Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2009–2010

Science: Double Award (Modular)

Living Organisms and the Processes of Life
End of Module Test
Higher Tier

A **[GDA02]**

THURSDAY 20 MAY 2010, MORNING

GDA02

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.

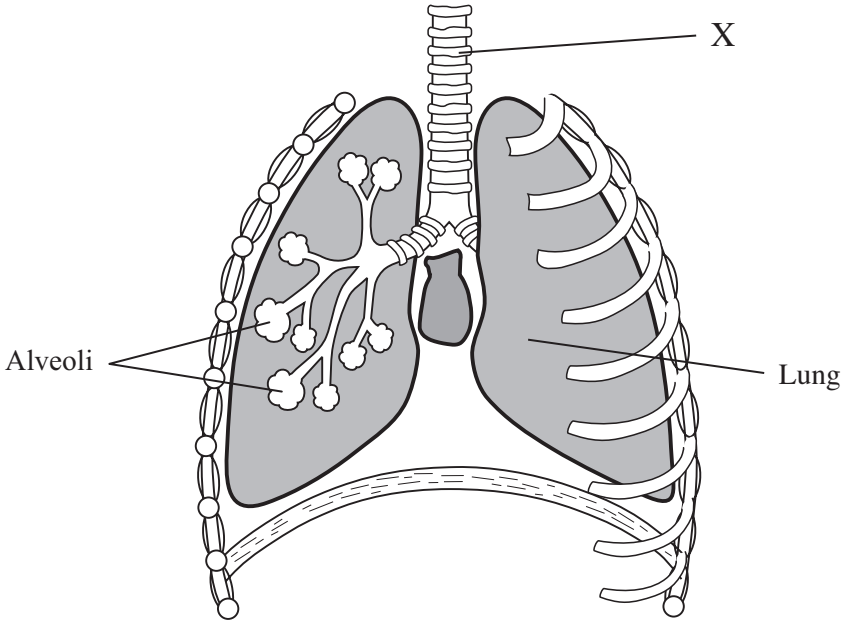
INFORMATION FOR CANDIDATES

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	
7	
8	
9	
10	
11	
12	
13	
Total Marks	

Examiner Only	
Marks	Remark

1 The diagram shows part of the respiratory system.



(a) Name the part labelled X.

_____ [1]

(b) On the diagram, draw an arrow on the diaphragm to show the direction it moves during inhalation. [1]

(c) **(i)** Name the substance in cigarette smoke that causes lung cancer.

_____ [1]

(ii) Describe and explain the effect that carbon monoxide in cigarette smoke has on the body.

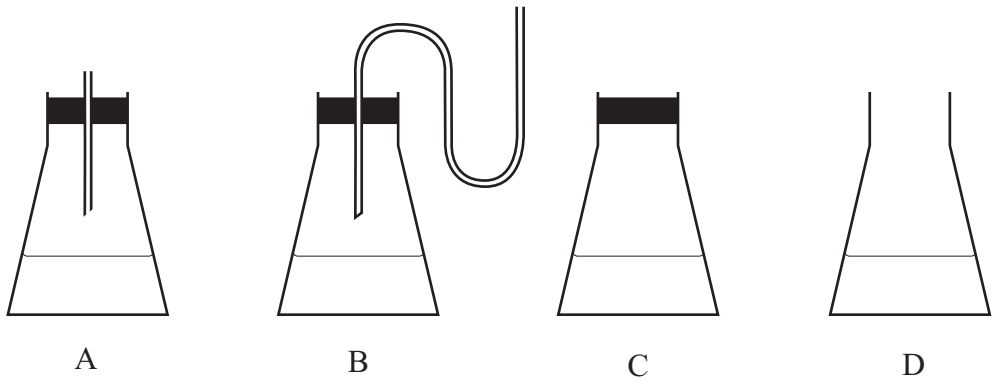
_____

_____ [2]

Examiner Only	
Marks	Remark

2 The diagram shows an experiment similar to one carried out by Pasteur.

All flasks contained sterile broth at the start of the experiment. Sterile broth is clear.



The apparatus was left for one week at room temperature.

(a) Complete the results table below by placing a tick (✔) if you would expect the broth to be contaminated with micro-organisms after a week, or an ✘ if you would expect the broth to be uncontaminated.

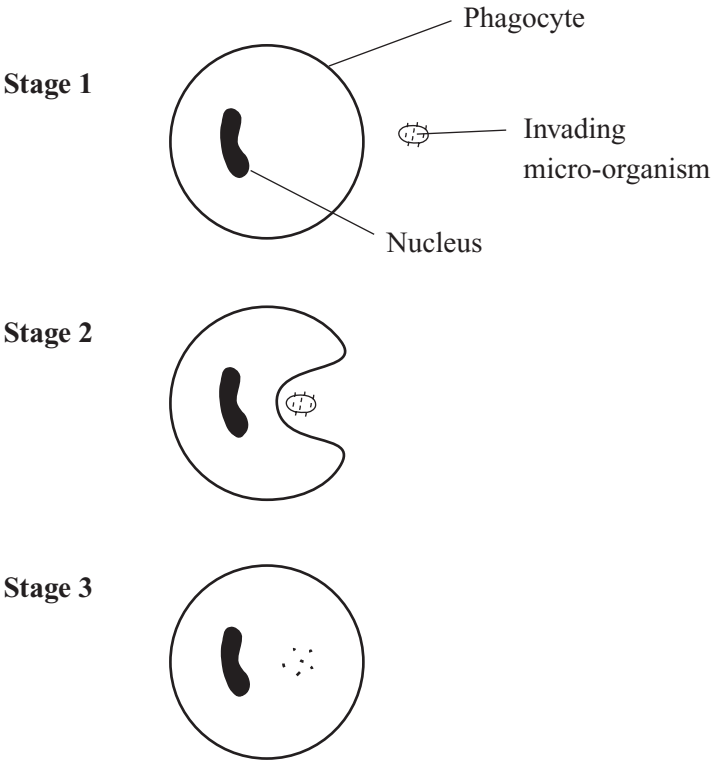
Flask	Contaminated/uncontaminated after one week
A	
B	
C	
D	

[3]

(b) Name the theory that the results of Pasteur's experiment disproved.

_____ [1]

3 The diagram shows one way in which the body defends itself against micro-organisms.



Examiner Only	
Marks	Remark

(a) Suggest what type of blood cell is a phagocyte.

_____ [1]

(b) Describe what is happening at:

Stage 2 _____

Stage 3 _____ [2]

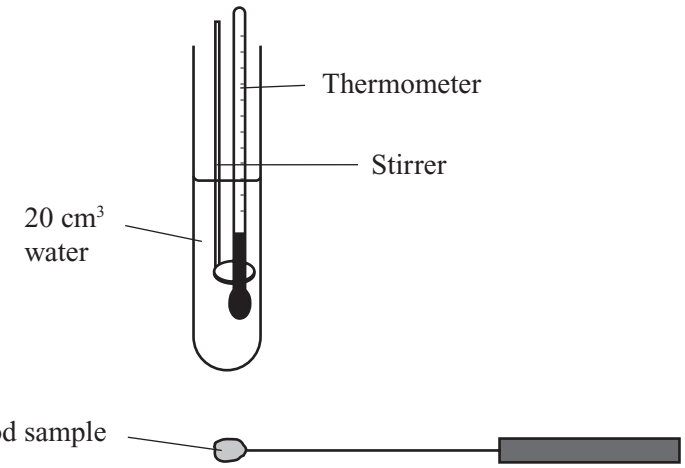
(c) Describe another way in which the body defends itself once micro-organisms have entered the bloodstream.

_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

4 The energy value of foods can be compared using the apparatus shown in the diagram.



(a) Using the apparatus and any additional materials, describe how you would compare the energy values of equal masses of biscuit and bacon.

_____

_____

_____

_____

_____

_____

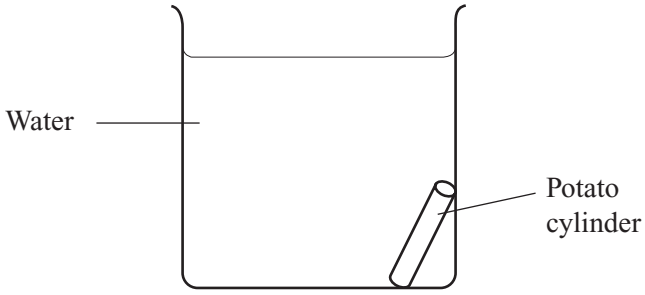
_____

_____ [4]

(b) How would you expect the results for the biscuit and the bacon to differ?

_____ [1]

5 The diagram shows a potato cylinder that has just been put into a beaker of water.



The cylinder was left in the water for 24 hours.

Describe and explain the change in the potato cylinder after 24 hours.

Description: _____

Explanation: _____

_____

_____

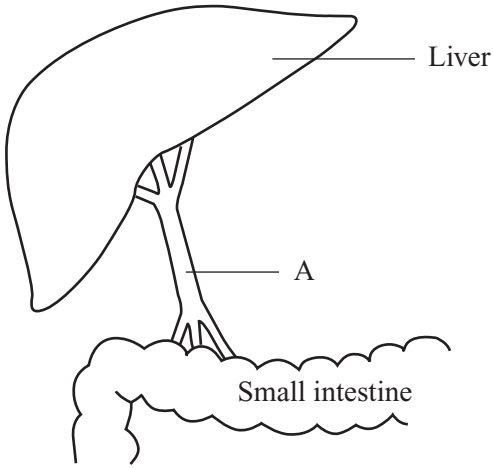
_____

_____ [4]

Examiner Only

Marks	Remark

6 The diagram shows the blood vessel that transports absorbed food from the small intestine to the liver.



(a) Name blood vessel A.

_____ [1]

(b) When the blood sugar level rises the body returns it to normal. Describe the liver's role in this process.

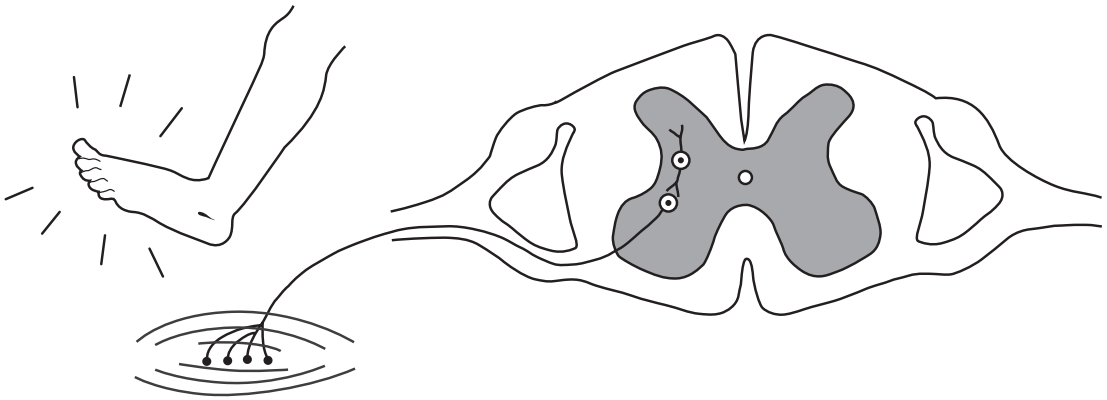
_____

_____

_____ [2]

Examiner Only	
Marks	Remark

7 The diagram represents a reflex action.



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

(b) Name the effector shown.

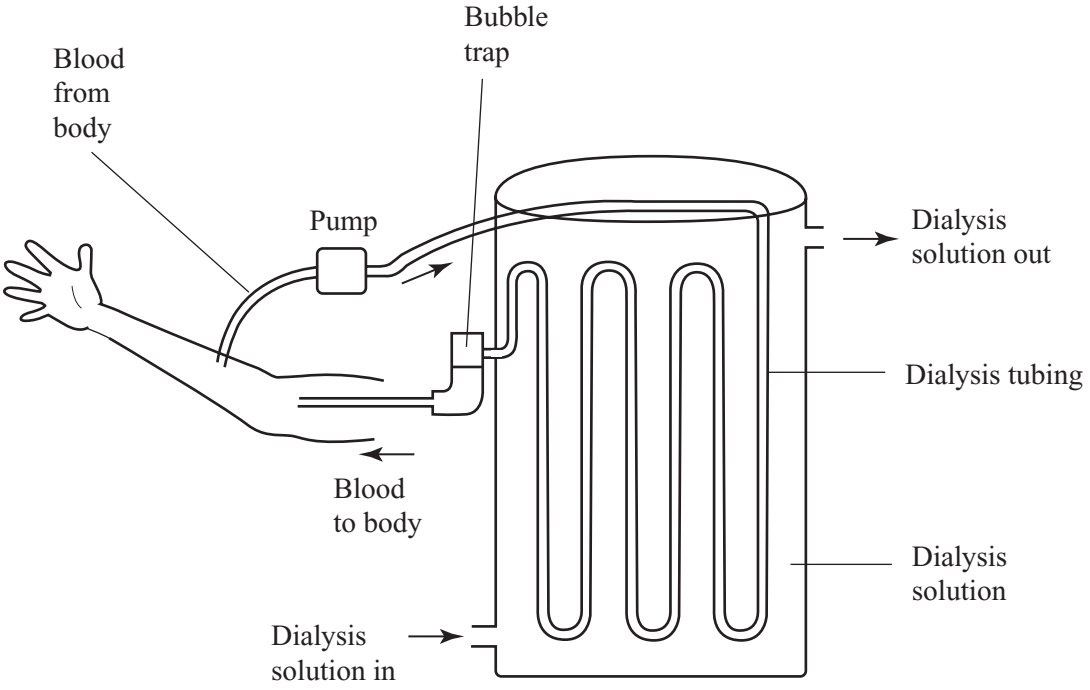
_____ [1]

(c) On the diagram draw a line to the association neurone and label it A. [1]

Examiner Only

Marks	Remark

8 The diagram shows a dialysis machine.



(a) Name two wastes that diffuse out of the blood into the dialysis solution.

1. _____

2. _____ [2]

(b) Explain how useful substances, e.g. sugars and amino acids, are retained in the blood.

_____

_____

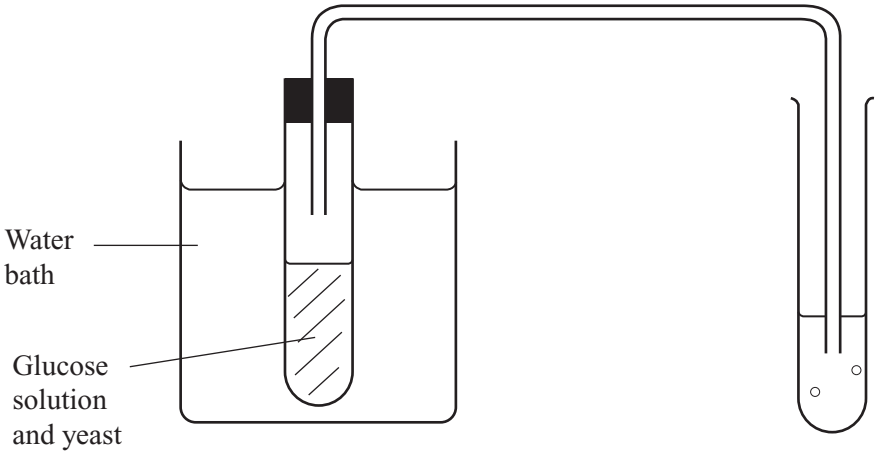
_____ [1]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

9 The diagram shows the apparatus used to show the effect of temperature on anaerobic respiration in yeast.



(a) (i) When setting up the experiment, suggest how you would ensure that the glucose solution is anaerobic at the start of the experiment.

_____

_____ [1]

(ii) Describe how you would ensure that the glucose solution remains anaerobic throughout the experiment.

_____ [1]

(b) Describe how you would use the apparatus to show the effect of temperature on the rate of anaerobic respiration.

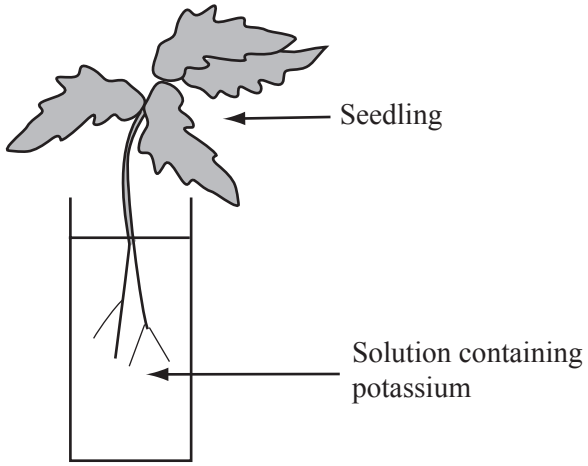
_____

_____

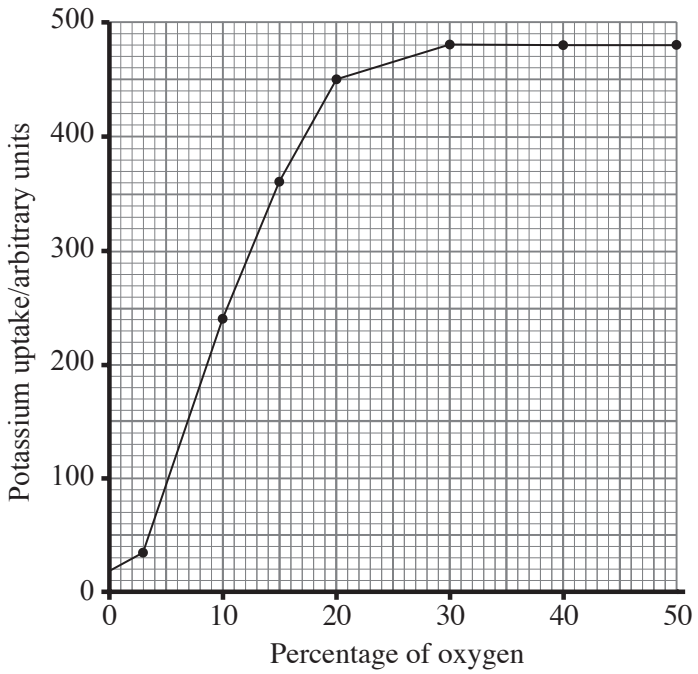
_____ [2]

10 An experiment was carried out to determine the effect of oxygen on the uptake of potassium ions by seedlings.

Examiner Only	
Marks	Remark



The seedlings were placed in seven solutions containing potassium ions. Each solution had a different percentage of oxygen present. The uptake of potassium ions is shown in the graph.



(a) State **two** factors, apart from size/type of seedlings, that should be controlled to ensure a fair test.

1. _____

2. _____ [2]

(b) Explain how the results indicate that potassium uptake is by active transport.

_____

_____

_____

_____ [2]

(c) Suggest why the potassium uptake levels off at the higher percentage oxygen levels.

_____

_____ [1]

Examiner Only	
Marks	Remark

11 One effect of adrenaline is to relax the muscles surrounding the bronchioles. Explain why this is a benefit in preparation for 'flight or fight'.

_____

_____

_____

_____

_____ [3]

Examiner Only	
Marks	Remark

12 The activity of the enzyme lipase was investigated at three different temperatures. The initial pH of the reaction mixture was 7.0 in all cases. The final pH was measured after 60 minutes and the results are presented in the table.

Temperature/°C	pH of reaction mixture after 60 minutes
20	6.8
35	5.8
50	7.0

(a) Suggest what product produced by the action of lipase affects pH.

_____ [1]

(b) Describe and explain the effect of temperature on lipase activity.

_____

_____

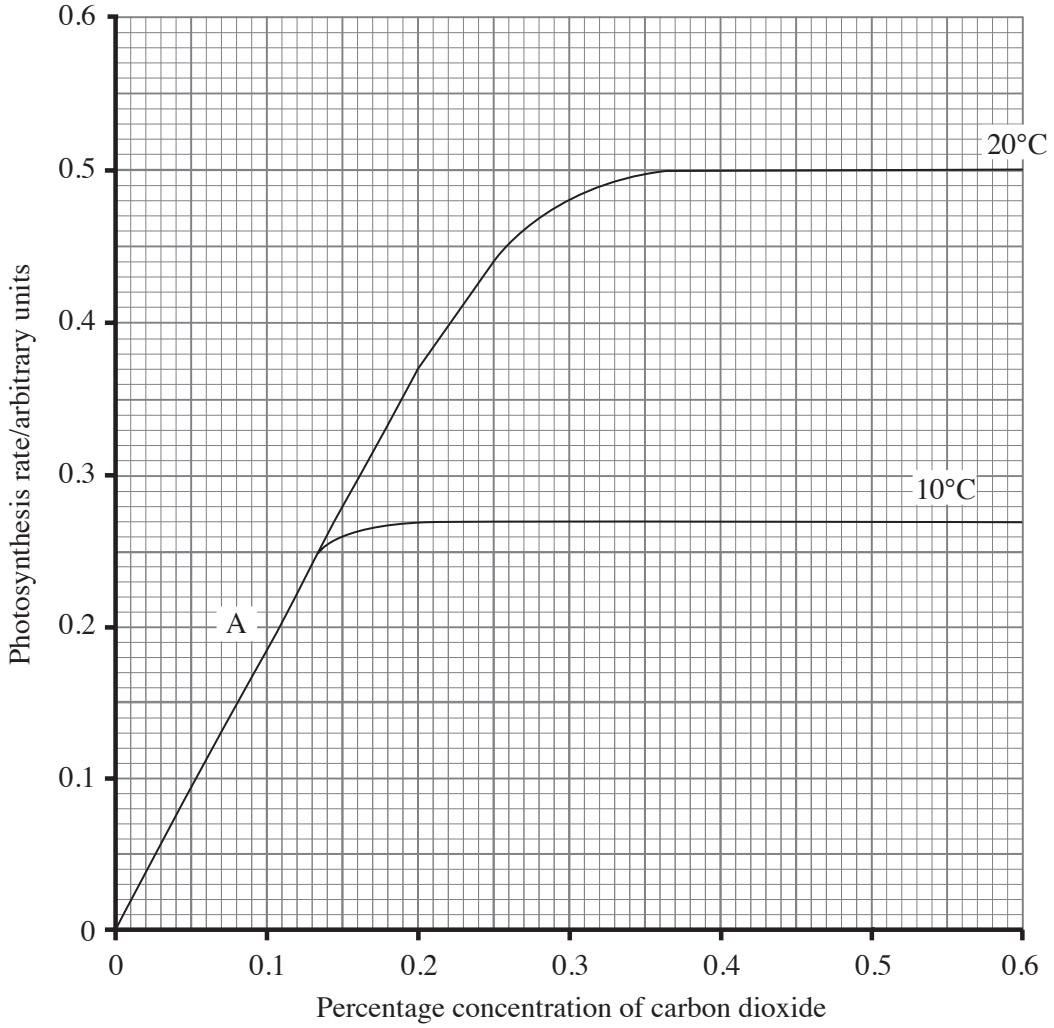
_____

_____ [3]

Examiner Only

Marks	Remark

13 The graph shows the effect of carbon dioxide concentration on the rate of photosynthesis at different temperatures for tomato plants.



(a) Name the environmental factor limiting the rate of photosynthesis at A.

_____ [1]

(b) Suggest a reason why the optimum temperature for photosynthesis of many plants is 20°C rather than 40°C.

_____

_____ [2]

Examiner Only

Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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