

8.3 Photosynthesis

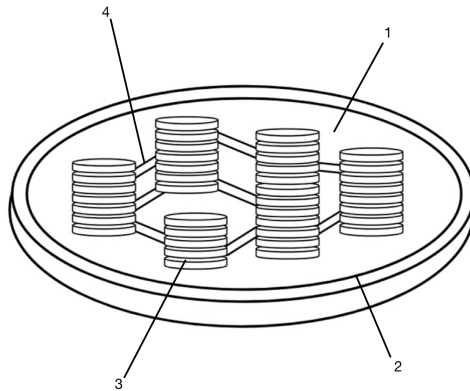
Question Paper

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

Time allowed: 20
Score: /10
Percentage: /100

Question 1

The image below shows a chloroplast.



Identify the location of the light independent and light dependent reactions.

	Location of light independent reaction	Location of light dependent reaction
A	1	3
B	3	2
C	1	4
D	3	1

[1 mark]

Question 2

Which events occur during the light dependent stage of photosynthesis?

- I. ATP is produced
- II. NADP is reduced to NADPH
- III. Water splits into photons, electrons and oxygen
- IV. NADPH is oxidised to NADP

- A. All of them
- B. I, II, III
- C. I, III, IV
- D. II, III, IV

[1 mark]

Question 3

What are the functions of excited electrons in photosynthesis?

- I. To generate a proton gradient
- II. To reform RuBP
- III. To reduce G3P
- IV. To reduce NADP

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

[1 mark]

Question 4

Which event occurs during non-cyclic photophosphorylation?

- A. Dephosphorylation of ATP
- B. Reduced NADH is synthesised
- C. Chemiosmosis in the stroma of the chloroplast
- D. Excited electrons enter an electron transport chain

[1 mark]

Question 5

Which process is **not** part of the light-independent reaction of photosynthesis?

- A. Glycerate-3-phosphate is converted to triose phosphate
- B. Rubisco is regenerated from triose phosphate
- C. ATP is dephosphorylated to ADP
- D. Carboxylation of RuBP

[1 mark]

Question 6

What allows the cyclic nature of the Calvin cycle?

- A. Reduced NADP accumulates in the stroma
- B. A buildup of ATP in the stroma
- C. Decarboxylation of Ribulose biphosphate
- D. The catalytic nature of RuBP

[1 mark]

Question 7

Which technological methods were used by Melvin Calvin in his studies of the light-independent reactions of photosynthesis?

	Autoradiography	Paper chromatography	Thin layer chromatography	Use of radioactive sources
A	No	No	Yes	Yes
B	Yes	Yes	No	No
C	Yes	Yes	No	Yes
D	Yes	No	Yes	No

[1 mark]

Question 8

Melvin Calvin used radioactive sources of carbon dioxide in his research using the alga *Chlorella*.

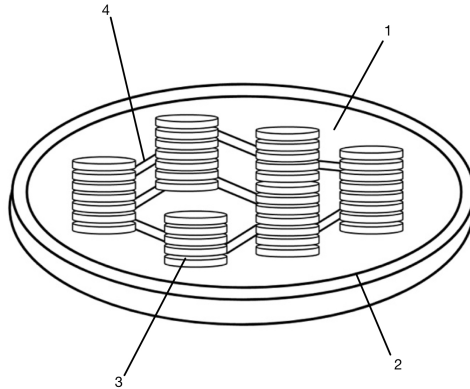
Which molecule would be the first to contain radioactive carbon-14 in *Chlorella* that was grown in the presence of radioactive carbon dioxide?

- A. Ribulose biphosphate
- B. Glycerate-3-phosphate
- C. Triose phosphate
- D. Rubisco

[1 mark]

Question 9

Where is ATP synthase located in the chloroplast below?



- A. 1
- B. 2
- C. 3
- D. 4

[1 mark]

Question 10

The thylakoid intermembrane space has a small volume.

What advantage does this have for photosynthesis?

- A. High proton concentration can be rapidly developed
- B. Short diffusion pathway for the movement of hydrogen ions
- C. High electron concentration can be readily developed
- D. Rapid accumulation of reduced NADP

[1 mark]