



EXAM PAPERS PRACTICE

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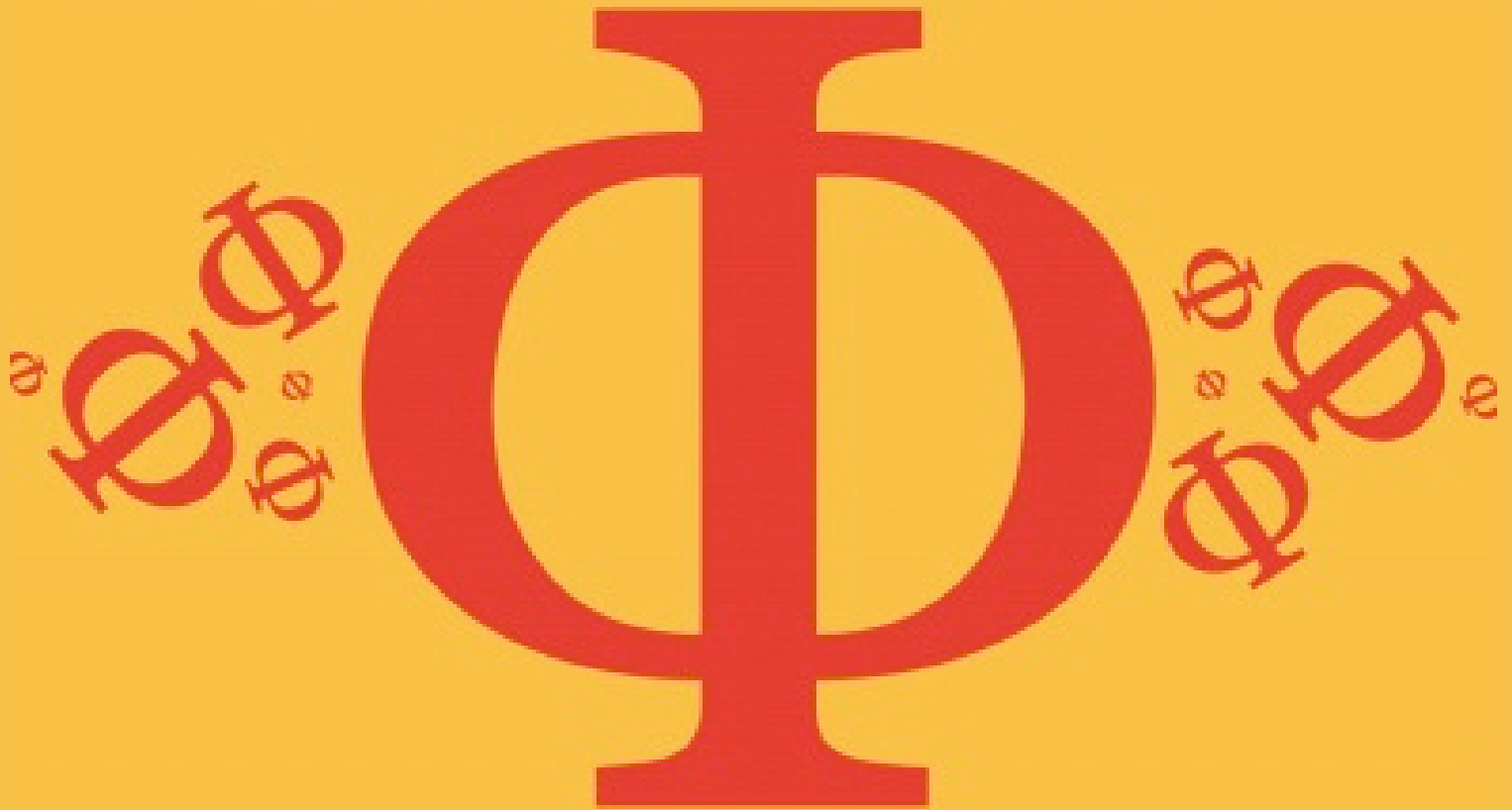
Detailed mark scheme

Suitable for all boards

Designed to test your ability and

8.3 Photosynthesis

Medium



BIOLOGY

IB HL

8.3 Photosynthesis

Question Paper

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

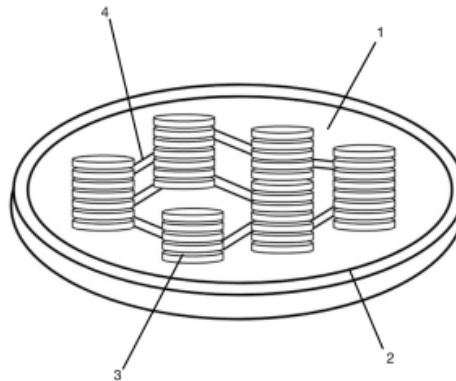
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Time allowed: 20
Score: /10
Percentage: /100



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

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[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

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[1 mark]

Question 8

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

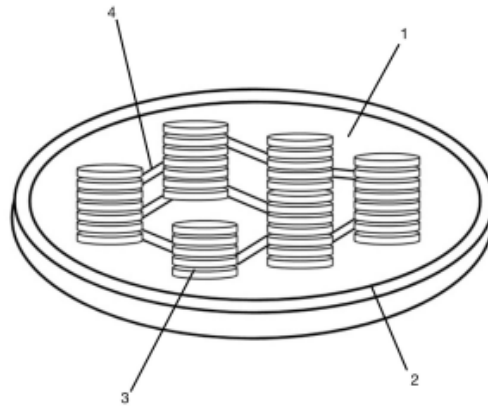
Which molecule would be the first to contain radioactive carbon-14 in *Chlorella* that was grown in the presence of radioactive carbon dioxide?

- 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]