GCSE Biology A (Gateway)

J247/03 B1-B3 and B7 Higher (Higher Tier)

Question Set 13

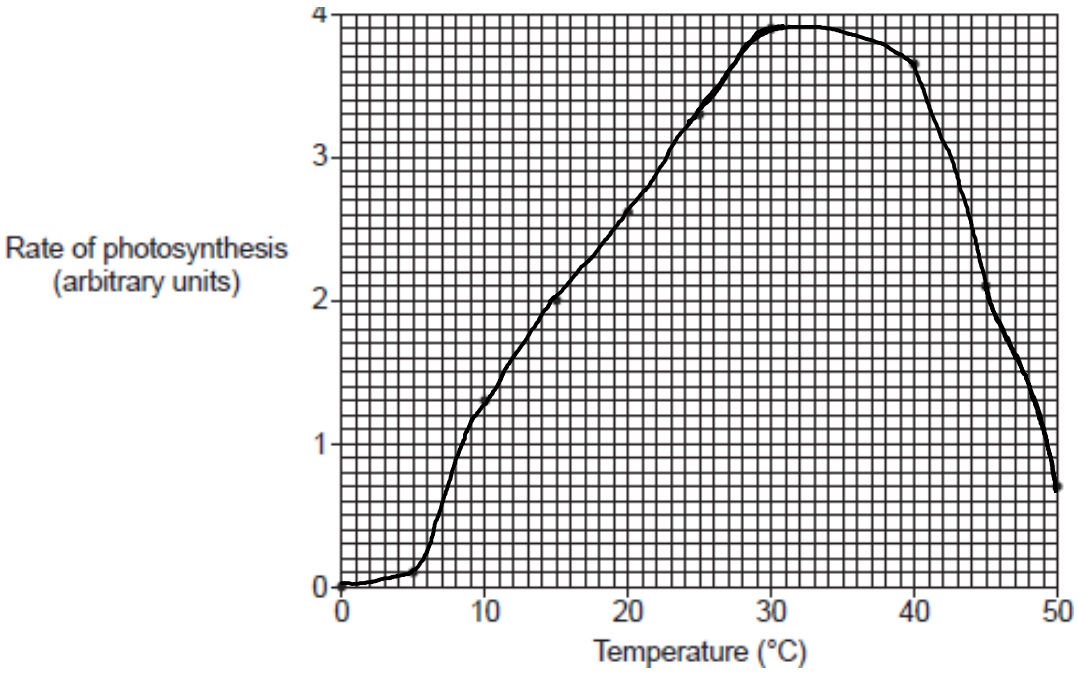
1 (a) Photosynthesis involves reactions that are endothermic.

What is meant by the term endothermic reaction?

Energy/Heat is taken in from the surroundings into the reaction.

[1]

(b) The graph is from an experiment to show the effect of temperature on the rate of photosynthesis.

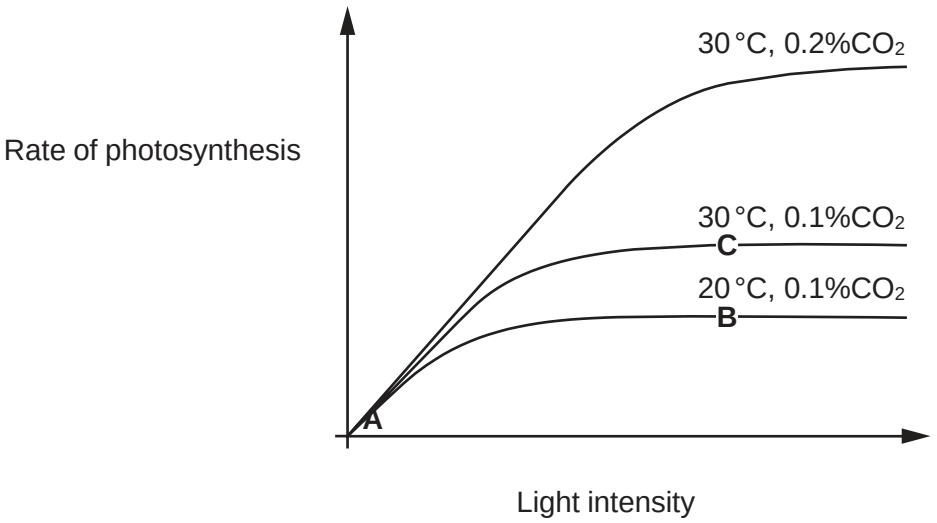


[1]

Draw a line of best fit.

(c) Look at the graph. It shows how light intensity affects the rate of photosynthesis.

The lines show different carbon dioxide concentrations and temperatures.



Explain what is limiting the rate of photosynthesis at the three points **A**, **B** and **C** on the graph.

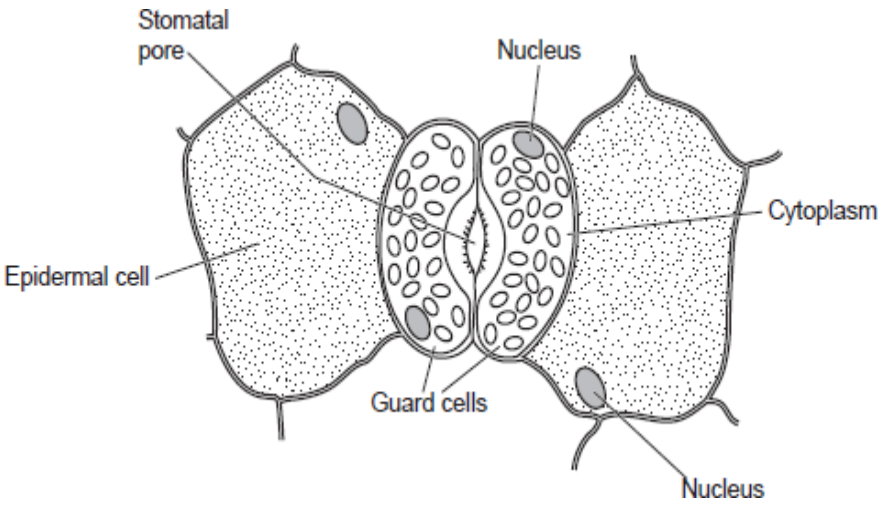
Use evidence from the graph in your answer.

At point A, light is limiting as increasing light intensity increases the rate while there is sufficient light and CO_2.

At point B, temperature is limiting as increasing temperature increases rate as it has sufficient light and CO_2. **[3]**

At point C, carbon dioxide is limiting as increasing CO_2 increases rate when sufficient temperature and light.

(d) **(i)** The diagram shows structures on the surface of a leaf.



Photosynthesis occurs in the guard cells but not the epidermal cells.

Explain why this is important in the control of the rate of transpiration in the plant.

Photosynthesis makes sugars in guard cells. Epidermal cells don't photosynthesise so lower in sugar than guard cell. [4]
Epidermal cells have a higher water potential than guard cells so water enters guard cells by osmosis. This increases in turgidity in guard cell opens up stomata which affects transpiration rates.

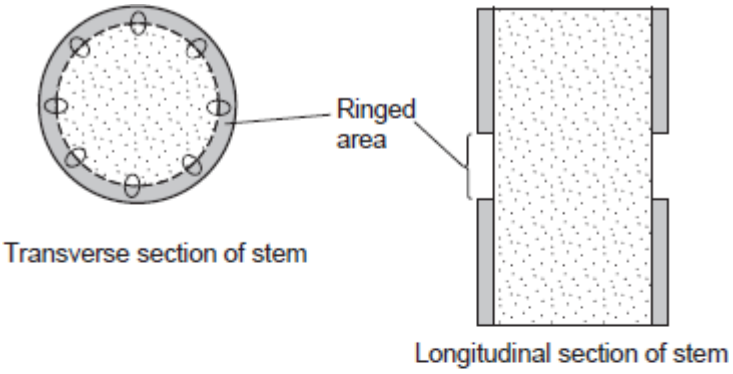
(ii) Explain why guard cells are an example of specialised cells.

They have been differentiated for a specific job in the plant.

[2]

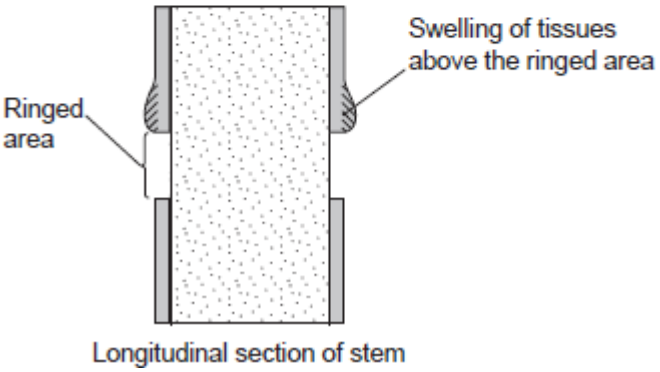
(ii) An experiment was done to look at the effect of 'ringing' on a tree trunk. Ringing removes astrip of plant tissue from around the stem of the tree.

The diagram shows where the stem is ringed.



The results were recorded after one week.

The diagram shows the results.



What conclusions can be made about the results?

The phloem has been removed and so swelling has occured because of a build-up of sugar. The sugar produced in the leaves can't get past the ringed area so have accumulated above it.

[3]

Total Marks for Question Set 13: 14