Name:

Date:

B4 - Test 1
BIOENERGETICS

GCSE

AQA

BIOLOGY

Mark	Grade

Materials

For this paper you must have:

- Ruler
- Pencil and Rubber
- Scientific calculator, which you are expected to use when appropriate

Instructions

- Answer all questions
- Answer questions in the space provided
- All working must be shown

Information

- The marks for the questions are shown in brackets

1 (a) Balance the following equation for photosynthesis.

..... CO_2 + ... H_2O → $C_6H_{I2}O_6$ + ... O_2

(1)

(b) Give **two** conditions necessary for photosynthesis apart from a suitable temperature range and the availability of water and carbon dioxide.

1. .....

2. .....

(2)

(a) Plants have leaves which contain guard cells and palisade cells. Explain how **each** of these kinds of cell assists photosynthesis.

Guard cells .....

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.....

(2)

Palisade cells .....

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(2)

(d) Glucose is a product of photosynthesis. Give **three** uses which green plants make of glucose.

1. .....

2. .....

3. .....

(3)

(Total 10 marks)

2 Plants are grown in glasshouses to protect them from the weather or extend the growing season.

Plants make food by photosynthesis.

$$6CO_2 + 6H_2O \xrightarrow[\text{light}]{\text{energy from}} C_6H_{12}O_6 + 6O_2$$

glucose

In winter, when days are shorter, glasshouses are heated to keep the enzyme reactions in plants at optimum rates.

What else should a grower do to make sure that the plants are photosynthesising at the optimum rate? Give a reason for your answer.

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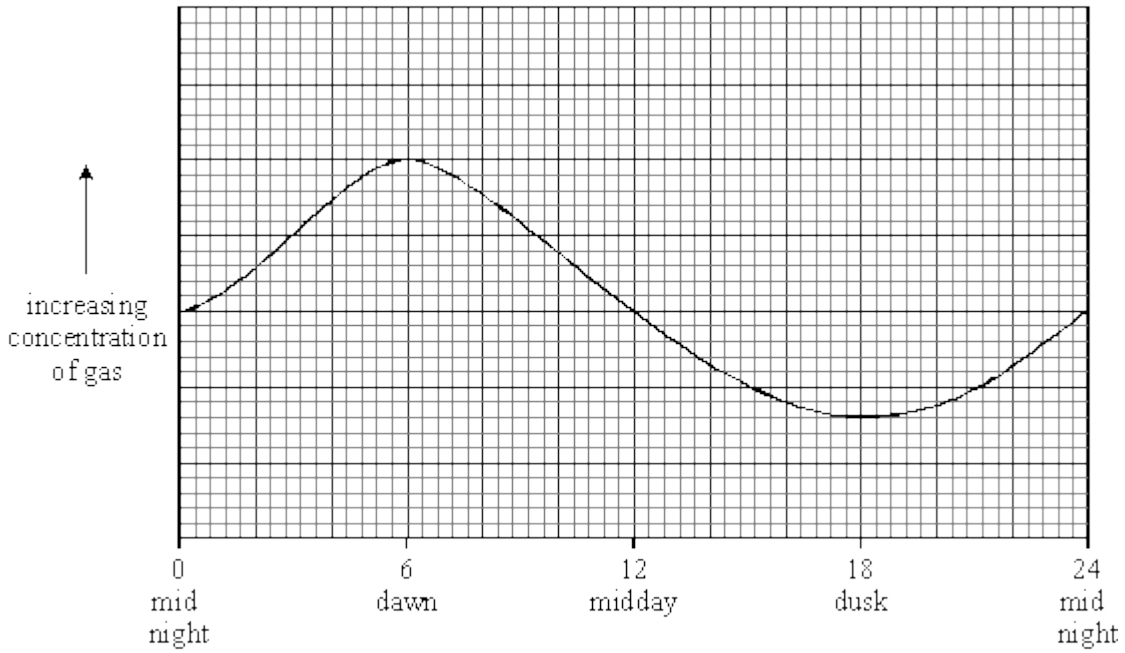
(Total 3 marks)

3 Plants produce glucose by a process called photosynthesis.

$$\text{carbon dioxide + water} \xrightarrow[\text{chlorophyll}]{\text{light}} \text{oxygen + glucose}$$

The plant uses glucose to grow.

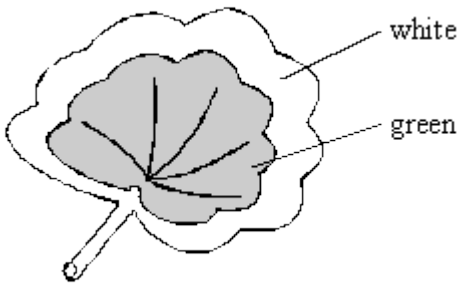
(a) The graph shows the change in concentration of carbon dioxide in a glasshouse full of plants over 24 hours.



Draw a line on the graph to show how the concentration of oxygen changes in the glasshouse.

(3)

(b)



Some plants have variegated leaves with white parts which contain no chlorophyll.

How do you think a variegated geranium would grow compared to a similar sized geranium with all green leaves?

Explain your answer.....

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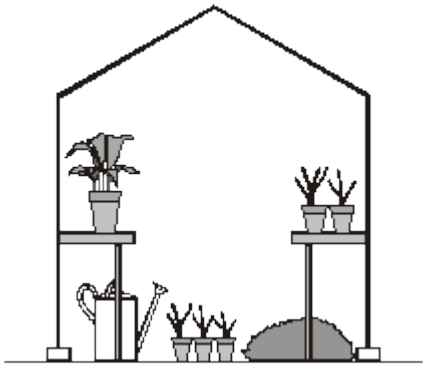
(2)
(Total 5 marks)

4 The diagram shows some plants growing in a greenhouse on a hot summer's day.



Which **one** of the following factors is most likely to limit the rate of photosynthesis at this time?

- carbon dioxide concentration
- light intensity
- temperature

Factor .....

Explain the reason for your answer.

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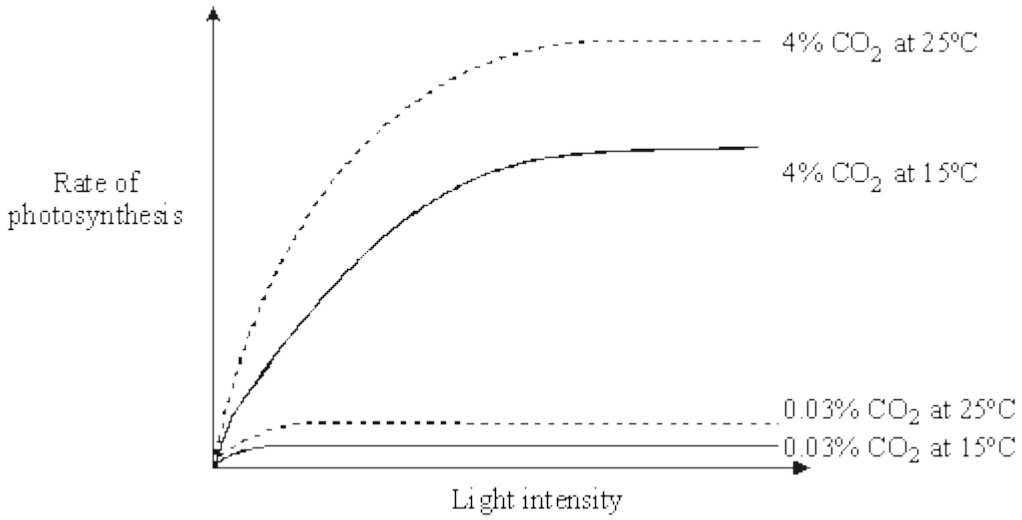
(Total 4 marks)

5 The graph shows how the rate of photosynthesis is affected by different conditions.



(a) What patterns can you find from this graph?

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(5)

(b) How useful could this information be to a grower using glasshouses? Give reasons for your answer.

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(2)

(Total 7 marks)