

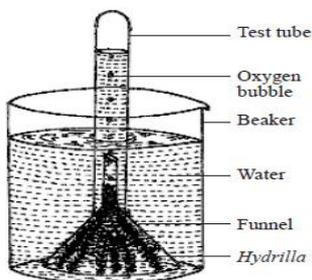
17. **Differences between Cyclic and Non cyclic photophosphorylation : (Any 3 points)**

S.No	Cyclic photophosphorylation	Non cyclic photophosphorylation
1	It is associated with PS I	It is associated with both PS I and PS II.
2	The electron expelled from chlorophyll molecule is cycled back	The electrons are not cycled back but compensated by the electrons from photolysis of water
3	Photolysis of water and evolution of oxygen do not take place	Photolysis of water and evolution of oxygen take place.
4	Photophosphorylation takes at two places.	Photophosphorylation takes place only at one place.
5	NADP is not reduced.	NADP ⁺ is reduced to NADPH ₂ .

1
1
1

18. **Experiment to demonstrate that oxygen is evolved during photosynthesis:**

The test tube funnel experiment demonstrates that oxygen is evolved during photosynthesis. A few branches of Hydrilla are kept in a beaker containing pond water in which a small amount of sodium bicarbonate is dissolved. The branches are covered with a glass funnel and a test tube full of water is kept inverted over the stem of the funnel as shown in the figure. Now the apparatus is kept in sunlight for 4 to 6 hours. The gas bubbles may be observed from the ends of hydrilla branches kept within the glass funnel. These gas bubbles are collected in the test tube by the downward displacement of water. The gas is tested for oxygen. When a burnt splinter is taken near the mouth of the tube, it glows brightly and proves that the gas is oxygen. The test tube and funnel experiment demonstrates that oxygen evolves during photosynthesis.



2
1

19. **1) Disease of the plant:** Tikka disease of groundnut
2) Causative pathogen : Disease incited by a fungus *Cercospora personata*
3) Control measures : The disease can be controlled by sanitation and crop rotation. The use of phosphatic and potassic manures reduce the disease. Sulphur dusting is quite effective. Resistant variety should be sown.

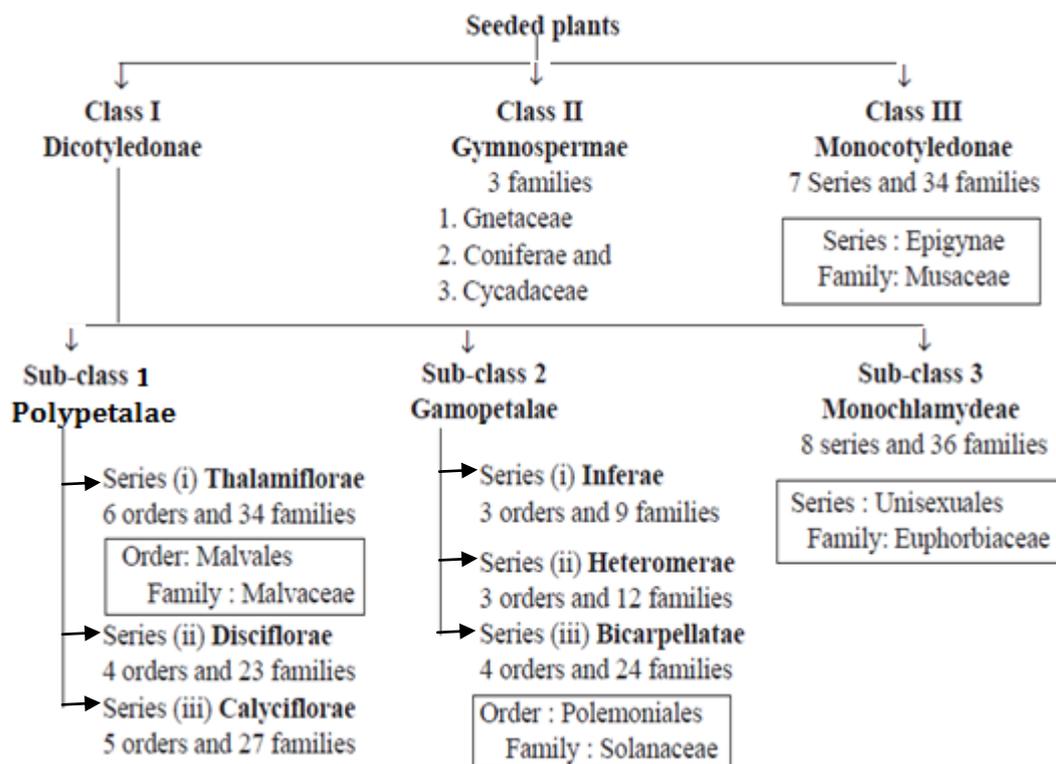
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SECTION -IV

Answer the following questions

2x5=10

20. **a) Classification of Bentham and Hooker:**



5

(OR)
b) Coupling aspect in Lathyrus odoratus :

	Blue flower long pollen	Red flower round pollen										
Parent	BBLL	bbll										
Gametes	BL	bl	×									
F ₁ generation	BbLl (Blue long)											
Dihybrid test cross	BbLl × bbll											
Gametes	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">BL</td> <td style="text-align: center;">Bl</td> <td style="text-align: center;">bL</td> <td style="text-align: center;">bl</td> </tr> <tr> <td style="text-align: center;">BbLl</td> <td style="text-align: center;">Bbll</td> <td style="text-align: center;">bbLl</td> <td style="text-align: center;">bbll</td> </tr> </table>	BL	Bl	bL	bl	BbLl	Bbll	bbLl	bbll	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">bl</td> </tr> </table>	bl	
BL	Bl	bL	bl									
BbLl	Bbll	bbLl	bbll									
bl												
Phenotype	Blue long	Blue round	Red long Red round									
Observed percentage frequency	44	6	6 44									
Observed ratio	7 : 1 : 1 : 7											
Expected ratio	1 : 1 : 1 : 1											

2

	<ul style="list-style-type: none"> ❖ In 1906, William Bateson and Reginald Punnett conducted experiments in sweet pea, <i>Lathyrus odoratus</i> to confirm Mendel's dihybrid testcross. They observed an exception to the independent assortment of two genes in this plant. ❖ Here, blue flower (B) is dominant over the red flower (b) and long pollen (L) dominant over round pollen (l). They crossed true breeding plants having blue flower with long pollen (BBLL) and red flower with round pollen (bbll). All the F₁ hybrids have blue flowers with long pollen (BbLl). ❖ A testcross between heterozygous blue long (BbLl) of F₁ hybrid and double recessive parental stock red round (bbll) did not result in ratio 1:1:1:1 but gave unexpected phenotype frequency as shown below. ❖ Here, blue long and red round are parental forms and show greater frequency 88 per cent. Blue round and red long are recombinant forms and show lesser frequency 12 per cent. ❖ The dihybrid test cross ratio obtained is 7:1:1:7 and not 1:1:1:1. This indicates that the genes do not independently assort. ❖ From the above test cross, it is clear that if dominant alleles or recessive alleles are present in the same plant, they tend to remain together resulting in increased parental forms. Thus, the two genes which inherit together are called linked genes. This aspect is called coupling. 	<p>2</p> <p>1</p>
<p>21.</p>	<p>a) (i) Respiratory quotient :</p> <p>Respiratory quotient may be defined as “the ratio between the volume of carbon dioxide given out and oxygen consumed during respiration”. This value depends upon the nature of the respiratory substrate and its rate of oxidation.</p> $\text{Respiratory quotient} = \frac{\text{Volume of CO}_2 \text{ evolved}}{\text{Volume of O}_2 \text{ consumed}}$ <p>(ii) Respiratory quotient of a carbohydrate and that of anaerobic respiration:</p> <p>In anaerobic respiration, carbon dioxide is evolved but oxygen is not consumed. Therefore, the respiratory quotient in such case is infinity.</p> <p>For example,</p> $\text{C}_6\text{H}_{12}\text{O}_6 \xrightarrow{\text{zymase}} 2\text{C}_2\text{H}_5\text{OH} + 2\text{CO}_2 + \text{Energy}$ <p>Respiratory quotient of glucose in anaerobic respiration $\left. \vphantom{\text{Respiratory quotient of glucose in anaerobic respiration}} \right\} = \frac{2 \text{ moles of CO}_2}{\text{zero moles of O}_2} = \infty$ (infinity)</p>	<p>2</p> <p>3</p>

(OR)

b) Economic importance of the plant which is the chief source of carbohydrates: (Any 5 points)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| ❖ Parched rice (pori) is crisp to eat. It is sold either salted or unsalted. | 1 |
| ❖ The flattened parboiled rice is known as flaked rice. Like corn flakes, it is a very good break-fast food. Flaked rice is also used for preparing different kinds of food items. | 1 |
| ❖ Sake is an important alcoholic beverage in Japan. Sake is prepared by the fermentation of rice. | 1 |
| ❖ Bran is an important by-product of rice milling industry. It is used as a cattle feed. | |
| ❖ Bran oil is extracted either by expression in a hydraulic press or extra-ction with solvents. Bran oil is used as edible oil and for preparation of vanaspathi, making soaps. It is also used in the textile industry, leather industry. | 1 |
| ❖ Bran wax is a by-product in bran-oil extraction. It is used in chocolate industry and in the manufacture of lip-sticks. | 1 |
| ❖ Paddy husk is used as fuel, in brick kilns. It is also used in brick making. | |
| ❖ Straw is used as cattle feed, in the manufacture of straw-boards and for making hats, ropes, mats, etc. | |

Mrs. P.GEETHA M.SC.,B.Ed.,

DEPARTMENT OF BOTANY

SHRI VIDHYABHARATHI MATRIC HR.SEC.SCHOOL,

SAKKARAMPALAYAM, AGARAM (PO) ELACHIPALAYAM,

TIRUCHENGODE(TK), NAMAKKAL (DT). PIN-637202

Cell.No: 8428971051, 9786237982.

www.nammakalvi.org