



## BIOLOGY

# NCERT - FULL MARKS BIOLOGY(TAMIL)

## PHOTOSYNTHESIS

### Questions

1. By looking at a plant externally can you tell whether a plant is  $C_3$  or  $C_4$  ? Why and how?



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2. By looking at which internal structure of a plant can you tell whether a plant is  $C_3$  or  $C_4$ ? Explain.



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3. Even though a very few cells in a  $C_4$  plant carry out the biosynthetic – Calvin pathway, yet they are highly productive. Can you discuss why?



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4. RuBisCo is an enzyme that acts both as a carboxylase and oxygenase. Why do you think RuBisCo carries out more carboxylation in  $C_4$  plants?



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5. Suppose there were plants that had a high concentration of Chlorophyll-b, but lacked chlorophyll-a, would it carry out

photosynthesis? Then why do plants have chlorophyll-b and other accessory pigments?



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6. Why is the colour of a leaf kept in the dark frequently yellow, or pale green? Which pigment do you think is more stable?



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7. Look at leaves of the same plant on the shady side and compare it with the leaves on the sunny side. Or, compare the potted plants kept in the sunlight with those in the shade. Which of them has leaves that are darker green? Why? Answer



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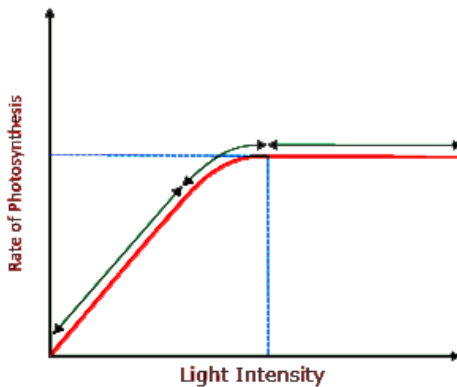
8. Figure 13.10 shows the effect of light on the rate of photosynthesis. Based on the graph,

answer the following questions:

(a) At which point/s (A, B or C) in the curve is light a limiting factor?

(b) What could be the limiting factor/s in region A?

(c) What do C and D represent on the curve?



or 8:



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9. Give comparison between the following:

(a)  $C_3$  and  $C_4$  pathways

(b) Cyclic and non-cyclic photophosphorylation

(c) Anatomy of leaf in  $C_3$  and  $C_4$  plants



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## Check Your Grasp

1. Name the products produced from Non-Cyclic photophosphorylation?



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2. Why does PS II require electrons from water?



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3. Can you find the difference in the Pathway of electrons during PS I and PS II?



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4. What will be the quanta requirement for complete light reaction which releases 6 oxygen molecules?



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5. In Botany class, teacher explains, Synthesis of one glucose requires 30 ATPs in  $C_4$  plants and only 18ATPs in  $C_3$  plants. The same teacher explains  $C_4$  plants are more

advantageous than  $C_3$  plants. Can you identify the reason for this cont



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## Evaluation

1. Assertion (A): Increase in Proton gradient inside lumen responsible for ATP synthesis  
Reason (R ): Oxygen evolving complex of PS I located on thylakoid membrane facing Stroma, releases  $H^+$  ions

- A. Both Assertion and Reason are True.
- B. Assertion is True and Reason is False.
- C. Reason is True and Assertion is False.
- D. Both Assertion and Reason are False.

**Answer:**



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2. Which chlorophyll molecule does not have a phytol tail?

A. Chl -a

B. Chl - b

C. Chl - c

D. Chl -d

**Answer:**



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**3.** Identify the correct sequence of flow of electrons in the light reaction is

A. PS II, Plastoquinone, cytochrome, PS I,  
ferredoxin.

B. PS I, Plastoquinone, cytochrome, PS II  
ferredoxin.

C. PS II, ferredoxin, plastoquinone,  
cytochrome, PS I.

D. PS I, plastoquinone, cytochrome, PS II,  
ferredoxin.

**Answer:**



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4. For every  $CO_2$  molecule entering the  $C_3$  cycle, the number of ATP and NADPH required is

A.  $2ATP + 2NADPH$

B.  $2ATP + 3NADPH$

C.  $3ATP + 2NADPH$

D.  $3ATP + 3NADPH$

**Answer:**



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5. Identify true statement regarding light reaction of photosynthesis

A. Splitting of water molecule is associate with PS I.

B. PS I and PS II involved in the formation of  $NADPH + H^+$ .

C. The reaction centre of PS I is chlorophyll a with absorption peak at 680 nm.

D. The reaction center of PS II is Chlorophyll  
a with absorption peak at 700 nm.

**Answer:**



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6. Two groups (A & B) of bean plants 450nm & Group B to light of wave of similar size and same leaf area were length of 500-550nm. Compare the placed in identical conditions. Group A photosynthetic rate of the2 groups



givwas exposed to light of wavelength 400 reasons.



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7. A tree is believed to be releasing oxygen during night time. Do you believe the truthfulness of this statement?



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8. Grasses have an adaptive mechanism to compensate photorespiratory losses and describe the mechanism.



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**10.** When there is plenty of light and higher concentration of  $O_2$ , what kind of pathway does the plant undergo? Analyse the reasons.



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