Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2010–2011

Science: Double Award (Modular)

Living Organisms and the Processes of Life

End of Module Test

Higher Tier

A

[GDA02]

GDA02

THURSDAY 24 FEBRUARY 2011, MORNING

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all twelve** questions.

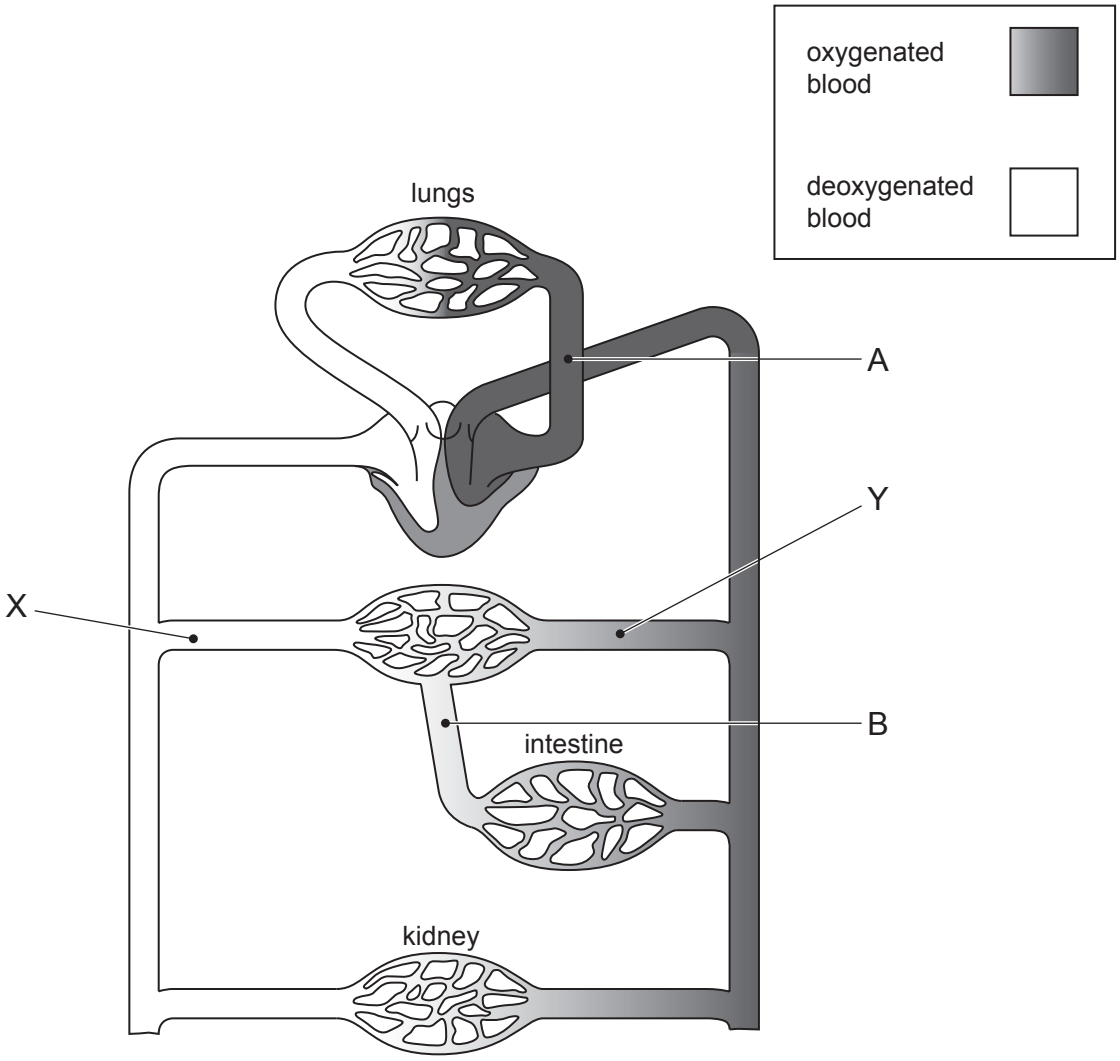
INFORMATION FOR CANDIDATES

The total mark for this paper is 50.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total Marks	

Examiner Only	
Marks	Remark

1 The diagram shows part of the circulatory system.



(a) What is meant by **double circulation**?

_____

_____ [1]

(b) Name the blood vessels:

A _____

B _____ [2]

(c) Explain why the concentration of oxygen is lower in vessel X than in vessel Y.

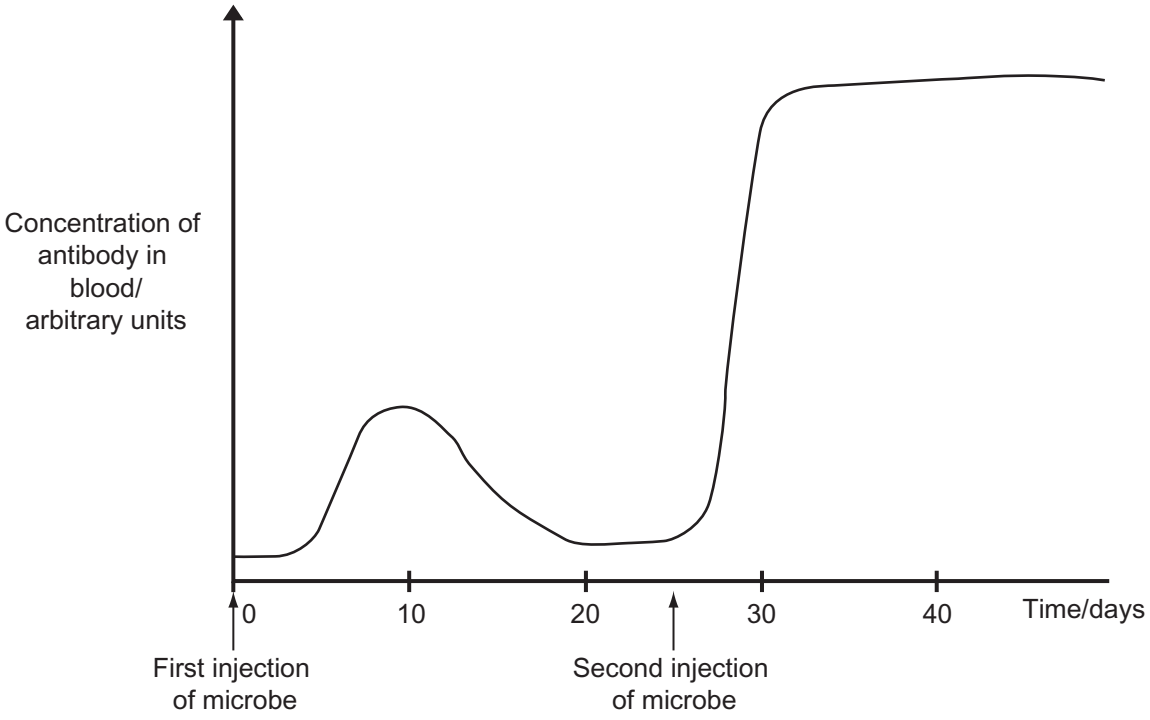
_____

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

2 The graph shows the body's response to the injection of a microbe.



(a) Name the method of fighting disease where a weakened form of the microbe is injected into the body.

_____ [1]

(b) Use the graph to give two differences between the responses to the first and second injections.

1. _____

2. _____ [2]

(c) The antibodies connect with the microbes to form a clump. Name the process by which the body destroys the clump.

_____ [1]

Examiner Only	
Marks	Remark

3 In blood donation, blood is taken from a vein in a person's arm and used to treat patients who need a blood transfusion

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The photograph shows a needle inserted into a blood vessel in a donor's arm.

(a) Suggest why the needle is inserted into a vein rather than an artery.

_____ [1]

(b) Use your knowledge of osmosis to explain why the blood cells would be damaged if water was added to the donated blood by mistake.

_____

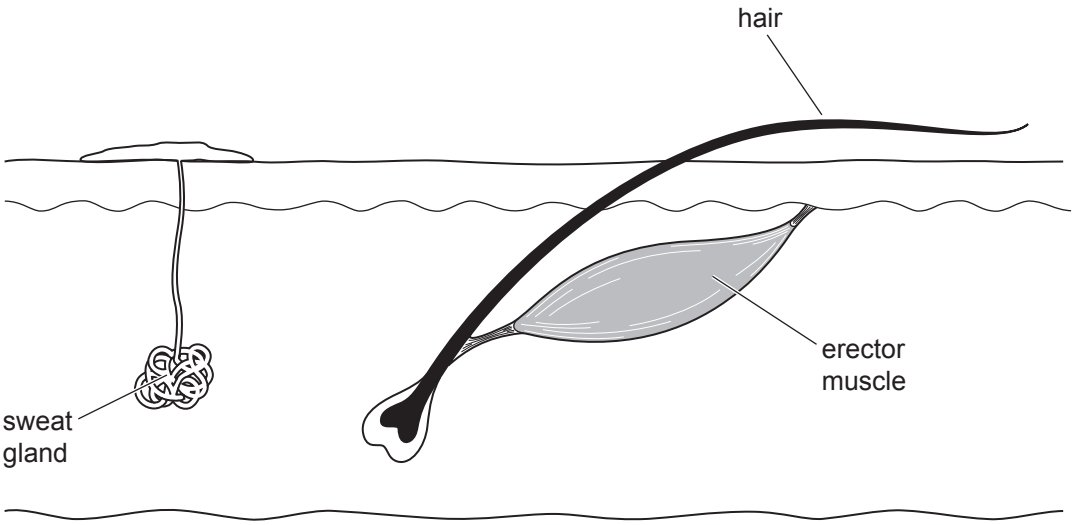
_____

_____

_____

_____ [4]

4 The skin plays an important role in temperature regulation.



The diagram shows the skin on a hot day. Complete the table to show how the following actions help the body lose heat.

Action	How this helps heat loss
Hair lies flat	
Sweat is produced	

[4]

Examiner Only

Marks	Remark

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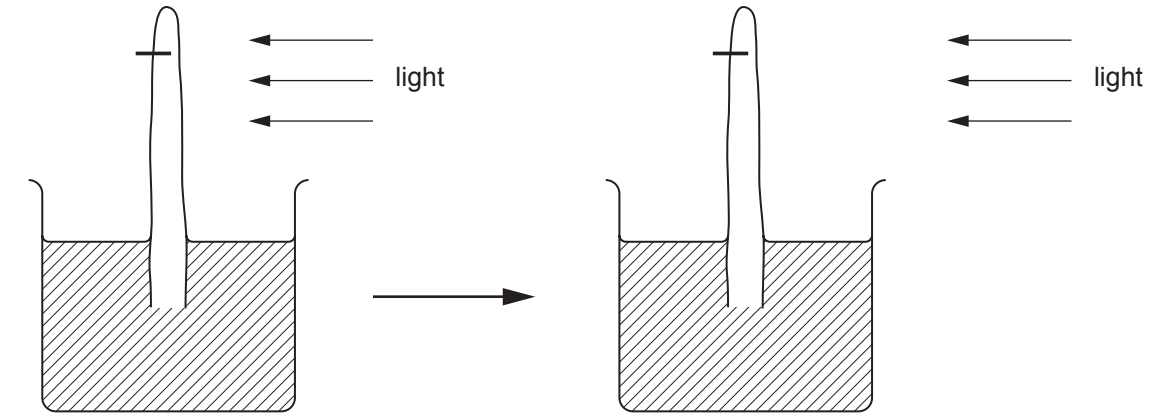
(Questions continue overleaf)

Examiner Only	
Marks	Remark

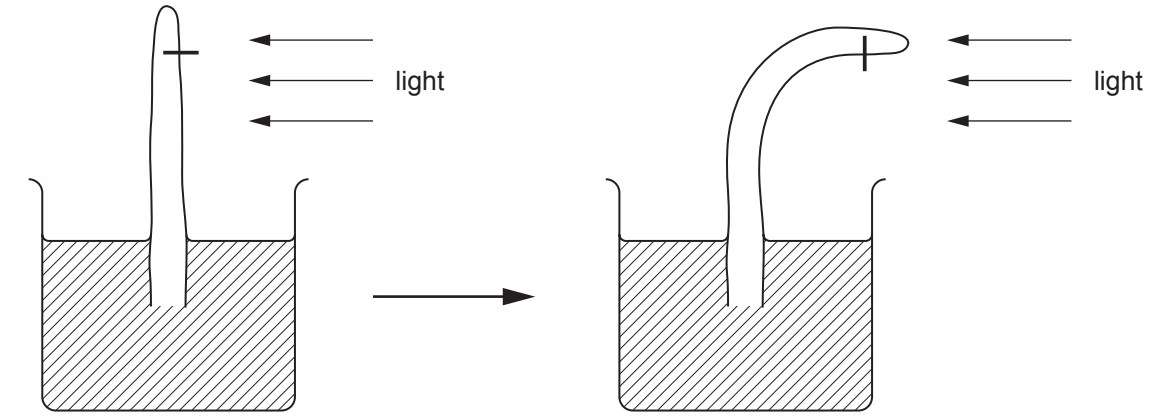
5 An experiment was carried out to investigate the effect of light shining from one side on a plant shoot.



small sheet of impermeable material placed in shaded side of shoot tip

after 5 days

Experiment A



small sheet of impermeable material placed in illuminated side of shoot tip

after 5 days

Experiment B

(a) A plant hormone (auxin) causes the bending response. Auxin is produced in the tip and travels downwards to cause the cells to elongate. Use the results to explain which side of the shoot the auxin travels downwards in.

_____

_____ [2]

(b) (i) Name the response shown by the shoot in experiment B.

_____ [1]

(ii) Explain how this response will benefit the plant.

_____

_____ [2]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

6 **(a)** The table gives information about digestive enzymes.

Complete the table.

Enzyme	Food broken down	Product(s) of digestion
amylase		maltose (glucose)
lipase	fat	+

[2]

(b) Explain why lipase will not break down protein.

_____

_____

_____ [2]

Examiner Only	
Marks	Remark

7 **(a)** Add one word to each box to complete the equations for aerobic and anaerobic respiration.

Aerobic:

Glucose + Oxygen → Carbon dioxide + [ ] + Energy

Anaerobic:

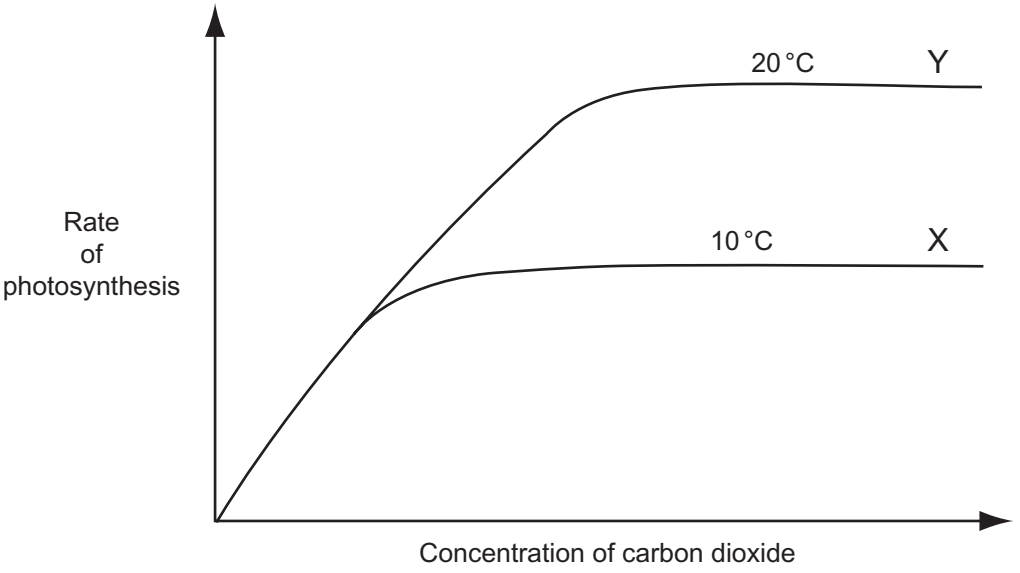
Glucose → Carbon dioxide + [ ] + Energy

[2]

(b) Suggest why more energy is released in the breakdown of one molecule of glucose in aerobic rather than anaerobic respiration.

_____ [1]

8 The graph shows the effect of carbon dioxide on the rate of photosynthesis.



(a) Which factor is **not** limiting the rate of photosynthesis at both X and Y?

_____ [1]

(b) Explain why the rate of photosynthesis in plants is higher at 20 ºC than at 10 ºC.

_____

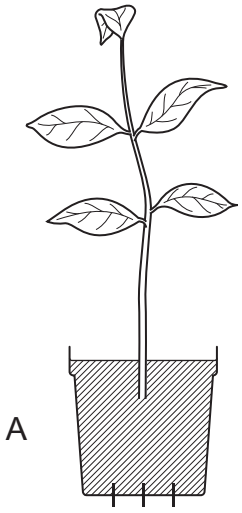
_____

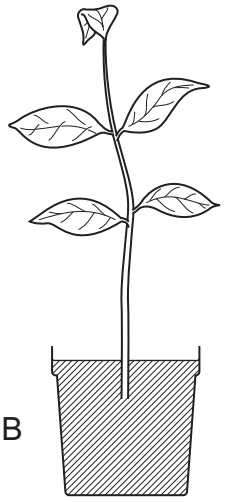
_____ [2]

Examiner Only

Marks	Remark

9 Two tree seedlings, A and B, were placed in pots.





The base of pot A was perforated. This allowed any excess water to drain out. Seedling B was in a pot that did not allow drainage. Waterlogged soil contains little oxygen. Explain why seedling B grew poorly and its leaves eventually turned yellow.

_____

_____

_____

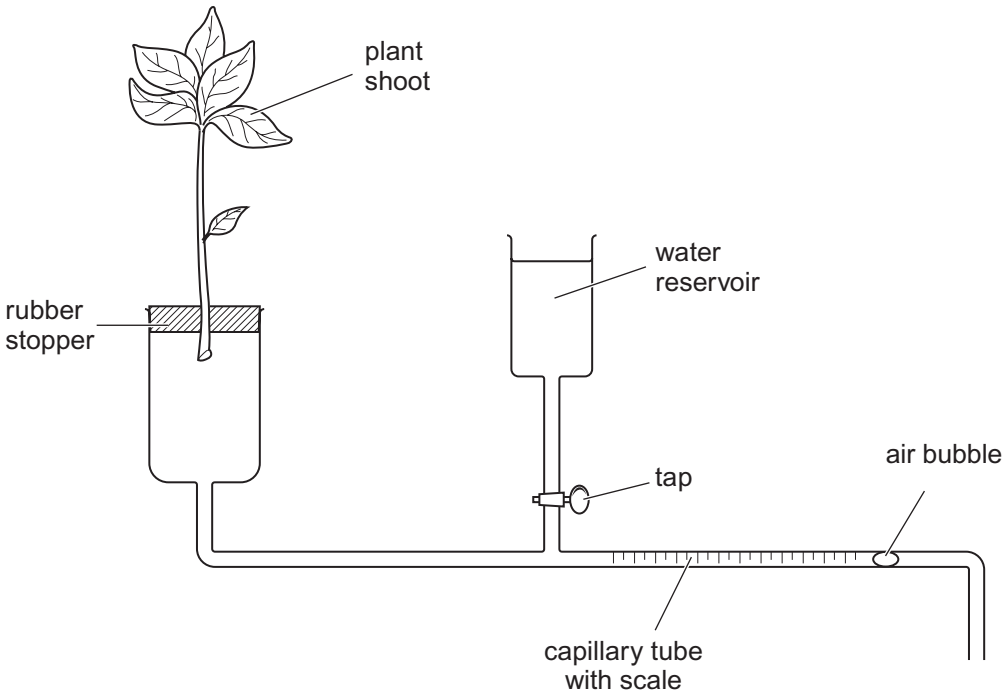
_____

_____ [4]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

10 The diagram shows a potometer which is used to measure the rate of water uptake by a leafy shoot.



(a) Give **two** precautions you would take when setting up the potometer to ensure that no air bubbles are present apart from the one shown in the diagram.

_____

_____

_____ [2]

(b) If a clear polythene bag was placed over the shoot, describe and explain how this would affect the rate of water uptake.

_____

_____

_____ [2]

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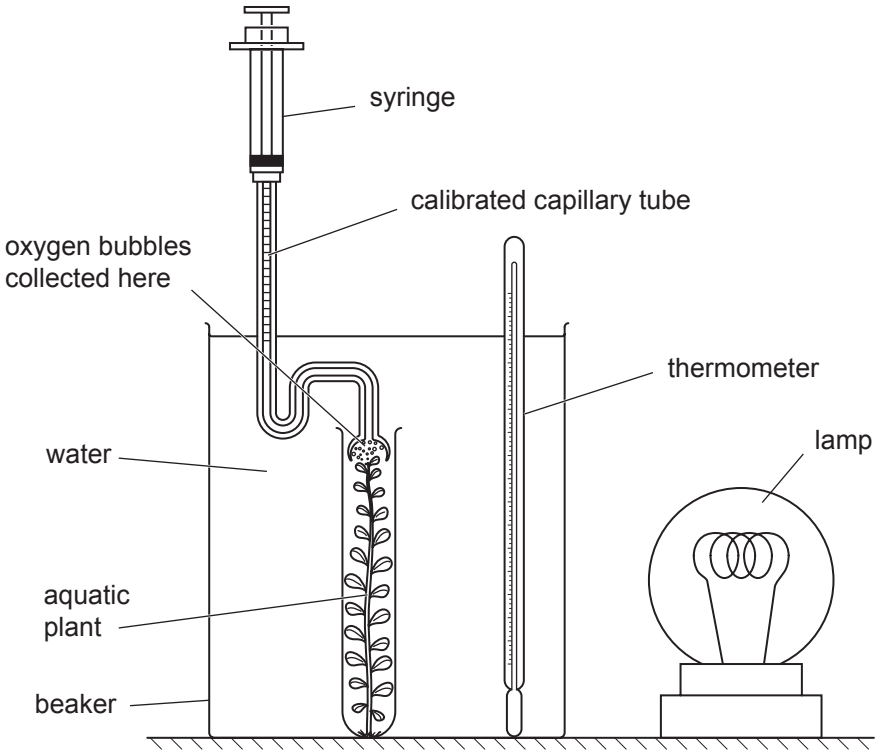
11 The diagram shows apparatus used to investigate the effect of light on the release of oxygen during photosynthesis by an aquatic plant.

Examiner Only	
Marks	Remark



(a) Suggest why the boiling tube containing the aquatic plant is placed in a beaker of water.

_____ [1]

(b) Suggest how the apparatus is used to measure the rate of oxygen production at a particular light intensity.

_____

_____

_____

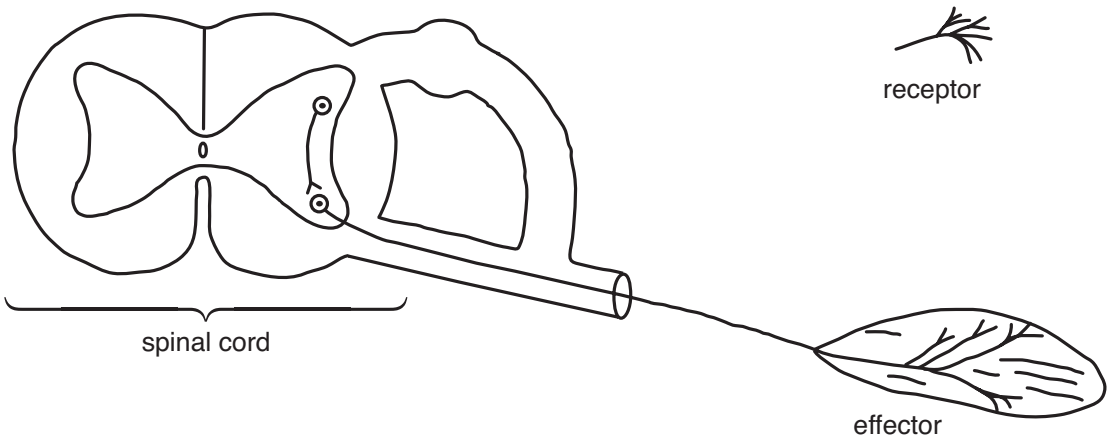
_____ [3]

(c) Suggest **one** reason why the oxygen released by the plant is an underestimation of the oxygen produced by photosynthesis.

_____

_____ [1]

12 The diagram shows a cross section of the spinal cord to illustrate a reflex arc.



(a) Complete the diagram by drawing in the sensory neurone. [1]

(b) Name the effector in a reflex arc.

_____ [1]

(c) What is the advantage of a reflex action?

_____ [1]

(d) Reflex arcs in the spinal cord connect with other neurones (not shown on the diagram) that travel up the spinal cord. Suggest what their function is.

_____ [1]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only

Marks	Remark

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