Chapter- 13

PHOTOSYNTHESIS IN HIGHER PLANTS

VERY SHORT ANSWER QUESTIONS (1 mark)

01. Name the raw materials required for photosynthesis.
02. What do you mean by the light reaction? Name the end products of this reaction.
03. Define photosynthesis.
04. Expand RuBisCo and PEPcase. What do you mean by LHC?
05. What is the role of antennae pigments?
06. Name the technique used for the separation of leaf pigments.
07. How is the excited PS - II brought back to the ground state?
08. How many molecules of ATP and NADPH required to synthesis one molecule of glucose?
09. Name two crops produced in greenhouses with increased carbon dioxide concentration.
10. Name the scientist who showed (a) Only green plant parts could release oxygen
(b) Oxygen liberated in photosynthesis comes from water and not carbon dioxide.

SHORT ANSWER TYPE QUESTIONS (2 marks)

11. Expand - (i) OAA (ii) PGA (iii) NADP (iv) ADP
12. State Blackman's law of limiting factor.
13. Diagrammatically represent chloroplast.
14. Write any four differences between cyclic and non-cyclic photophosphorylation.
15. (a) Name the two plants showing Kranz anatomy. (b) Mention the importance of Kranz anatomy in the C4 plant.
16. What do you mean by the photolysis of water? Give the reaction.
17. What do you mean by the biosynthetic phase? Name the end product.

SHORT ANSWER TYPE QUESTIONS (3 marks)

18. How the photochemical phase is different from the biosynthetic phase.
19. Describe the light-harvesting complexes of photosynthesis
20. Name the accessory pigments of photosynthesis. Mention their role.

21. Give any six-point difference between C_3 and C_4 plants.

22. What do you mean by photorespiration? Why photorespiration is a wasteful process?

23. Describe cyclic phosphorylation with a diagram.

24. Graphically represent pigments showing the absorption spectrum.

LONG ANSWER TYPE QUESTIONS (5 marks)

25. Diagrammatically represent the Hatch and Slack pathway. Expand PEP. What is its role in the biosynthesis process?

26. Describe and draw Z-scheme.

27. Schematically represent the process of ATP synthesis through chemosmosis in the chloroplast. Explain how ATP synthase is activated.

HOTS/ MODEL QUESTIONS:

01. Name the reaction centre of PS - I and PS - II

02. Give the name of CO_2 concentration at which saturation of photosynthesis occurs in C_3 and C_4 plants. Explain how light affects photosynthesis.

03. Why is the C_3 pathway of photosynthesis also known as the Calvin cycle?

04. Name all the electron carries involved in non-cyclic photophosphorylation.

05. Write the simple equation of photosynthesis as given by Van Niel.

06. Why is the lumen of thylakoid acidic while stroma is alkaline?

07. Explain “There is no oxygen evolution in bacterial photosynthesis”.

08. Why did Melvin Calvin use Chlorella for his experiment?

09. Mention the steps common to C_3 and C_4 photosynthesis.

10. Why is it an advantage that bundle sheath chloroplast lack grana?

11. Suggest some habitats in which light intensity, CO_2 concentration, and temperature might be a limiting factor in photosynthesis.

12. In C_4 plants which type of chloroplast is specialized for light reaction and which for dark reaction.

13. Dark reactions are temperature controlled. Why?

14. Explain Blackmann's Law of limuting factors.

15. Name the hormones which increase and decrease the rate of photosynthesis.

16. Why is photorespiration also called the C_2 cycle?

17. How many ATP molecules are required for the synthesis of one molecule of Glucose in the C_4 plant?