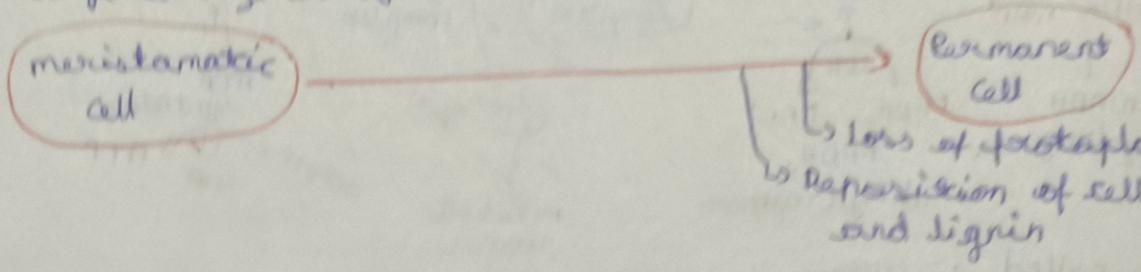
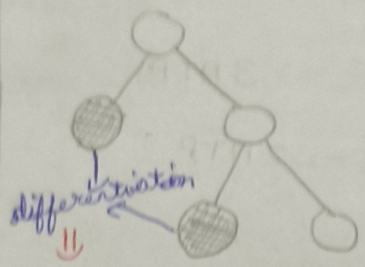
Lesson - 10

Plant growth and Development

- meristematic cell converting into permanent cell is called differentiation / maturation.
- Change in size is growth





Go phase
(No cell division)

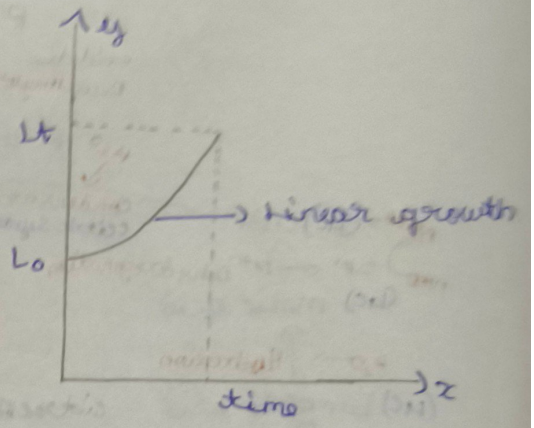
Arithematic Growth

- Growth rate is stable

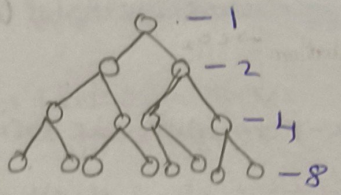
Eg 1 Length of the root

2 Late steps of embryo formation

- $L_t = L_0 + xt$



Geometric growth



- Growth rate is unstable

Eg Early stage of embryo formation

- Absolute growth = $\frac{\text{total growth}}{\text{time}} \times 100$
- Relative growth = $\frac{\text{total growth}}{\text{initial growth}} \times 100$

I Differentiation

Meristamatic cells → loss of protoplasm → cellulose and lignin deposition → Permanent cell (Differentiated cell) ⇓ Tracheary element

⇓
SAM
RAM
Cambium

II Dedifferentiation

Meristamatic cell (Differentiated cell) ⇐ Differentiated permanent cell ⇓ Parenchyma

⇓
- Interfascicular cambium
- Cork cambium

III Redifferentiation

Dedifferentiated meristematic cell → Permanent cell
Dedifferentiated meristematic cell → Xylem, phloem, fibres

Heat growth regulators

Promotors ⇓
auxins
Gibberellins
Cytokinins

Inhibitors ⇓
ABA

Ethylene

Auxins

1 Charles Darwin and Francis Darwin

→ Unilateral (Phototropism)
→ Coleoptile
→ Canary grass

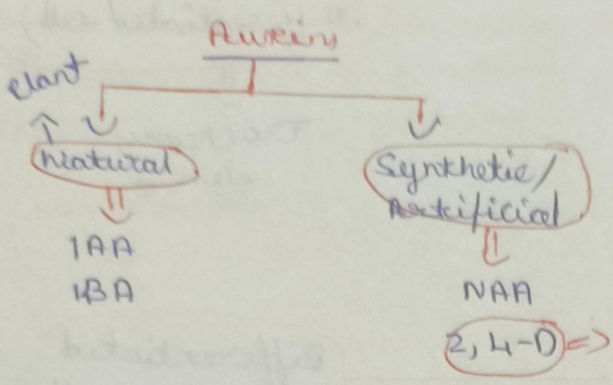
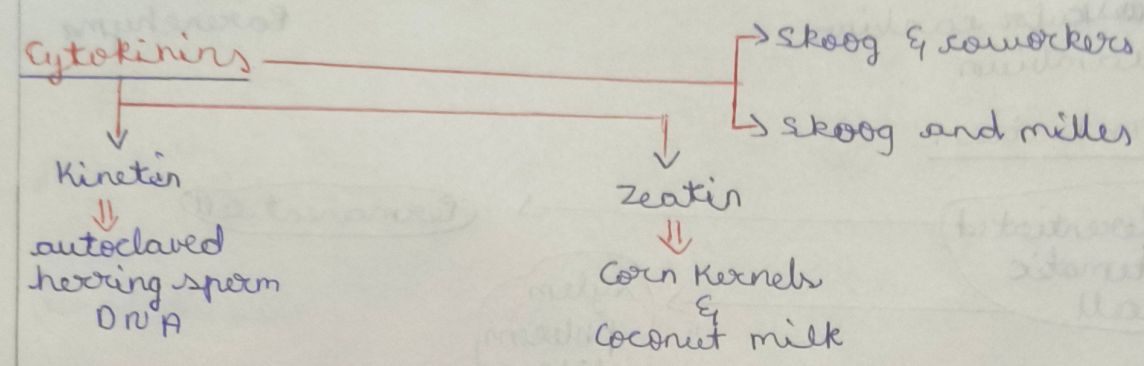
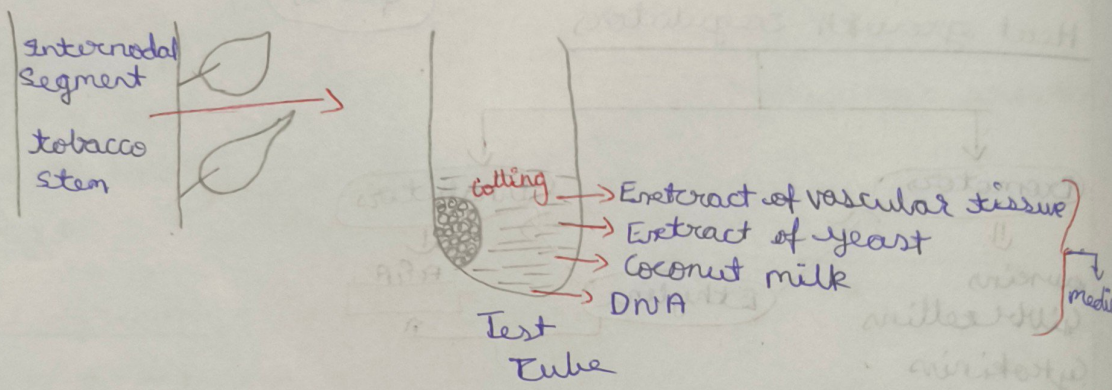
2 F.W. Went

→ Extracted auxins
→ Coleoptile
Oat seedlings

3 Human Urine

4 SAM
RAM

5



Gibberellins