R.K. VIGYAN P.G. MAHAVIDHYALAYA

Affiliated to University of Rajasthan, Approved by Govt. of Raj.)

Kalwar Road, Kalwar, Jaipur (Raj.)

Website : rkgroupofcollege.com , Mob. No. : 9314501146

E-mail : hrshreebalajieducationsamiti@gmail.com

B.A. / B.Sc. / B.Com.

ASSIGNMENT WORK / MIDTERM TEST

Session 20 ..... - 20 .....

Semester III rd .....

Name of Student Radha Yadav ..... **Father's Name** Gyan Singh Yadav

Roll No. ..... **Enrollment No.** .....

Year ..... **Semester** III rd .....

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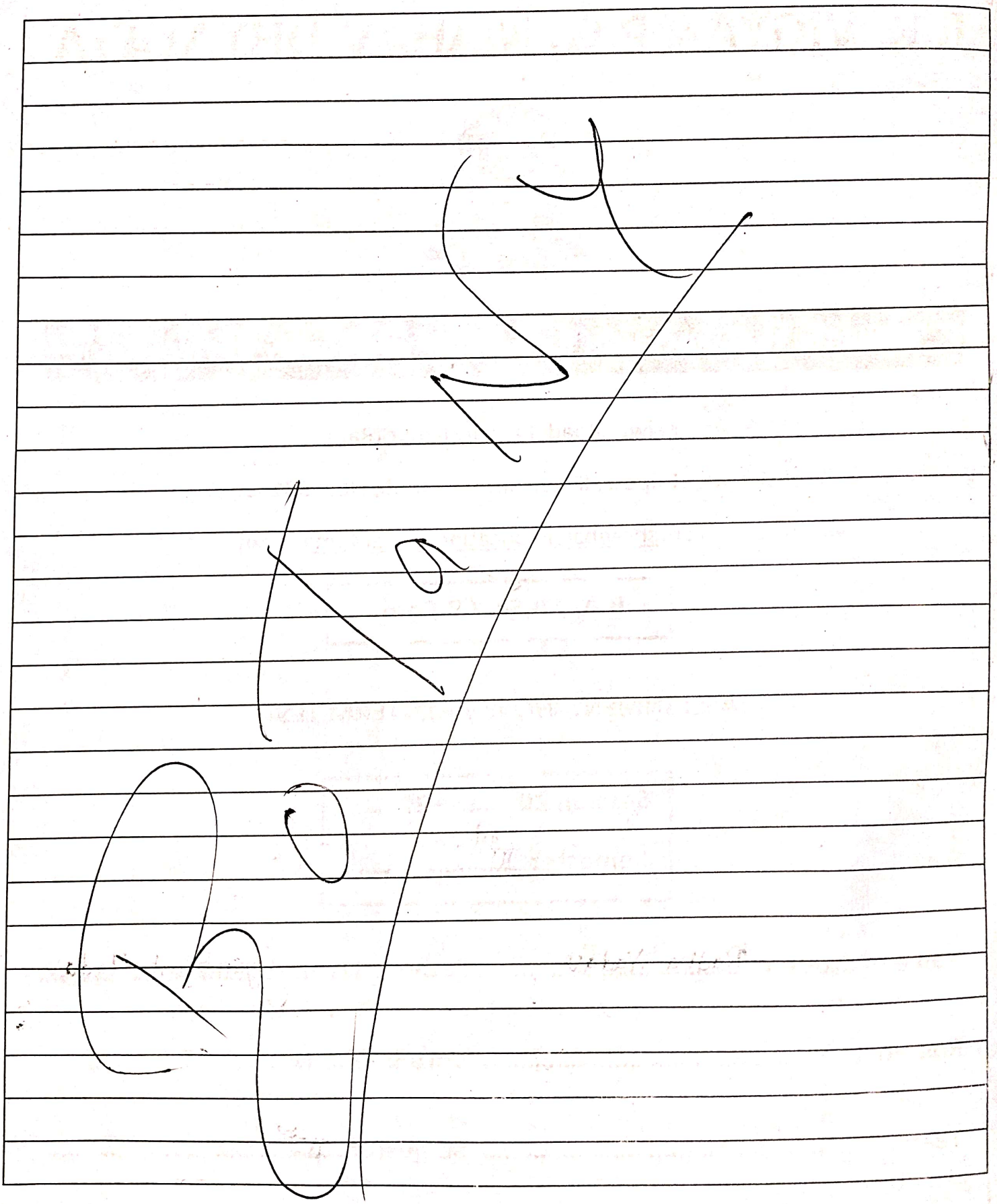

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Q.1 Write a note on the wostes Louis Pasteur and write a note a Robert Coach.

Q.2 Explain the types of nutrition in bacteria and Explain structure of bacteria and methods of sexual reproduction.

Q.3. Explain structure and characteristics of Tobacco mosaic virus

Or

Explain biological and non-biological diseases.

Q.4 Explain the detail life cycle of black Caterpillar disease of wheat

Or

Explain about the life cycle and Control

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Ans-1 Louis pasteur →

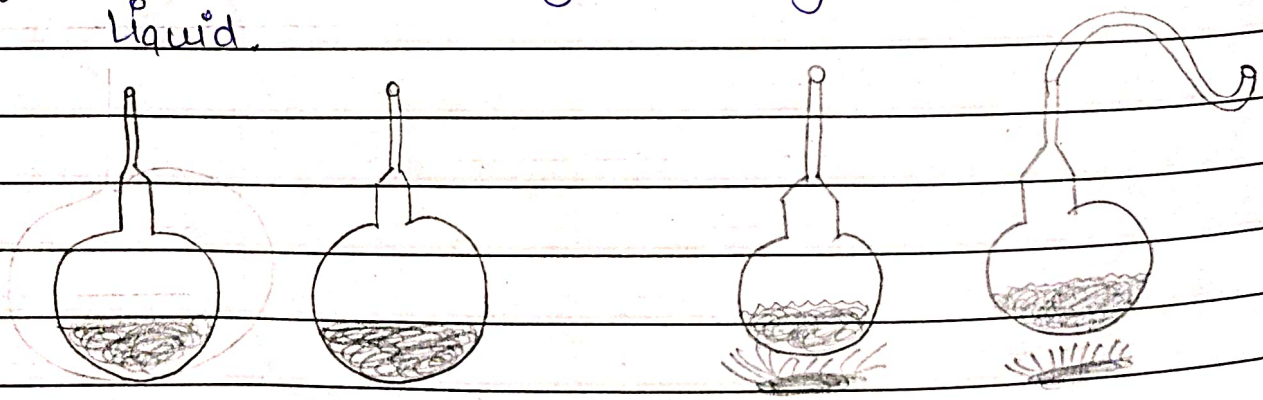
Louis pasteur born on December 27, 1822 in Dole, France and Died on September 28, 1895.

First, Pasteur prepared a nutrient broth similar to the broth one would use in soup.

Next, he placed equal amounts of the broth into two long-necked flasks.

He left one flask with a straight neck. The other he bent to form an "S" shape.

Then he boiled the broth in each flask to kill any living matter in the liquid.



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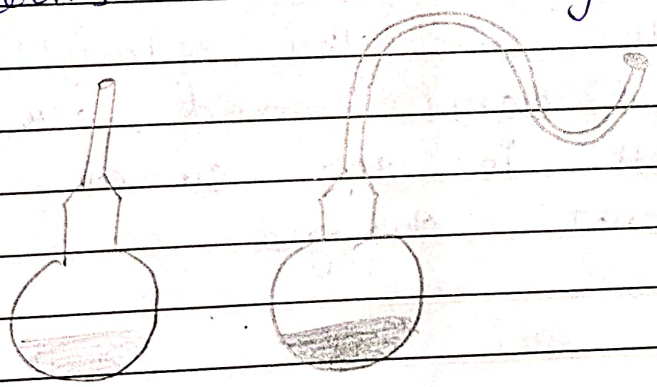
The sterile broths were then left to sit, at room temp. and exposed to air, in their open-mouthed flasks.

After several weeks, Pasteur observed that the broth in the straight-neck flask was discolored and cloudy, while the broth in the Curved-neck flask had not changed.

But the Curved-neck flask never became infected, indicating that the germs could only come from other germs.



Pasteur's experiment has all of the hallmarks of modern scientific Inquiry.

It begins with a hypothesis and it tests that hypothesis using a Carefully controlled experiment.

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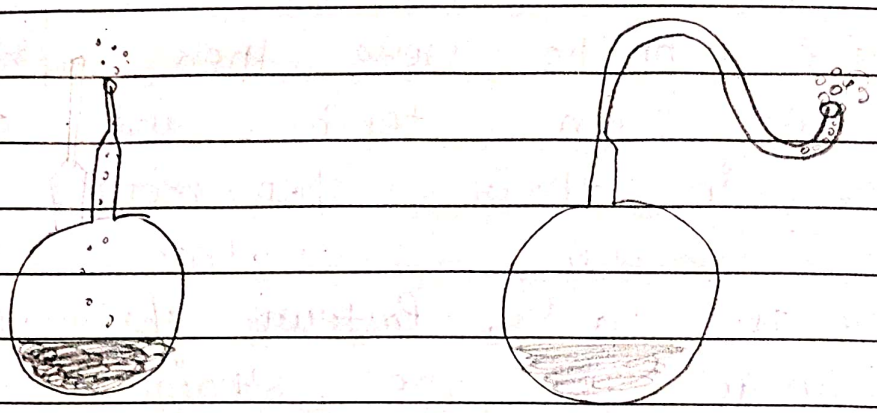

The same process — based on the same logical sequences of steps — has been employed by scientists for nearly 150 years.

After several weeks, Pasteur observed that the broth in the straight-neck flask was discolored and cloudy, while the broth in the curved-neck flask had not changed.

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Ans-2 Bacteria

- Bacteria are type of biological cell. They constitute a large domain of prokaryotic microoganisms.

- Bacteria is two type of Nutrition:-
  (1) Autotrophic Bacterial
    a) Photoautotrophs
    b) chemoautotrophs
  (2) Heterotrophic Bacterial

(1) Autotrophic Bacterial ⟶

These bacteria synthesize all their food from inorganic substances (CH_2O, CO_2, H_2S salts).

The autotrophs bacteria are of two types.

(1) Photoautotrophs

(2) chemoautotrophs

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(ii) Photoautotrophs →

The bacteria capture the energy of sunlight and transform it into the chemical energy.

In this process, CO_2 is reduced to carbohydrates.

$$6\,CO_2 + 12\,H_2O \xrightarrow[\text{Chlorophyll}]{\text{Light}} C_6H_{12}O_6 + 6H_2O + 6O_2 + \text{energy}$$

Purple sulphur bacteria →

These have the pigment bacteria chlorophyll membrane. That is thylakoids.

Eg: → chromatium, Thiospirillum.

$$6\,CO_2 + 15\,H_2O + 3\,Na_2S_2O_3 \xrightarrow[\text{bacteria}]{\text{Light}} C_6H_{12}O_6 + 6\,NaHSO_4 + 6H_2O$$

Chlorophyll

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Green sulphur bacteria →

These bacteria use hydrogen sulphide (H_2S) as hydrogen donor.

Eg:- Chlorobium limicola, chlorobacterium.

$$6CO_2 + 12H_2S \longrightarrow C_6H_{12}O_6 + 6H_2O + 12S$$

(2) chemoautotrophs →

These bacteria do not require light but have the dark phase of photosynthesis and pigment for their nutrition.

Sulphomonas →

These bacteria obtain energy by oxidation of element sulphur or H_2S

Eg:- Thio bacillus.

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$2S + 2H_2O + 3O_2 \longrightarrow 2H_2SO_4 + 126$ K Cal

Hydromonas →

These convert hydrogen into water.

Eg. → Hydrogenomonas

$2H_2 + O_2 \longrightarrow 2H_2O + 55$ K Cal

$4H_2 + CO_2 \longrightarrow 2H_2O + CH_4 +$ Energy

Ferromonas →

- These bacteria inhibit water and obtain energy by oxidation of ferrous compounds into ferric form.

Eg:- Ferro bacillus.

$4FeCO_3 + 6H_2O + O_2 \longrightarrow 4Fe(OH)_3 + 4CO_2 \uparrow$

81 K Cal

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Methanomonas →

These bacteria get their energy by oxidation of methane into water and carbon dioxide.

Eg :- Bacillus oligo Carbonphillous

$$2CO + O_2 \longrightarrow 2CO_2 + \text{Energy}$$

Nitrosomonas →

These bacteria obtain energy by oxidizing ammonia into nitrate.

The first step ammonia is oxidized into nitrites by the bacteria, Nitrococcus.

$$2NH_3 + 3O_2 \longrightarrow 2HNO_2 + 2H_2O + 79 \text{ K Cal}$$

Second step

$$2HNO_2 + O_2 \longrightarrow 2NHO_3 + 21.6 \text{ K Cal}$$

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(2) HETEROTROPHIC BACTERIA ⟶

The heterotrophic bacteria obtain their ready made food organic substances, living or dead.

Most of pathogenic bacteria of human beings, other plant and animals are heterotrophs.

Heterotrophic bacteria are two parts:-

(1) Photoheterotrophic.
(2) Chemoheterotrophic

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Ans- 3

Tobacco Mosaic Virus →

Tobacco mosaic virus (TMV) is a plant virus that belongs to the genus Tobamovirus.

It is named so because it majorly infects tobacco plants, potatoes, tomatoes and other members of the solanaceae family.

The tobacco mosaic virus (TMV) has a rod-like apperance that is 300 nm long with a diameter of 18 nm.

It is covered by a protein shell called Capsid that encloses the virus's genetic material.

The genetic material is a single-standard RNA molecule.

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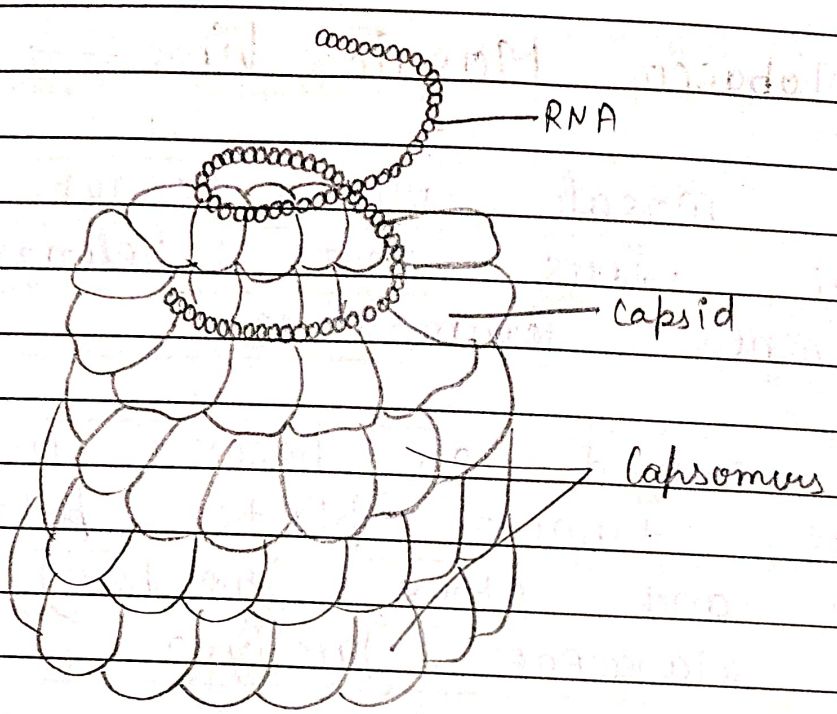

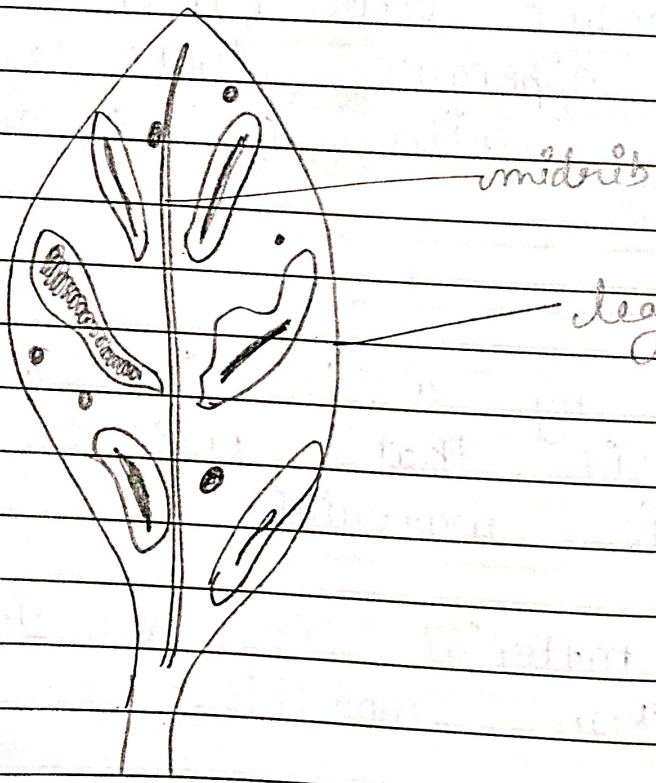

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The Capsid is made up of 2130 molecule of Coat proteins that assemble in a rod-like helical structure processing 16.3 proteins per helix turn.

The RNA is found in a Coiled manner inside the Capsid coat and is made up of approximately 6395 nucleotides.

It has structural chirality and inherent symmetry in the structure which gives the organism an easy way for chemical or genetic modifications.

The injection creates a mosaic like pattern, mottling and discolora-tion of the leaves.

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TMV is a plant virus that creates a mosaic - like pattern,

It can have a significant impact on vegetables, reducing yield and quality to the point that commercial crops cannot be marked.

It is named so because it majorly injects tobacco plants, potatoes, tomatoes and other members of the Solanaceae family.

Ans-4 COVERED SMUT OF BARLEY

(A) Causal Organism → Ustilago hordei

(B) class → Basidiomycetes

(C) Host Plant → Barley

Pathogen :→

- Covered smut of Barley is caused by fungus ustilago hordei.
- Dark brown masses of powdery spores or smut balls replace the grains barley head.
- The chlamydomonas spores are dark brown to charcoal brown in mass usually sub-spherical or spherical smooth walled, and lighter coloured on one side,

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- When young the chlamydospores are dikaryotic and with maturity karyogamy takes place.

Life Cycle :—

- This is an extrnally seed-borne of systemic disease every year the occurance of disease tobes take place by Contaminated Seeds.

- After the fungus has entered the seedling, its hyphae Continue to grow with shoot & eventually replace the grains by masses of spores.

- A warm, moist acid soil favours seedling infection.

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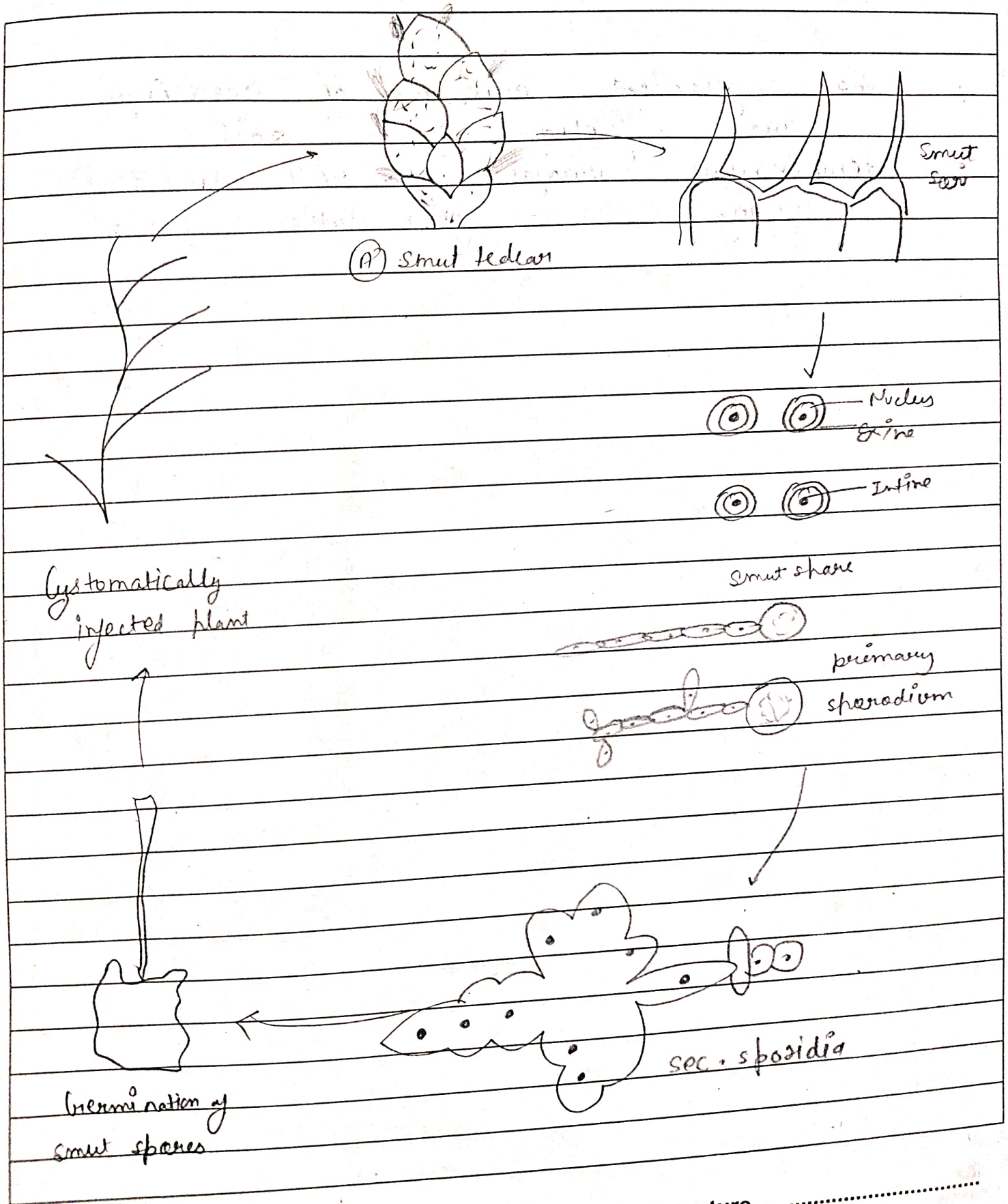

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