

# 8.3 Photosynthesis

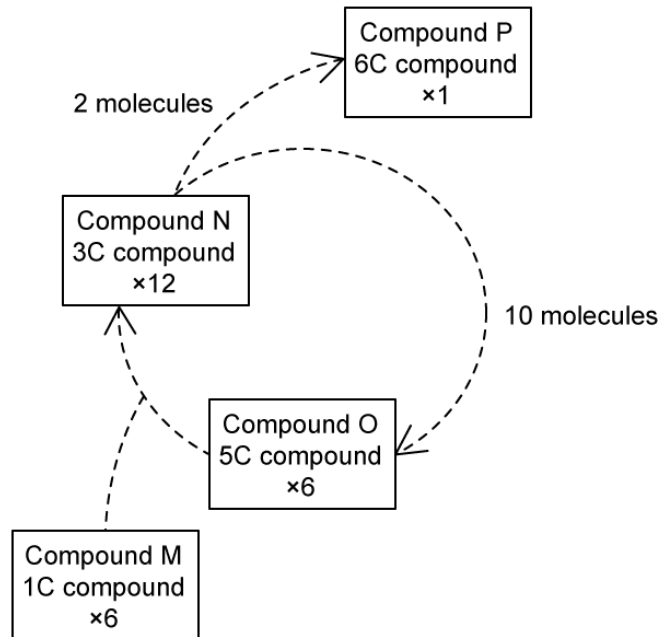
## Question Paper

Course	DP IB Biology
Section	8. Metabolism, Cell Respiration & Photosynthesis (HL Only)
Topic	8.3 Photosynthesis
Difficulty	Hard

**Time allowed:** 10  
**Score:** /5  
**Percentage:** /100

### Question 1

The diagram below shows the Calvin cycle of the light-independent reactions.



Which of the following correctly identifies compound **M** to **P**?

	<b>M</b>	<b>N</b>	<b>O</b>	<b>P</b>
<b>A.</b>	carbon dioxide	ribulose biphosphate	glycerate 3-phosphate	glucose
<b>B.</b>	carbon dioxide	glycerate 3-phosphate	ribulose biphosphate	glucose
<b>C.</b>	Rubisco	glycerate 3-phosphate	ribulose biphosphate	triose phosphate
<b>D.</b>	carbon dioxide	triose phosphate	glycerate 3-phosphate	ribulose biphosphate

[1 mark]

## Question 2

The following steps describe non-cyclic photophosphorylation involving the electron transport chain.

- I. Electrons from the photolysis of water replace lost electrons from photosystem II
- II. Light passes to primary pigments in photosystem I and II
- III. Electrons are passed from photosystem II to photosystem I via electron transport chain
- IV. Energy is released to synthesise ATP
- V. Electrons are excited to a higher energy level

Which of the following represents the correct sequence of the steps?

- A. II. → V. → IV. → III. → I.
- B. V. → IV. → III. → II. → I.
- C. II. → V. → III. → IV. → I.
- D. V. → III. → IV. → II. → I.

[1 mark]

## Question 3

The following molecules are all involved with the process of photosynthesis.

- I. Glucose
- II. ATP
- III. Water
- IV. Reduced NADP
- V. Carbon dioxide

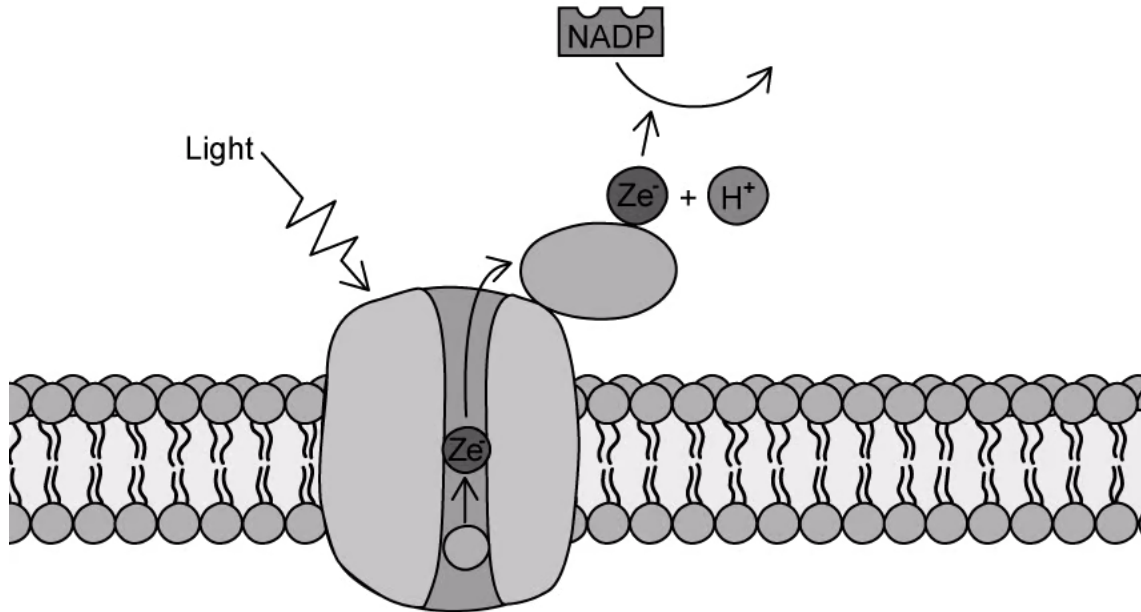
Which of these molecules are involved with both the light dependent **and** light independent reactions?

- A. I. and III.
- B. II. and IV.
- C. I., II. and IV.
- D. II., IV. and V.

[1 mark]

### Question 4

Which of the following provides the best explanation of the process illustrated in the diagram?



- A. Photosystem I and ferredoxin is involved with the reduction of NADP so that the hydrogen can be used during the light independent stage of photosynthesis
- B. Photosystem II and ferredoxin is involved with the reduction of NADP so that the hydrogen can be used during the light independent stage of photosynthesis
- C. Photosystem I and plastoquinone is involved with the reduction of NADP so that the hydrogen can be used during the light independent stage of photosynthesis
- D. Photosystem I and ferredoxin is involved with the reduction of NADP so that the hydrogen can be used during the light dependent stage of photosynthesis

[1 mark]

## Question 5

Which of the following statements is **not** correct with regards to chemiosmosis in photosynthesis?

- I. Protons move down their concentration gradient through ATP synthase located in the chloroplast membrane
- II. The photolysis of water provides protons needed for chemiosmosis to occur
- III. ADP is phosphorylated to ATP due to the energy released by the movement of electrons down the electron transport chain
- IV. A high concentration of protons build up outside the intermembrane space, creating a concentration gradient

- A. I. and IV. only
- B. II. and III. only
- C. I., III. and IV.
- D. II., III. and IV.

[1 mark]