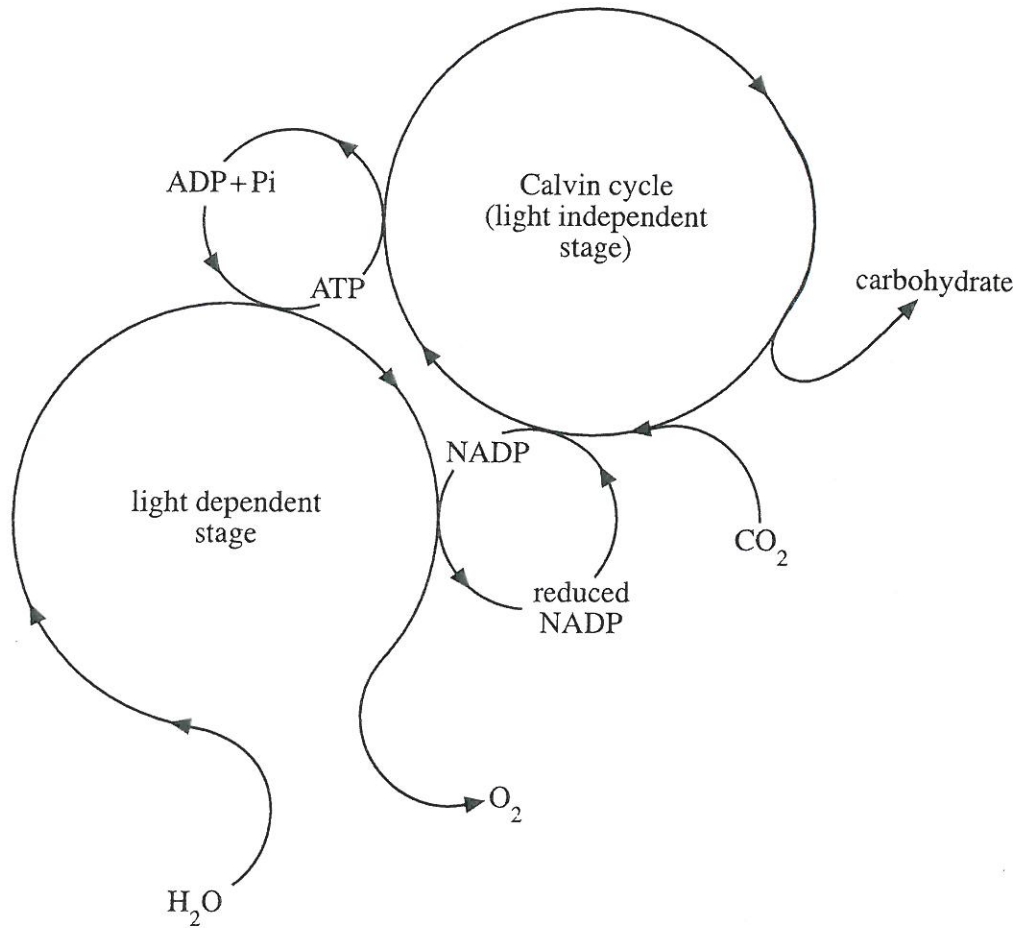


Unit 4.3 Photosynthesis Test 1

4. During the process of photosynthesis, light energy is converted into chemical energy. The diagram below outlines the processes involved.



- (a) When light strikes chlorophyll molecules some of the energy is transferred to electrons in the chlorophyll. Describe how this energy is used to make ATP. [3]

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- (b) Explain how carbon dioxide and ATP are used to build up carbohydrates which provide energy for humans to carry out their metabolic processes. [3]

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- (c) State **two** metabolic processes in humans that require the use of ATP. [2]

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- (d) The carbohydrate produced as a result of photosynthesis can be converted into other important compounds useful to humans. Apart from carbohydrates, state **two** of these products and explain how **each** is useful to humans. [2]

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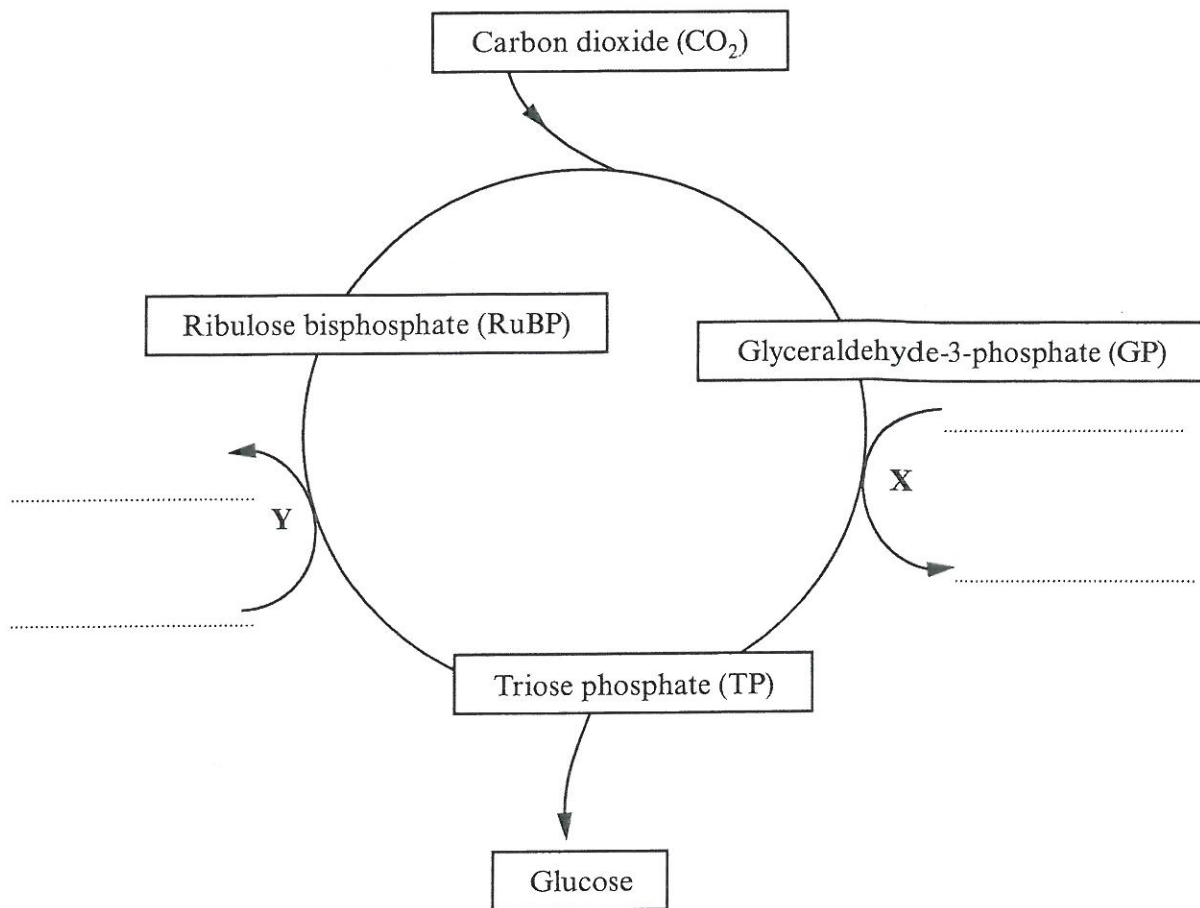
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(Total 10 marks)

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2. Calvin did experiments on a series of reactions which is now called the light independent stage of photosynthesis. He worked out that ribulose biphosphate is regenerated so that the reactions are in the form of a cycle, which is summarised below:



- (a) Compound X is a hydrogen carrier and compound Y is the universal energy currency in cells.
- (i) Complete the diagram to show how compounds X and Y change during the cycle. [2]
- (ii) Which series of reactions provides the compounds X and Y in chloroplasts? [1]
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- (iii) State precisely where the production of X occurs in chloroplasts. [1]
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- (b) How many molecules of triose phosphate would be needed to synthesise three molecules of glucose? [1]
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(Total 5 marks)

- (b) (i) Give an account of the light independent stage of photosynthesis. [7]
- (ii) Comment on the importance of photosynthesis to human life. [3]

Jan
2012