CBSE TEST PAPER-01

CLASS - XI BIOLOGY

(Photosynthesis in higher plants)

General Instruction:

- All questions are compulsory.
- Question No. 1 to 3 carry one marks each. Question No. 4 to 6 carry two marks each. Question No. 7 and 8 carry three marks each. Question No. 9 carry five marks.

1. Expand NADP.

2. Name one plant that carries out photosynthesis at night?

3. Name the cell – organelles involved in photorespiration.

4. What is red Drop?

5. What are the enzymes that catalyze the dark reaction of carbon fixation located?

6. What are the two main functions of pigments other than chlorophyll in green leaves?

7. Explain -There is no oxygen evolution in bacterial photosynthesis.

8. What is the advantage of using chlorella rather than a higher plant?

9. (a) suggest some habitats or natural circumstances in which

(i) Light intensity

(ii) CO_2 concentration

(iii) temperature might be limiting factors in photosynthesis.

(b) In C_4 plants which type of chloroplast is specialized for light reactions and which for dark reactions?

(c) Why is it an advantage that bundle sheath chloroplast lack grana?

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[ANSWERS]

Ans 01. Nicotinamide adenine dinucleotide phosphate.

Ans 02. Opuntia, chenopodium.

Ans 03. Mitcohondria, chloroplast and peroxisomes.

Ans 04. It is the occasional fall in photosynthetic yield beyond red region of spectrum. This is also called Emerson effect.

Ans 05. The stroma contains enzymes which are capable of utilizing ATP and $NADPH_2$ to produce carbohydrate during dark reaction. The carbon fixation occurs in the stroma by a series of enzymes catalysed steps which are located outside the thylakoids.

Ans 06. (i) To absorb light energy and transfer it to chlorophyll for photosynthesis.

(ii) To protect the chlorophyll molecule from photo oxidation.

Ans 07. In bacterial photosynthesis, the raw material for the supply of proton is H_2S than H_2O Thus, these is production of S than O_2 during splitting in light reaction.

$2H_2S \rightarrow 2HS^+ + 2H^+$

$HS + HS \rightarrow H_2S + S$

Ans 08. Photosynthesis in chlorella and higher plants is biochemically similar but chlorella was used by Melvin Calvin (1954) due to following reasons –

(i) Chlorella culture is a chloroplast culture as a large volume of every cell is occupied by a single chloroplast.

(ii) A synchroneous culture may easily be obtained in a short span of time.

(iii) Cells are very quickly exposed to radioactive carbondioxcide and are quickly killed; thus handling chlorella for experiments is easier.

Ans 09. (a) Some situations are –

(i) In a shaded community; dawn and twilight in a warm climate.

(ii) Carbon dioxide is normally limiting, but it may be more so in a crowded stand of plants under sunny, warm conditions.

(iii) On a bright day winter.

(b) Mesophyll chloroplast for light reaction.

Bundle sheath chloroplast for dark reaction.

(c) Oxygen production is related to grana and oxygen would compete with CO_2 for RuBP carboxylase and stimulate photorespiration. Grana occupy a large area of the chloroplast. In their absence in the bundle sheath there is more stroma, and so more RuBP carboxylase and more storage space for starch.