

SAINIK SCHOOL GOPALGANJ
ASSIGNMENTS
BIOLOGY (44)

Chapter 13: Photosynthesis in higher plants
General Instructions

Class: XI

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1. All questions are compulsory.
 2. Question 1 to 10 is multiple choice questions.
 3. Question 11 to 15 is short answer questions.
 4. Question 16 to 20 is long answer questions
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Q1. With reference to factors affecting the rate of photosynthesis, which of the following statements is incorrect?

- a) light saturation for CO₂ fixation occurs at 10% of full sunlight
- b) tomato is a greenhouse crop which can be grown in CO₂ – enriched atmosphere for higher yield
- c) C₃ plants respond to higher temperature with enhanced photosynthesis while C₄ plants have much lower temperature optimum
- d) Increasing atmospheric CO₂ concentration up to 0.05% can enhance CO₂ fixation rate

Q2. Water vapor comes out from plant leaf through the stomatal opening. Through the same stomatal opening, carbon dioxide diffuses into the plant during photosynthesis.

Reason out the above statements using one of the following options.

- a) Both processes can happen together because the diffusion coefficient of water and CO₂ is different
- b) Both processes cannot happen simultaneously
- c) One process occurs during day time and the other at night
- d) The above processes happen only during night time

Q3. The process making major difference between C₃ and C₄ plants is

- a) respiration
- b) Calvin cycle
- c) photorespiration
- d) glycolysis

Q4. Emerson's enhancement effect and Red drop have been instrumental in the discovery of

- a) two photosystems operating simultaneously
- b) oxidative phosphorylation
- c) photophosphorylation and cyclic electron transport
- d) photophosphorylation and non-cyclic electron transport

Q5. Light-independent reactions in photosynthesis takes place at

- a) thylakoid lumen
- b) photosystem II
- c) photosystem I
- d) stromal matrix

Q6. Read the following statements:

I. Symbiotic nitrogen fixers occur in free-living state also in soil

II. Stamens in flowers of Gloriosa and Petunia are polyandrous

III. In dicot stems, a new cambium originates from cells of pericycle at the time of secondary growth

IV. Both photophosphorylation and oxidative phosphorylation involve uphill transport of protons across the membrane

How many of the above statements are true?

- a) One
- b) Two
- c) Three
- d) Four

Q7. In Kranz anatomy, the bundle sheath cells have

- a) thick walls, many intercellular spaces and few chloroplasts
- b) thin walls, no intercellular spaces, and several chloroplasts
- c) thin walls, many intercellular spaces, and no chloroplasts
- d) thick walls, no intercellular spaces and large number of chloroplasts

Q8. PGA as the first CO₂ fixation product was discovered in the photosynthesis of

- a) alga
- b) angiosperm

- c) gymnosperm
- d) bryophyte

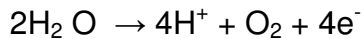
Q9. Kranz anatomy is one of the characteristics of the leaves of

- a) potato
- b) sugarcane
- c) wheat
- d) mustard

Q10. Electrons from excited chlorophyll molecule of photosystem II are accepted first by

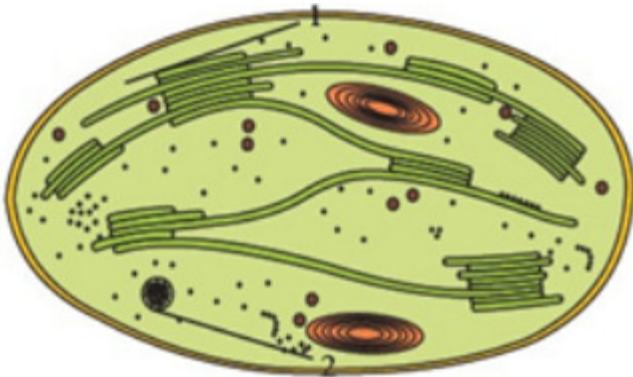
- a) cytochrome-*f*
- b) quinone
- c) cytochrome-*b*
- d) ferredoxin

Q11. Answer the following questions based on the equation given below:



- a) Where in plants does this reaction occur?
- b) What is the importance of this reaction?

Q.12. Observe the given figure:



- a) Is this composition present in a plant cell or animal cell?
- b) Can it be inherited by the offspring? How?
- c) Write the metabolic processes that are occurring at the places marked as (1) and (2) in the figure

Q13. Define accessory pigments. State their significance in photosynthesis.

In a C₃ plant, a light dependent cyclic process is occurring that requires oxygen. Instead of producing, it consumes energy.

- a) Name the process
- b) Is it necessary for survival?
- c) Write the end products of this process.
- d) Where does it take place?

Q14. In a certain 'X' organism, a process is occurring throughout the day in which cells are participating. Water, ATP and carbon dioxide are evolved during the process and is not a light-dependent process.

- a) Which process is discussed above?
- b) Is the process a catabolic or anabolic process?
- c) Write the material of this process.

Q15. Explain why is the colour of a leaf in the dark changes? Which pigment do you think is more stable?

Q16. List out the differences in anatomy of leaf in C3 and C4 plants?

Q17. List the location in the cell where the following reactions take place during the process of photosynthesis.

Q18. What are the important events and end products of light reaction?

Q19. Why photorespiration does not take place in C4 plants?

Q20. Describe Hatch and Slack Pathway in plants.