Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2011–2012

Science: Double Award (Modular)

Living Organisms and the Processes of Life

End of Module Test

Higher Tier

A

[GDA02]

GDA02

MONDAY 27 FEBRUARY 2012
9.30 am–10.15 am

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

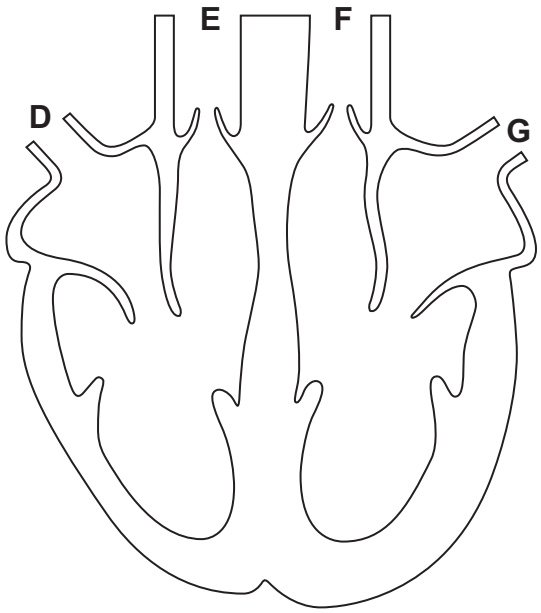
Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all twelve** questions.

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	

1 The diagram shows a section through the heart.



(a) Which of the blood vessels, **D**, **E**, **F** or **G**:

(i) carries oxygenated blood back to the heart?

[1]

(ii) carries deoxygenated blood to the lungs?

[1]

(b) Draw arrows on the diagram above to show the direction of blood flow through **each side** of the heart. [2]

Examiner Only	
Marks	Remark

2 Gaseous exchange takes place in the lungs.

Examiner Only	
Marks	Remark

(a) State two ways in which inhaled air is different from exhaled air.

1. _____

2. _____ [2]

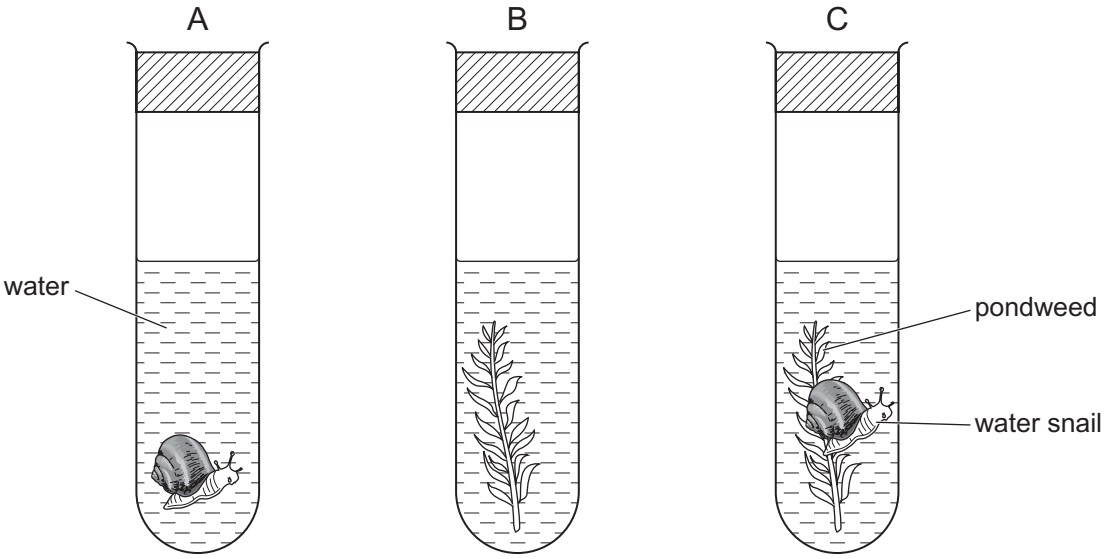
(b) List two features of the alveoli, in the lungs, that make them efficient gas exchange surfaces.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

3 A student sets up an experiment as shown in the diagram.



The tubes were left in the light for four hours. They were then tested for carbon dioxide concentration.

Which tube would have had the highest carbon dioxide concentration after four hours? Explain your answer.

Tube _____

Explanation _____

_____

_____

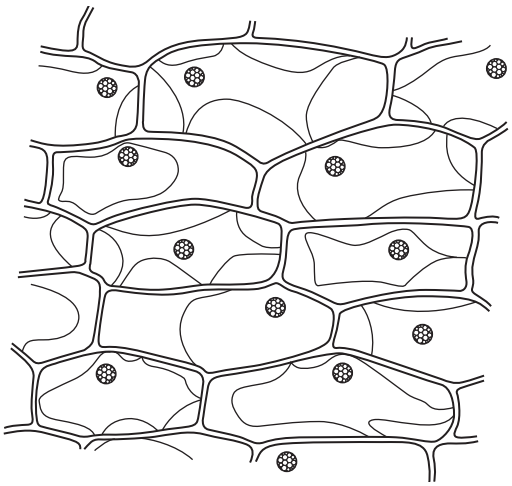
_____

_____

_____ [4]

Examiner Only	
Marks	Remark

4 The diagram shows onion epidermal cells that were placed in a strong sugar solution.



Describe and explain what has happened to the cells.

_____

_____

_____

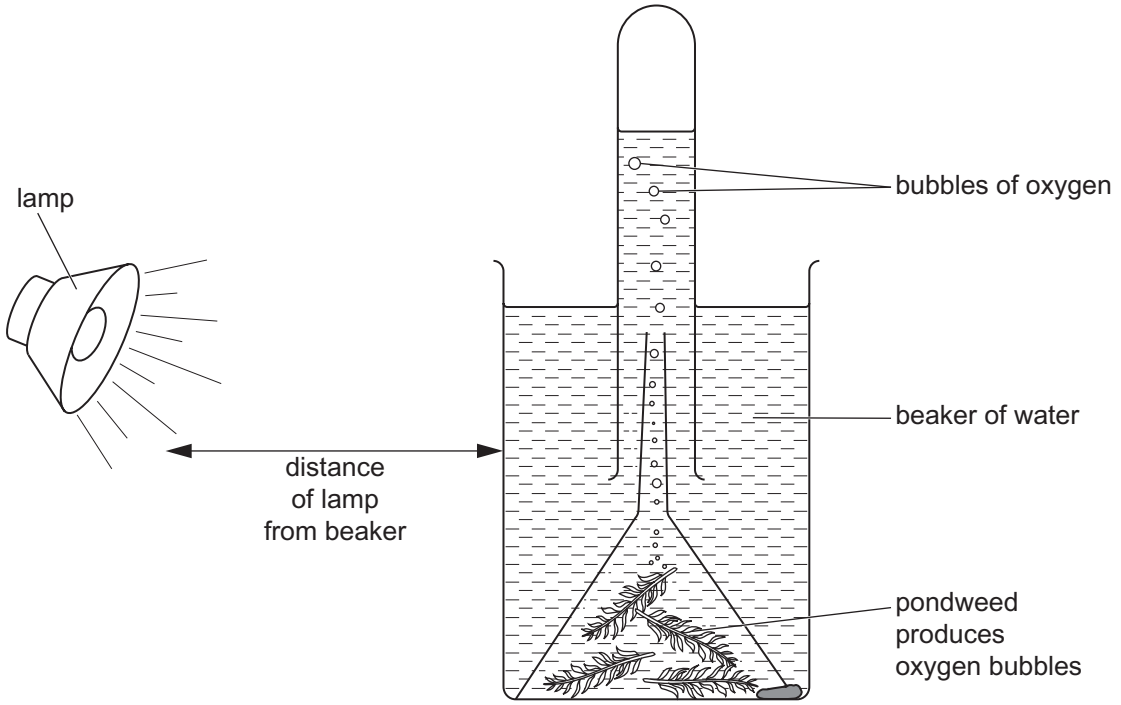
_____

_____

_____ [4]

Examiner Only	
Marks	Remark

5 An experiment was set up to investigate the effect of light intensity on photosynthesis.



Adapted from © GCSE Single Award Science for CCEA by T Laverty, J Napier & R White, page 3, published by Hodder Murray, 2006. ISBN 978 -340926000. 'Reproduced by permission of Hodder Education'.

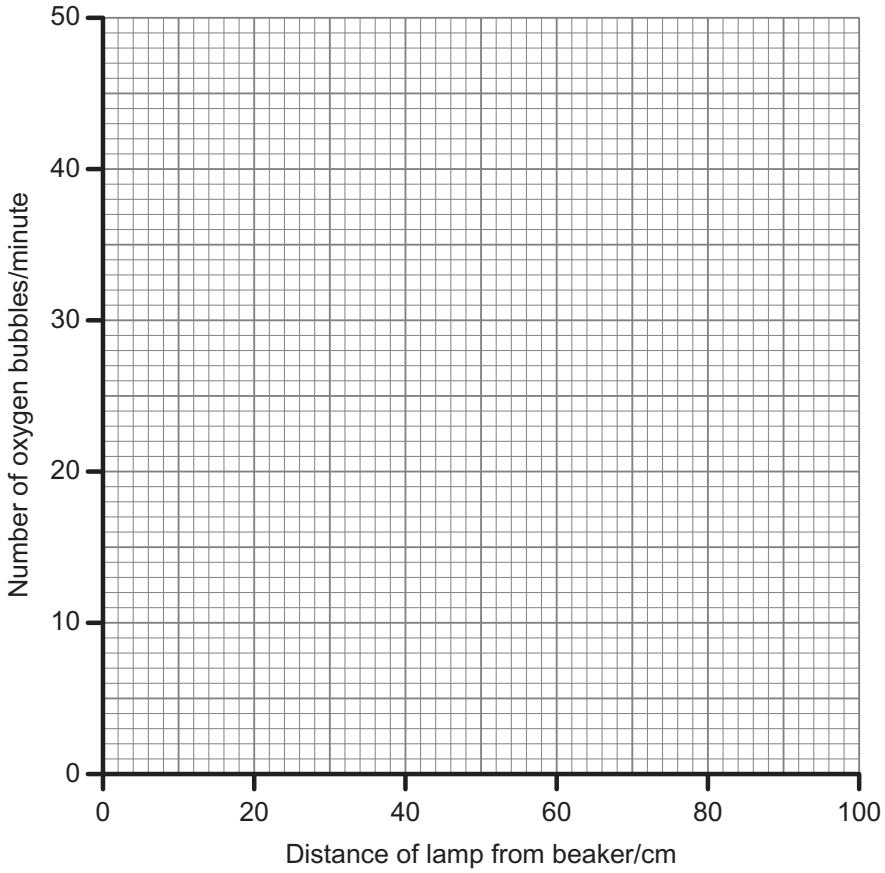
At a certain light intensity, the number of oxygen bubbles released in one minute was counted.

The experiment was repeated with the lamp placed at different distances from the beaker. The results are shown in the table.

Distance between lamp and beaker/cm	Number of oxygen bubbles/ minute
20	48
40	46
60	30
80	10
100	10

Examiner Only	
Marks	Remark

(a) Plot a line graph of these results.



[2]

(b) Use your graph to estimate the number of oxygen bubbles released per minute if the lamp was 50 cm away from the beaker.

_____ bubbles/minute [1]

(c) Describe the trend shown in the graph.

_____

_____ [1]

(d) **(i)** Describe **two** measures you could take to control variables in this experiment.

_____

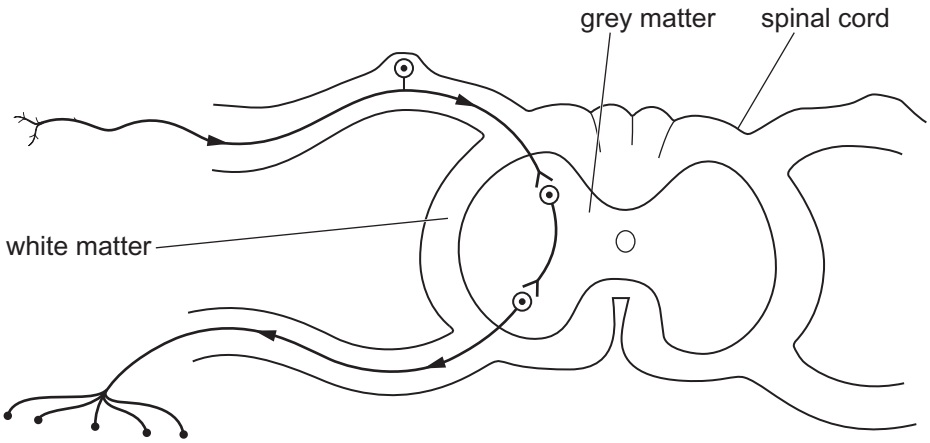
_____

_____ [2]

(ii) How could you improve the reliability of this experiment?

_____ [1]

6 The diagram shows a reflex arc.



(a) On the diagram, draw in the effector in its correct position. [1]

(b) If you touch a very hot object you pull your hand away rapidly. This is an example of a reflex action.

Explain why the response is so rapid.

_____

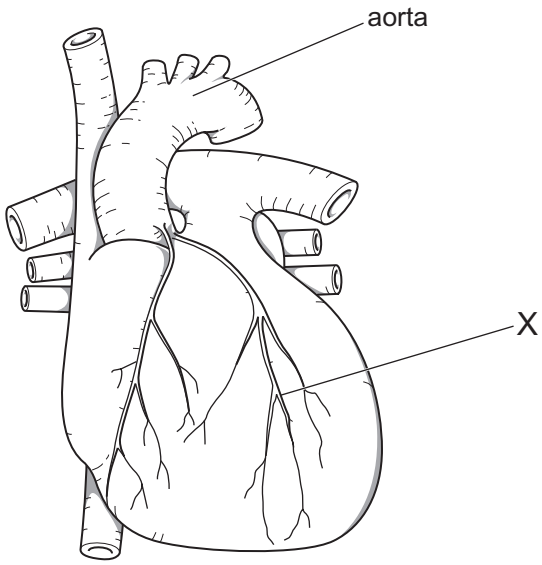
_____ [1]

(c) Give **one** other example of a reflex action.

_____ [1]

Examiner Only	
Marks	Remark

7 The diagram shows the heart and its associated blood vessels.



Explain what would happen if there was a blockage at X.

_____

_____

_____

_____

_____ [4]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

8 Children are vaccinated against certain diseases such as polio and tuberculosis. The vaccines contain antigens.

(a) What is the function of an antigen in a vaccine?

_____ [1]

(b) Two children are exposed to the measles virus. Paul had previously received a vaccination against measles but Laura has not been vaccinated.

Describe and explain the difference in the immune response of Paul and Laura.

_____

_____

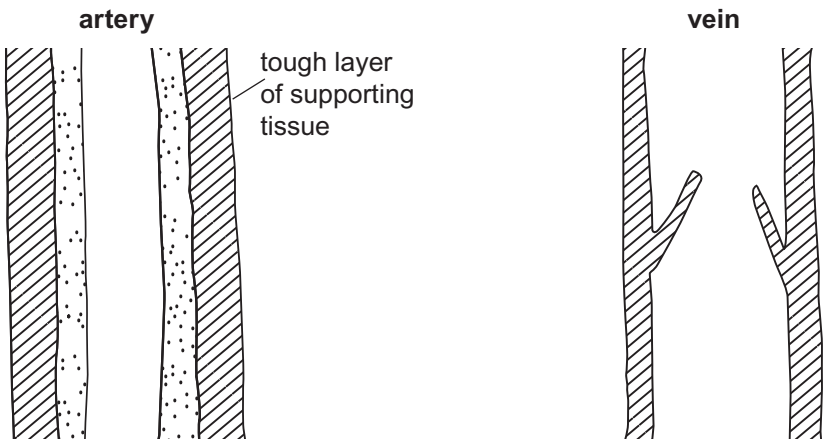
_____

_____

_____

_____ [3]

9 The diagrams show sections of an artery and a vein. [Not to scale.]



Use the diagram and your understanding to explain how arteries and veins are adapted for their functions.

_____

_____

_____

_____

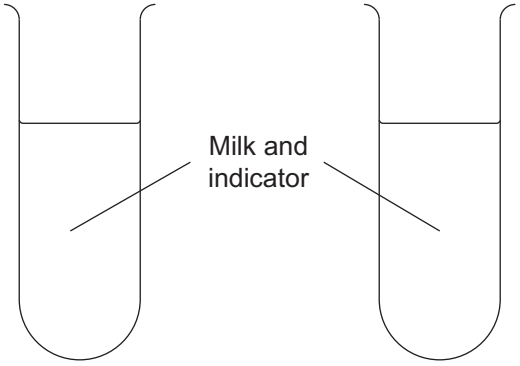
_____

_____ [3]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

10 An experiment was set up to investigate the effect of lipase on the fat in milk. Each tube contained 5 cm^3 of milk, universal indicator and lipase or boiled and cooled lipase as shown in the diagram.



Tube A
1 cm^3 lipase

Tube B
1 cm^3 boiled and cooled lipase

Tubes A and B were kept in a water bath at 35 °C for two hours. Universal indicator changes colour as shown in the box below.

pH4 orange	←	pH7 green	→	pH10 blue

(a) What colour would you expect in Tube A at the end of the experiment?

Explain your answer.

_____

_____

_____

_____

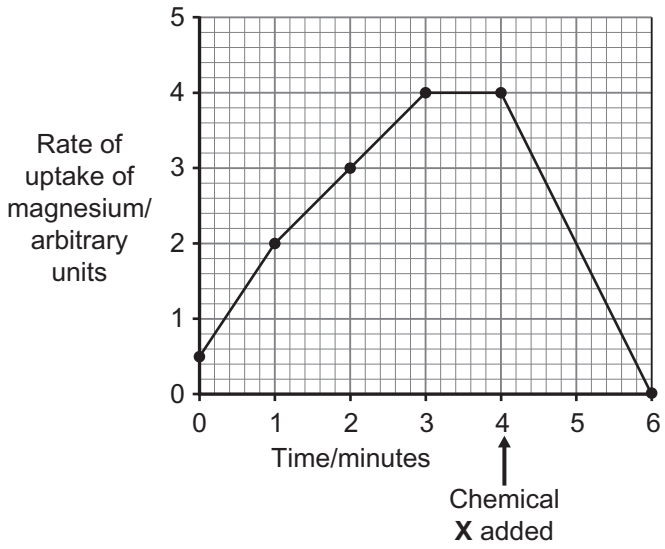
_____ [3]

(b) Explain why there would be no colour change in tube B at the end of the experiment.

_____ [1]

Examiner Only	
Marks	Remark

11 The graph shows the rate at which a plant absorbs magnesium through its roots by active transport. After four minutes a chemical **X** was added to the plant roots.



(a) Suggest why the rate of active transport had levelled off between three and four minutes.

_____ [1]

(b) Suggest which cellular process is stopped by chemical **X** that then caused the rapid decline in active transport.

_____ [1]

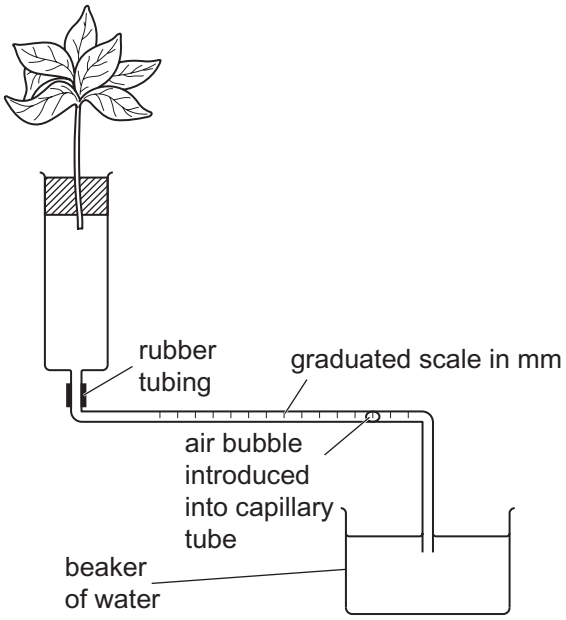
(c) State **one** advantage of active transport over diffusion.

_____

_____ [1]

Examiner Only	
Marks	Remark

12 A potometer was set up to measure the rate of water uptake by a leafy shoot.



To reset the apparatus the air bubble can be expelled from the potometer by squeezing the rubber tubing.

(a) Describe how you would use this potometer to investigate the difference in water loss between upper and lower leaf surfaces.

[4]

(b) Explain the results you would expect.

[2]

THIS IS THE END OF THE QUESTION PAPER

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