

Photosynthesis as an energy transfer process

Question Paper 5

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Photosynthesis
Sub Topic	Photosynthesis as an energy transfer process
Booklet	Theory
Paper Type	Question Paper 5

Time Allowed : 63 minutes

Score : / 52

Percentage : /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 Fig. 4.1 is an electron micrograph of a chloroplast from a mesophyll cell in a leaf.

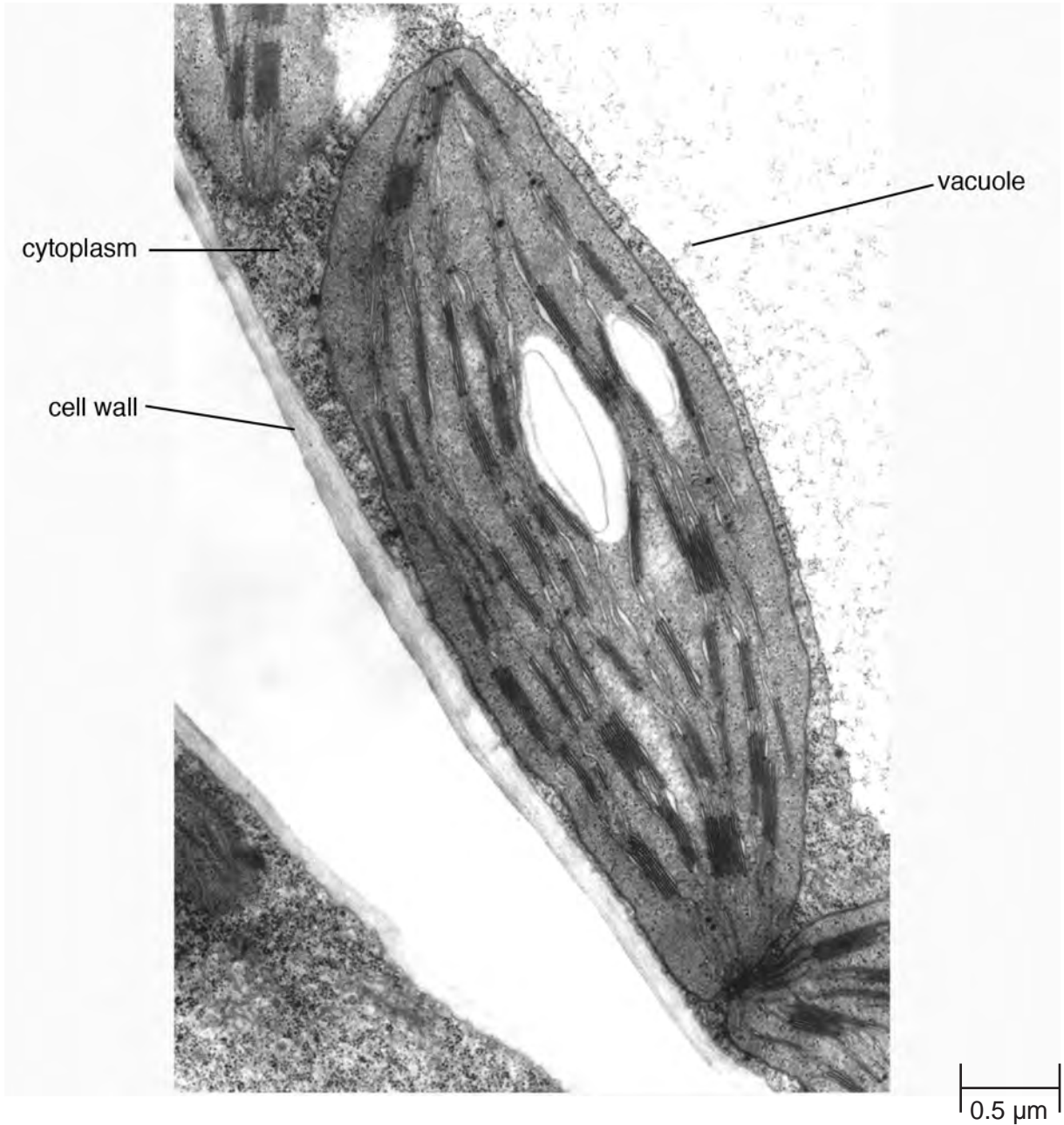


Fig. 4.1

(a) Calculate the magnification of the electron micrograph in Fig. 4.1.

Answer =[1]

(b) State two features **visible in Fig. 4.1** that identify the organelle shown as a chloroplast.

1.

2. [2]

(c) Chloroplasts absorb phosphate ions from the surrounding cytoplasm. Suggest one way in which chloroplasts use phosphate ions.

..... [1]

(d) Starch grains in plant cells contain both amylose and amylopectin.

Explain how **both** of these substances are formed from glucose in plant cells.

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.....
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.....
.....
.....
.....
..... [4]

(e) State three functions of the water stored in the vacuoles of plant cells.

1.

2.

3. [3]

[Total: 11]

2 Fig. 2.1 shows the results of experiments investigating the effect of different light intensities on the rate of photosynthesis of cucumber plants measured as $\text{mm}^3 \text{CO}_2$ uptake per cm^2 leaf area per hour. The experiments were carried out at two different temperatures and two different carbon dioxide concentrations.

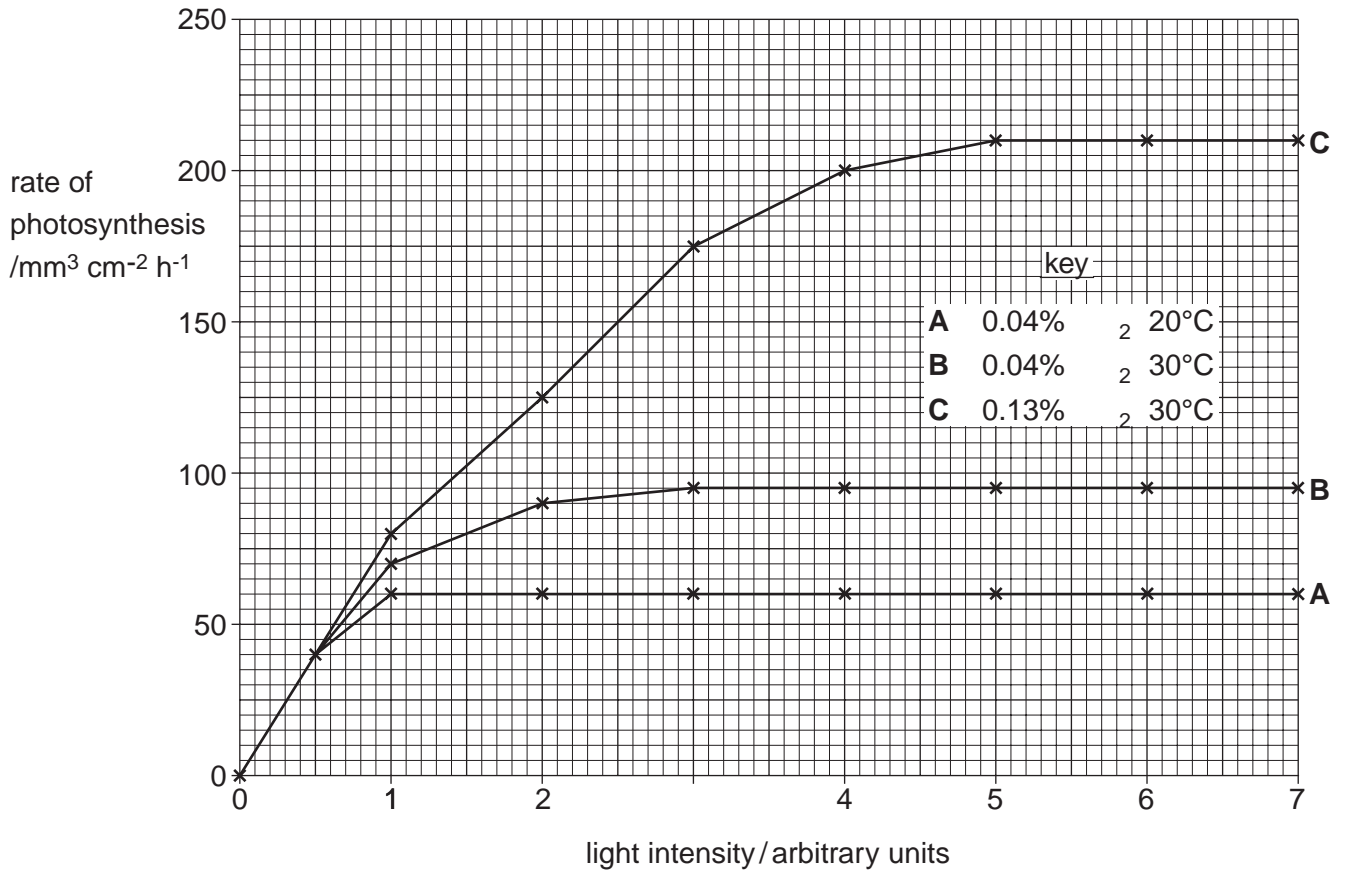


Fig. 2.1

(a) With reference to Fig. 2.1,

(i) describe the shape of curve A,

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[3]

(ii) explain the reasons for the difference between curves **B** and **C**.

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.....
.....
.....[4]

(b) Suggest **two** ways in which a commercial grower of cucumbers may increase the yield of the growing crop.

1

.....

2

.....[2]

[Total: 9]

3 Fig. 4.1 is a diagram of a section through the undersurface of a dicotyledonous leaf.

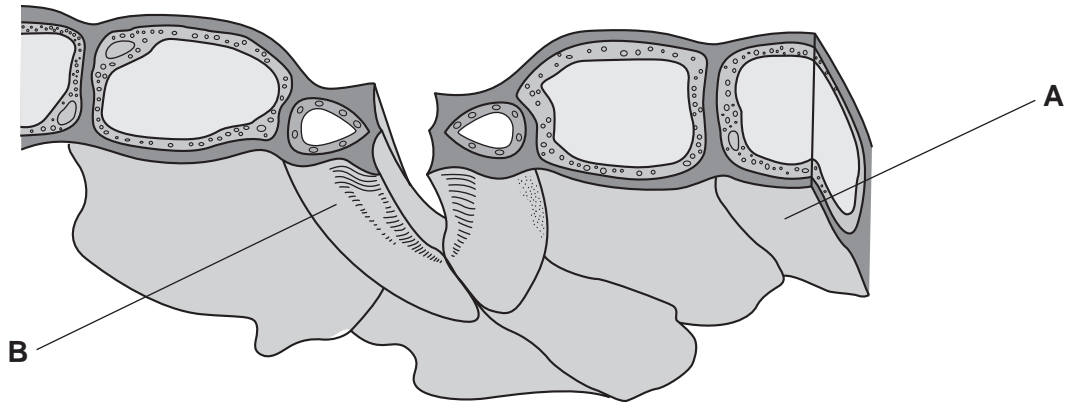


Fig. 4.1

(a) Name the cells **A** and **B**.

A

B[2]

(b) Explain the role of the pore shown, in relation to photosynthesis in the leaf.

.....
.....
.....
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.....
.....
.....[4]

(c) With reference to Fig. 4.1, list two visible features of the cell **B** that allows the pore to open and close.

feature 1

.....

feature 2

.....[2]

[Total: 8]

4 Fig. 5.1 shows the main stages of the Calvin cycle.

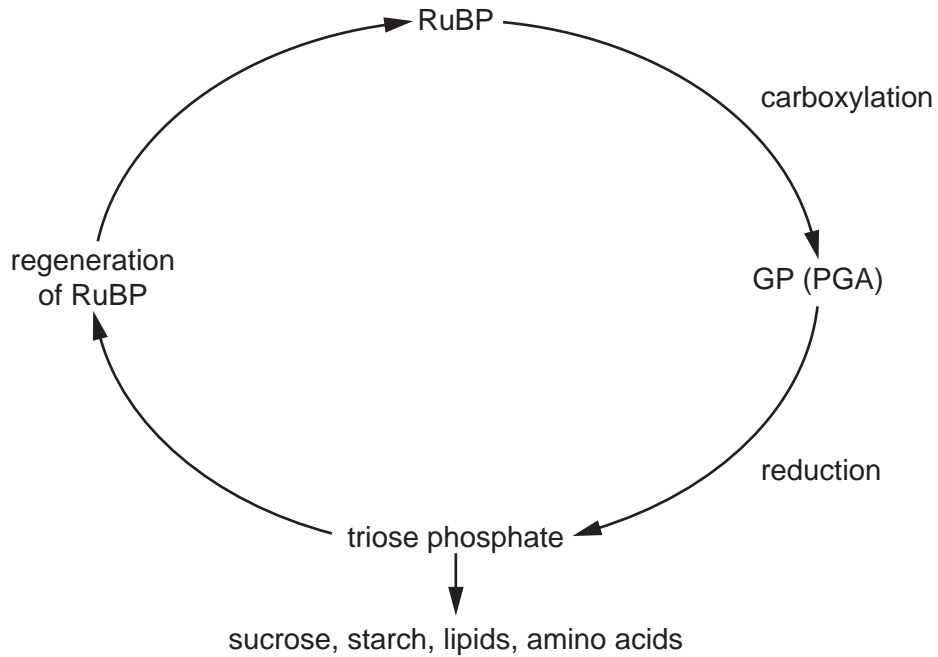


Fig. 5.1

(a) State precisely where the Calvin cycle occurs in plant cells.

.....[1]

(b) Describe how carbon dioxide is fixed in the Calvin cycle.

.....

[2]

(c) Explain how the products of photophosphorylation are used in the Calvin cycle.

.....

[3]

(d) Explain what initially happens to the concentration of RuBP and GP if the supply of carbon dioxide is reduced.

RuBP

 GP
[3]

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