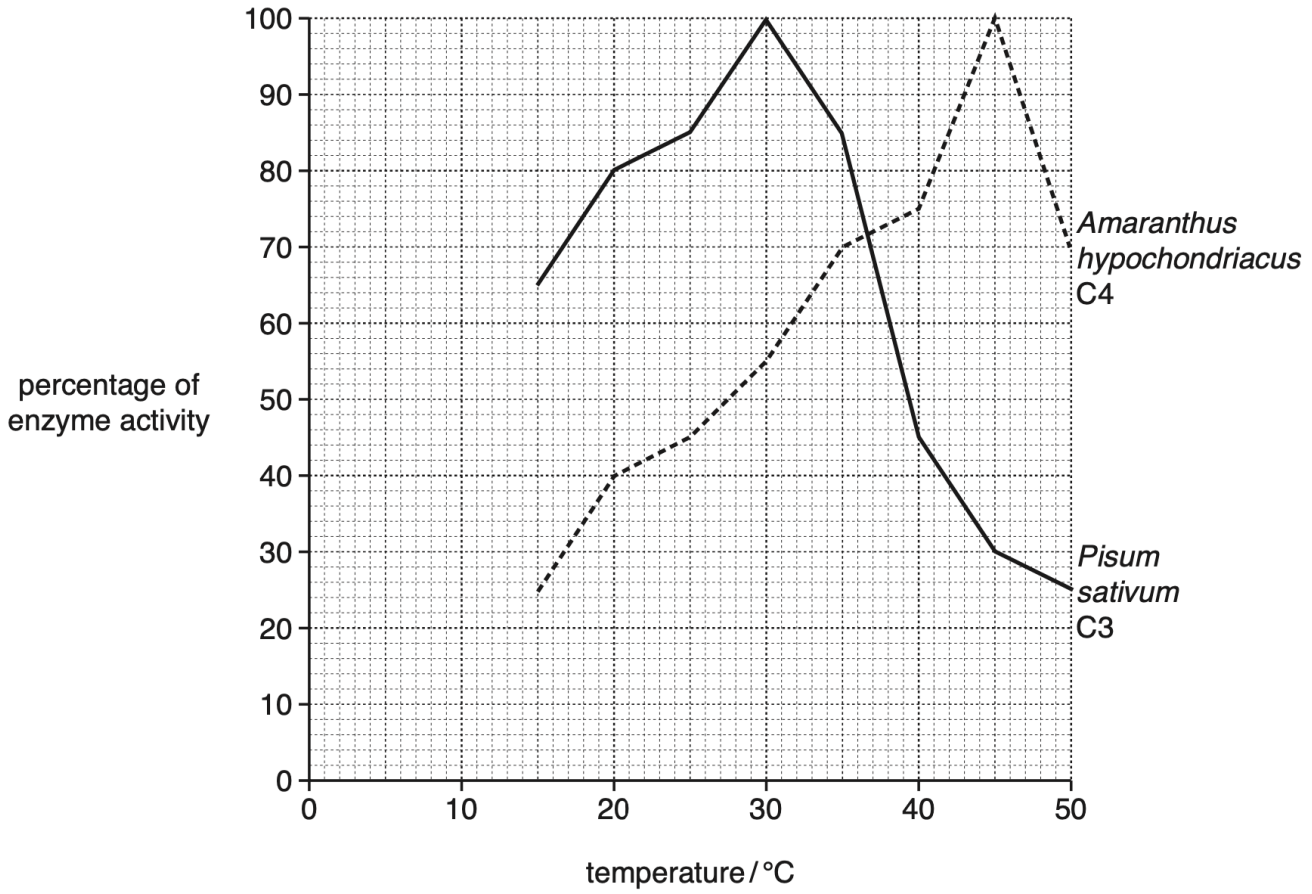
1. Several enzymes play a role in photosynthesis. The graph below shows the activity of two enzymes at varying temperatures.



Describe and explain the enzyme activity for Pisum sativum from 10C to 40C. (3)

M1 =

M2 =

M3 =

2. When oxygen levels in the leaf cell are high, a process called photorespiration occurs. In this process rubisco tends to combine oxygen, rather than carbon dioxide, with RuBP. This process reduces crop yield.

2.1 Suggest why photorespiration is more likely to occur in hot, dry conditions. (3)

M1 =

M2 =

M3 =

2.2 Suggest why photorespiration reduces crop yield. (3)

M1 =

M2 =

M3 =

3. When chloroplasts are incubated with a dye called DCPIP in the presence of light, they can reduce the DCPIP. The dye DCPIP is a hydrogen acceptor, changing colour from blue to colourless when it is reduced. In an experiment, isolated chloroplasts were incubated with DCPIP in an isotonic buffer solution.
Three test tubes were set up as shown below and left for 20 minutes to allow any colour change to occur. The results are shown in the table below:

Experiment	Contents	Conditions	Initial colour	Final colour
1	Buffer solution + DCPIP	Light	Blue	Blue
2	Buffer solution + Chloroplasts + DCPIP	Light	Blue-green	Green
3	Buffer solution + Chloroplasts + DCPIP	Dark	Blue-green	Blue-Green

Explain the results for test-tubes 1, 2 and 3. (4)

M1 =

M2 =

M3 =

M4 =

4. The rate of photosynthesis in green plants can be limited by factors such as light intensity, temperature and carbon dioxide concentration. State which factor would have **no** effect on the reducing ability of a chloroplast suspension. Give a reason for your answer. (2)

M1 =

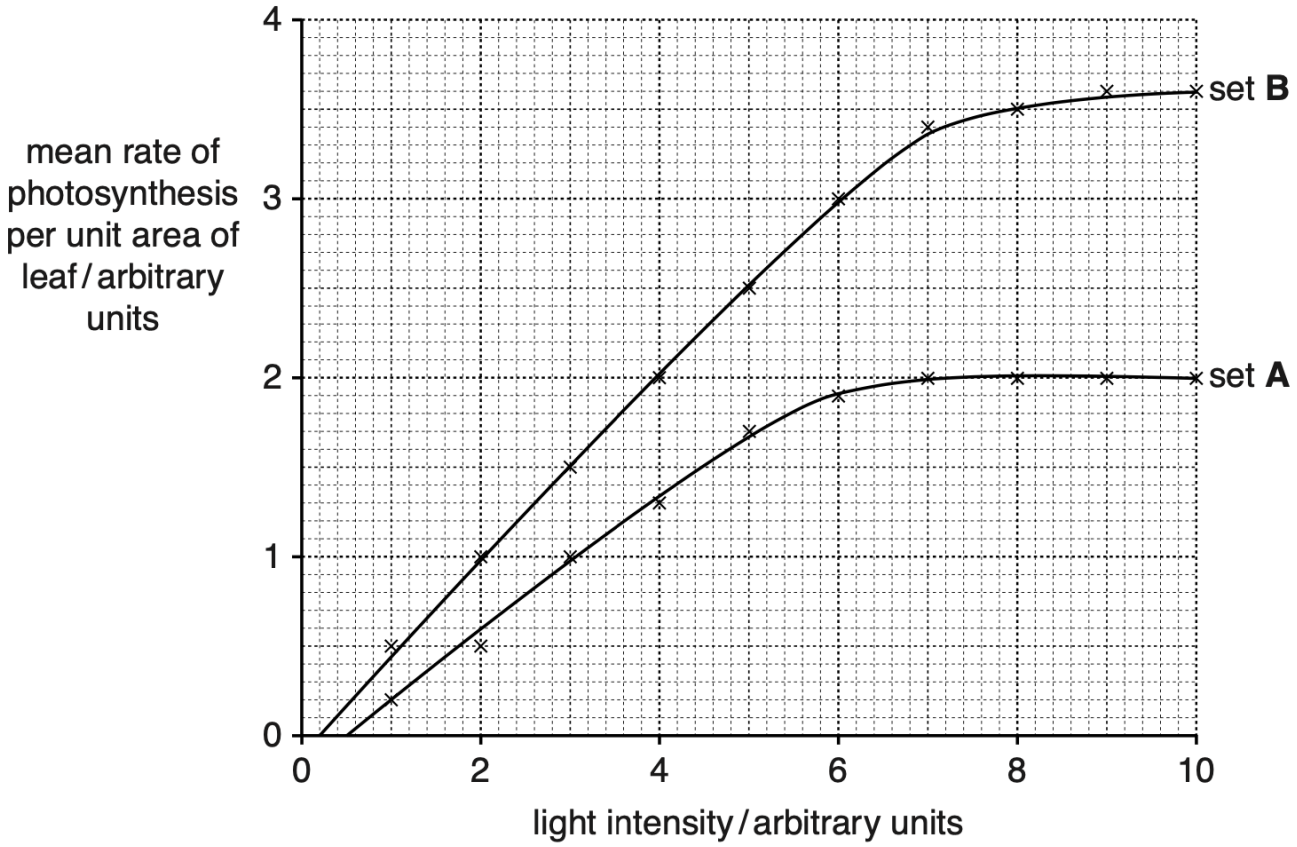
M2 =

5. In an investigation two sets of plants, **A** and **B**, were grown from seed at different concentrations of carbon dioxide:

• **A** – CO_2 concentration of 0.033%

• **B** –CO_2 concentration of 0.0636%

All the other control variables were the same. The mean rate of photosynthesis was recorded under both CO_2 concentrations, and the data is shown in the graph below.



5.1 Describe and explain the results from the plants in set **A.** (3)

M1 =

M2 =

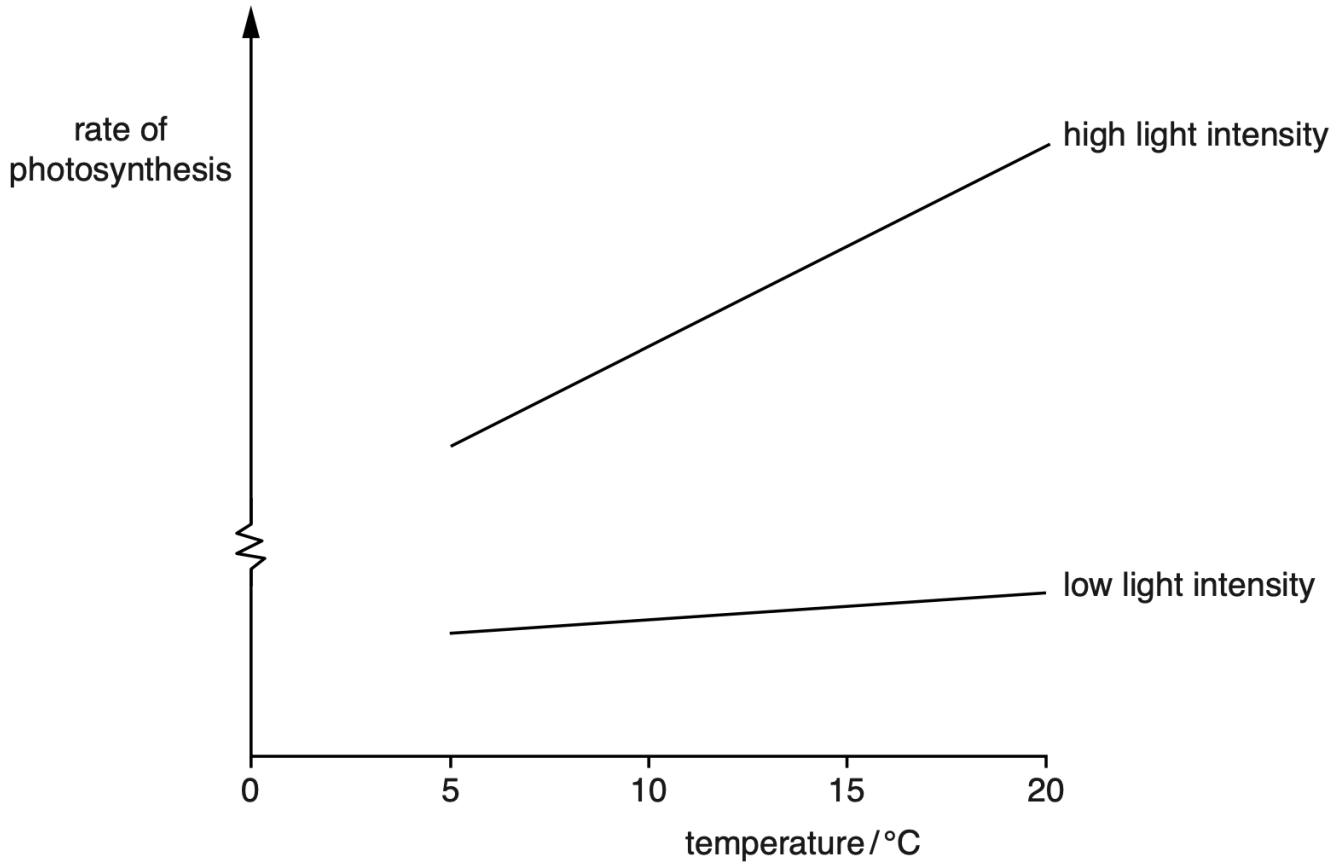
M3 =

5.2 Explain the difference between the results of set A and set B at high light intensities. (2)

M1 =

M2 =

6. The graph below shows the effect of temperature on the rate of photosynthesis of a plant at low light intensity and at high light intensity.



With reference to the graph, describe **and** explain the effect of temperature on the rate of photosynthesis.

(4)

M1 =

M2 =

M3 =

M4 =