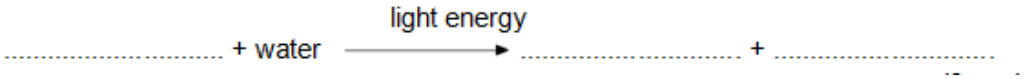
Photosynthesis 3

Q:1(a) Complete the equation for photosynthesis.



(3 marks)

(b) The rate of photosynthesis in a plant depends on several factors in the environment.

These factors include light intensity and the availability of water.

Describe and explain the effects of two other factors that affect the rate of photosynthesis.

You may include one or more sketch graphs in your answer.

(5 marks)

Q:2 Green plants can make glucose.

(a) Plants need energy to make glucose.

How do plants get this energy?

_____

_____

_____

_____

[2 marks]

(b) Plants can use the glucose they have made to supply them with energy.

Give four other ways in which plants use the glucose they have made.

_____

_____

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_____

[4 marks]

Q:4 Photosynthesis uses carbon dioxide to make glucose.

(a) (i) Complete the equation for photosynthesis.

carbon dioxide + ... $\xrightarrow{\text{energy}}$ glucose + ...

[2 marks]

(a) (ii) What type of energy does a plant use in photosynthesis?

_____

[1 mark]

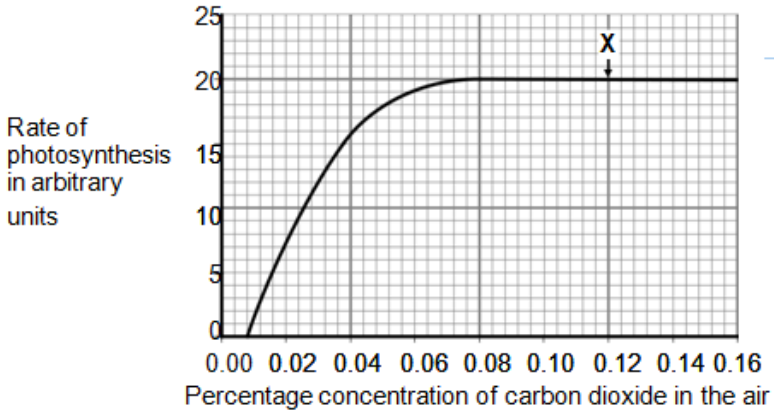
(a) (iii) Which part of a plant cell absorbs the energy needed for photosynthesis?

_____

[1 mark]

(b) Figure 3 shows the effect of the concentration of carbon dioxide on the rate of photosynthesis in tomato plants at 20 °C.

Figure 3



(b) (i) What is the maximum rate of photosynthesis of the tomato plants shown in Figure 3?

_____ arbitrary units

[1 mark]

(b) (ii) At point X on Figure 3, carbon dioxide is not a limiting factor of photosynthesis.

Suggest one factor that is limiting the rate of photosynthesis at point X.

[1 mark]

(c) A farmer plans to grow tomatoes in a large greenhouse.

The concentration of carbon dioxide in the atmosphere is 0.04%.

The farmer adds carbon dioxide to the greenhouse so that its concentration is 0.08%.

(c) (i) Why does the farmer use 0.08% carbon dioxide?

Tick (✓) one box.

To increase the rate of growth of the tomato plants ☐

To increase the rate of respiration of the tomato plants ☐

To increase water uptake by the tomato plants ☐

[1 mark]

(c) (ii) Why does the farmer not use a concentration of carbon dioxide higher than 0.08%?

Tick (✓) two boxes.

Because it would cost more money than using 0.08% ☐

Because it would decrease the temperature of the greenhouse ☐

Because it would not increase the rate of photosynthesis of the tomato plants any further ☐

Because it would increase water loss from the tomato plants ☐

[2 marks]

TOTAL MARKS=23