



**ISLAMIAH MAT HR SEC SCHOOL,
KILAKARAI, RAMANATHAPURAM DT.**

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

Question type A

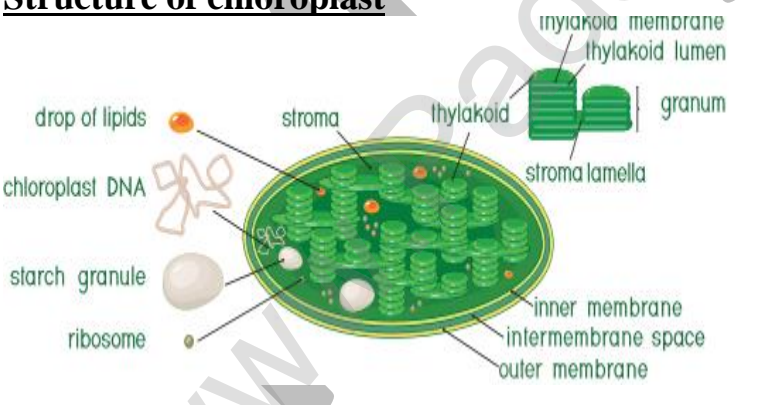
TENTATIVE ANSWER KEY

SUB: BOTANY

MARKS: 70

| Q.NO | CONTENT | MARKS | MODE OF QUESTION |
|------|----------------------------|------------|---|
| | PART -I | | |
| I. | CHOOSE THE CORRECT ANSWER | 15 X 1 =15 | BOOK BACK / BOOK INSIDE/ 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. | <p align="center">PART -III</p> <p align="center">ANSWER ANY SIX OF THE FOLLOWING QUESTION NUMBER 33 IS COMPULSORY</p> | 6 X 3 = 18 | BOOK BACK / BOOK INSIDE/ CREATIVE | | | | | | |
| 25 | <p>Importance of Studying Growth Rings</p> <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 | <p>Root climbers differ from Stem climber</p> <table border="1" data-bbox="252 837 1031 1144"> <thead> <tr> <th data-bbox="252 837 643 882"><u>root climbers</u></th> <th data-bbox="643 837 1031 882"><u>stem climber</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="252 882 643 1099">Plants climbing with the help of adventitious roots arising from nodes are called Root climbers.</td> <td data-bbox="643 882 1031 1099">Stem part of the plant coil round a support for climbing.</td> </tr> <tr> <td data-bbox="252 1099 643 1144">Eg. Piper nigrum</td> <td data-bbox="643 1099 1031 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 coil round a support for climbing. | Eg. Piper nigrum | Eg: Ipomoea. | 3 | BOOK BACK |
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| Eg. Piper nigrum | Eg: Ipomoea. | | | | | | | | |
| 27 | <p>Structure of chloroplast</p>  | 3 | BOOK INSIDE | | | | | | |
| 28 | <p>Starch sugar interconversion theory</p> <p>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.</p> | 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 diphtheriae</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 diphtheriae</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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| 10. | Syphilis | <i>Treponema pallidum</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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>(or)</p> $RQ = \frac{\text{Volume of CO}_2 \text{ liberated}}{\text{Volume of O}_2 \text{ consumed}}$ <p>(ii) When respiratory substrate is an organic acid the value of RQ will be more than unity.</p> <p>(or)</p> $RQ \text{ of malic acid} = \frac{4 \text{ molecules of CO}_2}{3 \text{ molecules of O}_2} = 1.33 \text{ (more than unity)}$ | 3 | BOOK INSIDE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 31 | <p>Wood</p> <p>Xylem derived from the Gk. Xylos – wood</p> <p>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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

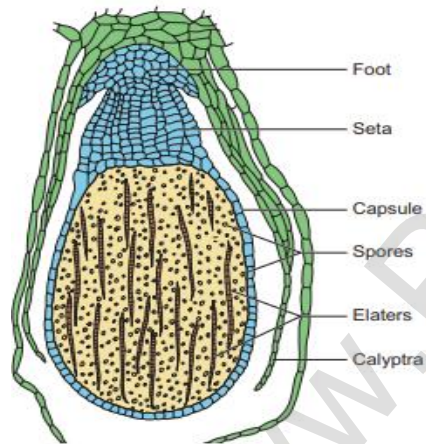
| | | | |
|----|---|---|-------------|
| 33 | <p><u>living Characters of Virus (Any 3 point)</u></p> <ul style="list-style-type: none"> • Presence of nucleic acid and protein. • Capable of mutation • Ability to multiply within living cells. • Able to infect and cause diseases in living beings. • Show irritability. • Host –specific | 3 | BOOK INSIDE |
|----|---|---|-------------|

| 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 | <p style="text-align: center;">BOOK BACK / BOOK INSIDE/ CREATIVE</p> |
| 34 (a) | <p><u>Physiological effect of Cytokinins (Any 5 points)</u></p> <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 <ul 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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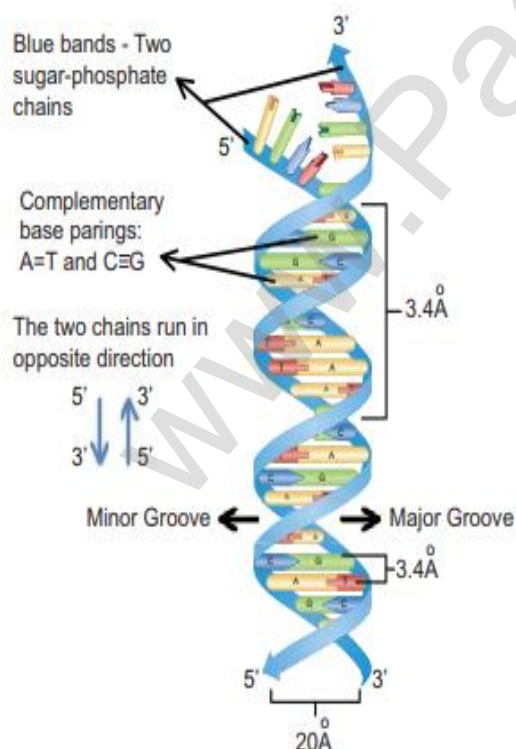
BOOK BACK

model of double helical structure of DNA which is the most prevalent form of DNA, the B-DNA. This is the secondary structure 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 structure 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.

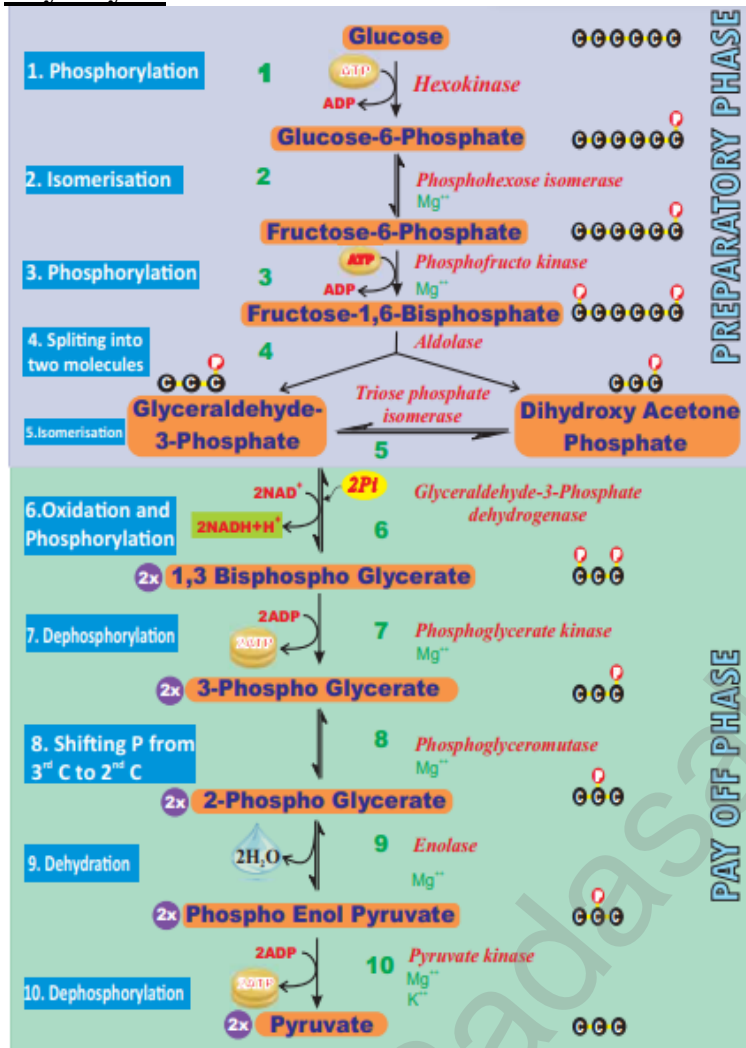


36 (b)

Glycolysis

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BOOK INSIDE

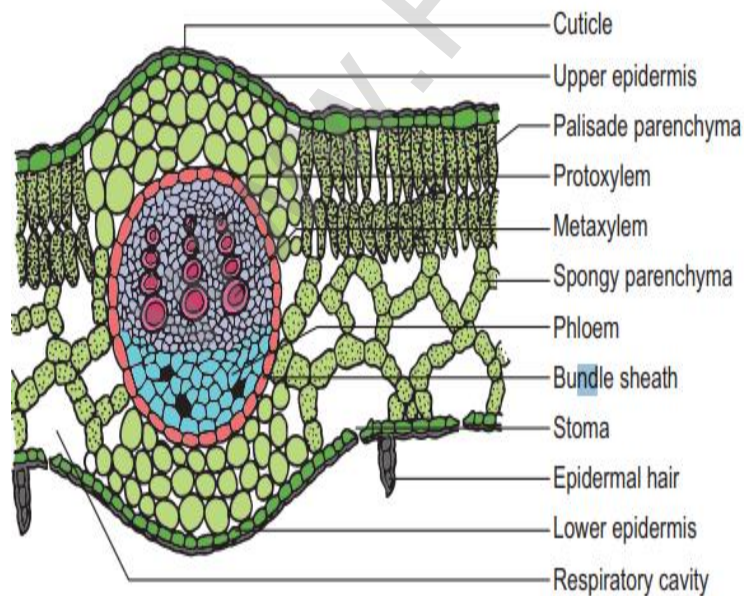


37 (a)

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, Sorghum, Amaranthus 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.

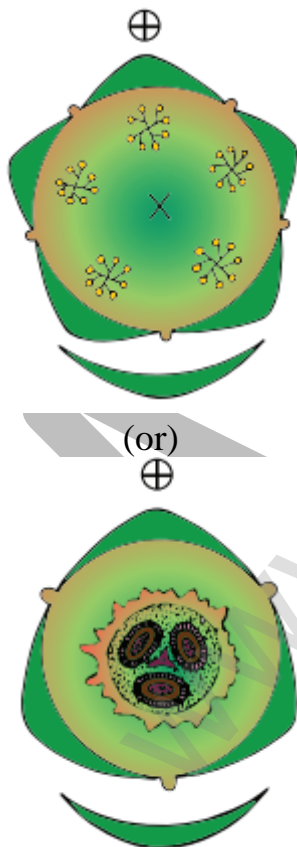
Fruit: A schizocarp with spiny outgrowth, splits into three one seeded cocci.

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

Floral Formula:

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

Female flower: $Br., Ebri., \oplus, \rho, P_{(3)}, A_0, G_{(3)}$

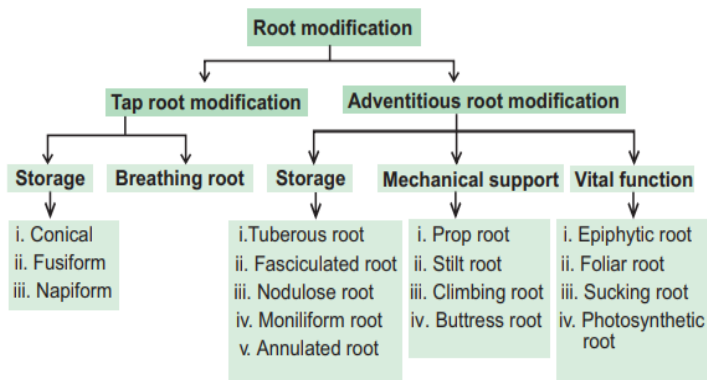


38 (b)

Tap root modification

5

BOOK INSIDE



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PGT IN BOTANY,
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- Daily classes by **Namakkal Well Experienced Staff**
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- We teach from basics make you achievers.
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- Daily practice test and monthly cumulative test for state board.
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kindly send me your key Answers to our email id - padasalai.net@gmail.com