



ISLAMIAH MAT HR SEC SCHOOL,
KILAKARAI, RAMANATHAPURAM DT.

XI COMMON PUBLIC EXAMINATION, MARCH -2024 (18-03-2024)

Question type A

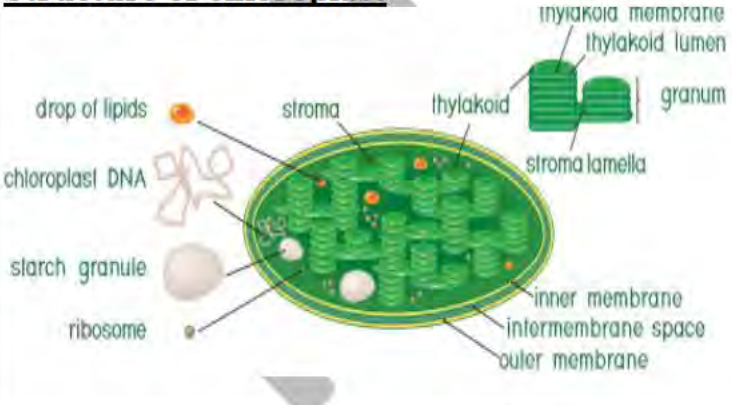
TENTATIVE ANSWER KEY

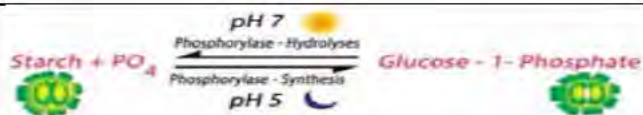
SUB: BOTANY

MARKS: 70

Q.NO	CONTENT	MARKS	MODE OF QUESTION
	PART - I		BOOK BACK /
			BOOK INSIDE/
I.	CHOOSE THE CORRECT ANSWER	15 X 1 =15	CREATIVE
1	c) Glycocalyx	1	BOOK INSIDE
2	b) Cuticular	1	BOOK INSIDE
3	a) 202 Families	1	BOOK INSIDE
4	a) Acetyl CoA	1	BOOK BACK
5	c) Copper	1	BOOK INSIDE
6	d) Pachytene	1	BOOK BACK
7	d) C ₄ plants	1	BOOK INSIDE
8	d) Chloroplast	1	BOOK INSIDE
9	d) Foliar bud, cauline bud	1	BOOK BACK
10	c) B	1	BOOK INSIDE
11	b) Mixed inflorescence	1	BOOK INSIDE
12	b) Cucurbitaceae	1	BOOK INSIDE
13	b) Pea, Barley, Oats	1	BOOK INSIDE
14	a) Floridean starch	1	BOOK INSIDE
15	c) Duramen	1	BOOK BACK

Q.NO		MARKS	MODE OF QUESTION
II.	PART -II ANSWER ANY SIX OF THE FOLLOWING QUESTION NUMBER 24 IS COMPULSORY	6 X 2 = 12	BOOK BACK / BOOK INSIDE/ CREATIVE
16	<u>Apical dominance</u> Suppression of growth in lateral bud by apical bud due to auxin produced by apical bud is termed as apical dominance.	2	BOOK INSIDE
17	<u>4 types of ascocarps</u> Cleistothecium (Completely closed), Perithecium (Flask shaped with ostiole), Apothecium (Cup shaped, open type) and Pseudothecium	2	BOOK INSIDE
18	<u>The vessels of angiosperms are larger in size</u> In the spring season, cambium is very active and produces a large number of xylary elements having vessels/tracheids with wide lumen. The wood formed during this season is called spring wood or early wood	2	BOOK BACK
19	<u>Nucule</u> In Chara the female sex organ is called Oogonium or Nucule	2	BOOK BACK
20	<u>Mineral deficiency</u> Plant A Molybdenum (or) Mo Deficiency Plant B Zinc (or) Zn Deficiency	2	BOOK BACK
21	<u>Solanaceae food plants (Any 2 plants)</u> Solanum tuberosum Lycopersicon esculentum Solanum melongena Capsicum annum Capsicum frutescens Physalis peruviana	2	BOOK INSIDE
22	<u>Overall process of respiration</u> $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{Energy}$ (686 K cal or 2868 KJ)	2	BOOK INSIDE
23	<u>Parameters which control water potential</u> (i) Solute concentration or Solute potential (Ψ_s) (ii) Pressure potential (Ψ_p)	2	BOOK BACK
24	<u>Mangrove plant respiration</u> They have a large number of breathing pores or pneumatophores for exchange of gases	2	BOOK INSIDE

Q.NO	CONTENT	MARKS	MODE OF QUESTION						
III.	PART -III ANSWER ANY SIX OF THE FOLLOWING QUESTION NUMBER 33 IS COMPULSORY	6 X 3 = 18	BOOK BACK / BOOK INSIDE/ CREATIVE						
25	<u>Importance of Studying Growth Rings</u> <ul style="list-style-type: none"> • Age of wood can be calculated. • The quality of timber can be ascertained. • Radio-Carbon dating can be verified. • Past climate and archaeological dating can be made • Provides evidence in forensic investigation. 	3	BOOK INSIDE						
26	<u>Root climbers differ from Stem climber</u> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th data-bbox="252 837 644 882" style="width: 50%;"><u>root climbers</u></th> <th data-bbox="644 837 1038 882" style="width: 50%;"><u>stem climber</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="252 882 644 1099">Plants climbing with the help of adventitious roots arising from nodes are called Root climbers.</td> <td data-bbox="644 882 1038 1099">Stem part of the plant co round a support for climbing.</td> </tr> <tr> <td data-bbox="252 1099 644 1144">Eg. Piper nigrum</td> <td data-bbox="644 1099 1038 1144">Eg: Ipomoea.</td> </tr> </tbody> </table>	<u>root climbers</u>	<u>stem climber</u>	Plants climbing with the help of adventitious roots arising from nodes are called Root climbers.	Stem part of the plant co round a support for climbing.	Eg. Piper nigrum	Eg: Ipomoea.	3	BOOK BACK
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Eg. Piper nigrum	Eg: Ipomoea.								
27	<u>Structure of chloroplast</u> 	3	BOOK INSIDE						
28	<u>Starch sugar interconversion theory</u> The discovery of enzyme phosphorylase in guard cells by Hanes (1940) greatly supports the starch-sugar interconversion theory. The enzyme phosphorylase hydrolyses starch into sugar and high pH followed by endosmosis and the opening of stomata during light. The vice versa takes place during the night.	3	BOOK BACK						



29	<p>Human disease by Bacteria</p> <table border="1"> <thead> <tr> <th>S.No</th> <th>Name of the disease</th> <th>Name of the pathogen</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Cholera</td> <td><i>Vibrio cholerae</i></td> </tr> <tr> <td>2.</td> <td>Typhoid</td> <td><i>Salmonella typhi</i></td> </tr> <tr> <td>3.</td> <td>Tuberculosis</td> <td><i>Mycobacterium tuberculosis</i></td> </tr> <tr> <td>4.</td> <td>Leprosy</td> <td><i>Mycobacterium leprae</i></td> </tr> <tr> <td>5.</td> <td>Pneumonia</td> <td><i>Diplococcus pneumoniae</i></td> </tr> <tr> <td>6.</td> <td>Plague</td> <td><i>Yersinia pestis</i></td> </tr> <tr> <td>7.</td> <td>Diphtheria</td> <td><i>Corynebacterium diphtheria</i></td> </tr> <tr> <td>8.</td> <td>Tetanus</td> <td><i>Clostridium tetani</i></td> </tr> <tr> <td>9.</td> <td>Food poisoning</td> <td><i>Clostridium botulinum</i></td> </tr> <tr> <td>10.</td> <td>Syphilis</td> <td><i>Treponema pallidum</i></td> </tr> </tbody> </table>	S.No	Name of the disease	Name of the pathogen	1.	Cholera	<i>Vibrio cholerae</i>	2.	Typhoid	<i>Salmonella typhi</i>	3.	Tuberculosis	<i>Mycobacterium tuberculosis</i>	4.	Leprosy	<i>Mycobacterium leprae</i>	5.	Pneumonia	<i>Diplococcus pneumoniae</i>	6.	Plague	<i>Yersinia pestis</i>	7.	Diphtheria	<i>Corynebacterium diphtheria</i>	8.	Tetanus	<i>Clostridium tetani</i>	9.	Food poisoning	<i>Clostridium botulinum</i>	10.	Syphilis	<i>Treponema pallidum</i>	3	BOOK INSIDE
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30	<p>Respiration Quotient and malic acid</p> <p>(i) The ratio of volume of carbon dioxide given out and volume of oxygen taken in during respiration is called Respiratory Quotient or Respiratory ratio</p> <p style="text-align: center;">(or)</p> $\text{RQ} = \frac{\text{Volume of CO}_2 \text{ liberated}}{\text{Volume of O}_2 \text{ consumed}}$ <p>(ii) When respiratory substrate is an organic acid the value of RQ will be more than unity.</p> <p style="text-align: center;">(or)</p> $\text{RQ of malic acid} = \frac{4 \text{ molecules of CO}_2}{3 \text{ molecules of O}_2} = 1.33 \text{ (more than unity)}$	3	BOOK INSIDE																																	
31	<p>Wood</p> <p>Xylem derived from the Gk. Xylos – wood The secondary xylem also called wood.</p>	3	BOOK BACK																																	
32	<p>Three phase of Dark reaction</p> <ol style="list-style-type: none"> 1. Carboxylation (fixation) 2. Reduction (Glycolytic Reversal) 3. Regeneration 	3	BOOK INSIDE																																	

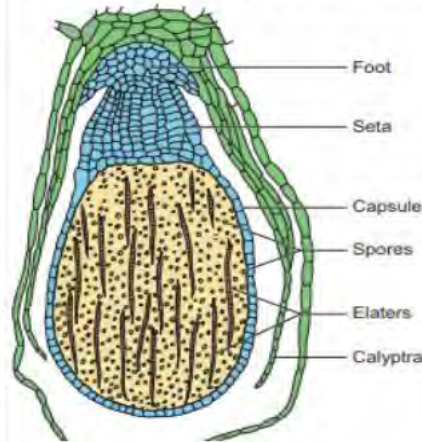
33	<u>living Characters of Virus (Any 3 point)</u> <ul style="list-style-type: none"> • Presence of nucleic acid and protein. • Capable of mutation • Ability to multiply within living cells. • Able to infect and cause diseases in living beings. • Show irritability. • Host –specific 	3	BOOK INSIDE
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Q.NO	CONTENT	MARKS	MODE OF QUESTION
IV.	<p style="text-align: center;">PART –IV</p> <p style="text-align: center;">ANSWER ALL THE QUESTION</p>	5 X 5 = 25	BOOK BACK / BOOK INSIDE/ CREATIVE
34 (a)	<u>Physiological effect of Cytokinins (Any 5 points)</u> <ul style="list-style-type: none"> • Cytokinin promotes cell division in the presence auxin (IAA). • Induces cell enlargement associated with IAA and gibberellins • Cytokinin can break the dormancy of certain light-sensitive seeds like tobacco and induces seed germination. • Cytokinin promotes the growth of lateral bud in the presence of apical bud. • Application of cytokinin delays the process of Aging by nutrient mobilization. It is known Richmond Lang effect. • Cytokinin <ol style="list-style-type: none"> (i) increases rate protein synthesis (ii) induces the formation of inter-fascicular cambium (iii) overcomes apical dominance (iv) induces formation of new leaves, chloroplast and lateral shoots. (v)Plants accumulate solutes very actively with help of cytokinins. 	5	BOOK BACK

34 (b)

Marchantia Sporophyte

Zygote develops in to a multicellular structure called sporophyte. The sporophyte is not free-living but attached to the photosynthetic gametophyte and derives nutrition from it. Sporophyte is differentiated into foot, seta and capsule. The foot is bulbous and is embedded in the gametophyte. It derives nutrition from the gametophyte and transfers to the sporophyte. Seta is short and connects foot and capsule. The capsule consists of single layered jacket layer and encloses numerous haploid spores and elaters. The capsule is covered by protective covering called calyptra. On maturation the capsule dehisces and spores are released. Elaters helps in the dispersal of spores. The spores under favourable conditions germinate and develop into new gametophyte. The haploid gametophytic phase alternates with diploid sporophytic phase, thus the life cycle of Marchantia shows alternation of generation



5

BOOK INSIDE

35 (a)


Different types of placentation with example

5


BOOK BACK

Placentation
The mode of distribution of placenta inside the ovary


Marginal
It is with the placenta along the margin of a unilocular ovary.
Example: Fabaceae.




Axile
The placenta arises from the column in a compound ovary with septa.
Example: Hibiscus, tomato, lemon




Superficial
Ovules arise from the surface of the septa.
Example: Nymphaeaceae




Parietal
It is the placenta on the ovary walls or upon intruding partitions of a unilocular, compound ovary.
Example: Mustard, Argemone, cucumber.



Free-central
It is with the placenta along the column in a compound ovary without septa.
Example: Caryophyllaceae, Dianthus, Primrose



Basal
It is the placenta at the base of the ovary.
Example: Sunflower (asteraceae) Marigold



35 (b)

Difference Between Mitosis and Meiosis

Mitosis	Meiosis
One division	Two divisions
Number of chromosomes remains the same	Number of chromosomes is halved
Homologous chromosomes line up separately on the metaphase plate	Homologous chromosomes line up in pairs at the metaphase plate
Homologous chromosome do not pair up	Homologous chromosome pair up to form bivalent
Chiasmata do not form and crossing over never occurs	Chiasmata form and crossing over occurs
Daughter cells are genetically identical	Daughter cells are genetically different from the parent cells
Two daughter cells are formed	Four daughter cells are formed

5

BOOK BACK

36 (a)

Structure of DNA

Watson and Crick shared the Nobel Prize in 1962 for their discovery, along with Maurice Wilkins, who had produced the crystallographic data supporting the model. Rosalind Franklin (1920–1958) had earlier produced the first clear crystallographic evidence for a helical structure. James Watson and Francis Crick (Figure 8.40) of Cavendish laboratory in Cambridge built a scale

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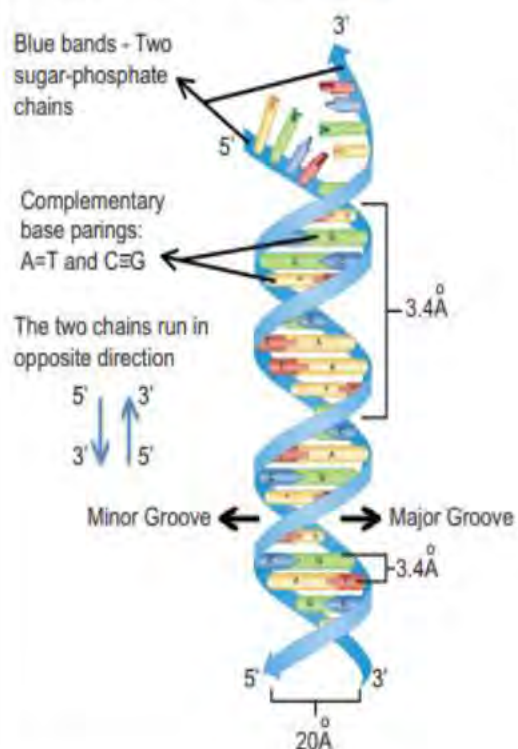
BOOK BACK

model of double helical structure of DNA which is the most prevalent form of DNA, the B-DNA. This is the secondary structure of DNA as proposed by James Watson and Francis Crick, DNA consists of right handed double helix with 2 helical polynucleotide chains that are coiled around a common axis to form right handed B form of DNA. The coils are held together by hydrogen bonds which occur between complementary pairs of nitrogenous bases. The sugar is called 2'-deoxyribose because there is no hydroxyl at position 2'. Adenine and thymine base pairs have two hydrogen bonds while guanine and cytosine base pairs have three hydrogen bonds.

Chargaff's Rule:

- $A = T$; $G = C$
- $A + G = T + C$
- $A : T = G : C = 1$

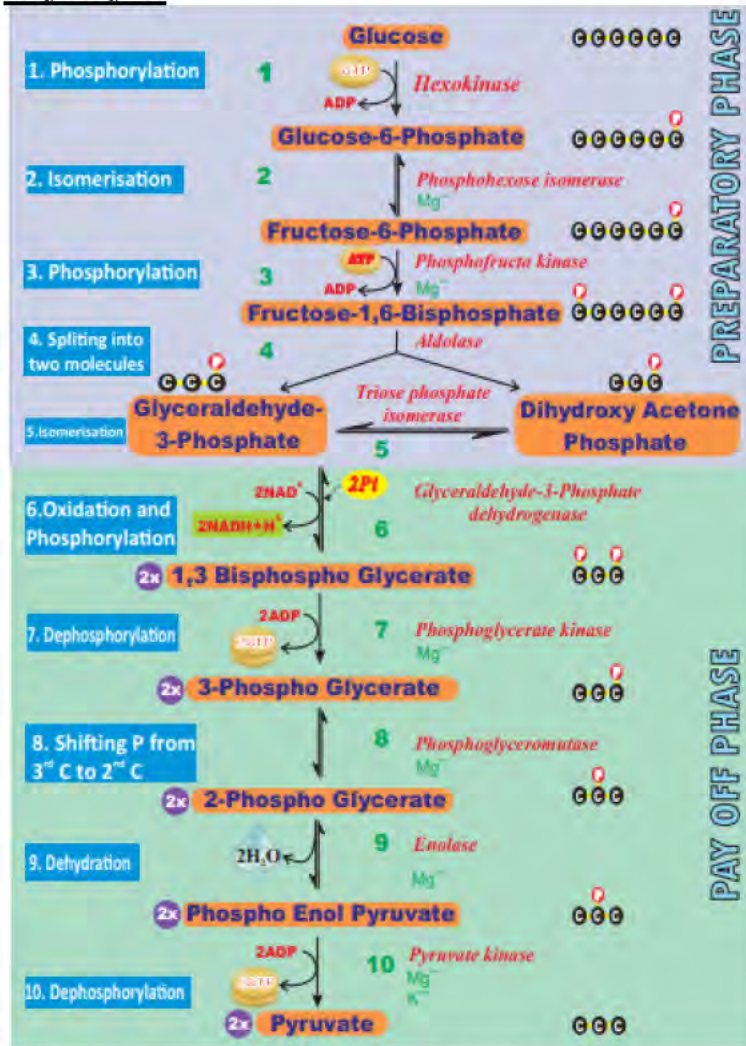
As published by Erwin Chargaff in 1949, a purine pairs with pyrimidine and vice versa. Adenine (A) always pairs with Thymine (T) by double bond and Guanine (G) always pairs with Cytosine (C) by triple bond.



36 (b) **Glycolysis**

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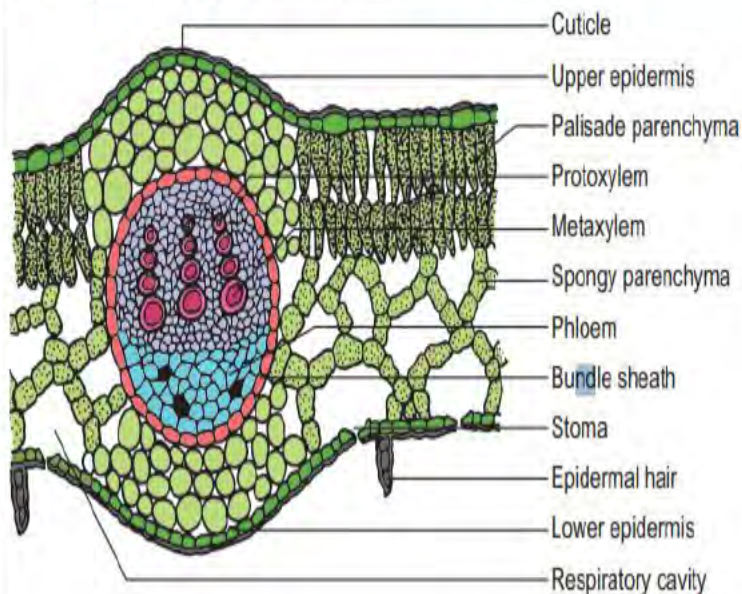
BOOK INSIDE



37 (a) T.S of Dicot leaf

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BOOK INSIDE



37 (b) **Difference between C₃ and C₄ plants**

(Any 5 points)

C ₃ Plants	C ₄ Plants
1. CO ₂ fixation takes place in mesophyll cells only	1. CO ₂ fixation takes place mesophyll and bundle sheath
2. CO ₂ acceptor is RUBP only	2. PEP in mesophyll and RUBP in bundle sheath cells
3. First product is 3C- PGA	3. First product is 4C- OAA
4. Kranz anatomy is not present	4. Kranz anatomy is present
5. Granum is present in mesophyll cells	5. Granum present in mesophyll cells and absent in bundle sheath
6. Normal Chloroplast	6. Dimorphic chloroplast
7. Optimum temperature 20° to 25°C	7. Optimum temperature 30° to 45°C
8. Fixation of CO ₂ at 50 ppm	8. Fixation of CO ₂ even less than 10 ppm
9. Less efficient due to higher photorespiration	9. More efficient due to less photorespiration
10. RUBP carboxylase enzyme used for fixation	10. PEP carboxylase and RUBP carboxylase used
11. 18 ATPs used to synthesize one glucose	11. Consumes 30 ATPs to produce one glucose.
12. Efficient at low CO ₂	12. Efficient at higher CO ₂
13. Example: Paddy, Wheat, Potato and so on	13. Example: Sugar cane, Maize, <i>Sorghum</i> , <i>Amaranthus</i> and so on

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BOOK INSIDE

38 (a) **Ricinus communis**

Habit: Tall perennial shrub

Root: Branched tap root system

Stem: Aerial, erect, cylindrical, branched and hollow solid at the base, glabrous,

Leaf: Simple, petiolate, hollow, exstipulate, alternate broad, palmately lobed, usually 7-9 lobes, serrate, palmately reticulate divergent venation.

Inflorescence: Terminal panicle.

Male Flower Bracteate, ebracteolate, pedicellate, male flowers

(open for one day) towards lower portion of the inflorescence, actinomorphic, incomplete.

Perianth: Tepals 5, apophyllous, uniseriate, green, valvate aestivation, odd tepal posterior in position.

Androecium: Stamens numerous (upto 1000) crowded and connate into about 8mm long cluster of stipitate phalanges, each stamen profusely branched, anthers globose basifixed.

Gynocium: usually absent rarely represented by pistillode. Female Flower Bracteate, ebracteolate, pedicellate,

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BOOK INSIDE

female flowers (open for fourteen days) found toward the apical portion of inflorescence, actinomorphic, incomplete and hypogynous.

Perianth: Tepals 3, apophyllous, green valvate.

Androecium: Absent but staminode is present.

Gynoecium: Tricarpellary, syncarpous, ovary superior distinctly trilobed, trilocular, covered with spiny outgrowth, single large ovule in each locule on axile placentation, style three with three bifid stigma.

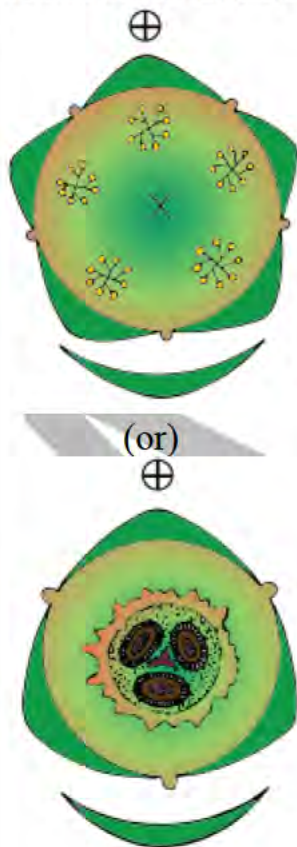
Fruit: A schizocarp with spiny outgrowth, splits into three one seeded cocci.

Seed: Endospermous, knob-like caruncle develops from the micropyle, that absorbs and temporarily retains water enabling germination.

Floral Formula:

Male flower: $Br., Ebrl., \oplus, \sigma, P_{(5)}, A_{\infty}, G_0$

Female flower: $Br., Ebrl., \oplus, \varnothing, P_{(3)}, A_0, \underline{G}_{(3)}$

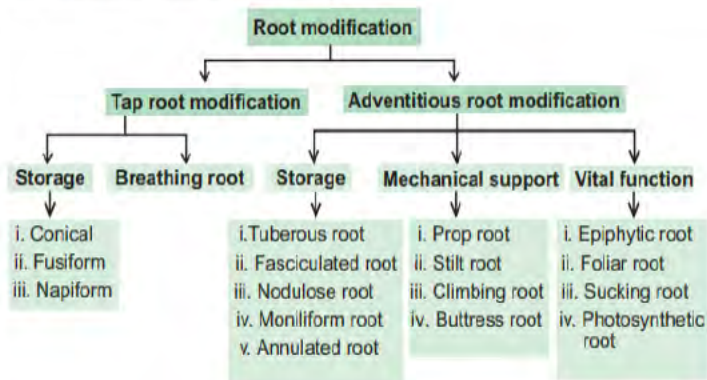


38 (b)

Tap root modification

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BOOK INSIDE



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- Daily classes by **Namakkal Well Experienced Staff**
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