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

WEDNESDAY 10 NOVEMBER 2010, AFTERNOON

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.

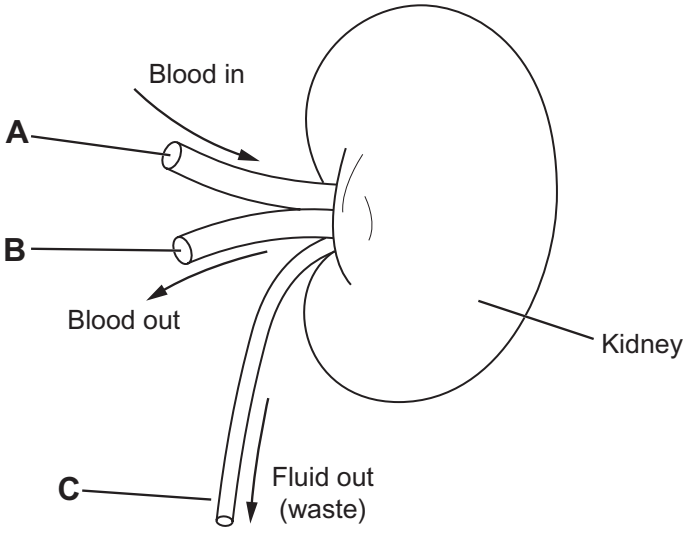
INFORMATION FOR CANDIDATES

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 kidney controls the water content of the body and removes waste from the blood.



(a) Name blood vessel **A**.

_____ [1]

(b) Suggest one substance that you would expect to be at a higher concentration in blood vessel **A** compared to blood vessel **B**.

_____ [1]

(c) Where is the fluid in **C** taken to for temporary storage?

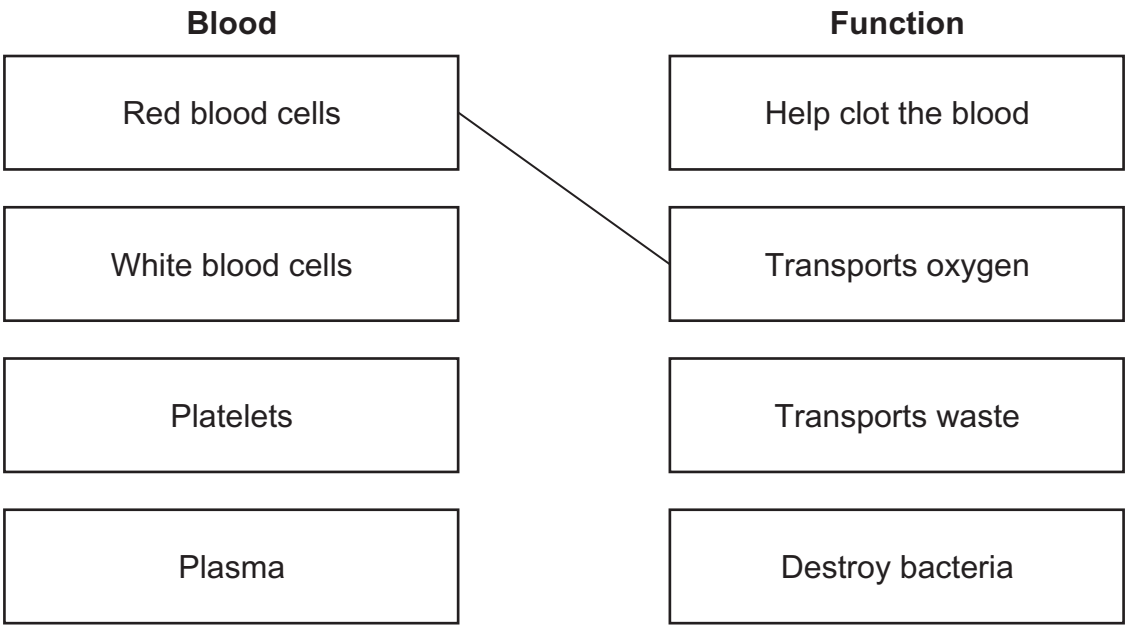
_____ [1]

Examiner Only	
Marks	Remark

2 The blood is made up of cells, plasma and platelets.

(a) Draw one line from each blood component to its function.

One example has been completed for you.



[2]

(b) The heart is supplied with blood by the coronary artery.

Explain why eating too much animal fat can cause a heart attack.

_____

_____

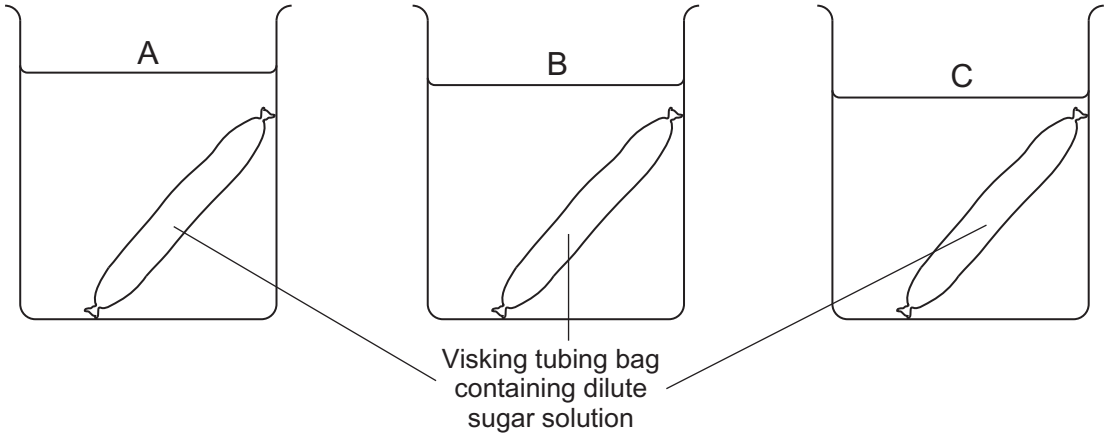
_____

_____

_____ [3]

Examiner Only	
Marks	Remark

3 Paul filled three Visking tubing bags with dilute sugar solution as shown in the diagram. Visking tubing is selectively permeable.
He then placed each bag into one of three beakers, A, B and C.
One beaker contained water, another dilute sugar solution and the other concentrated sugar solution.



After being weighed the bags were left in the beakers for one hour. They were then removed, excess liquid on the outside dried and the bags reweighed. The results are shown in the table.

Beaker	Mass of Visking tubing bag at start/g	Mass of Visking tubing bag after one hour/g	Change in mass/g
A	10.0	14.9	+4.9
B	10.0	10.0	0
C	10.0	6.4	–3.6

(a) Use the results to work out which fluid was in each beaker. Write the letter of the correct beaker in the appropriate box.

Concentrated sugar solution – beaker ☐

Dilute sugar solution – beaker ☐ [2]

(b) Explain why the Visking tubing in beaker A increased in mass.

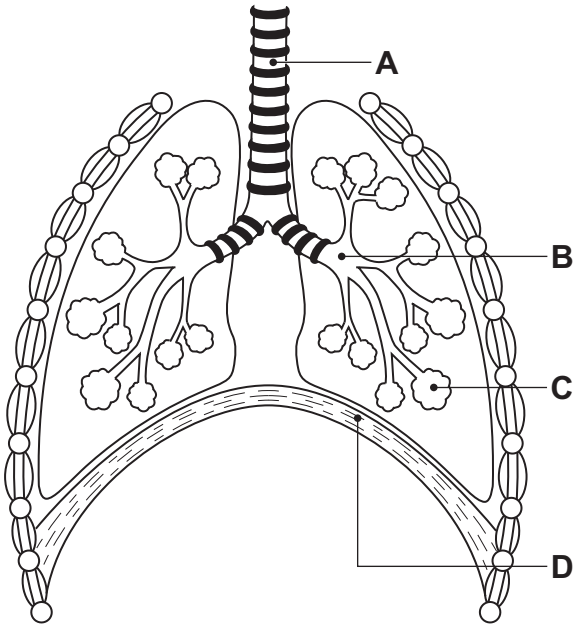
_____

_____

_____

_____ [3]

4 The diagram shows the human respiratory system.



(a) Which letter, **A**, **B**, **C** or **D** points to a bronchus?

_____ [1]

(b) Name the process by which oxygen moves from the alveoli into the blood.

_____ [1]

(c) Describe and explain the mechanism of inhalation (breathing in).

_____

_____

_____

_____

_____ [4]

Examiner Only

Marks	Remark

5 **(a)** Name the type of micro-organism that causes the disease athlete's foot.

_____ [1]

(b) Describe how the body defends itself against bacteria that have entered the bloodstream.

_____

_____

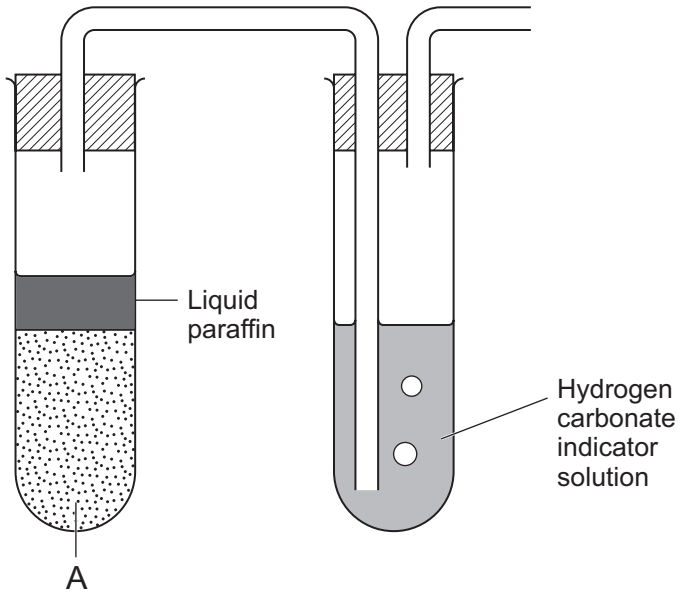
_____

_____

_____ [3]

Examiner Only	
Marks	Remark

6 The diagram shows the apparatus used to investigate anaerobic respiration.



(a) In addition to yeast, liquid paraffin and water, what else must be added to test tube A to ensure respiration takes place?

_____ [1]

(b) Describe two differences in the **products** of aerobic and anaerobic respiration.

1. _____

_____ [1]

2. _____

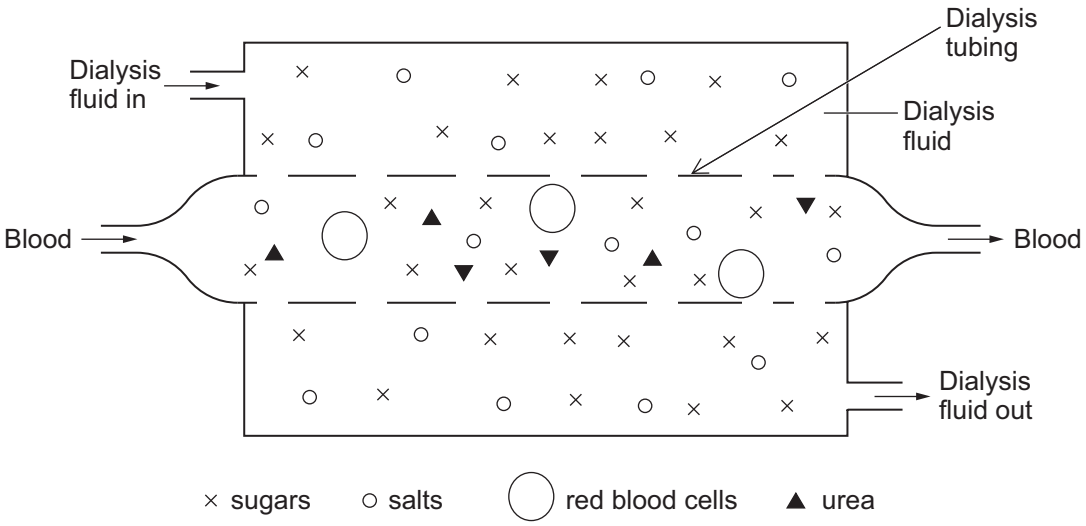
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

7 The diagram represents an artificial kidney machine. The diagram shows the relative concentrations at the start of dialysis.



(a) Explain why the concentration of sugars (x) is the same in the dialysis fluid and in the blood.

_____ [1]

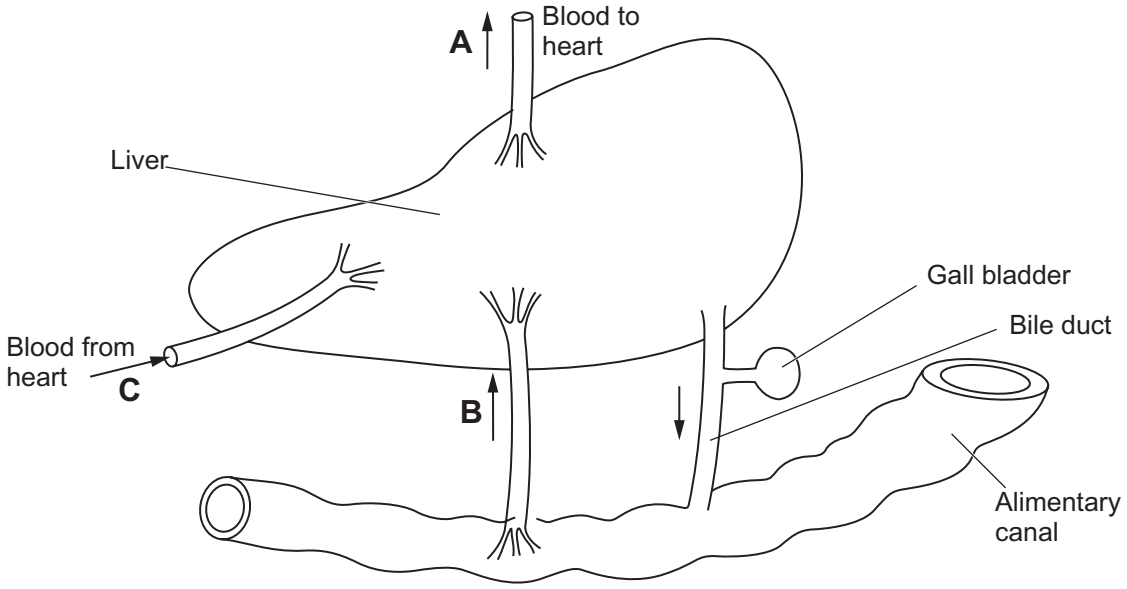
(b) Use the diagram and your knowledge to explain how urea is removed from the blood.

_____

_____

_____ [2]

8 The diagram summarises how substances get to and from the liver.



(a) Which blood vessel **A**, **B** or **C** is the hepatic artery? Explain your answer.

_____ [1]

(b) Bile is made in the liver and stored in the gall bladder. What is the function of bile in digestion?

_____

_____ [2]

(c) Describe one way in which the liver deals with excess glucose carried to it by vessel **B**.

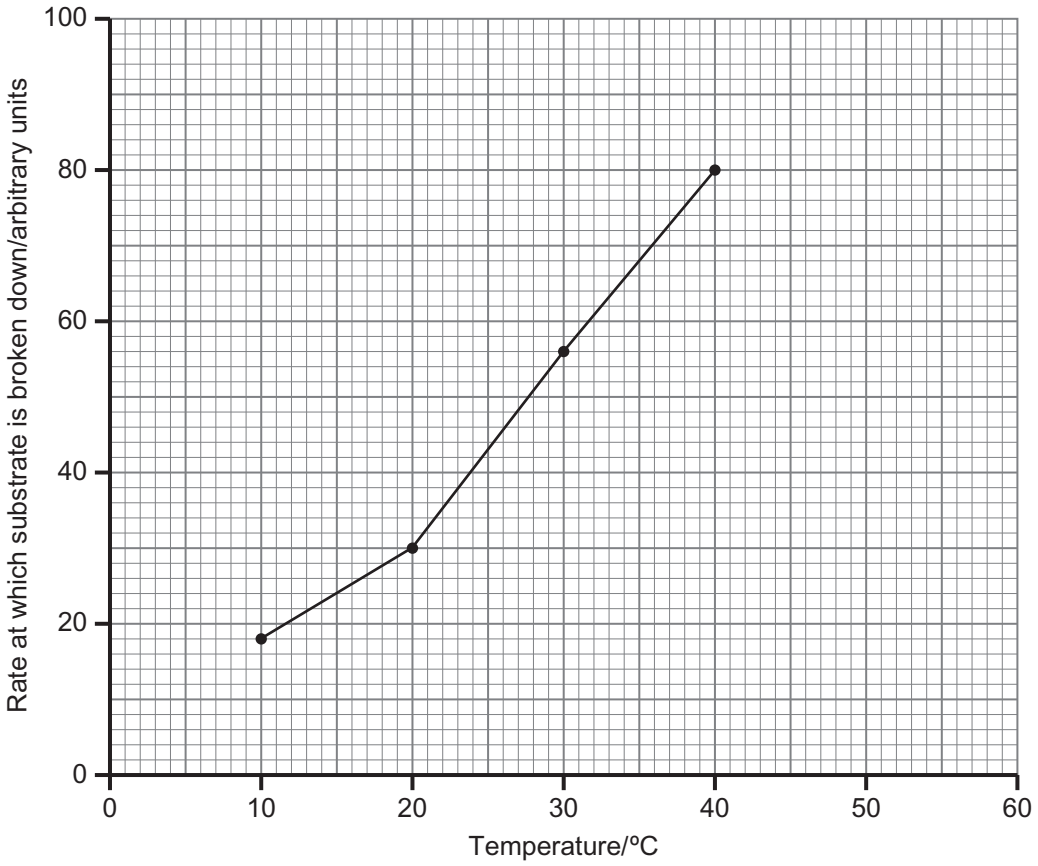
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

9 The temperature at which the enzyme amylase and its substrate are maintained will affect the rate of the reaction. The graph shows the effect of increases in temperature from 10 ºC to 40 ºC on the activity of amylase.



(a) Name the substrate used in the experiment.

_____ [1]

(b) Explain why an increase in temperature from 10 ºC to 40 ºC results in an increase in the rate of breakdown of the substrate.

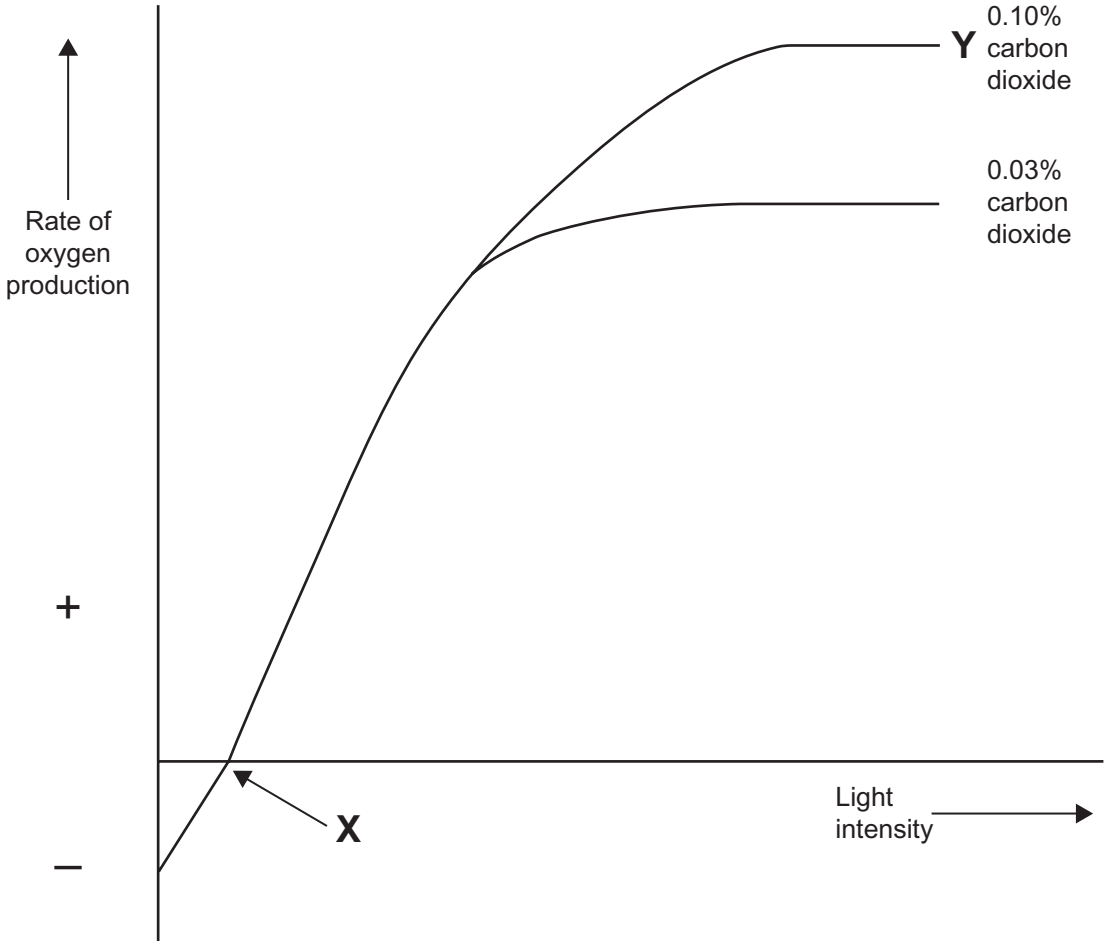
_____

_____

_____ [2]

(c) Continue the graph to show what you would expect to happen to the rate of breakdown of the substrate if the temperature was increased to 60 ºC. [1]

10 The graph shows the effect of light intensity on the rate of oxygen production by a plant.



(a) Explain why the rate of oxygen production is zero at point **X**.

_____

_____

_____ [2]

(b) Using only information on the graph, give the factor that does **not** limit the rate of oxygen production at **Y**.

_____ [1]

Examiner Only

Marks	Remark

11 (a) Define the term transpiration.

_____

_____ [1]

The table shows the results of an experiment which examined the effect of humidity on the rate of transpiration by a plant.

Humidity/%	Rate of transpiration/cm^3/h
20	9.0
40	4.5
60	2.5
80	1.0

(b) Describe and explain the effect of humidity on the rate of transpiration.

_____

_____

_____

_____ [2]

(c) List two factors which should have been kept constant during the experiment.

1. _____

2. _____ [2]

Examiner Only

Marks	Remark

12 (a) Give two differences between active uptake and diffusion.

Examiner Only

Marks	Remark

_____

_____

_____

_____ [2]

(b) An experiment was carried out to investigate how temperature affected the rate of nitrate uptake by two barley seedlings. The results after 60 minutes were that the barley seedling kept at 4 ºC took up 50 units of nitrate ions. The other barley seedling kept at 24 ºC took up 300 units of nitrate ions. Suggest an explanation for the difference in these results.

_____

_____

_____

_____ [2]

(c) How would a shortage of nitrate ions affect a plant?

_____ [1]

THIS IS THE END OF THE QUESTION PAPER

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