

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Secondary Education
Foundation Tier
January 2010

Additional Science

Biology

Unit Biology B2

Written Paper

Thursday 14 January 2010 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. 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 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.

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

BLY2F

F



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

G/K51862 6/6/6/6

BLY2F

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

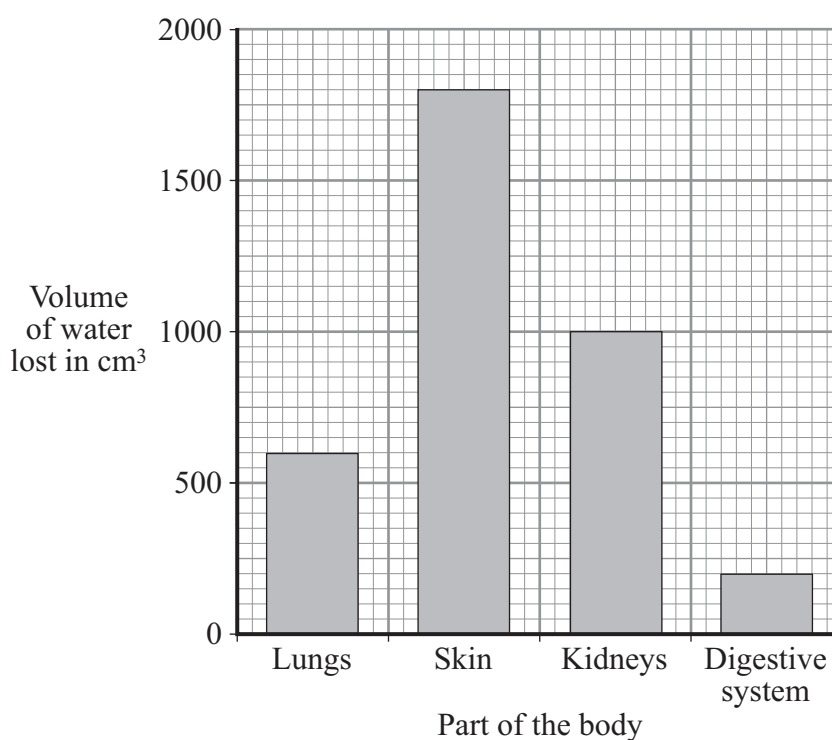
1 Water is lost from several parts of the body.

1 (a) Draw **one** line from each body part to the substance in which water is lost.

Body Part	Substance
Kidneys	Urine
Lungs	Faeces
Skin	Sweat
	Breath

(3 marks)

1 (b) The bar chart shows the volume of water a person lost from different parts of the body during a warm day.



- 1 (b) (i) What volume of water was lost through the skin on the warm day?

Tick (✓) **one** box.

600 cm³ ☐

1600 cm³ ☐

1800 cm³ ☐

(1 mark)

- 1 (b) (ii) What effect would colder weather have on the amount of water lost through the skin?

Draw a ring around your answer.

decreases

increases

stays the same

(1 mark)

- 1 (b) (iii) Give a reason for your answer.

.....

.....

(1 mark)

- 1 (c) What effect does cold weather generally have on the amount of urine produced?

Draw a ring around your answer.

decreases

increases

stays the same

(1 mark)

7

Turn over for the next question

Turn over ►



2 Humans reproduce sexually.

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

2 (a) (i) At fertilisation

chromosomes
genes
sex cells

 join together.

(1 mark)

2 (a) (ii) At fertilisation a single cell forms, which has new pairs of

chromosomes.
nuclei.
sex cells.

(1 mark)

2 (b) Cystic fibrosis can be inherited by children whose parents do not have it.

2 (b) (i) A person who has cystic fibrosis has

two
three
four

 copies of the cystic fibrosis allele.

(1 mark)

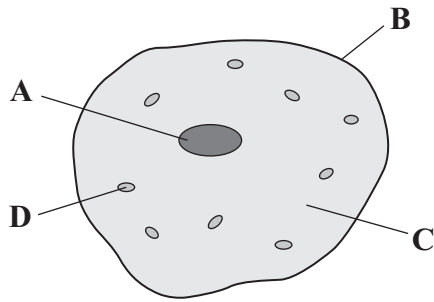
2 (b) (ii) The cystic fibrosis allele is

large.
recessive.
strong.

(1 mark)



- 2 (c) The diagram shows a human body cell.



Choose the correct answer from the box to complete each sentence.

cell membrane

cell wall

cytoplasm

nucleus

- 2 (c) (i) The part of the cell labelled **B** is the
(1 mark)

- 2 (c) (ii) The part of the cell labelled **C** is the
(1 mark)

- 2 (d) Which part of the cell, **A**, **B**, **C** or **D**:

- 2 (d) (i) contains the allele for cystic fibrosis ☐
(1 mark)

- 2 (d) (ii) is affected by cystic fibrosis? ☐
(1 mark)

Turn over for the next question

Turn over ►



3 Diabetes is a disease in which blood glucose (sugar) concentration may rise more than normal.

3 (a) Which organ in the body monitors this rise in blood sugar?

Draw a ring around your answer.

liver

pancreas

stomach

(1 mark)

3 (b) One way of treating diabetes is by careful attention to diet.

Chart 1 shows the recommended diet for a person with diabetes.

Chart 2 shows a diet for a person without diabetes.

Chart 1 Person with diabetes

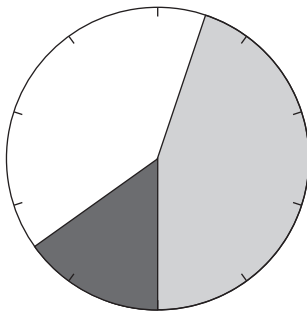
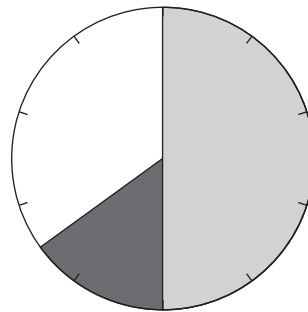


Chart 2 Person without diabetes



Key

Energy from: Carbohydrate Protein Fat

How is the recommended diet of a person with diabetes different from the diet of a person without diabetes?

Use information from the charts.

Tick (✓) **two** boxes.

The diabetic should get more energy from fat.

☐

The diabetic should get more energy from protein.

☐

The diabetic should get less energy from carbohydrate.

☐

The diabetic should get less energy from protein.

☐

(2 marks)



3 (c) Other than diet, give **one** way in which diabetes may be treated.

.....

.....

(1 mark)

4

Turn over for the next question

Turn over ►



4 Plants need mineral ions for healthy growth.

4 (a) Which part of a plant takes in mineral ions?

Tick (✓) **one** box.

Flower ☐

Leaf ☐

Root ☐

(1 mark)

4 (b) Leaves are usually green.

4 (b) (i) What is the green substance in leaves?

Draw a ring around your answer.

chlorophyll

glucose

starch

(1 mark)

4 (b) (ii) The green substance in leaves is important to plants.

Explain why.

.....

.....

.....

.....

(2 marks)



- 4 (c) A shortage of mineral ions can affect a plant.

Draw **one** line from each mineral ion to the effect of its shortage.

Mineral ion	Effect of its shortage
Magnesium	Yellow leaves
Nitrate	Stunted growth
	White flowers

(2 marks)

6

Turn over for the next question

Turn over ►



5 A group of pupils investigated the digestion of fat by the enzyme lipase.

5 (a) What **two** substances are produced when fats are digested?

Tick (✓) **two** boxes.

Glucose

☐

Fatty acids

☐

Glycerol

☐

Amino acids

☐

(2 marks)

In the investigation:

- the pupils set up five test tubes
- each tube contained 1 cm³ of fat and 10cm³ of lipase solution
- each tube was kept at a different temperature for 24 hours.

5 (b) (i) Give **one** control variable in this investigation.

.....
(1 mark)

5 (b) (ii) What was the independent variable being investigated?

.....
(1 mark)

5 (c) The pH of the solution in each tube was tested at the beginning of the investigation and after 24 hours.

The results of the pupils' investigation are shown in the table.

Tube	Temperature in °C	pH at the beginning	pH after 24 hours
1	0	Neutral	Neutral
2	20	Neutral	'Weak' acid
3	40	Neutral	'Strong' acid
4	60	Neutral	'Weak' acid
5	80	Neutral	Neutral



One pupil said, “We might **not** have found the best temperature for the lipase to work”.

What more could they do to find the best temperature?

.....

.....

.....

.....

.....

(2 marks)

- 5 (d) The pupils then placed **Tube 1** into a water-bath kept at 40 °C.
The tube was left in the water-bath for 24 hours.

- 5 (d) (i) What pH would you expect the contents of the tube to be after the extra 24 hours?

Tick (✓) **one** box.

Neutral ☐

'Strong' acid ☐

'Weak' acid ☐

(1 mark)

- 5 (d) (ii) Give the reason for your answer.

.....

.....

(1 mark)

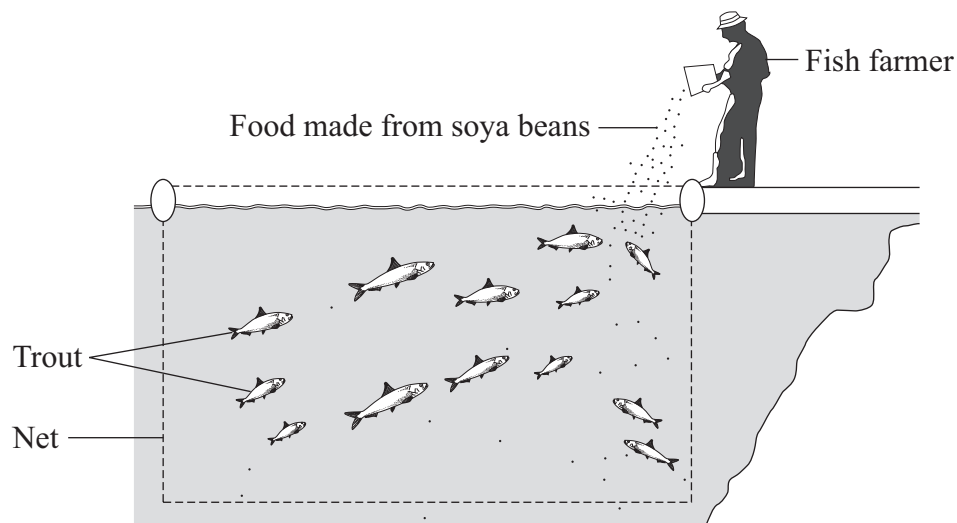
8

Turn over for the next question

Turn over ►



- 6 A fish farmer keeps trout in a large net in a lake.



The fish farmer feeds the trout on food made from soya beans.

When the trout are large enough the farmer sells them for food for people.

- 6 (a) Draw a pyramid of biomass for the three organisms in this food chain.

Label the pyramid.

(2 marks)



- 6 (b) It would be more energy efficient if people ate the soya beans rather than eating the trout.

Which **two** of the following are reasons for this?

Tick (✓) **two** boxes.

Some people do not like eating animals such as trout.

☐

The trout release energy when they respire.

☐

Soya bean plants release energy when they respire.

☐

Some energy will be lost in waste from the trout.

☐

Soya bean plants absorb energy during photosynthesis.

☐

(2 marks)

- 6 (c) Suggest **one** advantage to the fish farmer of keeping the trout in a large net instead of letting them swim freely in the lake.

.....

.....

(1 mark)

- 6 (d) Some trout die before they are large enough to be sold.
The dead trout contain carbon.

Use your knowledge of the carbon cycle to describe how this carbon is returned to the atmosphere after the trout die.

.....

.....

.....

.....

.....

(2 marks)

Turn over for the next question

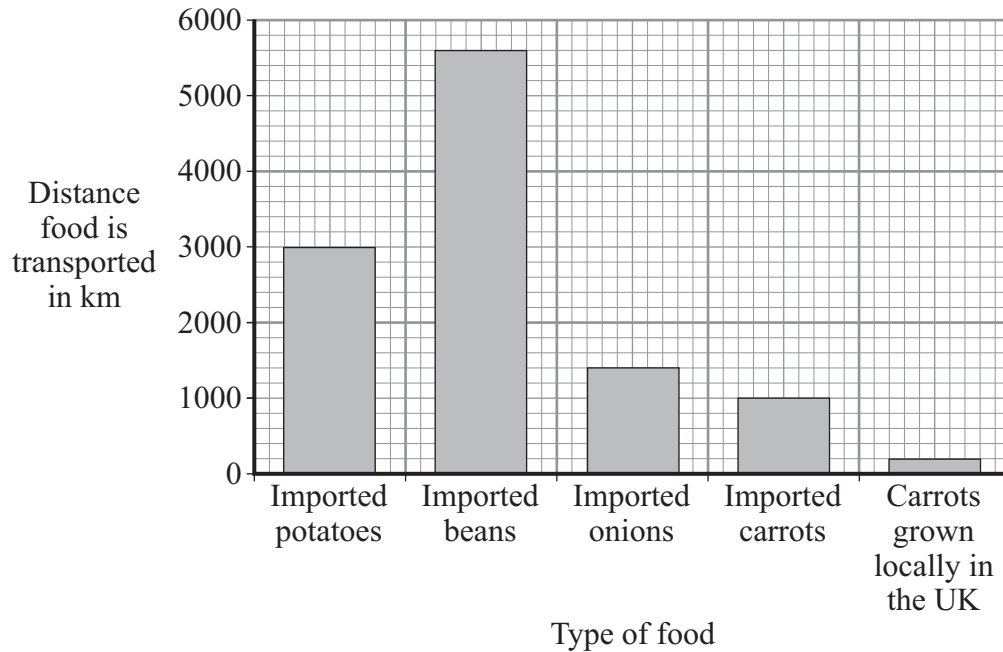
7

Turn over ►



- 7 Some people are concerned about the distance that food is transported between the grower and the supermarket.

The bar chart shows the distances for some foods.



- 7 (a) Both imported carrots and carrots grown locally in the UK can be bought in supermarkets all year round.

How many times further are imported carrots transported than carrots grown locally in the UK?

Show clearly how you work out your answer.

.....

.....

..... times
(1 mark)



- 7 (b) Many of the beans sold in supermarkets in the UK are grown in Kenya, a tropical country in Africa.

Beans grow faster in Kenya than they do in the UK.

Suggest and explain **one** reason why.

Reason

.....

Explanation

.....

(2 marks)

- 7 (c) Many people believe that we should buy locally produced food instead of food imported from abroad.

Explain how this would help the environment.

.....

.....

.....

.....

.....

(2 marks)

5

END OF QUESTIONS



There are no questions printed on this page

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