

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	



General Certificate of Secondary Education  
Foundation Tier  
June 2012

## Additional Science

### Unit Biology B2

**BLY2F**

## Biology

### Unit Biology B2

**F**

### Written Paper

**Monday 21 May 2012 9.00 am to 9.45 am**

**For this paper you must have:**

- a ruler.
- You may use a calculator.

**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. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

**Information**

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 45.
- 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**

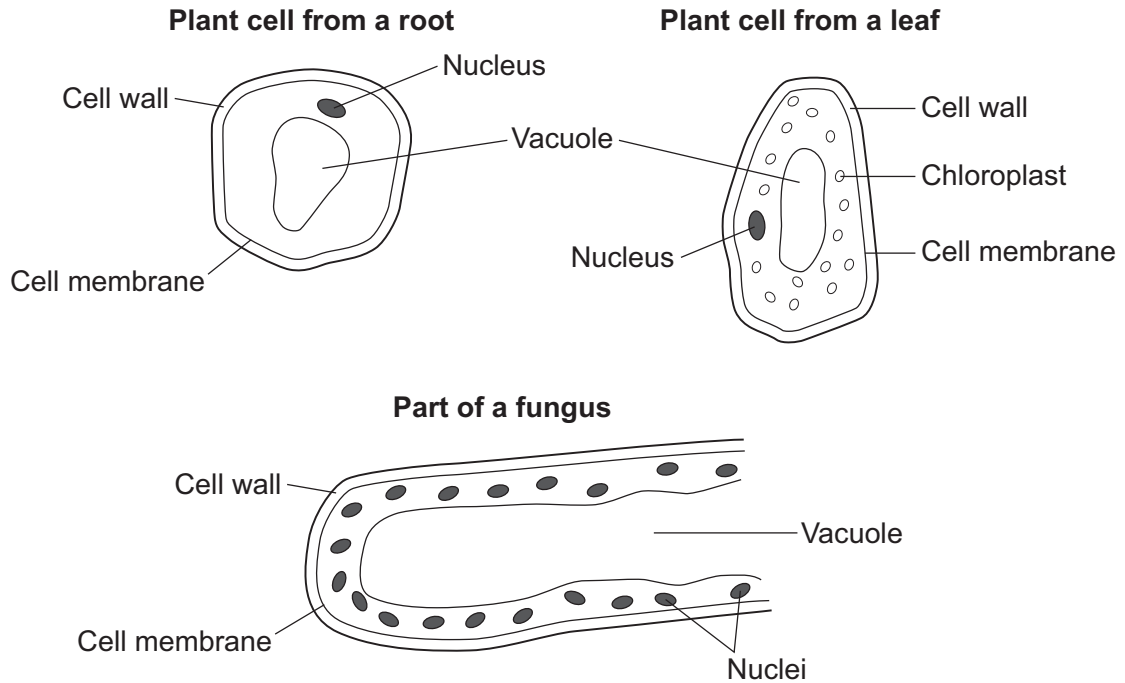
- In all calculations, show clearly how you work out your answer.



J U N 1 2 B L Y 2 F 0 1

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

- 1 The diagrams show plant cells from a root and a leaf, and part of a fungus.



- 1 (a) There are differences and similarities between the plant cells and the fungus.

Use evidence from the diagrams to answer these questions.

- 1 (a) (i) Draw a ring around the correct answer to complete the sentence.

The fungus is different from **both** plant cells because

the fungus contains

many nuclei.
a cell membrane and a cell wall.
no chloroplasts.

(1 mark)

- 1 (a) (ii) Give **one** way in which the fungus is similar to **both** plant cells.

.....

(1 mark)



**1 (b)** Fungi decay dead organisms.

**1 (b) (i)** Which **two** conditions will speed up the process of decay?

Tick (✓) **two** boxes.

Warm

Dry

Plenty of carbon dioxide

Moist

Cold

(2 marks)

**1 (b) (ii)** What happens to the dead organisms during the process of decay?

Draw a ring around **one** answer.

**they are digested**

**they photosynthesise**

**they respire**

(1 mark)

5

**Turn over for the next question**

**Turn over ►**



- 2 The table shows the mass of carbon dioxide passed into the atmosphere in one year.

	Mass of carbon dioxide passed into the atmosphere in billions of tonnes per year
Animals	45
Plants	15
Microorganisms	60
Human activity	9

- 2 (a) (i) Calculate the total mass of carbon dioxide passed into the atmosphere in one year.

.....  
.....

Answer = ..... billion tonnes  
(1 mark)

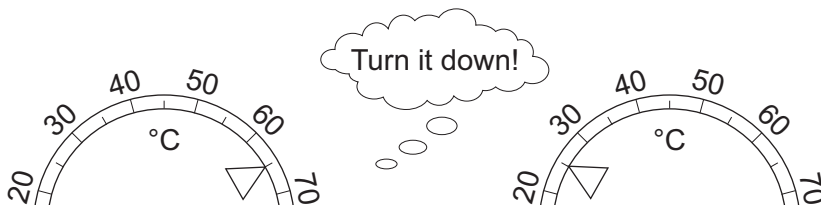
- 2 (a) (ii) Plants take 120 billion tonnes of carbon dioxide out of the atmosphere per year.

Use your answer to part (a)(i) to calculate the change in the mass of carbon dioxide in the atmosphere in one year.

.....  
.....

Answer = ..... billion tonnes  
(1 mark)

- 2 (b) The drawing shows part of a campaign to encourage householders to reduce the temperature of the water used to wash clothes.



Give **two** advantages to the environment of reducing the temperature of the water used to wash clothes.

1 .....

.....

2 .....

.....

(2 marks)

**2 (c)** A householder reduces the temperature of the water he uses to wash clothes. He finds that some stains are not removed at the new temperature. He decides to use a biological washing powder. Biological washing powders contain enzymes.

**2 (c) (i)** Draw a line from each enzyme in **List 1** to the type of stain the enzyme will remove, in **List 2**.

**List 1  
Enzyme**

**List 2  
Type of Stain**

Protease

Starch

Fat

Lipase

Protein

(2 marks)

**2 (c) (ii)** The biological washing powder would **not** have removed the stains from clothes if the water had been at 65 °C.

Use **one** word from the box to complete the sentence.

killed                      denatured                      diffused

At 65 °C the enzymes would be..... (1 mark)

7

Turn over ►



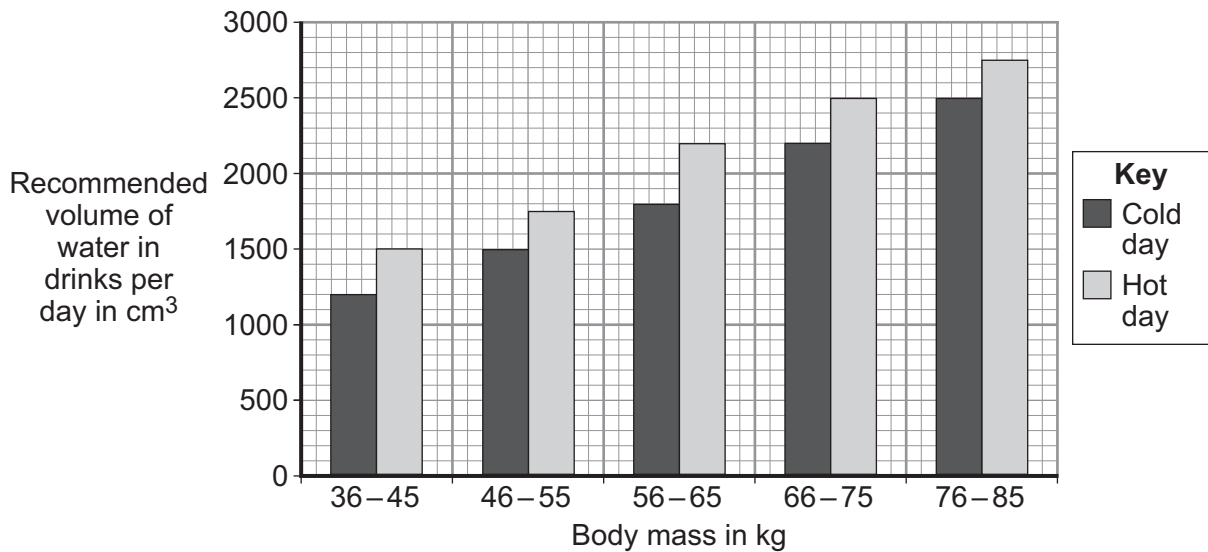
**3** The volume of water the body needs depends on a number of factors.

**3 (a)** Water enters the body in drinks.

Give **one** other way the body can get water.

.....  
(1 mark)

**3 (b)** The chart shows the recommended volume of water that women of different body masses should drink, on a cold day and on a hot day.



**3 (b) (i)** Describe the relationship between body mass and the recommended volume of water that a woman should drink.

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

**3 (b) (ii)** What is the recommended volume of water that a 70 kg woman should drink on a cold day?

..... cm<sup>3</sup>  
(1 mark)



**3 (b) (iii)** While following a diet, the 70 kg woman loses 10 kg of body mass.

Calculate how much less water she is recommended to drink on a cold day.

Use information from the chart.

Show clearly how you work out your answer.

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

Answer = ..... cm<sup>3</sup>  
(2 marks)

**3 (c)** It is recommended that women should drink more water on a hot day than on a cold day.

Why?

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

(2 marks)

**3 (d)** Excess water is lost from the body in urine.

Name the organ that produces urine.

.....

(1 mark)

8

**Turn over for the next question**

**Turn over ►**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**





- 4 The diagram shows a strawberry plant.  
The parent plant grows side shoots.  
New plants grow on the side shoots.



The new plants will all have the same inherited characteristics as the original parent plant.

Complete the sentences to explain why.

Use words from the box.

<b>asexual</b>	<b>differentiation</b>	<b>embryos</b>	<b>fertilisation</b>
<b>gametes</b>	<b>genes</b>	<b>mitosis</b>	<b>sexual</b>

- 4 (a) The new plant is produced by ..... reproduction.  
(1 mark)
- 4 (b) In this type of reproduction, body cells divide by .....  
(1 mark)
- 4 (c) The new plant has the same ..... as the parent plant.  
(1 mark)

3
---

Turn over ►



5 There are plans for a ‘cattle factory’ to be built in the UK.

Information about the cattle factory and traditional cattle farming in the UK is given below.



**Cattle factory**



**Traditional cattle farming**

**Cattle factory**

- There will be over 8 000 cows in three large sheds.
- Each cow will be milked three times a day.
- Each cow will produce about 50 litres of milk every day.
- Waste will be collected and used to produce electricity for 2 000 homes.
- Cows are kept near to each other so disease can spread easily.

**Traditional cattle farming**

- Most farms have between 5 and 500 cows.
- The cows spend most of the time in fields.
- Cows are milked once or twice a day.
- Each cow produces up to 20 litres of milk a day.
- The waste is used as natural fertiliser for crops.

5 (a) Use the information to answer the questions.

5 (a) (i) Give **two** reasons why some people think the cattle factory is a good idea.

1 .....

2 .....

(2 marks)



5 (a) (ii) Give **two** reasons why some people think traditional farming is better than the cattle factory.

1 .....

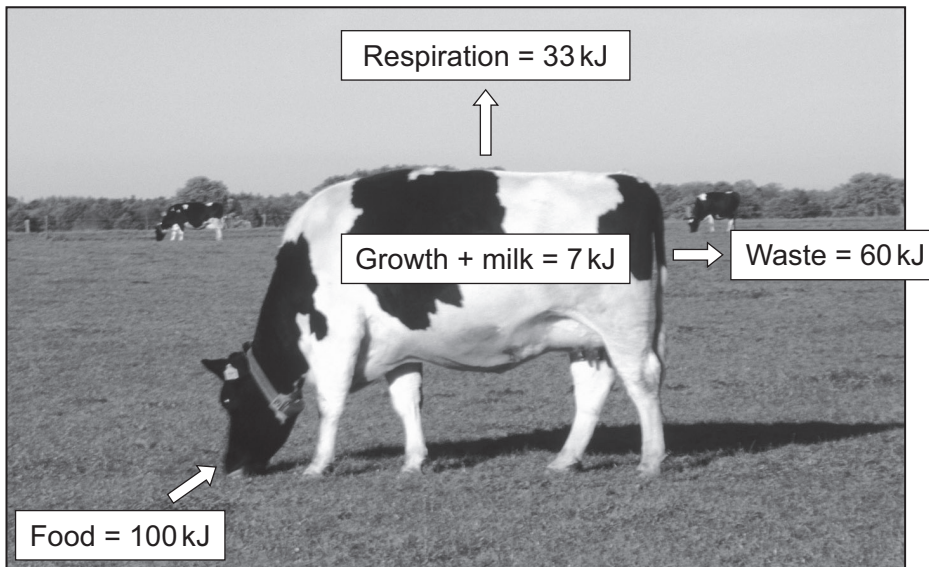
.....

2 .....

.....

(2 marks)

5 (b) The diagram shows what happens to 100 kJ of energy in the food eaten by a cow on a traditional farm.



Use your knowledge and the information in the diagram to answer this question.

Compare the transfer of energy from the food eaten by cows in the cattle factory with the energy transferred by cows on a traditional farm.

Use words from the box to complete the table.

**more**
**less**
**the same**

Energy	Amount of energy transferred by cows in a cattle factory compared with cows on a traditional farm
transferred for growth and milk	
transferred in respiration	

(2 marks)

<b>6</b>
----------

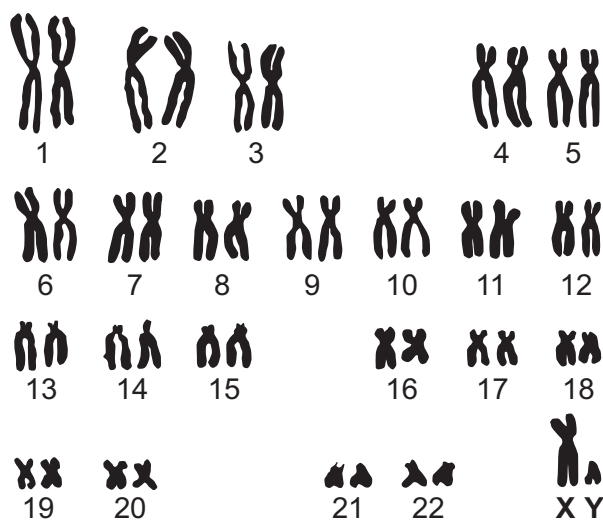
Turn over ►



- 6 When scientists look at dividing cells under a microscope, they can see strands that contain a chemical called DNA.

A photograph of these strands can be cut up and re-arranged.

The diagram shows an arrangement of the strands from a human cell.



- 6 (a) What name is given to the strands containing DNA shown in the diagram?

Draw a ring around **one** answer.

alleles

chromosomes

genes

(1 mark)

- 6 (b) Look carefully at the diagram.

- 6 (b) (i) The cell was taken from a man and not from a woman.

How can you tell?

.....

(1 mark)



**6 (b) (ii)** What evidence is there that the strands are from a body cell, and not from a gamete?

Tick (✓) **one** box.

The strands are arranged in order of size.

The strands are in pairs.

Gametes are made in the testes and ovaries.

(1 mark)

**6 (b) (iii)** When a human cell is not dividing the strands containing DNA are **not** clearly visible.

Draw a ring around the correct answer to complete the sentence.

In a human cell, the DNA is normally found in the

cell membrane.

cytoplasm.

nucleus.

(1 mark)

4

**Turn over for the next question**

**Turn over ►**



7 People often grow pondweed in fishponds to *oxygenate* the water.

7 (a) Name the process that the pondweed uses to produce oxygen.

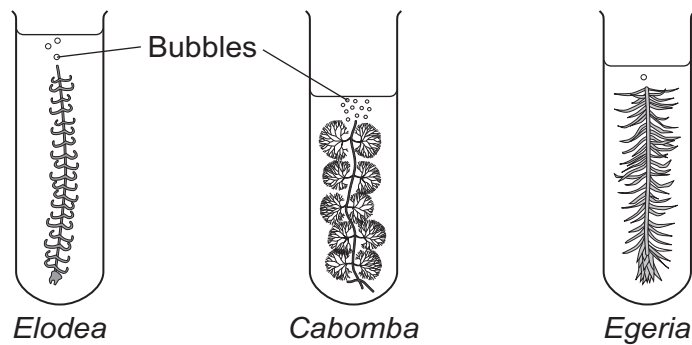
.....  
(1 mark)

7 (b) A student investigated oxygen production in three different pondweeds, *Elodea*, *Cabomba* and *Egeria*.

The student:

- cut a piece of pondweed from an *Elodea* plant
- put the pondweed into a tube of water
- counted the bubbles given off in one minute
- did the experiment again using a piece of pondweed from a *Cabomba* plant
- did the experiment a third time using a piece of pondweed from an *Egeria* plant.

The diagram shows the student's investigation.



The table shows the results.

Pondweed	Number of bubbles produced in 1 minute
<i>Elodea</i>	17
<i>Cabomba</i>	28
<i>Egeria</i>	8



7 (b) (i) The student said:

“I suggest that people grow *Cabomba* in garden ponds to oxygenate the water fastest.”

Give **three** variables the student should have controlled to make sure his conclusion was valid.

Use information from the student’s method and the diagram.

1 .....

.....

2 .....

.....

3 .....

.....

(3 marks)

7 (b) (ii) The three pondweeds all cost about the same.

Suggest **one** other factor that people with fishponds might think about before deciding which type of pondweed to use.

.....

(1 mark)

7 (c) A person grows *Cabomba* in his pond.

The *Cabomba* plants develop yellow leaves.

Which mineral ion would stop the leaves turning yellow?

.....

(1 mark)

6

Turn over for the next question

Turn over ►



**8** It is important that the concentration of glucose (sugar) in the blood is controlled.

**8 (a) (i)** Which hormone controls the concentration of glucose in the blood?

.....  
(1 mark)

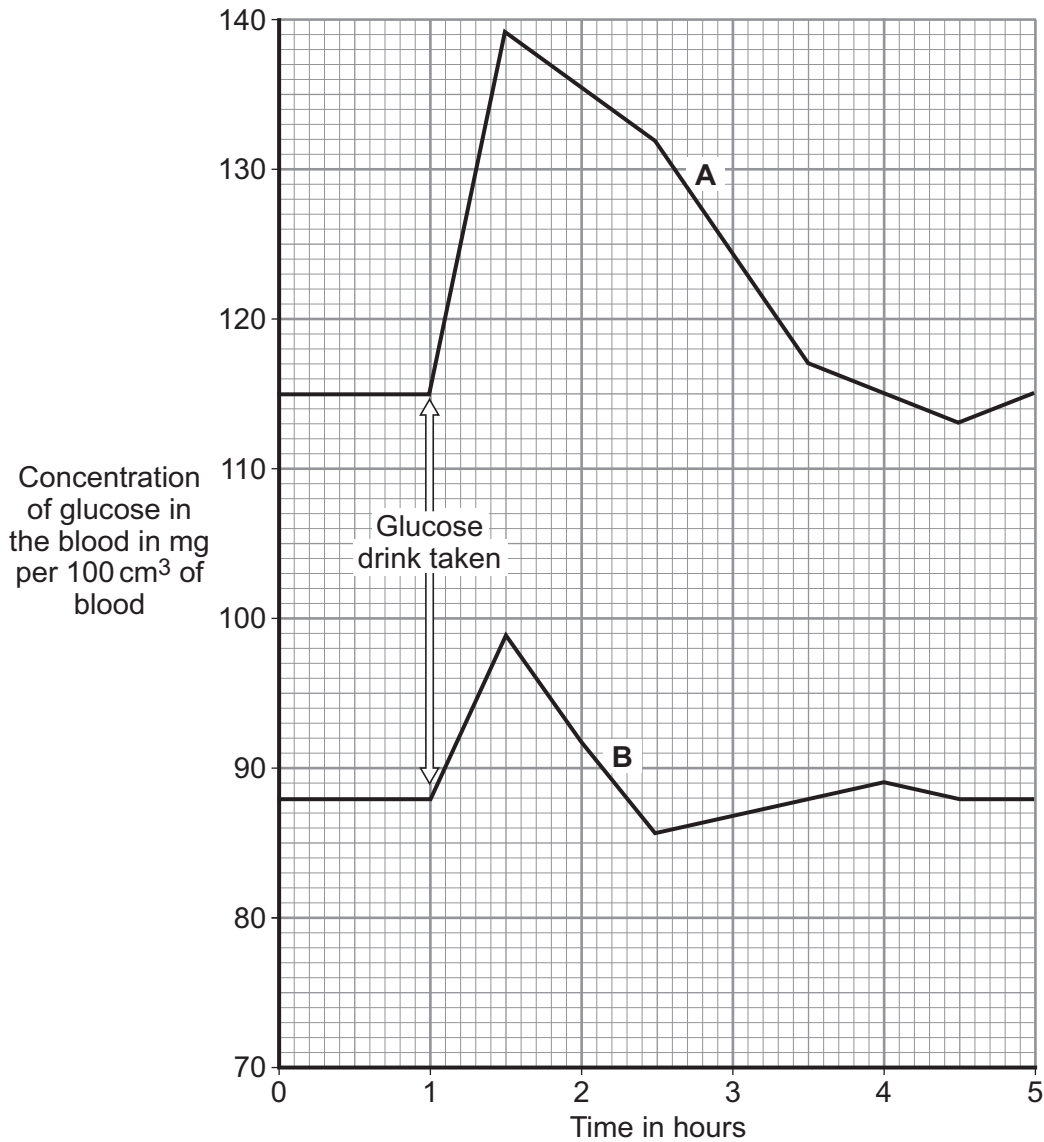
**8 (a) (ii)** Which organ produces this hormone?

.....  
(1 mark)

**8 (b)** The concentration of glucose in the blood of two people, **A** and **B**, was measured every half an hour.

One hour after the start, both people drank a solution containing 50 g of glucose.

The graph shows the result.





**8 (b) (i)** By how much did the blood glucose concentration in person **B** rise after drinking the glucose drink?

..... mg per 100 cm<sup>3</sup> of blood  
(1 mark)

**8 (b) (ii)** A doctor suggests that person **A** has diabetes.

Give **two** pieces of evidence from the graph to support this suggestion.

1 .....

2 .....

(2 marks)

**8 (b) (iii)** Give **one** reason for the fall in blood glucose concentration in person **B**, shown in the graph.

.....  
(1 mark)

6

**END OF QUESTIONS**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**



**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**

ACKNOWLEDGEMENT OF COPYRIGHT-HOLDERS AND PUBLISHERS

Question 4 Drawing: © D G Mackean

Question 5 Photographs: © Thinkstock

Copyright © 2012 AQA and its licensors. All rights reserved.

