

# Photosynthesis in Higher Plants

NEET previous year questions · Biology

10 questions from the official papers: NEET 2026 (3), Re-NEET 2026 (5), NEET 2020 (2). Each is followed by its answer and a worked solution written by BrainIt. Generated on 23 October 2026.



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## 1. NEET 2026 · Q111

Find the incorrect statement(s) about photosynthesis from the following and choose the answer from the options given below:

Statement I: The water splitting complex is associated with PS I.

Statement II:  $C_4$  plants use the  $C_3$  pathway of  $CO_2$  fixation as the main biosynthetic pathway.

Statement III: In  $C_4$  plants, photorespiration does not occur.

Statement IV:  $C_3$  plants exhibit 'Kranz' anatomy.

Statement V: ATP synthesis in chloroplast occurs through chemiosmosis.

- (1) II and III only                      (2) II only  
(3) II and V only                      (4) I and IV only

### Answer (4)

**Sol.** The water-splitting (oxygen-evolving) complex lies on the inner side of the membrane and is associated with Photosystem II, not PS I, so statement I is incorrect. Kranz anatomy is a feature of  $C_4$  plants, not  $C_3$  plants, so statement IV is incorrect. Statements II, III and V are correct. Hence the incorrect statements are I and IV only.

## 2. NEET 2026 · Q116

The enzyme required for carboxylation in the Calvin cycle is

- (1) Hexokinase  
(2) PEP carboxylase  
(3) RuBP carboxylase - oxygenase  
(4) Carboxypeptidase

### Answer (3)

**Sol.** In the Calvin cycle,  $CO_2$  is fixed onto ribulose biphosphate (RuBP) by RuBP carboxylase-oxygenase (RuBisCO), the most abundant enzyme in

the biosphere. PEP carboxylase catalyses the primary  $CO_2$  fixation in mesophyll cells of  $C_4$ /CAM plants but not the Calvin-cycle carboxylation, while hexokinase and carboxypeptidase have unrelated functions.

## 3. NEET 2026 · Q117

How many ATP and NADPH molecules are required to make one molecule of glucose through the Calvin pathway?

- (1) 18 ATP and 12 NADPH                      (2) 12 ATP and 18 NADPH  
(3) 24 ATP and 18 NADPH                      (4) 6 ATP and 12 NADPH

### Answer (1)

**Sol.** Fixing one  $CO_2$  in the Calvin cycle consumes 3 adenosine triphosphate (ATP) and 2 reduced nicotinamide adenine dinucleotide phosphate (NADPH). Synthesising one glucose requires the fixation of 6  $CO_2$  (six turns of the cycle), so the total need is  $6 \times 3 = 18$  ATP and  $6 \times 2 = 12$  NADPH.

## 4. Re-NEET 2026 · Q100

Photorespiration reaction catalyzed by RuBisCo is shown below:  $RuBP + O_2 \rightarrow 3\text{-Phosphoglycerate} + X$ . Identify "X" from the given options:

- (1) Phosphoenolpyruvate                      (2) 2-Phosphoglycolate  
(3) Oxaloacetate                      (4) Malate

### Answer (2)

**Sol.** Ribulose biphosphate carboxylase-oxygenase (RuBisCO) has affinity for both  $CO_2$  and  $O_2$  at the same active site. When oxygen wins, the five-carbon ribulose biphosphate (RuBP) is split into one molecule of the three-carbon 3-phosphoglycerate and one molecule of the two-carbon 2-phosphoglycolate - note the carbon bookkeeping,  $5 = 3 + 2$ . This wasteful route consumes adenosine triphosphate (ATP) without

fixing carbon or producing sugar. NCERT Class 11, Photosynthesis in Higher Plants.

5. Re-NEET 2026 · Q102

Which pigment has absorption peak at 700 nm in the photosynthetic reaction centre PS I (P700)?

- (1) Chlorophyll b                      (2) Chlorophyll a  
(3) Xanthophylls                      (4) Carotenoids

**Answer (2)**

**Sol.** Only chlorophyll a occupies the reaction centre of a photosystem, and it is named for its absorption peak: P700 in photosystem I and P680 in photosystem II. All other pigments - chlorophyll b, xanthophylls and carotenoids - are ACCESSORY pigments in the light-harvesting complex that capture photons and funnel the energy to chlorophyll a. NCERT Class 11, Photosynthesis in Higher Plants.

6. Re-NEET 2026 · Q114

Select the correct sequence of experiments that led to a gradual understanding of photosynthesis in green plants.

- (1) Absorption spectra of chlorophyll a and b → production of glucose → release of oxygen → role of air  
(2) Role of air → release of oxygen → production of glucose → absorption spectra of chlorophyll a and b  
(3) Release of oxygen → production of glucose → absorption spectra of chlorophyll a and b → role of air  
(4) Production of glucose → role of air → release of oxygen → absorption spectra of chlorophyll a and b

**Answer (2)**

**Sol.** The discoveries came in order of increasing refinement. Priestley first showed that plants restore something to 'injured' air. Ingenhousz then established that it is sunlight and the green parts that release oxygen. Sachs later demonstrated that glucose is produced and stored as starch in chloroplasts. Finally Engelmann worked out the action spectrum and the absorption properties of the chlorophylls. NCERT Class 11, Photosynthesis in Higher Plants (early experiments).

7. Re-NEET 2026 · Q116

How many turns of Calvin cycle are required for the formation of three molecules of glucose?

- (1) 6                      (2) 3                      (3) 1                      (4) 18

**Answer (4)**

**Sol.** Each turn of the Calvin cycle fixes ONE molecule of CO<sub>2</sub>, so building the six-carbon skeleton of one

glucose needs six turns. Three glucose molecules therefore need  $3 \times 6 = 18$  turns. The common trap is to forget that the cycle handles one carbon at a time, not one sugar. NCERT Class 11, Photosynthesis in Higher Plants.

8. Re-NEET 2026 · Q122

Which of the following statements regarding photorespiration are correct?

Statement I: Do not occur in C<sub>3</sub> plants

Statement II: CO<sub>2</sub> is consumed and O<sub>2</sub> is generated

Statement III: Phosphoglycolate is formed

Statement IV: No synthesis of ATP and NADPH

Choose the correct answer from the options given below:

- (1) (I) and (IV) only                      (2) (III) and (IV) only  
(3) (II) and (IV) only                      (4) (I) and (II) only

**Answer (2)**

**Sol.** Statement III is correct: the oxygenase activity of ribulose biphosphate carboxylase-oxygenase (RuBisCO) splits ribulose biphosphate (RuBP) into 3-phosphoglycerate and 2-phosphoglycolate. Statement IV is also correct: photorespiration is purely wasteful, producing no sugar, no adenosine triphosphate (ATP) and no reduced nicotinamide adenine dinucleotide phosphate (NADPH) while consuming energy. Statement I is false because photorespiration is characteristic OF C<sub>3</sub> plants - it is C<sub>4</sub> plants that avoid it. Statement II reverses the gas exchange: photorespiration consumes O<sub>2</sub> and releases CO<sub>2</sub>. NCERT Class 11, Photosynthesis in Higher Plants.

9. NEET 2020 · Q41

The oxygenation activity of RuBisCo enzyme in photorespiration leads to the formation of

- (1) 1 molecule of 3-C compound  
(2) 1 molecule of 6-C compound  
(3) 1 molecule of 4-C compound and 1 molecule of 2-C compound  
(4) 2 molecules of 3-C compound

**Answer (1)**

**Sol.** During photorespiration, the oxygenation activity of RuBisCo leads to the formation of one molecule of 3-phosphoglycerate (3-C) and one molecule of phosphoglycolate (2-C). Chapter: Photosynthesis in Higher Plants.

**10. NEET 2020 · Q45**

In light reaction, plastoquinone facilitates the transfer of electrons from

- (1) Cytb<sub>6</sub>f complex to PS-I
- (2) PS-I to NADP<sup>+</sup>
- (3) PS-I to ATP synthase
- (4) PS-II to Cytb<sub>6</sub>f complex

**Answer (4)**

**Sol.** Plastoquinone facilitates the transfer of electrons from PS-II to the cytochrome *b<sub>6</sub>f* complex during the light reactions of photosynthesis. Chapter: Photosynthesis in Higher Plants.

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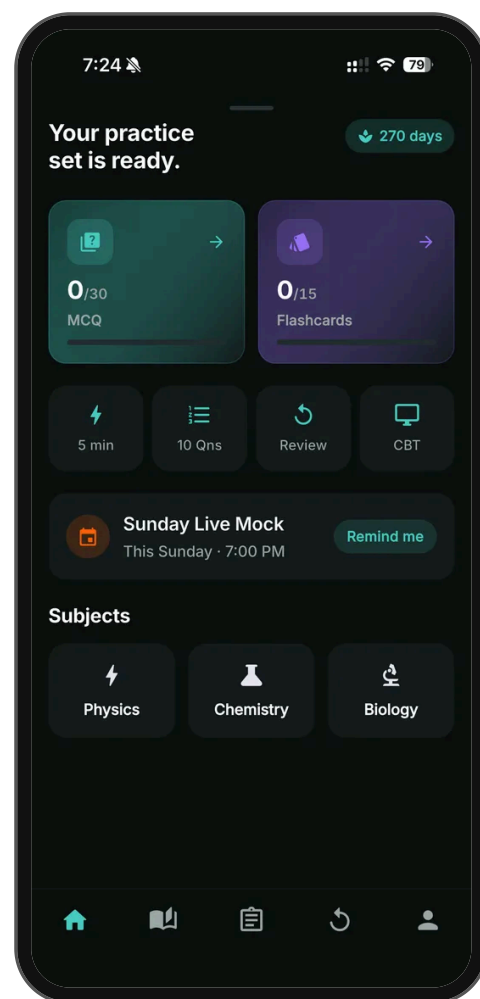
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