paren chymatous calls completely arranged bellow the hypodermis. but are bosely compactly arranged in the middle.

Vascular Burello :- Many small vascular bundles scattered in the ground tissue.

- They are more in no taconacls the periphery than the centre of the stem.

Teacher's Signature : _____

Date

Expt. No. Page No. 15

- xylem and pholen tissue conetubule bundles combine is dosent.

Xylem : It consist of vessels [Proto and meta-xylem], tracheids and xylem parenechyma.

- vessels appear in
- Metaxylem is present at the lower are of 4. consisting of two small vessels and surrounded by tracheids and xylem. iorocheym.
- It has also a cavity as lysigenous cavity.

Phloem:- It has cavity of only sieve tube and compernion cells.

- Pholem fibers and Phlem parechy is present
- The outer parts of the phloem is dilergonisied are called protoxylem.

Identification :-

Monocot stem :- vascular bundle are cojoint and encharch

- Stomata present in epidermis
- No differentiation of ground tissue
- Scattered vascular bundle
- vessels appear in 'Y' shape
- combium is absent
- secondary growth is absent.

Teacher's Signature :

Expt. No. _____ Date _____

Page No. 16

Practical -05

Aim:- To study normal dichotomous stem [Luffa]

Requirment:- Luffa stem, slide, cover slip, safrain, fast green glycerine, light microscope etc.

The T.S of luffa stem showing following details.

Epidermis:- It is single layered consist of many barrel shaped cells.

Some alls extended out like the shark hair.

Cortex:- It is differentiated into collenchyma hydrous, chlorenchyma and intermost layer of it endodermic.

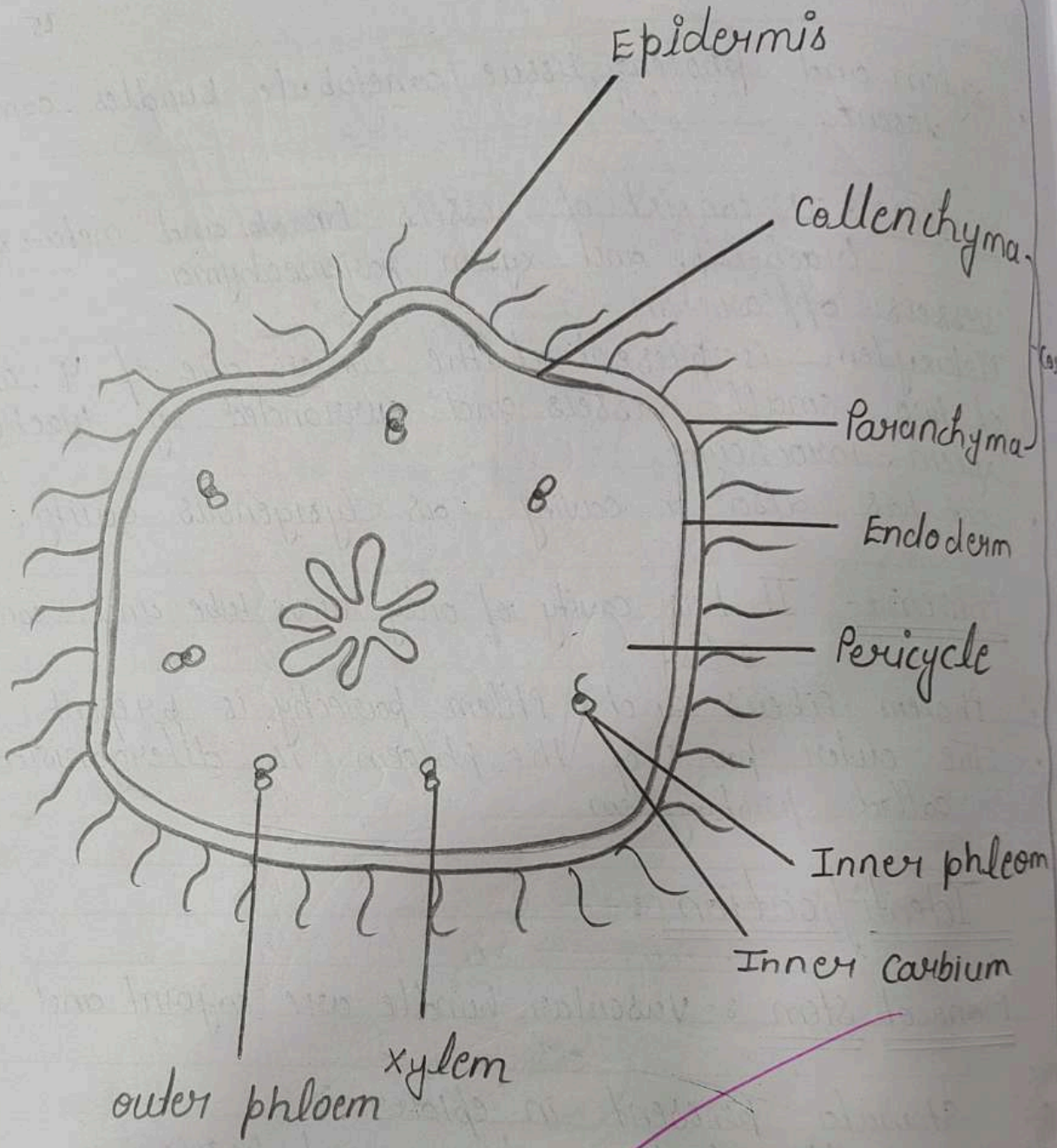
Pericycle:- It is made of 4 to 5 layers of thick-walled magnified beneath the endodermis.

Ground tisslle:- It extended between schlerenchyma is the central pith cavity and made of thin-walled parenchyma cells in which many vascular bundles are present.

Pith:- It is made of thin walled parenchymatous

Vascular bundles:- The vascular bundles are arrangement in two rings of five each.

Teacher's Signature : _____



[A] T.S of Stem Luffa.

Expt. No. _____ Date _____

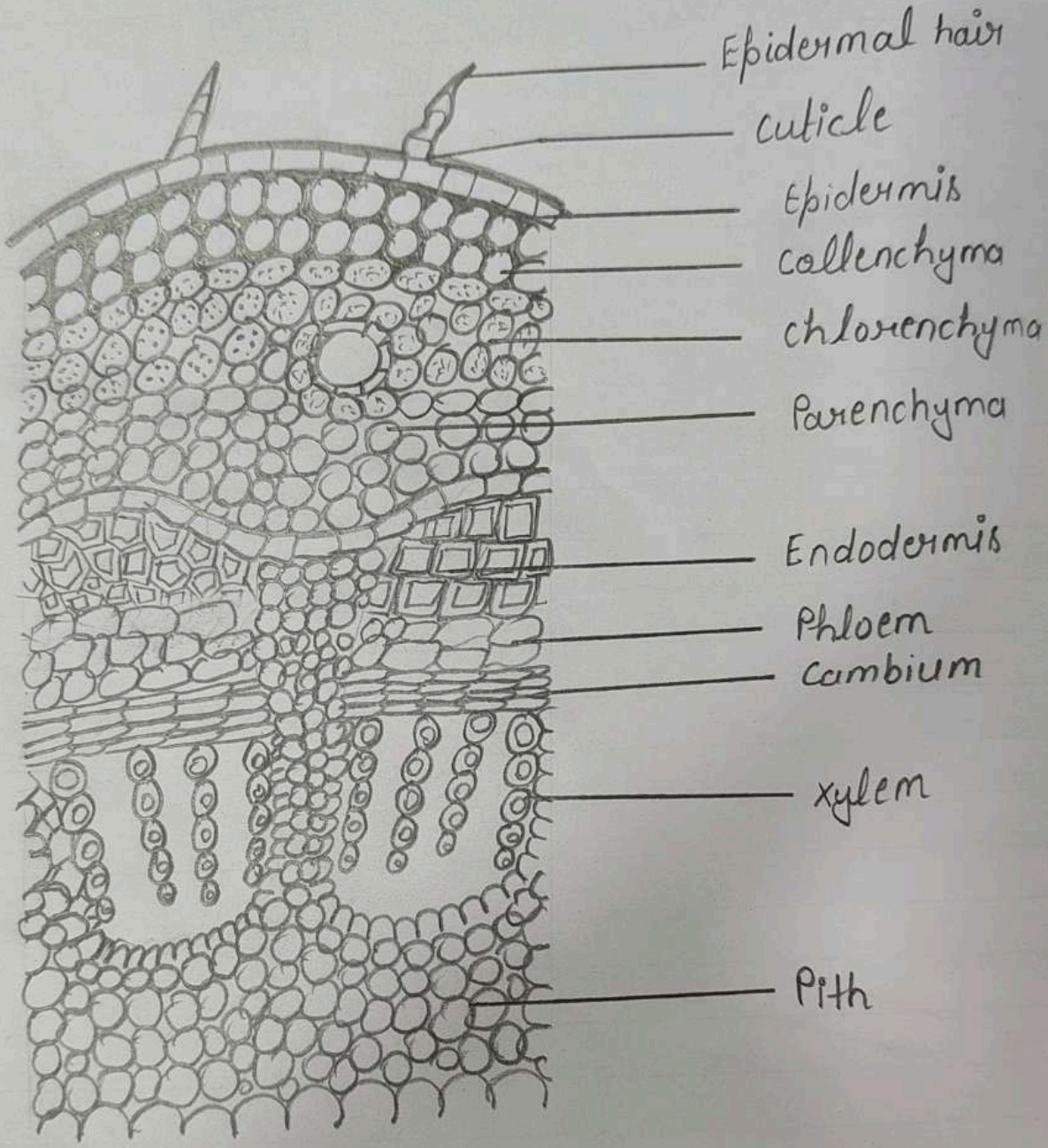
Page No. 17

- Vascular bundles are conjomt, bicovalated opend and endoderm xylem consists of vessels, tracheids, wood fibres & xylem parenchyma

Identification :

- Vascular are conjoint open bicovalated and endodern cortex is differentiated cell. Multicellular, hairs are present, Pith present.
- Vascular bundles are arranged into rings.

Teacher's Signature : _____



T.S of Dicot Stem

Expt. No. _____ Date _____

Page No. 18

Practical - 06

Aim :- To study the primary structure of Monocot root [zea mays]

Procedure :- Cut this section of root of mays stain with safranin, mount on slide in glycrine and observe under light microscope.

T.S Root :- It is circular in outline and shoven the following tissues.

(ii) **Epidermis :-** Outermost single-layered epidermis consist of barrel shaped or rounded cells.

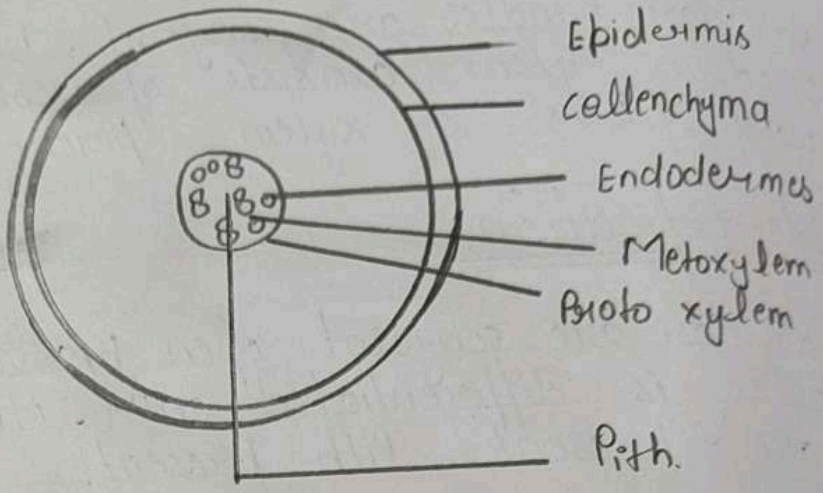
Many unicellular hair are present.

(iii) **Cortex :-** It has many layered and epidermis consist of barrel shaped or rounded cells.

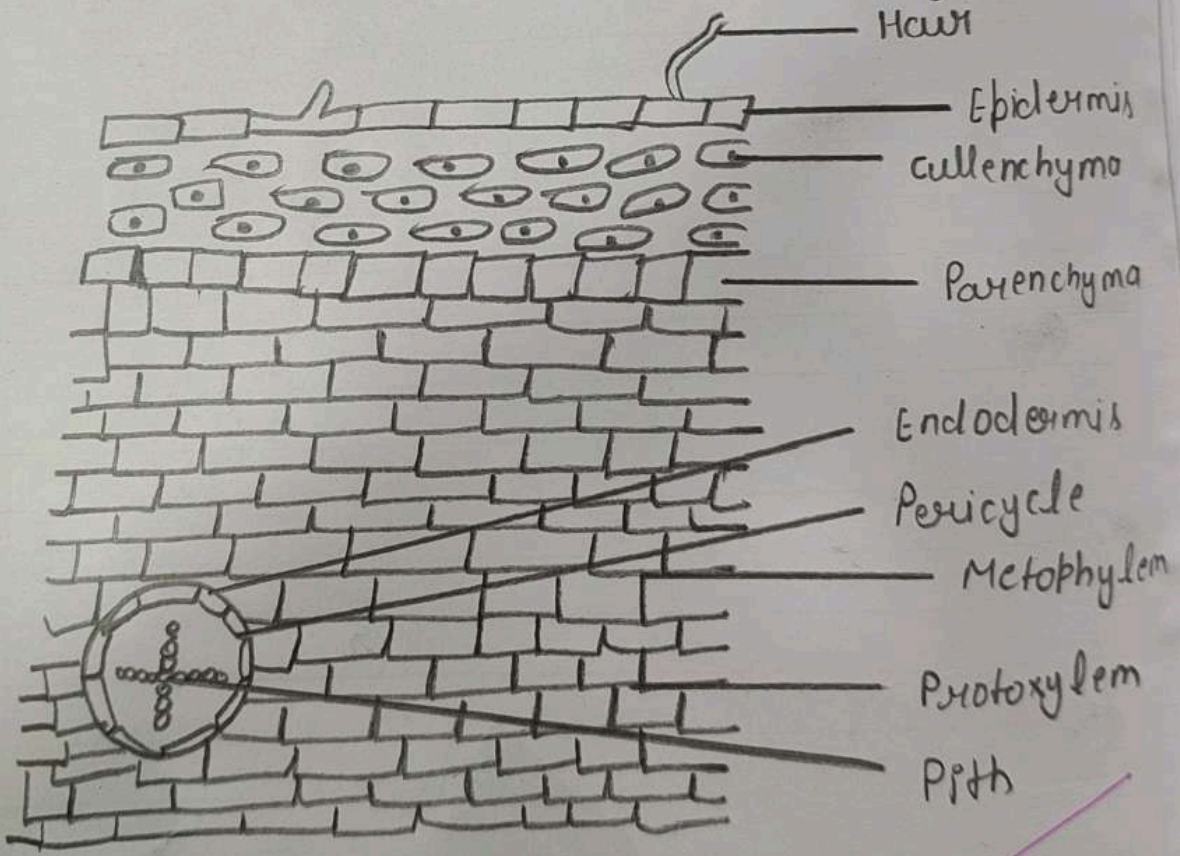
The cells are thin walled rounded in shape.
It has many intracellular spaces.
Endodermis is the intermost layer of cortex
It consists of many innermost endodermis.

(iii) **Pith :-** In the well developed parenchymatous pith are present.

Teacher's Signature : _____



T.S. of root (Zea Mays)



(A) Part Showing cellular details

Date

Expt. No. _____ Page No. 19

. The cells are round in shape & have many intracellular spaces.

(iv) Vascular tissue : It consisting of alternating strand of Phloem & xylem.
- Vasculer bundles are radial
- Cambium is absent.
- Well developed Pith is present.

Teacher's Signature : _____

Date

Expt. No. Page No. 20

Practical - 07

Aim :- The study of Internal structure of Dicot root (Cicer arichmum)

Procedure :- Cut this section of cicer root strain with safranin and fast green. Mount on slide in glycerine and observe under microscope, T.S stem consist of following tissue-

Epidermis :- The outermost layer consisting of many this walled cells.
Many unicellular P hair are present.

Cortex :- It is many layer parenchymdous and well developed Many Intercellular space present corticel cells are filled with starch grains.
In older roots, few layered of Cortex become cyfinished and form exodermis.
cosparion smps are present in some the endodermis cells.

Vascular tissue :- The vascular are six in no and are radial xylem and Phloem are equal in xylem consist of vessels branchcids B xylem paranchymas.

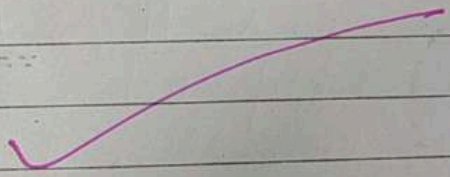
Teacher's Signature :

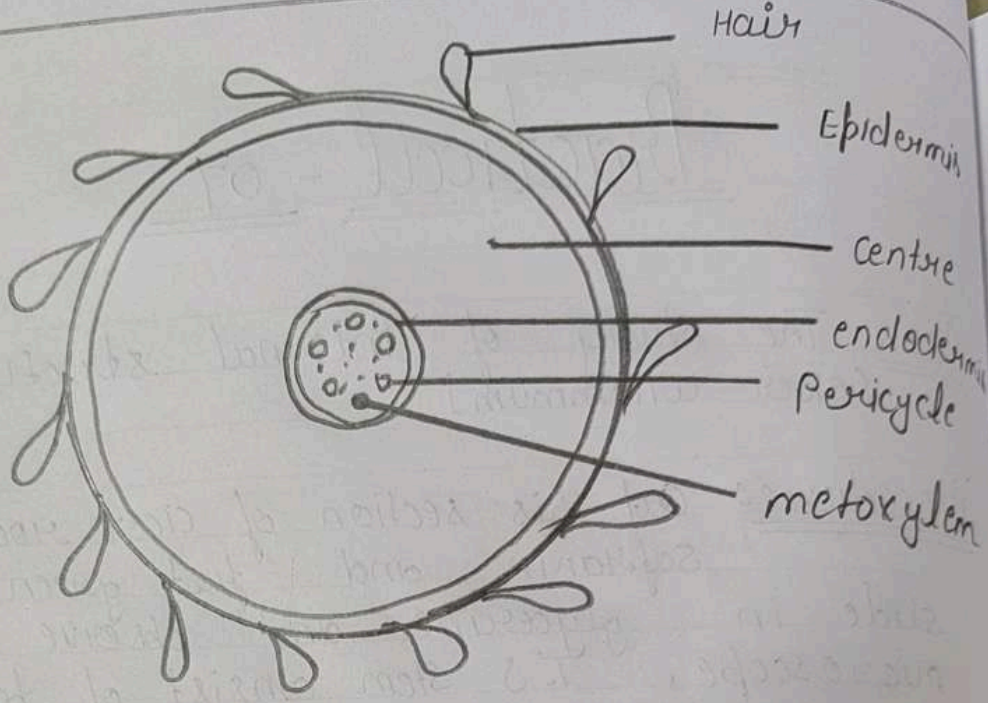
- Phloem consists of sieve-tubes companion cells & Phloem parenchyma.

Identification :-

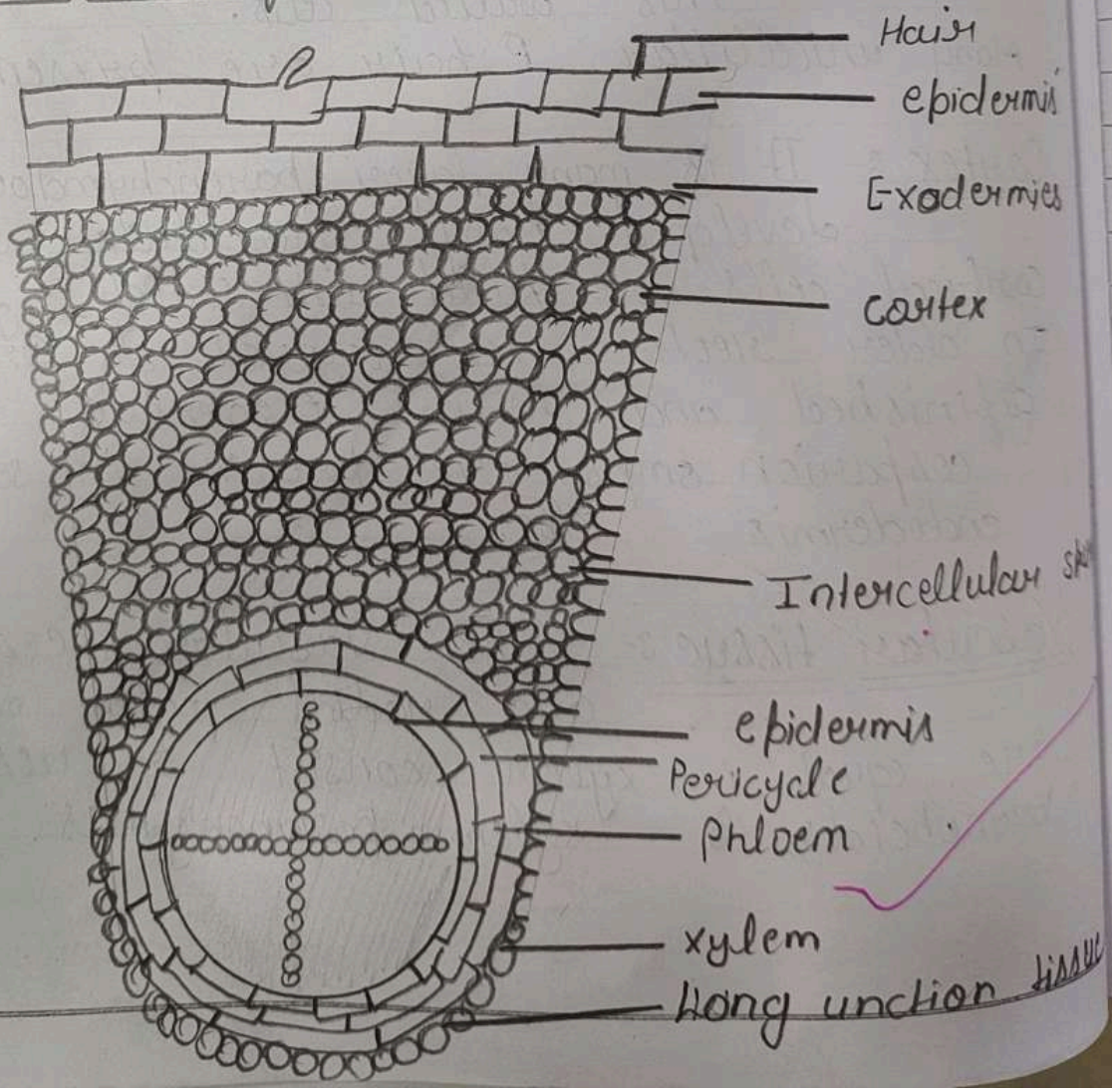
Roots :- Vascular bundles are radical
- Cortex is unchifferential
- Unicellular root hair are present

Dicot roots :- Vascular bundle found to six
- Combium develops form secondary growth
- Pith very much reduced.





A T.S. of root Axiontion



Expt. No. _____ Date _____

Page No. 22

Practical - 08

Aim :- Producing and propagation of some arrangement plat for lands coping. Many plants are propagated by methods like spores, bilbes, division and layered.

Producing and propagation of pteris from for Lands caping by using spores. Pteris produce large quality of spores which many be used to propegate pteris at large qualities by them following methods. collect spores from the underside of perm fronds which are dark brown and black in colour.

Taxe glass contains sterile it.

- ccep the contain sufficiently moist
- After one month spore start sprouting
- After 5-6 month thus sporophytic plants are ready to nearplant.

By division: Taxe methods dumps of farm

By bulbils :- Bulbils or suckers produced mainly at the tounx Removal of bulbils toxes places treatment of these with the fungicide. Root harmones may be applied on bulbils in order to initidte rooting.

Teacher's Signature : _____

Expt. No. _____ Date _____

Page No. 23

Propagating and production of conifeerales for landscoping -

conjereus including many arrangemental plants includes diff. species of pinus.

Methods of propagation

1 By seeds :- Sook the conjer seed in warm water for 12.24 hrs.

- Dry the seeds and place the seeds in the damp peat soil for turn monts.
- Place the seeds on the top the tray 1-2 inches deep.
- Some liquid feutilses. The seeds were spouting
- Transplant the seeding into ground.

2 By cutting :- Make 5-6 inches cutting from the terminal shoot.

- Remove the brown from the lower portion
- Term the remaining stub with a shap knife
- Cut one side of the lower one inch of the shoot
- Keep the lower portion of shoot into water & dry it with papper.
- Dippin the rooting harmones.

Now this cutting in having clamp soil callected farm containing my carrahiza.

Teacher's Signature : _____

Expt. No. _____ Date _____

Page No. 24

Practical - 9

Aim : To observe and describe the structure of pollen grains under a Microscope.

Material needed :

1. Fresh flower lily. hibiscous abisy
2. clean glass slides and causes slips
3. Forceps
4. seciss or needle
5. Dropper bottle with coater (or glycerine)
6. staining due (optional syranin, idine, or aceteroviny)
7. Light microscope
8. paper bowels.

Procedure :-

Propere the slide

- Take a clean glass slide
- Use forceps to tap or swrope to anther to releas Pollen on to the slide sud form for as ground.
- Divide it into pieces
- Every seperate dump of found can developed into individual plants.

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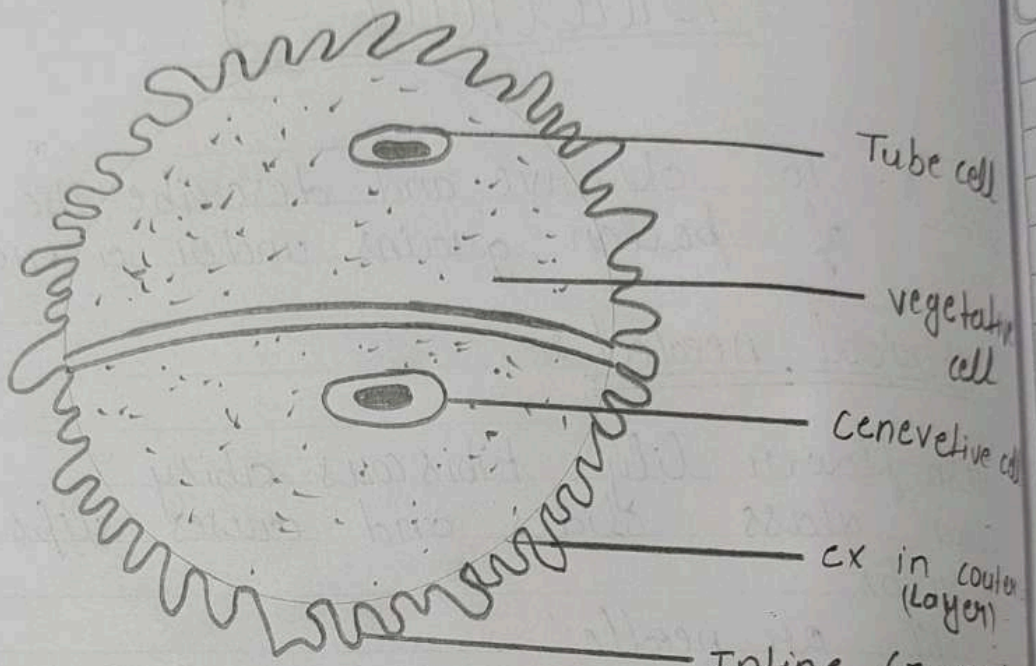
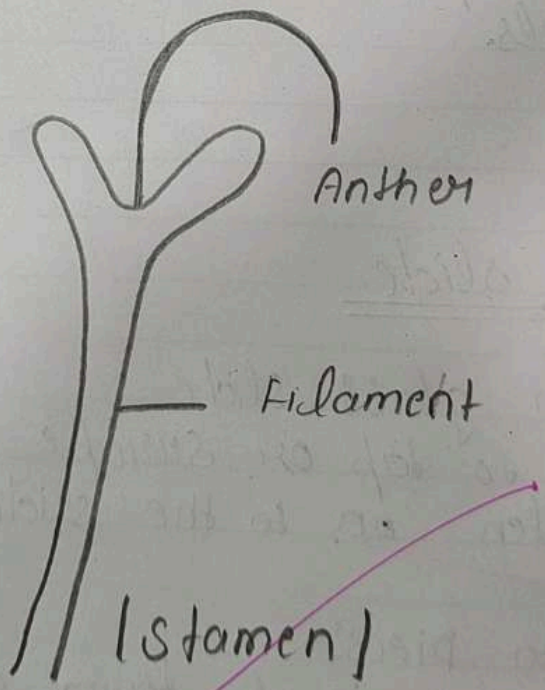
Pollen

1. self Pollination
2. cross Pollination



Pollen grains



Expt. No. _____ Date _____

Page No. 25

By Poting and Repotting

preparaction of cywicls for landscaping :- cycoicls are evergreen slow growing and moist ancient group of seed bearing pants.

- They are one of the most endangered Plant
- cycids are dicecicus plant which can be grown as ornamental Plants.

Methods of Propagation

Though seeds :- Remove fleshly outer coat of mature seeds and leaf it with a fungiside some slid bccome ready to germinate often five me seed with fully grown embryo can be shown during apavil to july.

Add mountiong medium :- Add a drop of water or glycerine option Add a drop of stevin

Place the coverslip :- Lower a cover slip gently to around air bubles.

Microscope setup :- Stalt with be - Power objective stvitch to higher magnification to observe details.

Teacher's Signature : _____