

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

For Examiner's Use

General Certificate of Secondary Education
June 2008

ADDITIONAL SCIENCE
Unit Biology B2

BIOLOGY
Unit Biology B2

Foundation Tier

Wednesday 21 May 2008 1.30 pm to 2.15 pm

<p>You will need no other materials. You may use a calculator.</p>

Time allowed: 45 minutes

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 45.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

Advice

- In all calculations, show clearly how you work out your answer.

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F



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Question	Mark	Question	Mark
1		7	
2		8	
3			
4			
5			
6			
Total (Column 1)		→	
Total (Column 2)		→	
TOTAL			
Examiner's Initials			



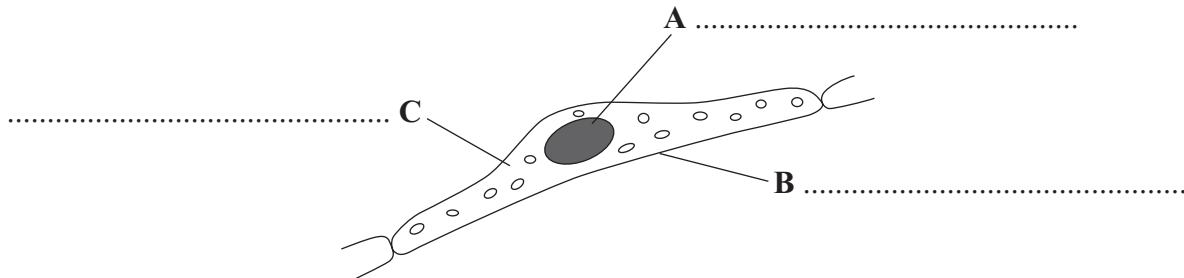
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ANSWER IN THE SPACES PROVIDED**



Answer **all** questions in the spaces provided.

- 1 The diagram shows a cell from the lining of the lung. This cell is specialised to allow gases to pass through quickly.



- 1 (a) Use words from the box to label structures A, B and C.

cell membrane	chloroplast	cytoplasm	mitochondria	nucleus
---------------	-------------	-----------	--------------	---------

(3 marks)

- 1 (b) (i) Which feature of this cell allows oxygen to pass through quickly?

Put a tick (✓) in the box next to your choice.

It is thin.

It has a large nucleus.

It has many mitochondria.

(1 mark)

- 1 (b) (ii) Complete the sentence by drawing a ring around the correct answer in the box.

Oxygen passes through this cell by

diffusion
osmosis
respiration

(1 mark)

5

Turn over ►



2 Green plants are able to make their own food.

Complete each sentence by drawing a ring around the correct answer in the box.

2 (a) Green plants make their own food during the process of

diffusion
photosynthesis
respiration

(1 mark)

2 (b) This process can be summarised by the equation:

carbon dioxide + water → glucose +

mineral salts
light
oxygen

(1 mark)

2 (c) The energy needed for this process is trapped for the plant by

chlorophyll
glucose
light

(1 mark)

2 (d) Some of the food made by plants is stored as insoluble

chlorophyll
glucose
starch

(1 mark)

4



3 Gardeners often collect fallen leaves in autumn and place them on compost heaps.



Leaves fall
from tree



Gardener collects
fallen leaves



Leaves placed on
compost heap

3 (a) Over the next year the leaves decay.

Which living things cause leaves to decay?

.....
(1 mark)

3 (b) The leaves decay more quickly in summer than in winter.

Give **one** reason why.

.....
.....
(1 mark)

3 (c) The compost heap has holes in its sides to allow gases to enter.

Which gas is needed for decay?

Put a tick (✓) in the box next to your choice.

Carbon dioxide

Nitrogen

Oxygen

(1 mark)

3

Turn over ►



- 4 The volume of water that the body loses must balance the volume of water that it gains.

Tables 1 and 2 show losses and gains of water by the body in one day.

Table 1
Losses of water by the body

Method	Volume in cm^3
breathing	300
sweating	600
faeces	100
urine	
Total	2400

Table 2
Gains of water by the body

Method	Volume in cm^3
drinking	1300
food	800
chemical reactions	300
Total	2400

- 4 (a) (i) Calculate the volume of urine lost by the body.

Show clearly how you work out your answer.

.....
.....

Volume of urine lost by the body = cm^3
(2 marks)

- 4 (a) (ii) What proportion of water gained by the body comes from food?

Put a tick (✓) in the box next to your choice.

$\frac{1}{4}$

$\frac{1}{3}$

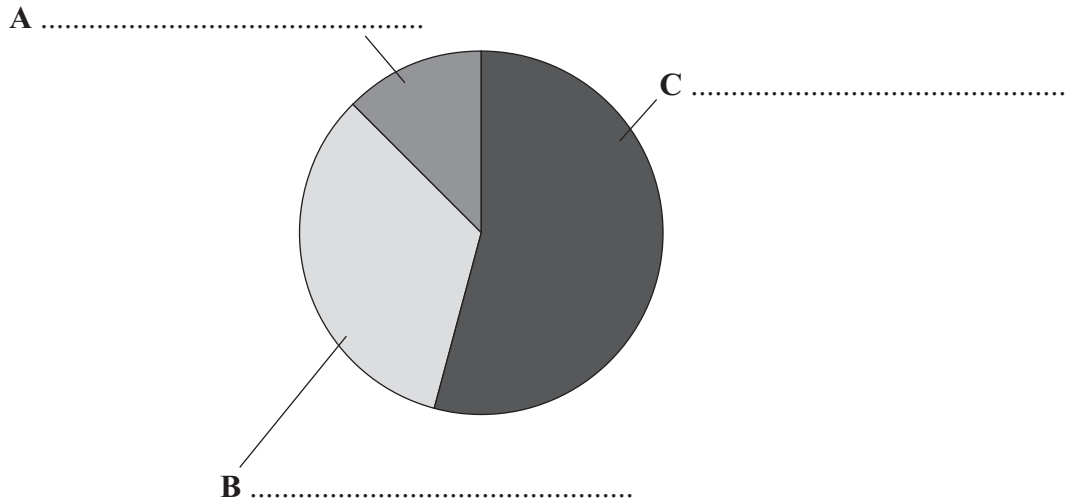
$\frac{1}{2}$

(1 mark)



- 4 (b) One pupil decided to show the figures from **Table 2** as a pie chart.

Label sections **A**, **B** and **C** of the pie chart.



(1 mark)

- 4 (c) How does sweating help the body?

.....

.....

(1 mark)

- 4 (d) On a hotter day, the volumes of water lost and gained will be different.

What differences will there be?

Tick (✓) **two** answers from the list.

More sweat produced

More faeces produced

More food eaten

Less urine produced

Less liquid drunk

(2 marks)

7

Turn over ►



5 In fish and chip shops, potatoes are cut into chips several hours before they are cooked.

The amount of water in the chips must be kept constant during this time.

To keep the water in the chips constant, the chips are kept in salt solution.

A student investigated the effect of different concentrations of salt solution on the mass of chips.

- He weighed each of five chips.
- He placed each chip into a different concentration of salt solution.
- After one hour he removed the chips, then reweighed them.

His results are shown in the table.

Concentration of salt solution	0 M	0.5 M	1 M	2 M	3 M
Mass of chip at start in grams	2.6	2.8	2.8	2.5	2.6
Mass of chip after one hour in grams	2.7	2.8	2.7	2.3	2.1

5 (a) (i) In which concentration of salt solution did the chip gain mass?

..... M
(1 mark)

5 (a) (ii) Complete the sentence by drawing a ring around the correct answer in the box.

The chip gained mass because water entered by

digestion
osmosis
respiration

(1 mark)



5 (b) In which concentration of salt solution should the chips be kept?

..... M

Give a reason for your answer.

.....
.....

(2 marks)

5 (c) How could the student have made his investigation more reliable?

.....
.....

(1 mark)

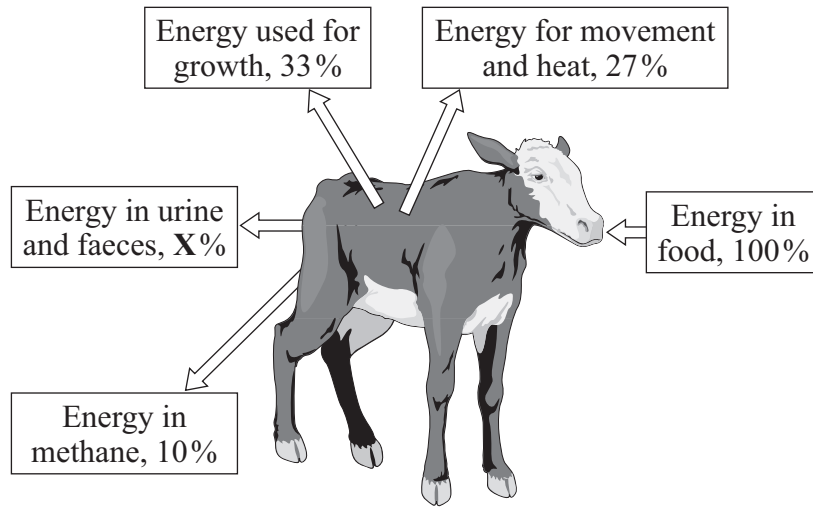
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Turn over for the next question

Turn over ▶



6 The diagram shows what happens to the energy in the food that a calf eats.



6 (a) Calculate the % energy lost as urine and faeces (X). Show clearly how you work out your answer.

.....

Energy lost as urine and faeces %
 (2 marks)

6 (b) The energy in the food eaten by the calf in one day is 6 megajoules.

Calculate the amount of this energy that would be used for growth. Show clearly how you work out your answer.

.....

Energy used for growth megajoules.
 (2 marks)

6 (c) Which process in the body transforms energy in food into heat?

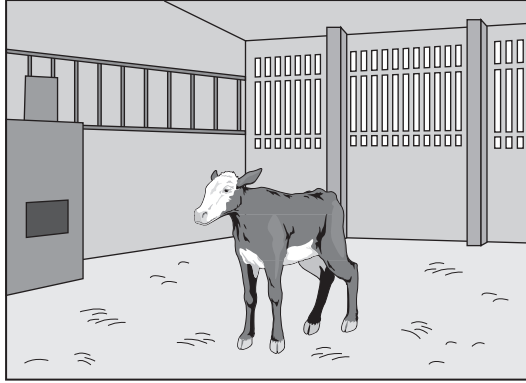
.....
 (1 mark)



6 (d) The pictures show two methods of raising calves indoors.

Method 2 is now banned.

Method 1



Method 2



6 (d) (i) Calves raised indoors grow faster than calves raised outdoors.

Suggest **one** reason why.

.....

(1 mark)

6 (d) (ii) **Method 2** was banned after public campaigns.

Suggest **one** reason why people campaigned against this method of rearing calves.

.....

(1 mark)

7

Turn over for the next question

Turn over ▶



7 Enzymes are used in biological detergents.

7 (a) Name the type of enzyme that digests stains containing fats.

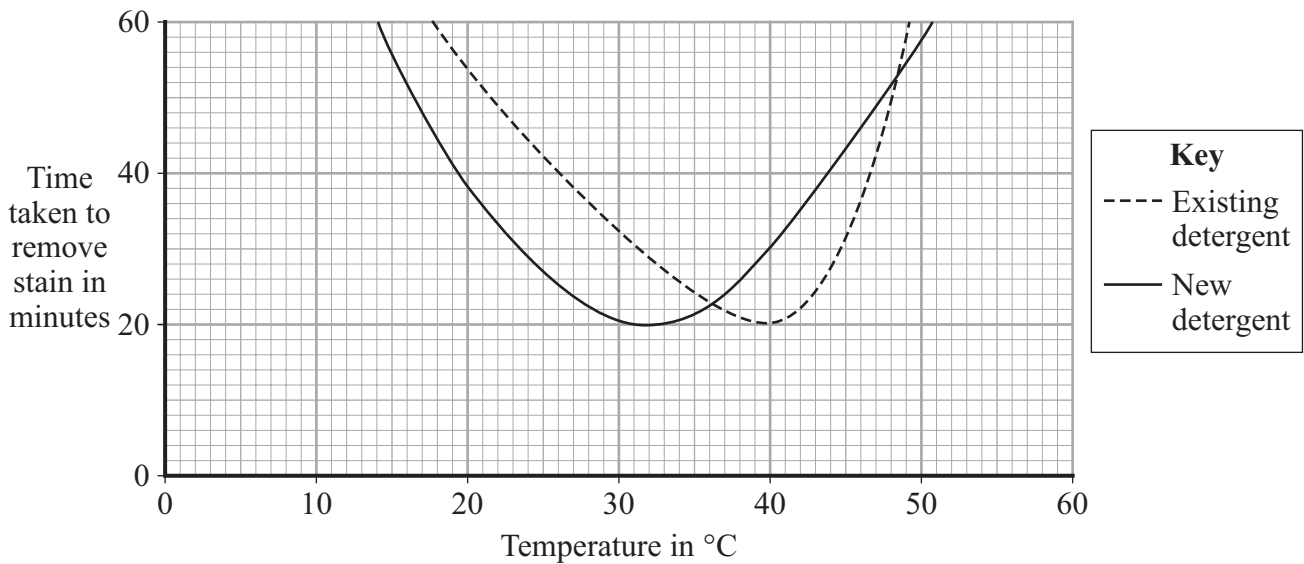
.....
 (1 mark)

7 (b) A new detergent is marketed as being ‘environmentally-friendly’.

Scientists compared the performance of this new detergent with an existing detergent.

They measured the time taken by the two detergents to remove a fat stain at different temperatures.

The graph shows their results.



7 (b) (i) Describe the effect of increasing the temperature on the time taken by the existing detergent to remove the stain.

.....

(2 marks)



- 7 (b) (ii) The new detergent works at a lower temperature than the existing one.

Is the new detergent likely to be more 'environmentally-friendly' than the existing detergent?

Draw a ring around your answer. **Yes / No**

Explain the reason for your answer.

.....

.....

.....

.....

(2 marks)

- 7 (c) Neither detergent works well at 60°C.

Explain why.

.....

.....

.....

.....

(2 marks)

7

Turn over for the next question

Turn over ►



8 Cystic fibrosis is an inherited disorder that can seriously affect health.

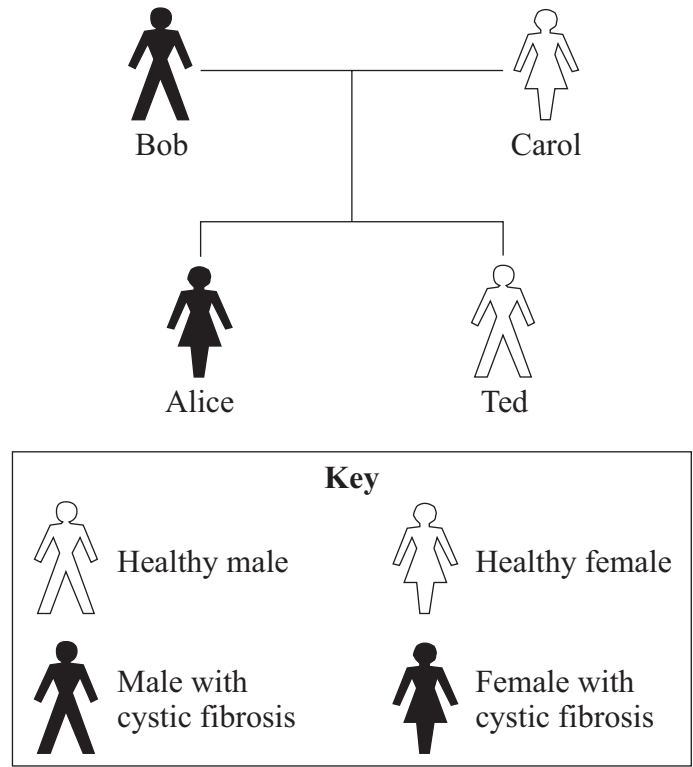
8 (a) Which **one** of these is affected by cystic fibrosis?

Draw a ring around your answer.

- blood cell membranes kidneys nervous system**

(1 mark)

8 (b) The diagram shows the inheritance of cystic fibrosis in a family. The allele that produces cystic fibrosis is recessive.



8 (b) (i) Explain why Alice inherited cystic fibrosis.

.....

.....

.....

.....

(2 marks)



8 (b) (ii) Explain why Ted did **not** inherit cystic fibrosis.

.....
.....
.....
.....

(2 marks)

8 (c) Bob and Carol know that there is a risk that their next baby will have cystic fibrosis.

Embryos can be screened for the allele that produces cystic fibrosis.

Many people support the screening of embryos, but others do not.

8 (c) (i) Suggest **one** reason why many people support the screening of embryos for the cystic fibrosis allele.

.....
.....
.....

(1 mark)

8 (c) (ii) Suggest **one** reason why many people are against the screening of embryos for the cystic fibrosis allele.

.....
.....
.....

(1 mark)

7

END OF QUESTIONS



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