

**AQA, OCR, Edexcel**

**A Level**

# **A Level Biology**

## **Photosynthesis 3 Questions**

Name:

**M M E**

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**Total Marks: /17**

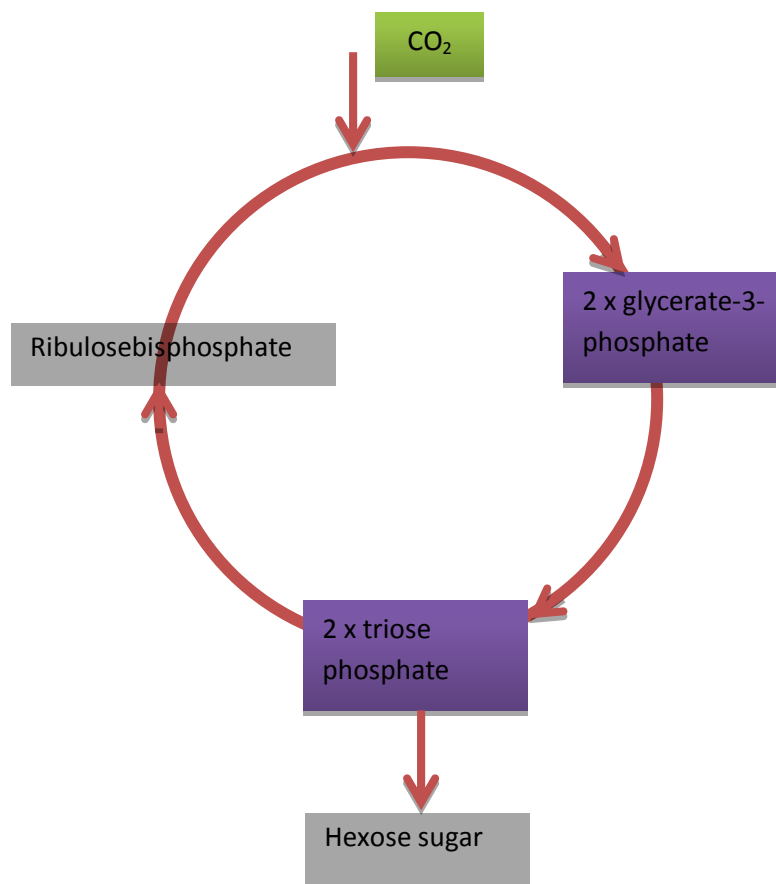
## Photosynthesis

1. The final stage of photosynthesis is the light independent reaction, sometimes it is called the Calvin Cycle.

a) The light independent reaction is a cycle, for it to keep going it requires some of the products from the light dependent reaction.

i) What products from the light dependent reaction are required in the Calvin Cycle?  
(2 marks)

b) The diagram below shows the Calvin Cycle.



- i) Identify how many carbon atoms are in each molecule at each stage of the reaction and where Carbon Dioxide is added. (4 marks)
- ii) Draw arrows on the diagram to show where energy is used in the Calvin cycle. (2 marks)

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iii) What is the role of the enzyme Rubisco in the light independent reaction?  
(1 mark)

iv) What proportion of triose-3- phosphate molecules form hexose sugars?  
(1 mark)

c) Many useful organic products are synthesised from the molecules generated in the light independent reaction.

i) Where does the CO<sub>2</sub> required in the cycle come from? (1 mark)

2. Photosynthesis, like any other reaction, has optimum conditions.

a) i) What is meant by the term 'limiting factor'? (1 mark)

b) Light intensity of a certain wavelength can be a limiting factor.

i) Why can photosynthesis not take place if the light intensity is too low? (1 mark)

ii) How does the plant respond if the level of CO<sub>2</sub> is too high? (1 mark)

iii) In industry, how is knowledge about limiting factors in photosynthesis useful for farmers?  
(2 marks)

iv) Complete the table below to identify how a farmer could control limiting factors for maximum growth of produce in a greenhouse. (3 marks)

Limiting factor	Control in a greenhouse
Concentration of CO <sub>2</sub>	
Temperature	
Light	