



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

A

Higher Tier

[GDA02]



THURSDAY 19 MAY 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 thirteen** 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.

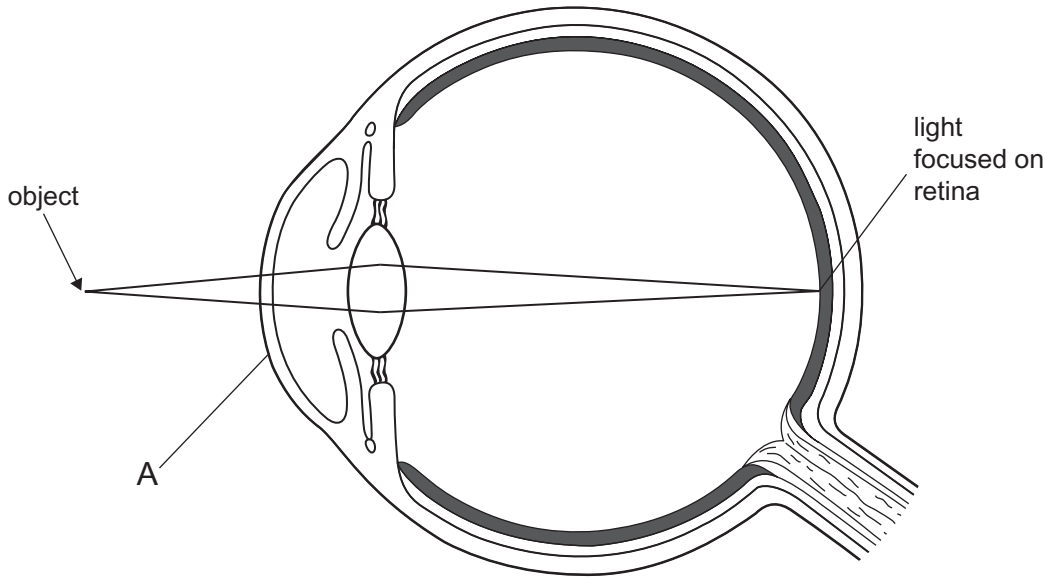
For Examiner's
use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
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10	
11	
12	
13	

Total
Marks



1 The diagram shows light from an object being focused by a human eye.



(a) Name part A.

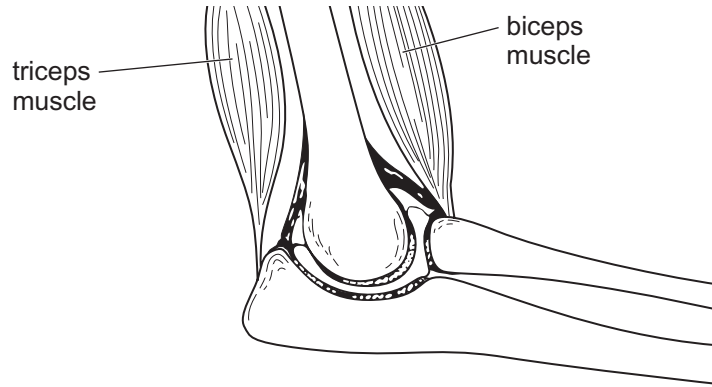
_____ [1]

(b) Describe how the image is focused on the retina and relayed to the brain.

_____ [3]

Examiner Only	
Marks	Remark

2 The diagram shows a section through the elbow joint.



(a) Use the diagram to explain what will happen to the two muscles when the lower arm is raised.

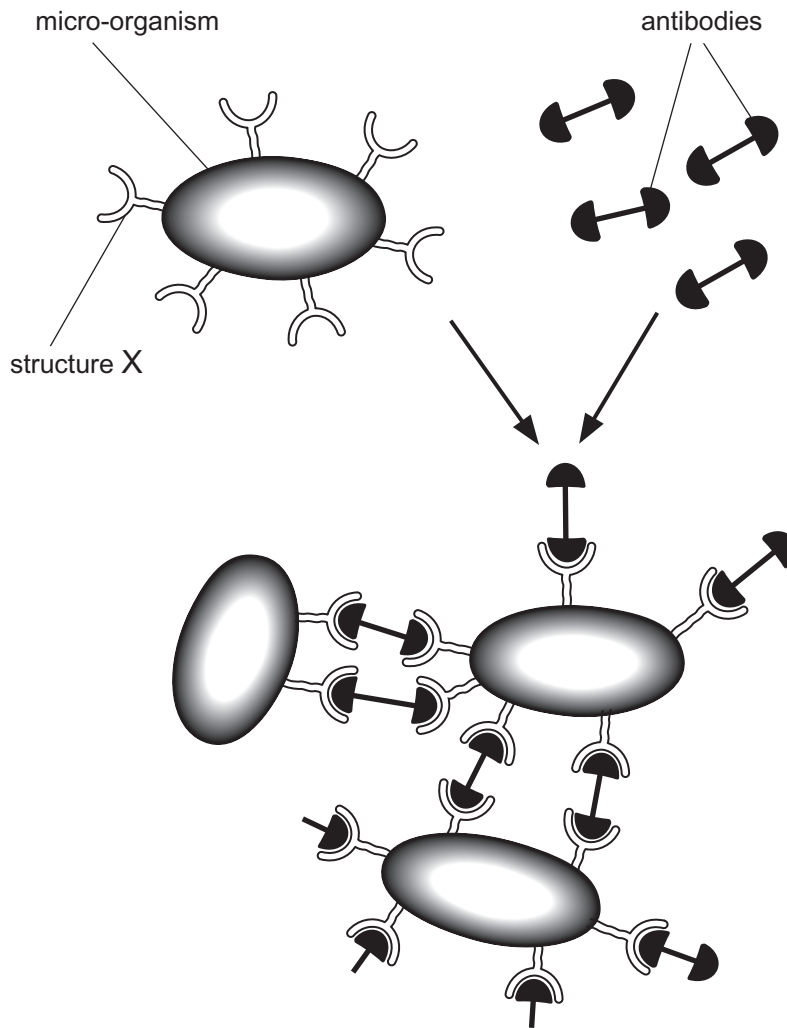
[2]

(b) Explain why the biceps and triceps are described as being an antagonistic pair of muscles.

[1]

Examiner Only	
Marks	Remark

3 One way that the body deals with invading micro-organisms is to produce antibodies. The diagram shows the sequence of events following the production of antibodies.



(a) Name structure X on the micro-organism that causes the production of antibodies.

_____ [1]

(b) Explain what will happen to the clump shown in the diagram.

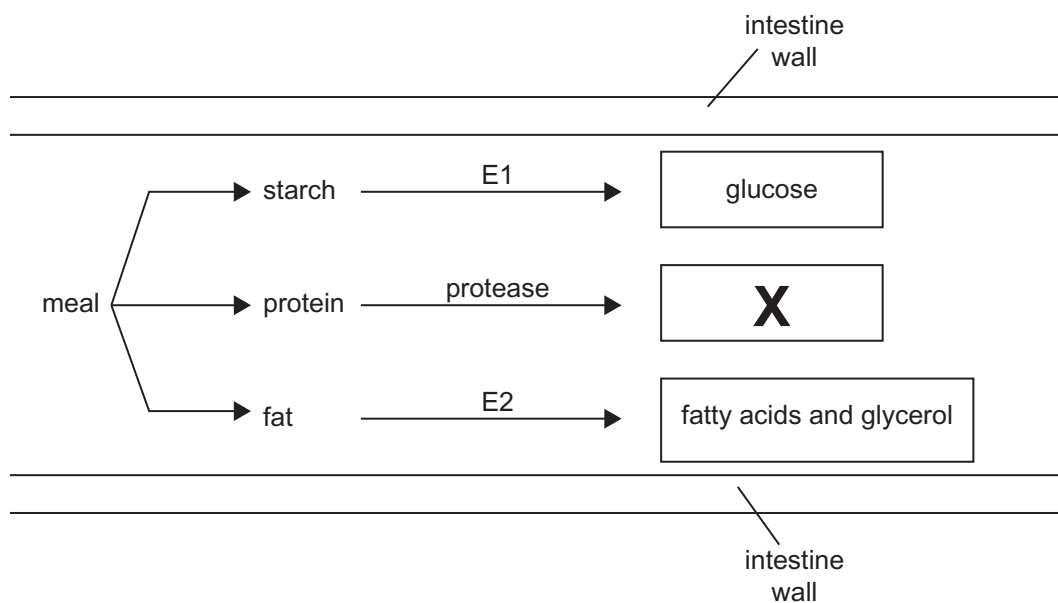
 _____ [2]

(c) Suggest why a person is unlikely to get the same disease twice, once antibodies have been produced.

_____ [1]

Examiner Only	
Marks	Remark

- 4 The diagram shows some of the processes going on in the small intestine after a meal has been eaten.



- (a) Use the diagram to name the enzymes, E1 and E2.

E1 _____

E2 _____ [2]

- (b) Name substance X.

_____ [1]

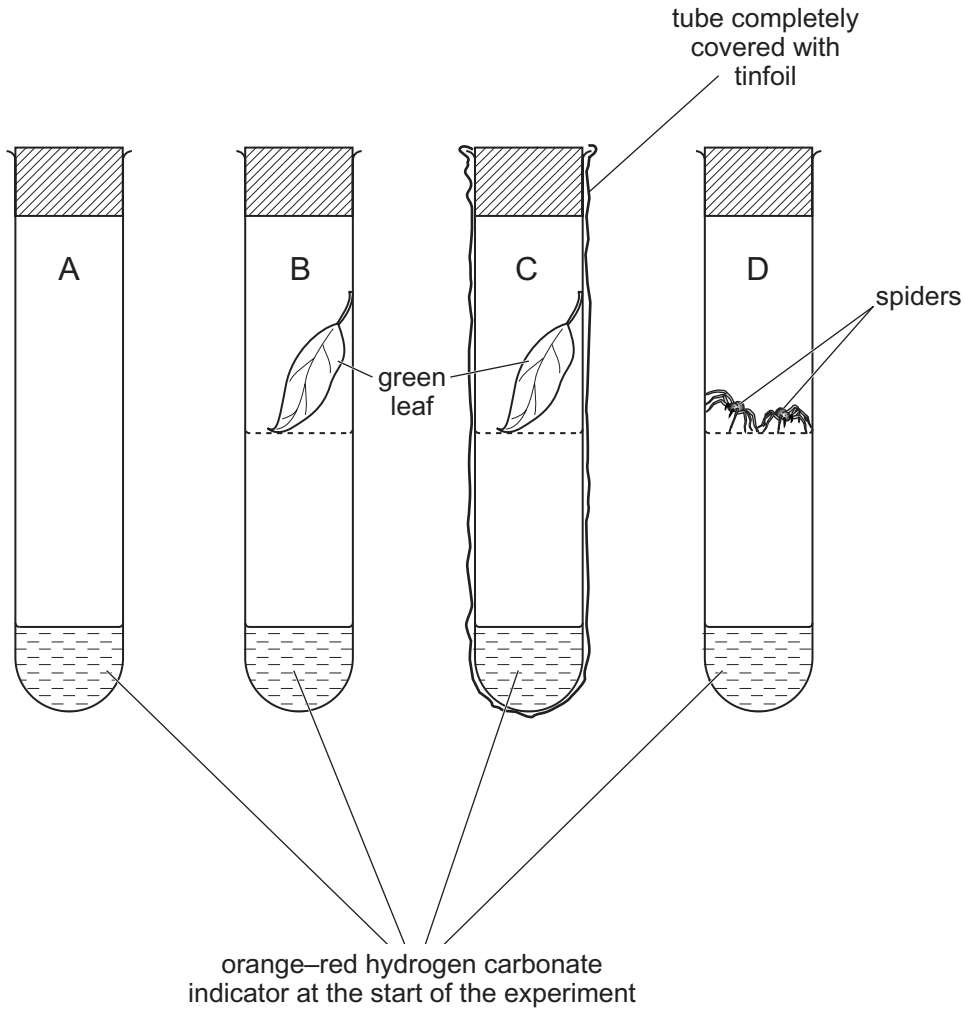
- (c) Give **one** way (not shown on the diagram) that the intestine wall is adapted for absorption.

_____ [1]

Examiner Only	
Marks	Remark

5 This experiment was set up to investigate gas exchange.

Examiner Only	
Marks	Remark



The colour changes of hydrogen carbonate indicator are shown below.

Purple ← Less carbon dioxide — Orange-red — More carbon dioxide → Yellow

The tubes were left in bright light for 10 hours.

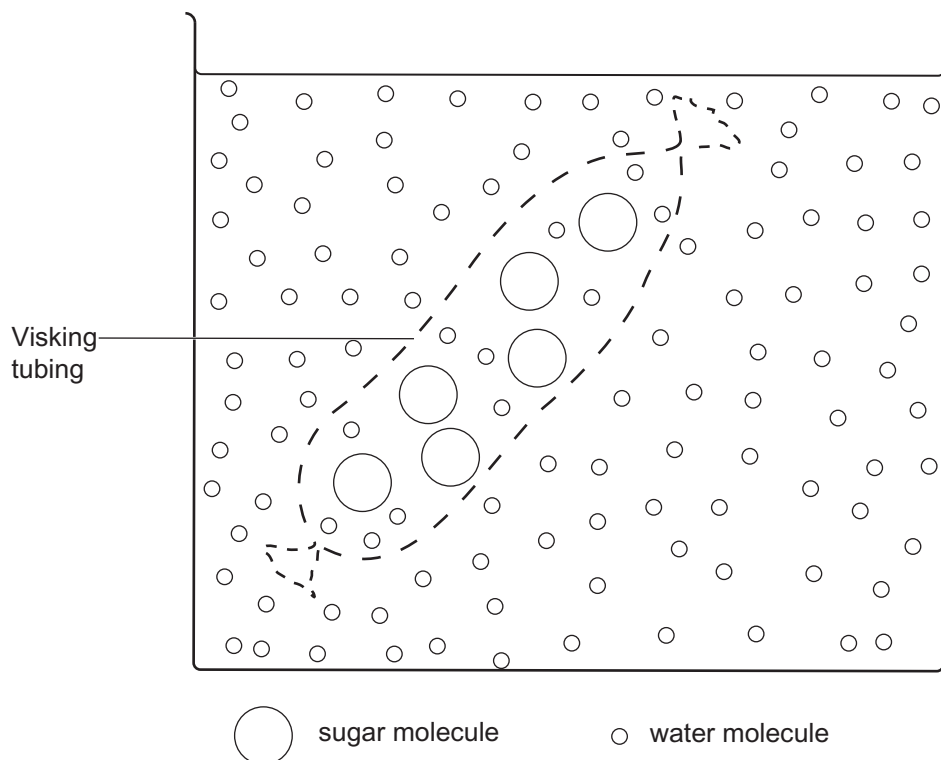
Complete the table below to state and explain the results of this experiment.

Tube	Colour of hydrogen carbonate indicator	Explanation of results
A	Orange-red	No living organisms present. No photosynthesis. No respiration.
B		Leaf in light. Uses more carbon dioxide in photosynthesis than it produces in respiration.
C		
D	Yellow	

[4]

Examiner Only	
Marks	Remark

6 Visking tubing was filled with sugar solution and then placed in a beaker of water.



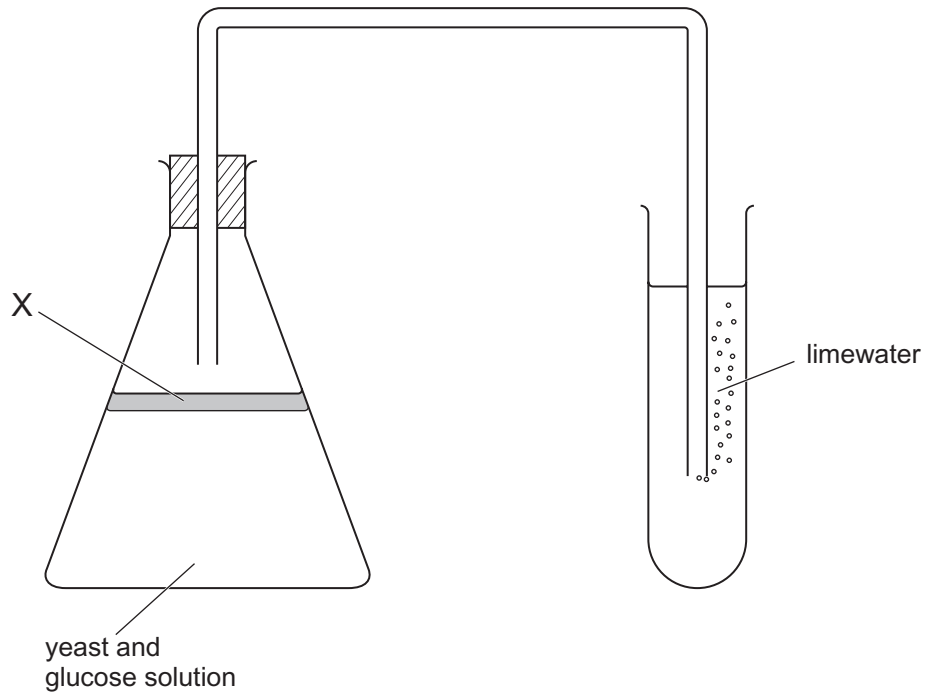
The Visking tubing is partially permeable.

Use the information in the diagram to describe and explain what would happen if the Visking tubing was left in the water for 24 hours.

[3]

Examiner Only	
Marks	Remark

7 An experiment was set up to investigate anaerobic respiration in yeast.



(a) Suggest what substance needs to be present at X.

_____ [1]

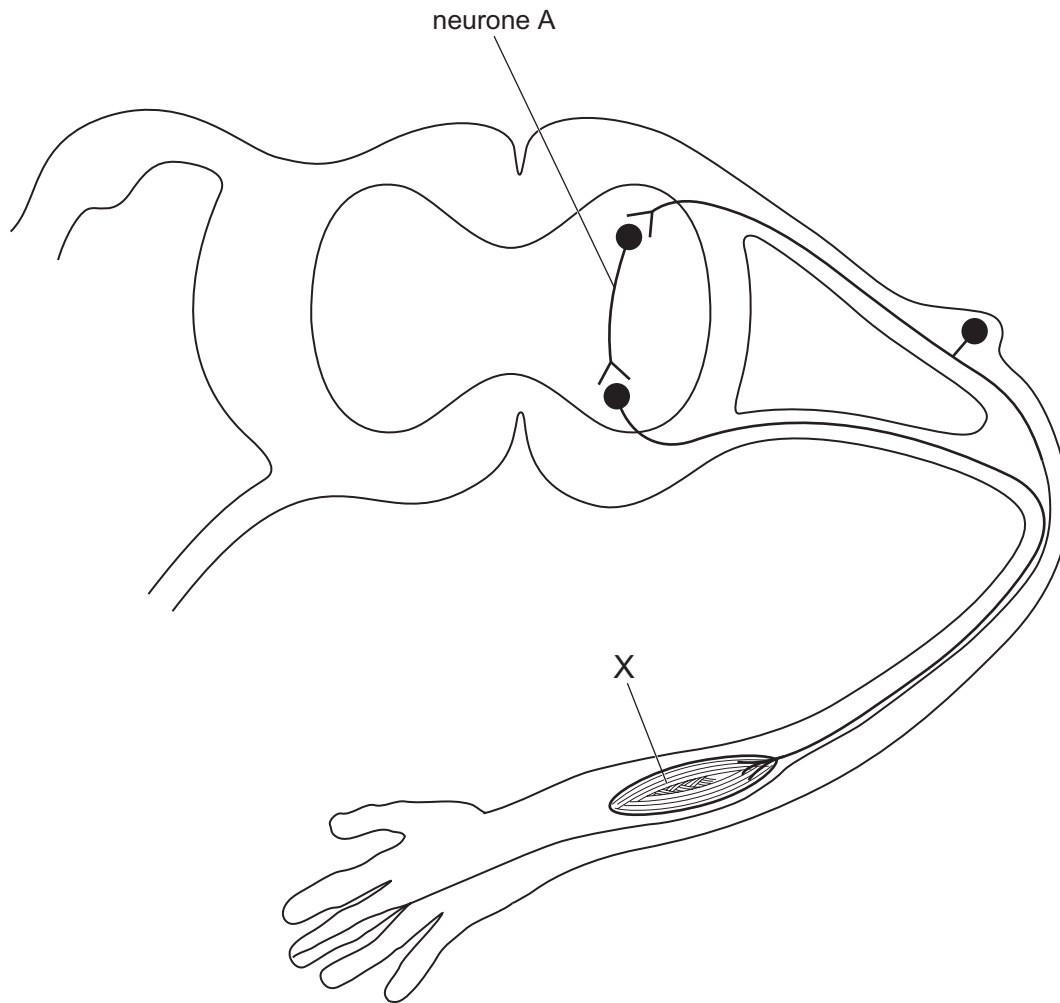
(b) State two ways in which the products of anaerobic respiration in yeast differ from the products of aerobic respiration.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

8 The diagram shows the neurones in a reflex arc.



(a) Name neurone A.

_____ [1]

(b) Name structure X.

_____ [1]

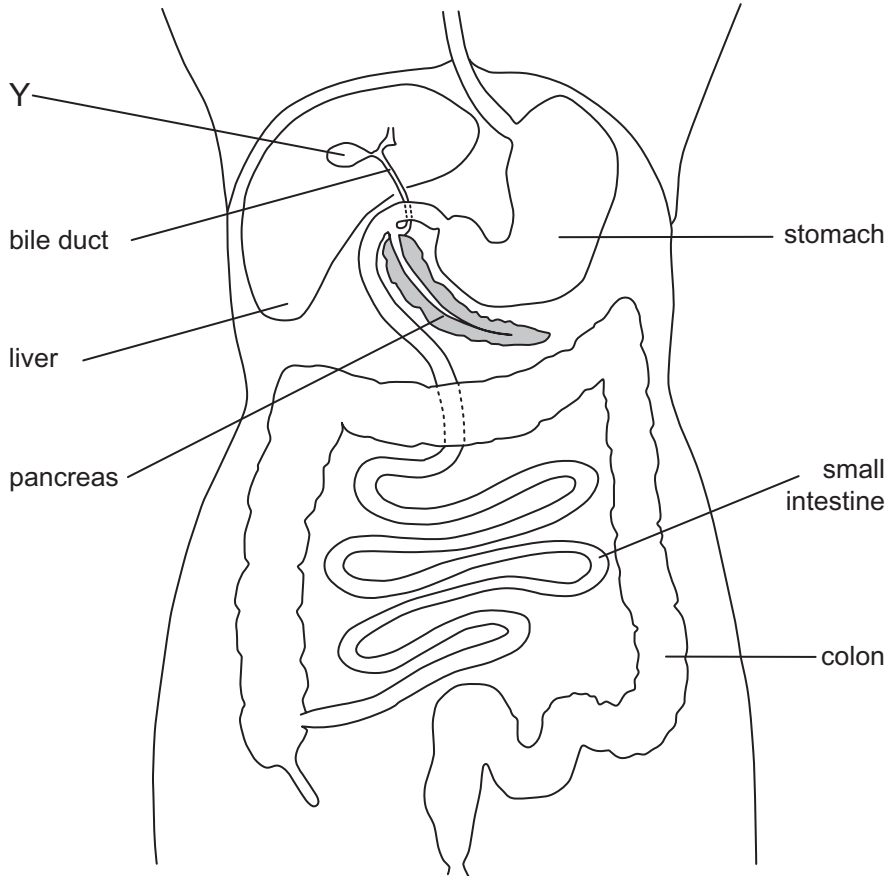
(c) Explain the advantage of **not** involving the brain in a reflex action.

_____ [1]

Examiner Only	
Marks	Remark

9 The diagram shows the liver and digestive system.

Examiner Only	
Marks	Remark



(a) (i) Bile is stored in structure Y after being produced in the liver. Name structure Y.

_____ [1]

(ii) Explain fully the role of bile in digestion.

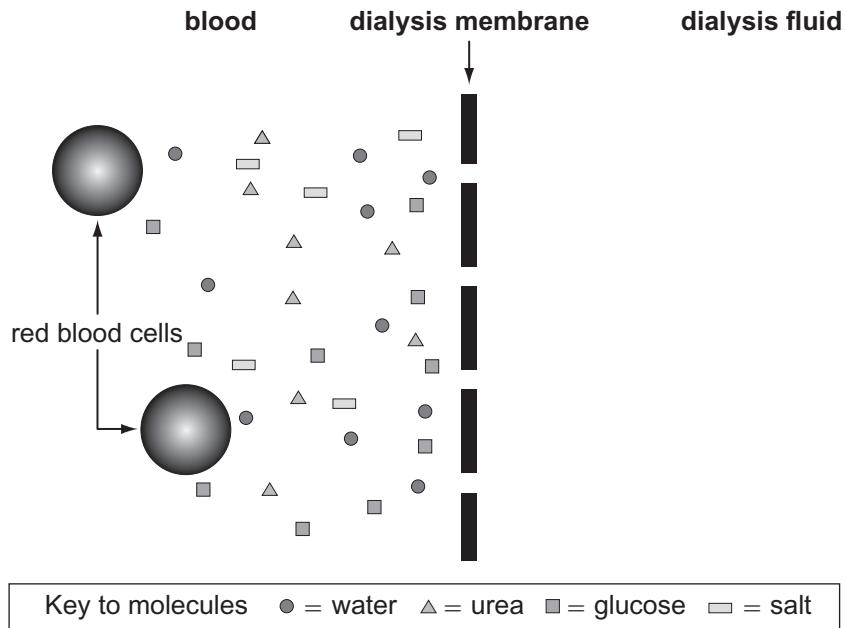
 _____ [2]

(b) If a person has had an operation to remove part of the colon, the colon will be shortened. What process will be affected?

_____ [1]

10 James has suffered kidney failure and has to have dialysis.

The diagram shows the composition of James' blood as it enters the dialysis machine. The composition of the dialysis fluid is not shown.



Complete the table to show whether each of the components listed is present in the dialysis fluid at the start of dialysis and at the end of dialysis.

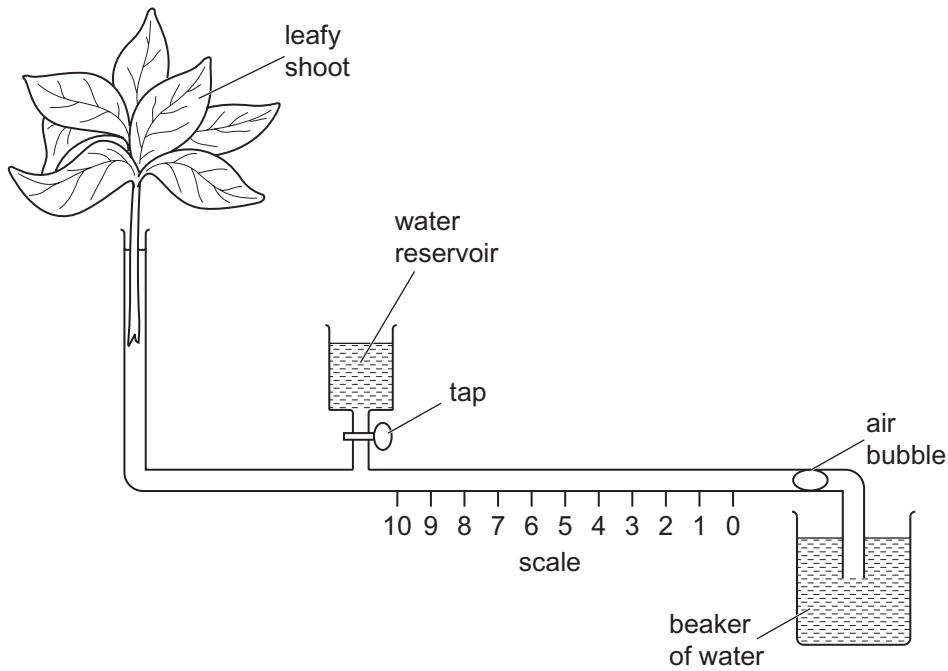
Place a tick (✓) if the component is present or a cross (X) if it is absent.

Component in James' blood	Component present or absent in the dialysis fluid	
	At start	At end
Water		
Urea		
Glucose		
Salt		
Red blood cells		

[5]

Examiner Only	
Marks	Remark

11 A potometer is shown below.



The apparatus is assembled under water to avoid trapping unwanted air bubbles.

(a) Use the diagram to suggest and explain how the air bubble is introduced into the potometer.

[2]

(b) When the upper or lower leaf surfaces are greased with Vaseline, this affects the transpiration rate. The results are shown in the table.

	Distance moved by air bubble (mm/s)
Upper leaf surfaces only greased	1.2
Lower leaf surfaces only greased	0.4

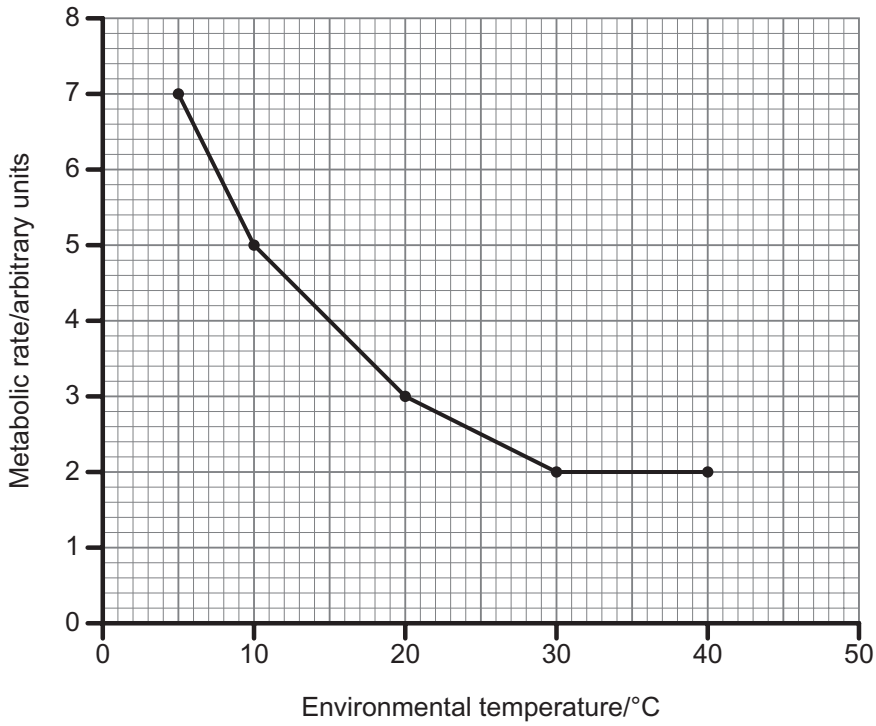
Explain why the rate of transpiration is higher when the upper leaf surfaces only were greased.

[2]

Examiner Only	
Marks	Remark

12 The metabolic rate (rate of cell reactions) of a mammal is affected by the temperature of the outside environment.

Examiner Only	
Marks	Remark



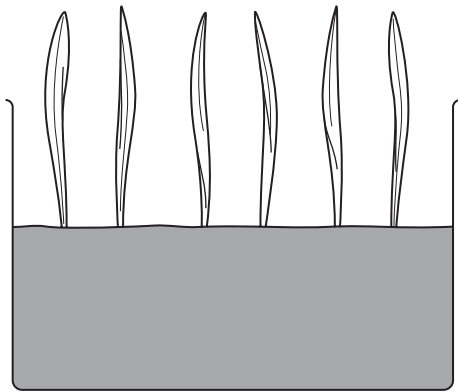
(a) Explain why the metabolic rate increases as the outside environment temperature falls below 30 °C.

[2]

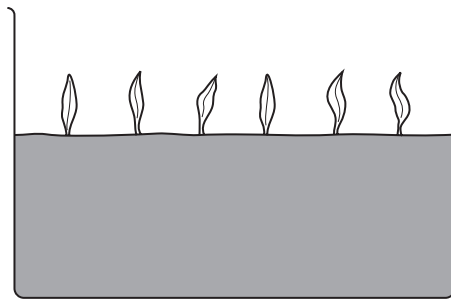
(b) Explain how the mammal will maintain a constant body temperature when the external temperature is 40 °C.

[3]

- 13 Barley seedlings were grown at 20 °C and at 6 °C in good light conditions. All other environmental conditions were kept constant.



barley seedlings
grown at 20 °C



barley seedlings
grown at 6 °C

Describe and suggest an explanation for the results of this experiment.

[4]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only	
Marks	Remark

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