Certificate

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Roll No. : Exam No. :

Institution _____

This is certified to be the bonafide work of the student in the _____

_____ Laboratory during the academic

Year 20 / 20 No of practicals certified _____ out of _____ in the

Subject of Botany _____

.....
Teacher In-charge

.....
Examiner's Signature

.....
Principal

Date :.....

Institution Rubber Stamp

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S. No.	Name of Experiment	Page No.	Date of Experiment	Date of Submission	Remarks
	Study of Symptoms of plant disease				
•	fungal disease				
	Early blight of potato				
	White rust of Crucifers				
	Black rust of wheat				
•	Nematodes disease				
	Root Knot Vegetable				
	leaf gall of pongonia				
	Root knot of tomato				
•	Specimen / Permanent Side				
	Downy mildew				
	Green ear disease of Bajara				
	Tabacco mosaic				
	citrus canker				
	Little leaf of brinjal				
	Auto clave				
	Laminar air flow				

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PLANT

DISEASE ☺

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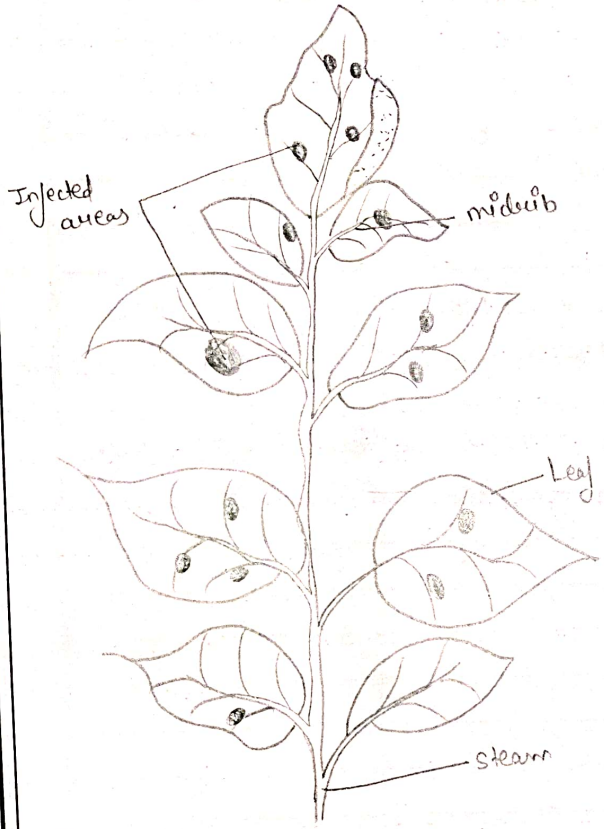
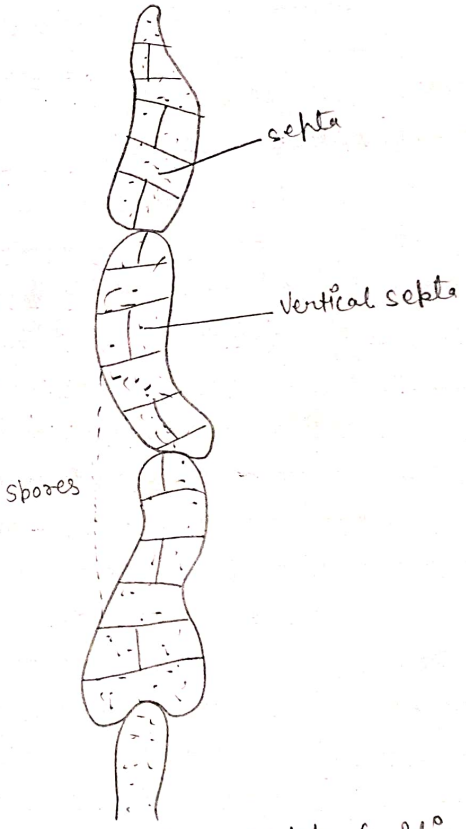
Alternaria

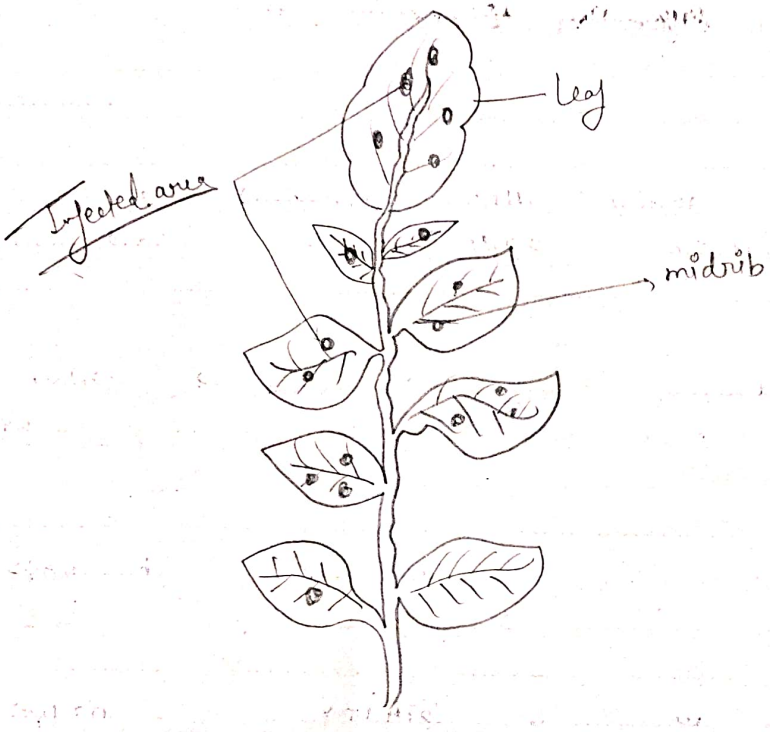
- Alternaria produces a melanin-like pigment that darkens the surface of its colonies from greyish black.
- Alternaria colonies are flat and can be downy or woolly.
- The reverse side of the colony is usually brown to black.
- Some species of Alternaria secrete mycotoxin, which can cause fungal black spot illness in fruits.



Alternaria:- Injection of alternaria Saloni of Potato



Alternaria:- Septate Conidia



Dig:- Alternaria → Infected leaf of Potato

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Early blight of Potato

Characters :→

- Spots begin as small, dark, dry, papery flecks, which grow to become brown-black, circular - to oval areas.
- The spots usually have a target appearance, caused by concentric rings of raised and depressed dead tissue.
- Deeply bury infected material, or burn or consign it to the local council green waste collection.
- ~~Concentric ring~~ Prevent long periods of wetness on leaf surfaces.

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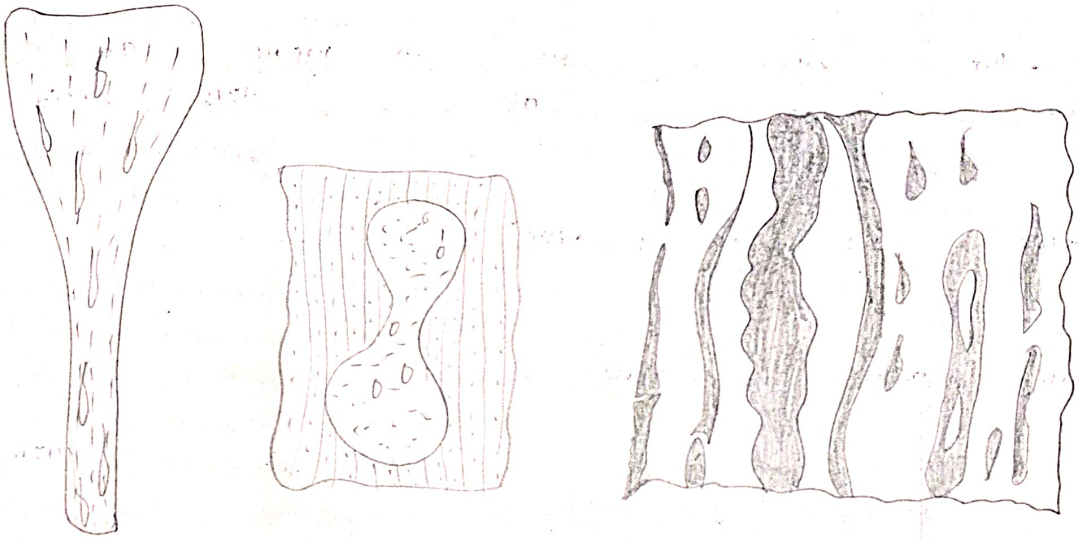
White rust of Crucifers

Characters

- White rust causes small white pustules on the underside of leaves, white can grow together to form larger lesions.
- The upper surface of the leaves may develop a mosaic patter.
- Inflorescenes may become malformed, resulting in a staghead appearance.
- White rust affects many Cruciferous plants, including radishes, horeradish, mustard, and turnips.

white Rust : (A) Pustules from leaf (B) Distorted inflorescence



Black dust of wheat

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Black rust of wheat

Character

- Reddish - brown pustules with torn margins appear on the stems, leaves, and glumes of the wheat plant.
- The pustules are oblong and powdery, and contain masses of urediospores.
- Black rust can spread quickly through strong breezes and splashing water.
- The Black rust requires 6-8 hours of moisture on the leaf surface.

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Root knot Vegetable

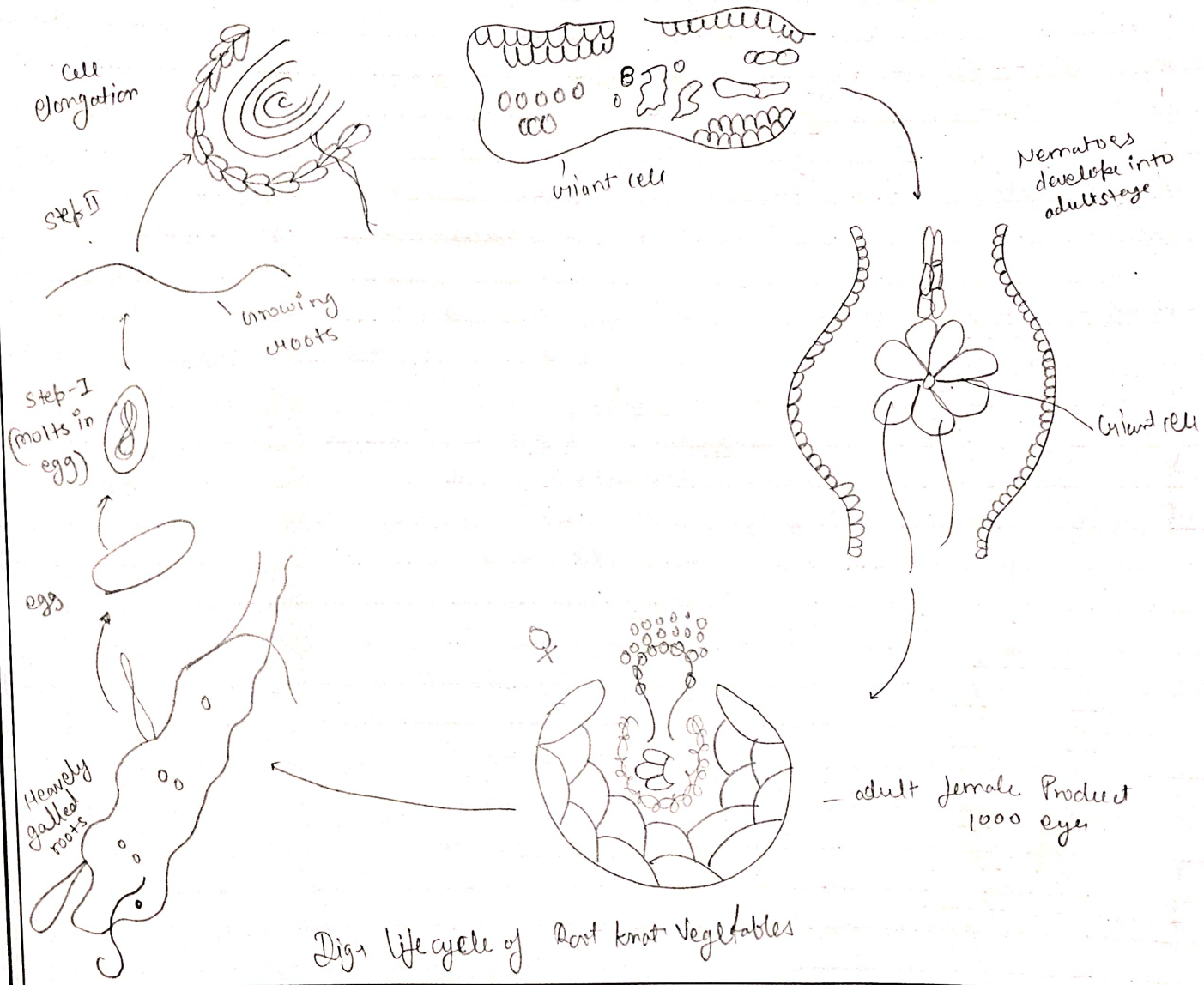
character

Root knot nematodes are most severe when crops are grown on sandy soils and warm climates above 25°C.

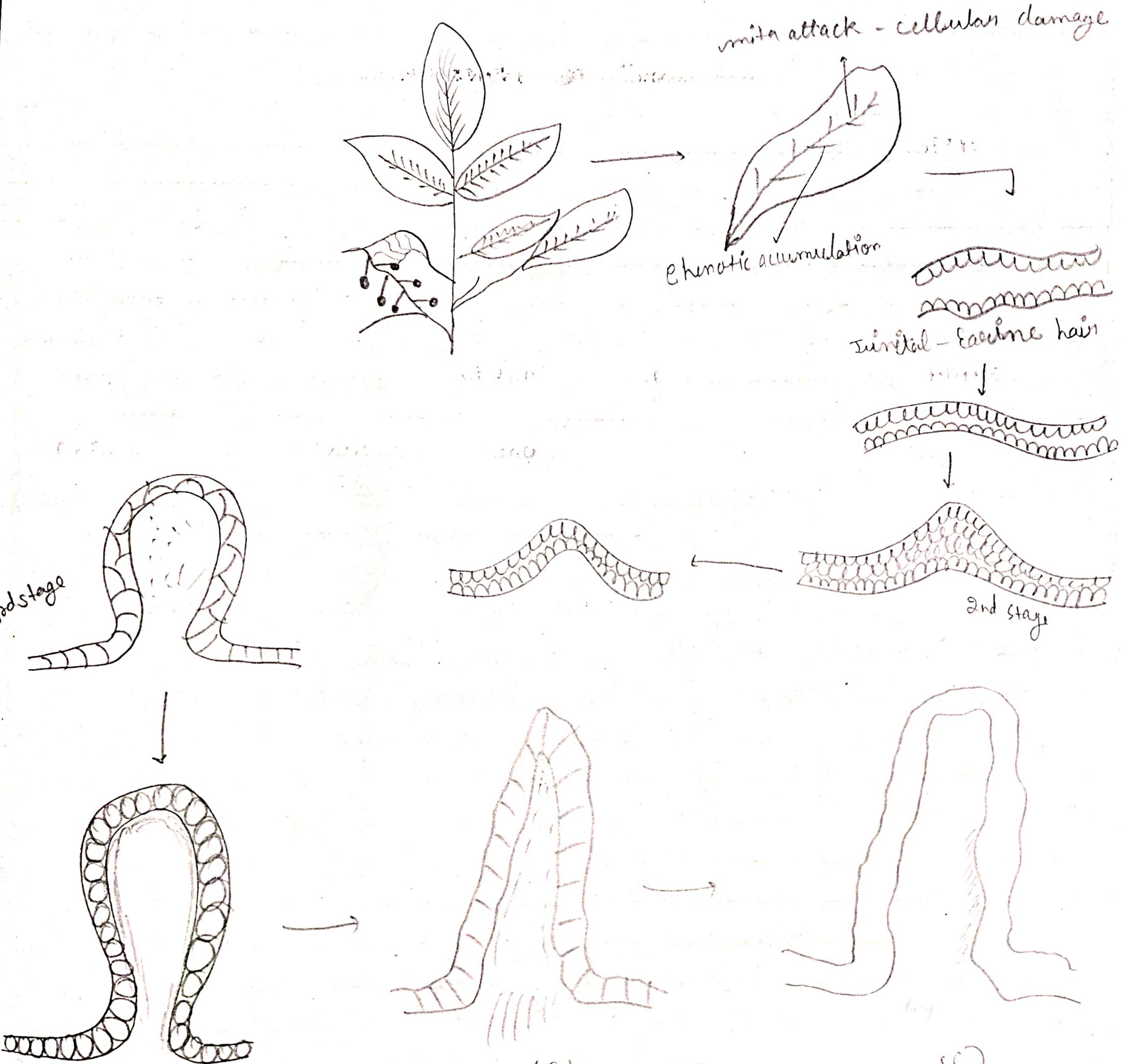
Plants may appear stunted, discolored, or wilt easily in hot, dry wheather.

Roots may have knots or galls that range in size from 1 to 10 mm in diameter.

Root crop such as carrots may be deformed or have hairy roots with nodules.



Diga Life cycle of Root knot Vegetables


mite attack - cellular damage
Chenotic accumulation
3rd stage
2nd stage
(A)
(B)
(C)

Pongonia

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Leaf gall of pongonia

character

- The galls have a thick waxy covering on their surface.
- The galls have large, thick and densely arranged erineal hairs.
- The galls have a basal stalk, or pedical, that attaches to the adaxial surface of the leaf.
- Pongamia glabra are spherical, solid, ligneous, sessile, indehiscent, greyish to greyish green up to 2 cm in diameter.

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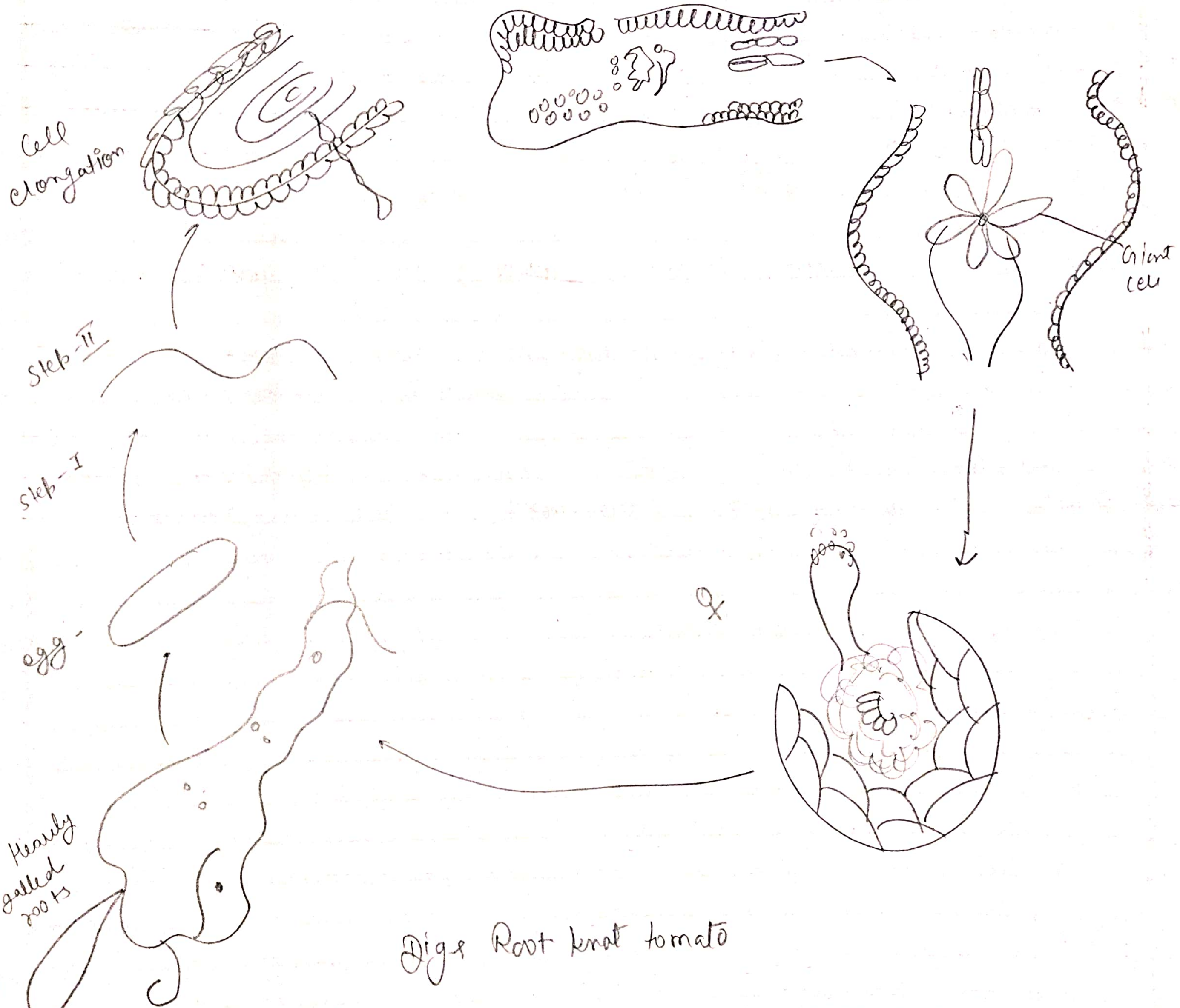
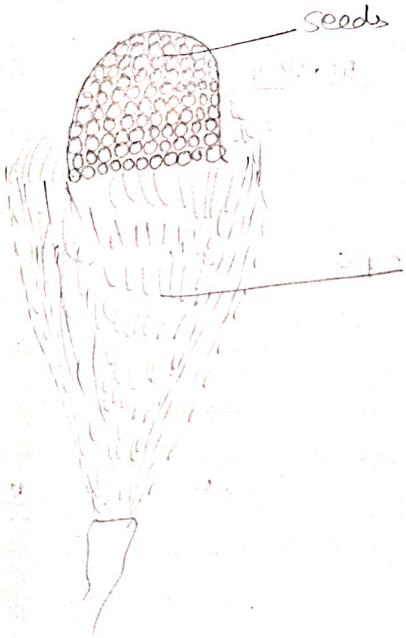
Root knot of Tomato

- It is stunted growth, wilting, even with adequate moisture.
- Pull up badly injected plants and dispose of the roots in the trash.
- Mark the area where the injected plants grew and avoid growing tomatoes, peppers, okra, or carrots again.
- Yellow or pale green leaves.



Dig: Root knot tomato



Green ear Disease

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Green ear disease of Bajara

Character

- chlorotic stripes on leaves, stunted growth, leafy structures on ears, and ears that fail to form or are malformed.
- Caused by the fungus Sclerospora graminicola.
- Soil borne and widespread in tropical and temperate regions.
- Use resistant varieties, crop rotation, remove diseased plants, seed treatment, and fungicide application.

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Downy mildew of Bajara

character

- Downy mildew is favored by rainy and humid environments.
- The disease can also be seed-borne, either externally on the oospore or internally in the embryo.
- Treat seeds or foliage with fungicides.
- Remove infested plants within 45 days of sowing.

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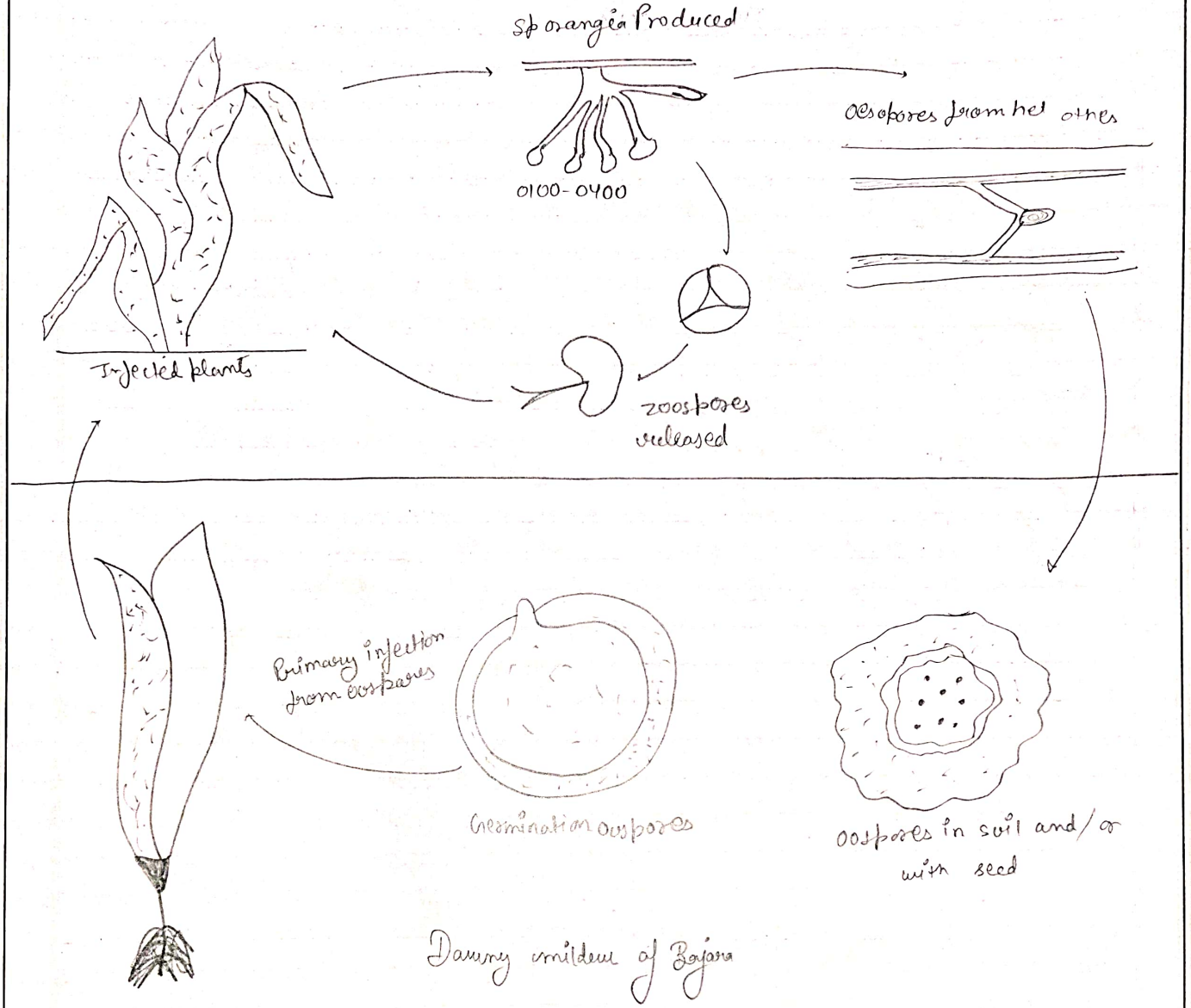

Downy mildew of Bajra

Teacher Signature .....

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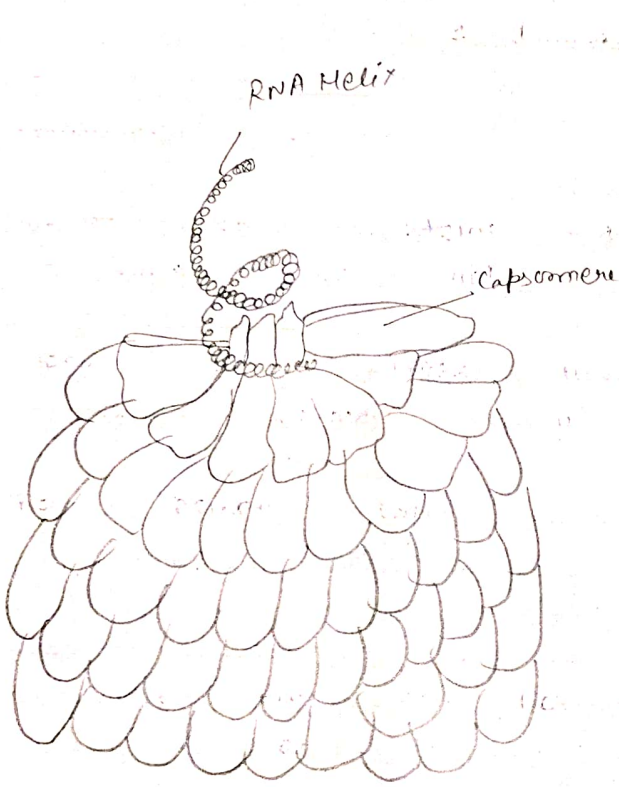

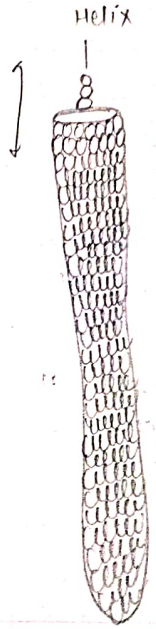

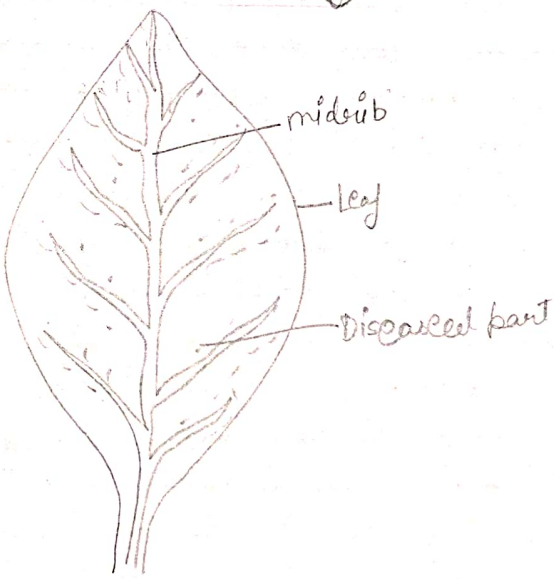

Tobacco Mosaic Virus

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Tabacco Mosaic Virus.

characters

- Tmv is a rigid, rod-shaped virus that is 3000 Å long and 180 Å wide.
- Tmv is made up of a protein coat and a single-strandard RNA molecule.
- Tmv causes a disease in tobacco plants that results in a mosaic pattern of yellow and green mottling on the leaves.
- Tmv has a rod-like apperance that is 300 nm long with a diameter of 18 nm.

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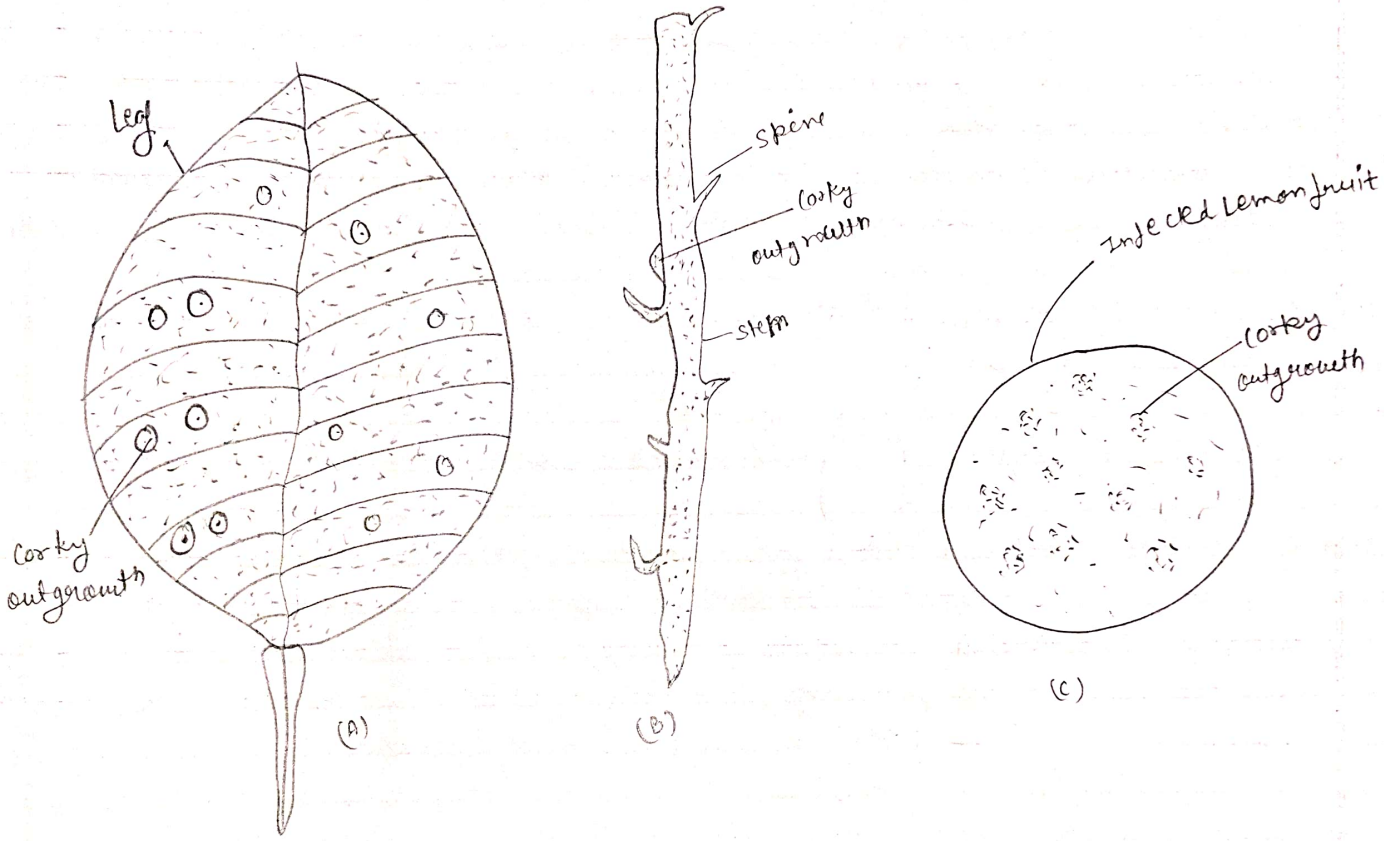
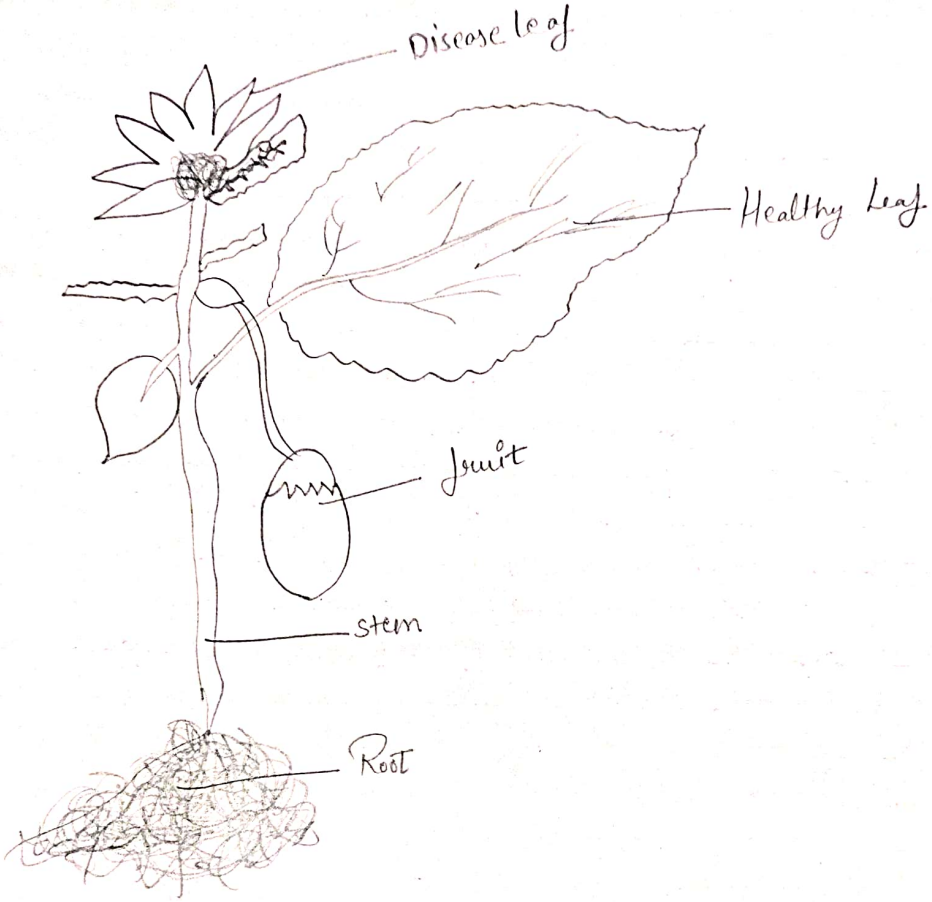
Citrus Canker

character

- The first symptoms are small, light green spots that appear on the leaves.
- These spots later turn grayish white, rupture, and become corky with a brown centre.
- The lesions can be surrounded by a yellow halo.
- Citrus canker is a bacterial disease that affects citrus plants, causing lesions on the leaves, stems, and fruits.



Citrus Canker:- Symptoms on Lemon plant (A) leaf (B) Twig (C) fruit



Little leaf of Brinjal

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Little leaf of Brinjal

Character

- leaves are deformed, malformed, and reduced in size, and are light yellow in color.
- Flower ~~plants~~ parts are deformed, and the plants are sterile.
- Early removal and destruction in injected plants.
- Adjust the sowing time to avoid the main flights of the leaf hopper.

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Q.1 Perform exercise of Microbiology Gram/ negative staining of bacteria or identification of virus / mycoplasma grams staining.

Q.2 Perform the exercise based on the microbiology media preparation any pure culture technique streak method.

Q.3 Study the material 'A' Carefully. prepare a suitable stained preparation and identify the causual organisms associated with the disease giving reasons (fungal disease) black rust of wheat.

Q.4 Identify the material "B" Carefully. prepare a suitable stained preparation and identify the Casual / organism associated with the disease giving reason (insect / Nemetodes disease) root knot of tomato.

Q.5 Spotting (5 spot)

(1) Green ear disease of bajra
(2) Trov
(3) Early bright
(4) laminar air flow
(5) Autoclove

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Ans-1 AIM:→ Gram staining bacteria

Requirements → 24 hours old Culture of bacteria, staining tray.

Reagents → Crystal violet, gram iodine soln, ethanol, Sabrine.

Theory → Gram staining was developed by Dr. Henery christian gram, its useful staining method for identify and classify bacteria into two major group.

Gram (+)	Gram (−)
Crystal violet	Primary stain
Iodine solution	gram dye
Alcohol	decolorising agent
Sabrine	Counter stain.

Principle → The different stain responses to gram staining can be related to chemical & physical differentiate in their cell wall. The gram (+) cell wall is this composition mouth layer higher liquid content addition to protein and muceopeptide. The hidden layer amount of lipid is being readly dissolution by alcohol loading to be formation a large pores in the cell wall.

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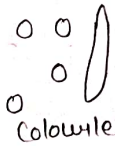
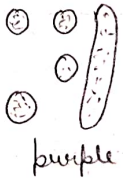
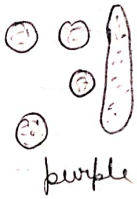
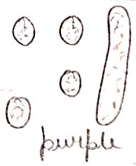
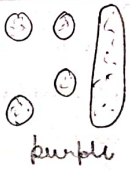
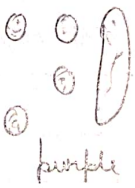
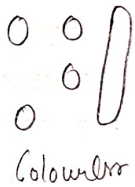
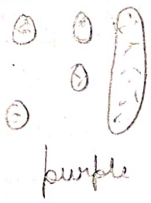
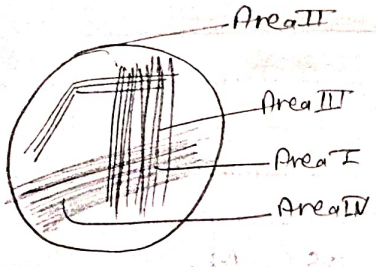
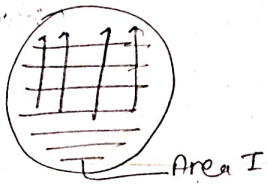
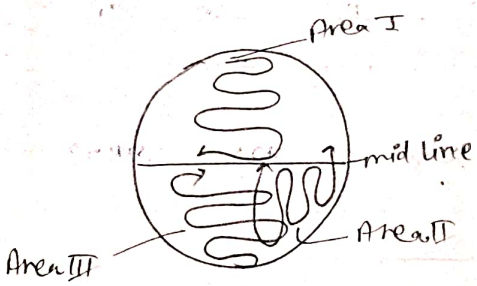
Reagent	Gram +ve	Gram -ve
Heat-fixed Cells	 Colourless	 Colourless
Crystal-violet (20 sec.)	 purple	 purple
Gram's iodine (1 minute)	 purple	 purple
Ethylalcohol (10-20 sec.)	 purple	 Colourless
Safranin (20 sec.)	 purple	 (Red) Pink)


Area II
Area III
Area I
Area IV

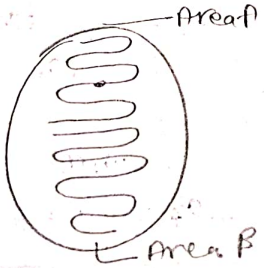
(1)


Area I

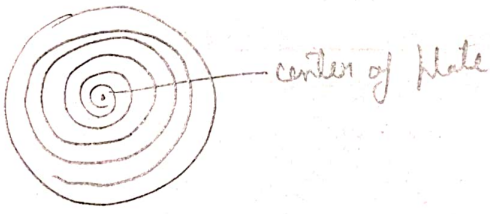
(2)


Area I
mid line
Area III
Area II

(3)


Area A
Area B

(4)


center of plate

(5)

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Ex-2

Streak Method

AIM:→ The aim of the streak plate method is to isolate pure colonies of microorganisms.

Principle → The streak plate technique is essentially a method of dilution but on a solid medium. Number of organisms down to a level that individual cells can be separated and isolated from each other.

Materials → bunsen burner, sample culture, a sterile petri dish, an inoculating loop, parafilm, a making pen.

Process →

- Sterilize the petri dish and agar medium to prevent contamination. Label the dish with than sample information.
- use a burner to sterilize an inoculation loop by heating it until it's red hot. let it cool.

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- Plate streaking are five types →
  (1) Quadrant
  (2) Radiant
  (3) T
  (4) Continuous
  (5) Circular.

Precautions →

- Avoid the edge.
- Don't use agar straight from the fridge.

Ans-3

Black rust of wheat

Character

- Reddish-brown pustules with torn margins appear on the stem, leaves and glumes of the wheat plant.
- The pustules are oblong and powdery, and contain masses of urediospores.
- Black rust can spread quickly through strong breezes and splashing water.
- The Black rust requires 6-8 hours of moisture on the leaf surface.

Date
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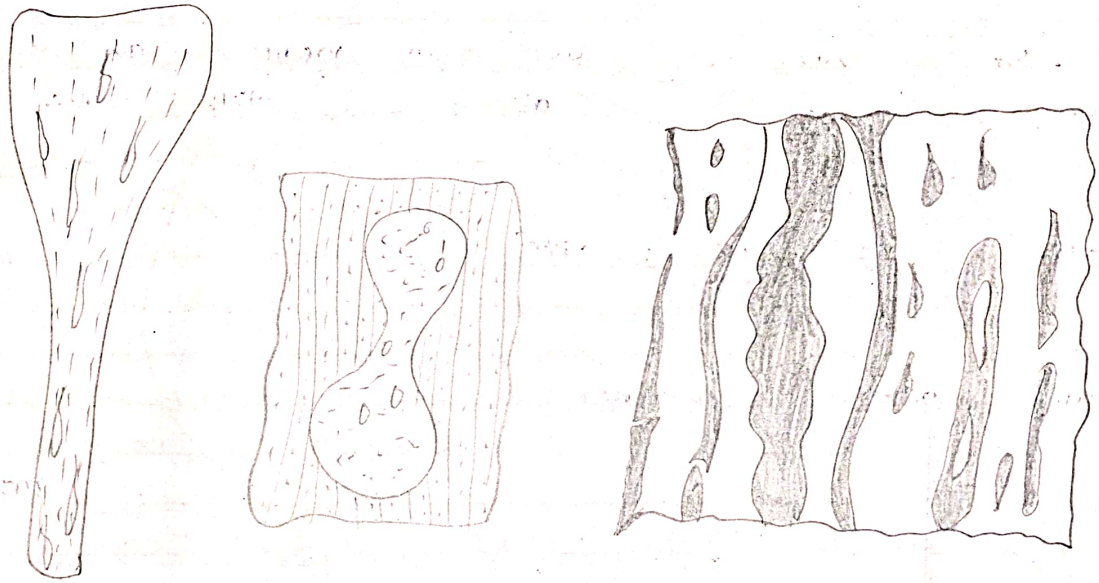
Ans-4 Root Knot of Tomato

Character

- It is stunted growth, wilting, even with adequate moisture.
- Pull up badly injected plants and dispose of the roots in the trash.
- Mark the area where the injected plants grew and avoid growing tomatoes, peppers, okra, or carrots again.
- Yellow or pale green leaves.



Black dust of wheat

Ans-4 Root knot of Tomato

Character

- It is stunted growth, wilting, even with adequate moisture.
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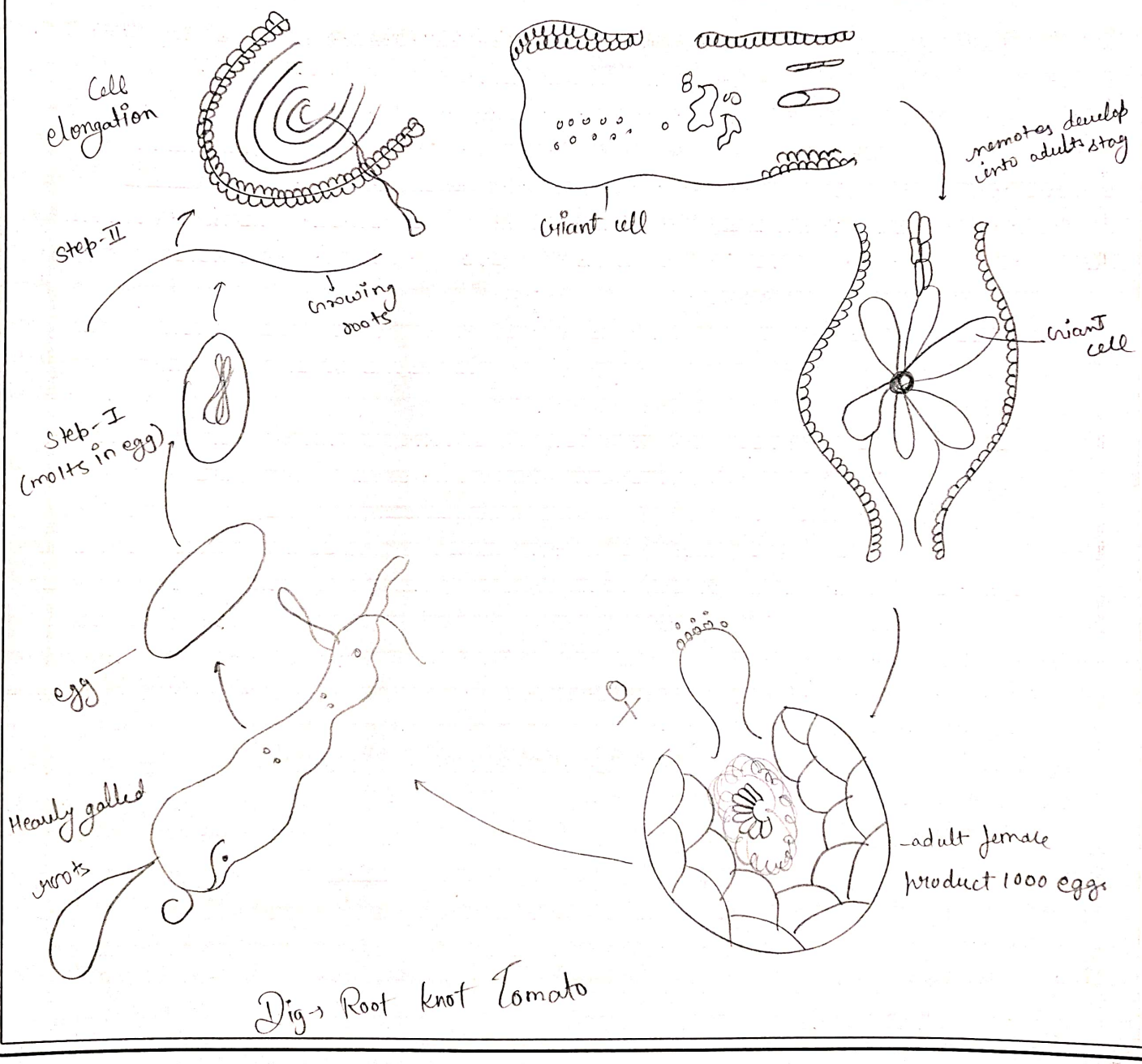

Dig:- Root knot Tomato

Teacher Signature .....

Spotting

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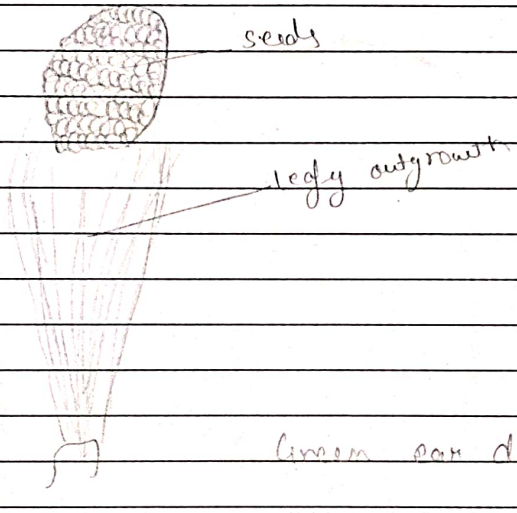
Ans-5 (i) Introduction → Green ear disease of bajra.

Diagram →



Green ear disease of bajra

character →

1) It is also known dowy mildew.

2) Removed diseased crop residues and affected plants.

3) Avoid heavy Irrigation in low-lying plants.

4) The plants appear stunted and sick, pale yellow in colour.

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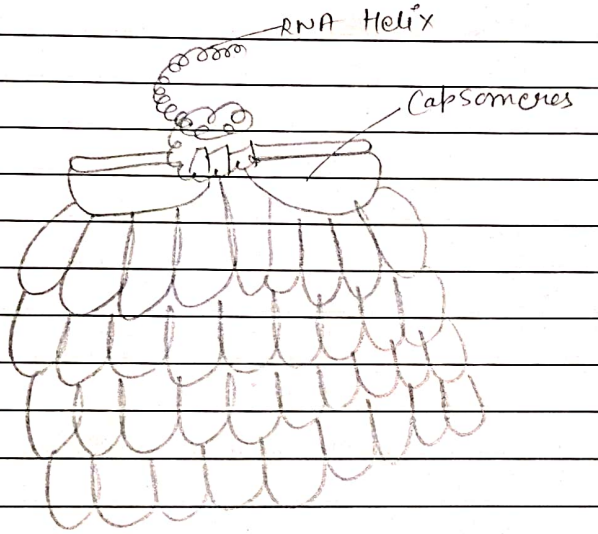
(ii) Introduction → "Tobacco mosaic virus"

Diagram →



Tobacco mosaic virus

characters →

- It is a rod-shape.
- In their protein-shell is a called Capsid.
- TMV is made up of a piece of nucleic acid.
- In a RNA-Helix are present.

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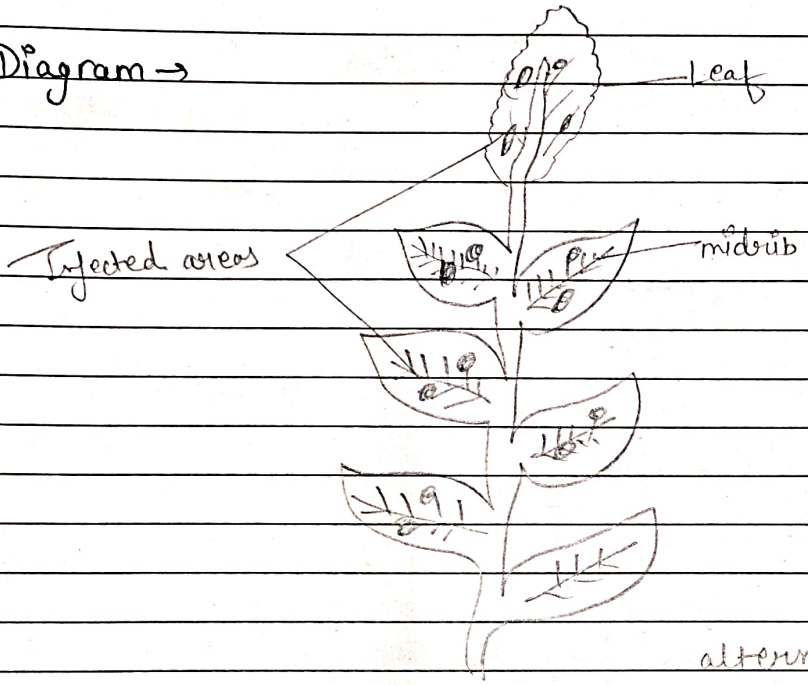
(iii) Introduction →

Diagram →



alternaria :- Infected leaf of potato

Character →

It is colony is usually brown to black.

Alternaria colonies are flat.

It is pathogen can effect plant, animal and human

Some species secrete mycotoxin.

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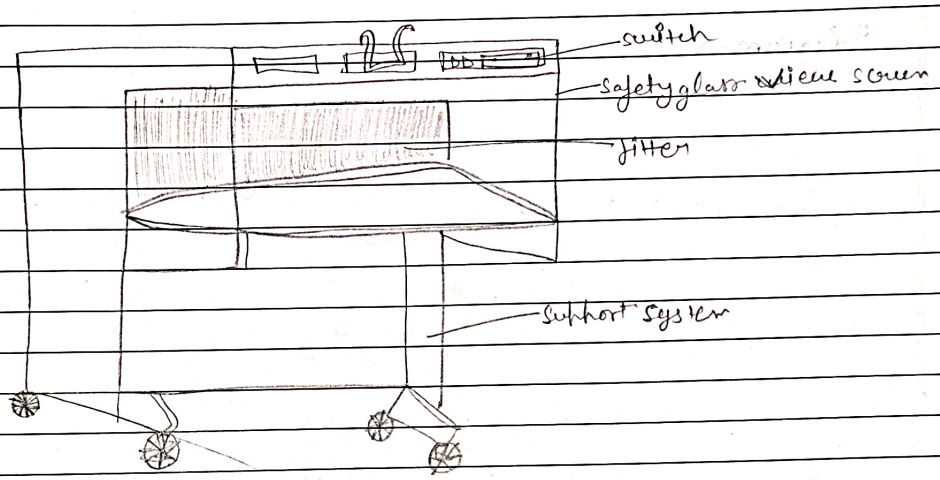
(iv) Introduction → "Laminar air flow chamber"

Diagram →



Dig - Laminar air flow chamber

Character →

1) It is also known as Laminar flow Cabinet
2) It is direction protects the sample from the user.
3) They also used for tissue culture
4) It is do not emit any poisonous gas into the environment.

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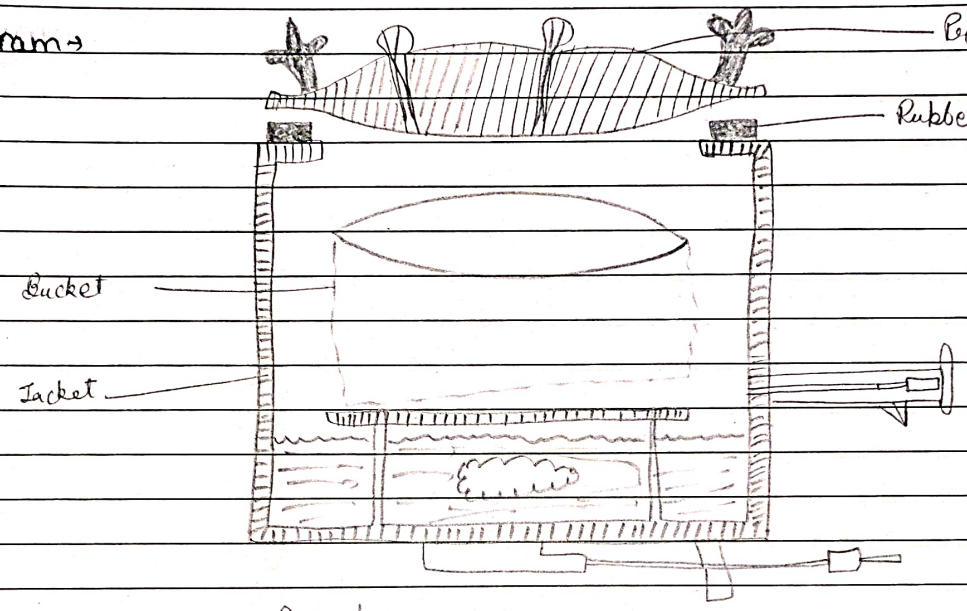
(v) Introtroduction → 'Autoclave'

Diagram →



Autoclave

Character –

1) The minimum temperature an autoclave is 121°C.
2) Autoclaves are used in Healthare.
3) And use also industrial setting, and laboratories in reasearch.
4) It is highly effective and inexpensive tools of sterilization.