Write your name here

Surname	Other names

Centre Number | Candidate Number

Edexcel GCSE

Biology/Additional Science

Unit B2: The Components of Life

Foundation Tier

Monday 10 June 2013 – Afternoon
Time: 1 hour

Paper Reference
5BI2F/01

You must have:
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care with your spelling, punctuation and grammar, as well as the clarity of expression, on these questions.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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P 4 1 9 3 2 A 0 1 2 0

PEARSON

Answer ALL questions

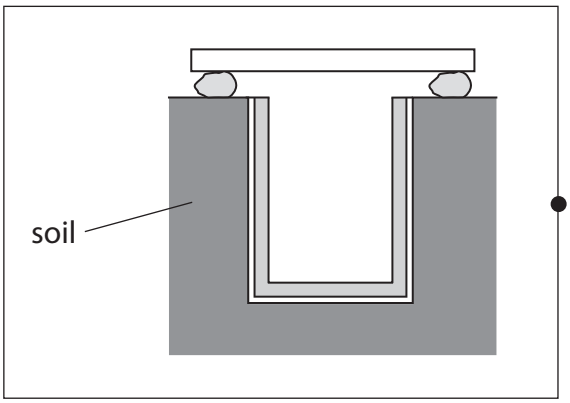
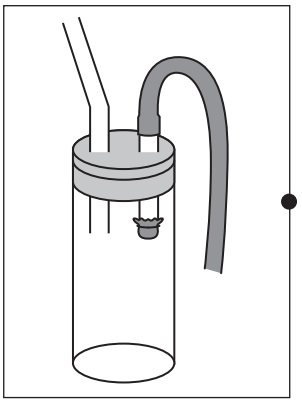
Some questions must be answered with a cross in a box ☒.
If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Sampling

1 Sampling can be used to find out the type and number of living organisms in a habitat.

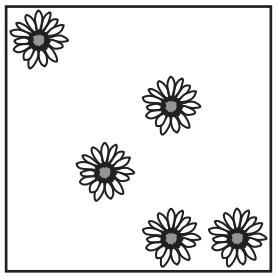
(a) (i) Draw **one** straight line from each piece of sampling equipment to its name.

(2)

sampling equipment	**name**
	pooter
	sweep net
	filter funnel
	pond net
	pitfall trap

(ii) A quadrat was used to estimate the number of daisies in a garden.

The diagram shows the number of daisies found in a 1 m^2 quadrat.

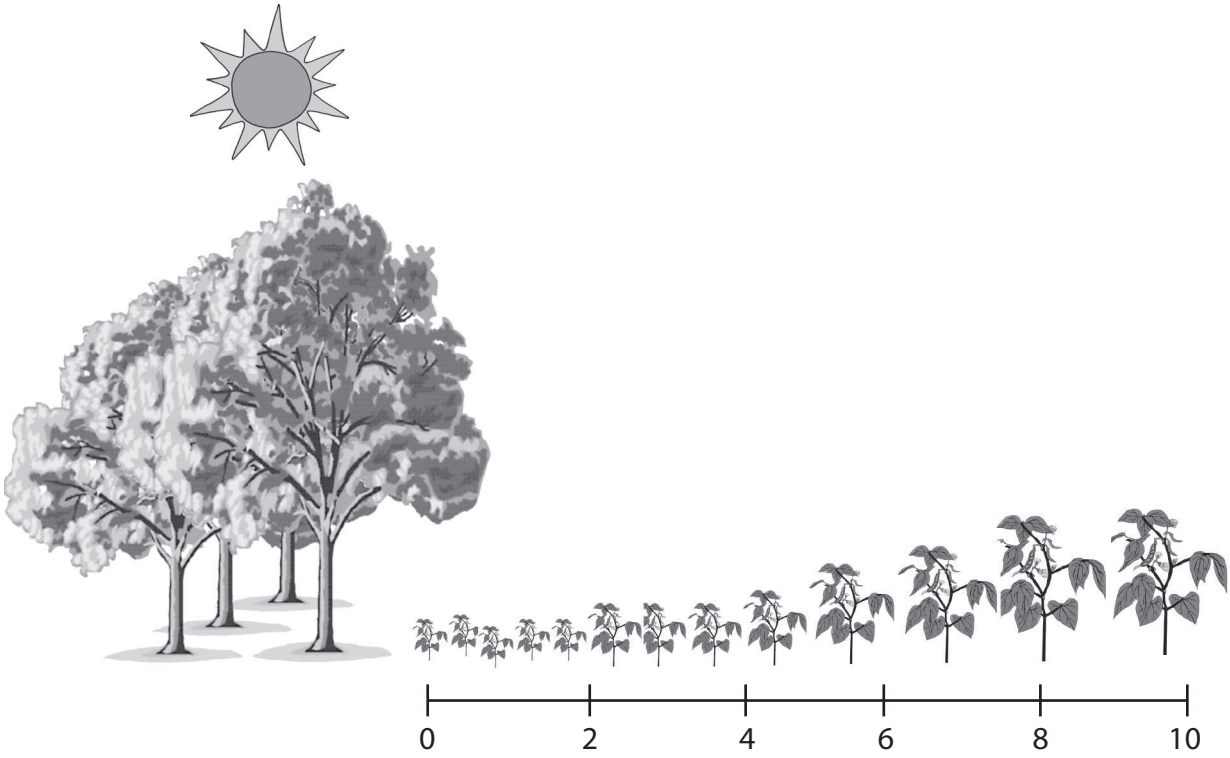


Estimate the number of daisies in a garden with an area of 20 m^2.

(2)

number of daisies = ...

(b) Some students measured the heights of one type of plant growing at the edge of a wood and into a field.



Suggest why the plants get taller as the distance between the plants and the wood increases.

(2)

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.....

.....

.....

(c) Name **two** substances that plants need to produce glucose, using light energy from the Sun.

(2)

1 .....

2 .....

(Total for Question 1 = 8 marks)

Digesting fat

2 (a) Food high in saturated fat can raise blood cholesterol levels.

(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

(1)

The enzymes for fat digestion are released into the

☒ **A** mouth

☒ **B** oesophagus

☒ **C** small intestine

☒ **D** stomach

(ii) Complete the sentence by putting a cross (☒) in the box next to your answer.

An enzyme that breaks down fat is

(1)

☒ **A** amylase

☒ **B** lipase

☒ **C** pepsin

☒ **D** protease

(iii) Explain the role of the muscular wall of the oesophagus in digestion.

(2)

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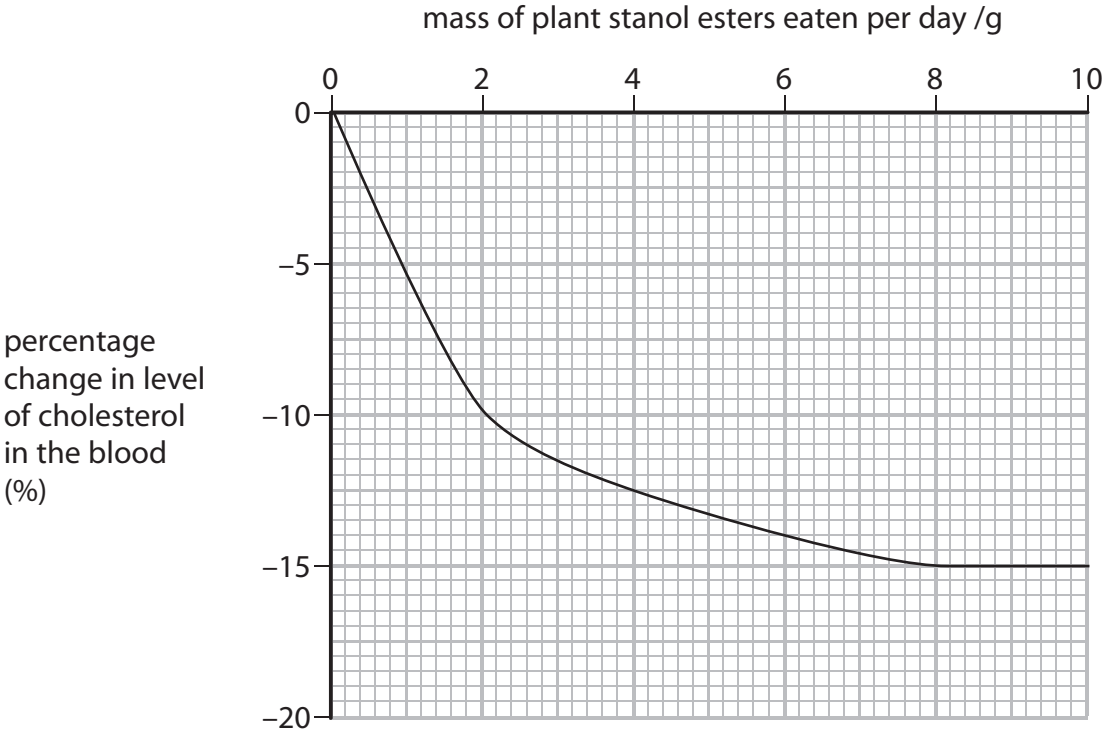
(b) Plant stanol esters in food can affect the level of cholesterol in the blood.

The graph shows the percentage change in the level of cholesterol in the blood when different quantities of plant stanol esters are eaten.



(i) Calculate the percentage change in the levels of cholesterol in the blood between eating 2 g of plant stanol esters per day and 8 g of plant stanol esters per day.

(2)

answer = ...

(ii) Describe how the level of cholesterol in the blood changes as the mass of plant stanol esters eaten increases.

(2)

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.....

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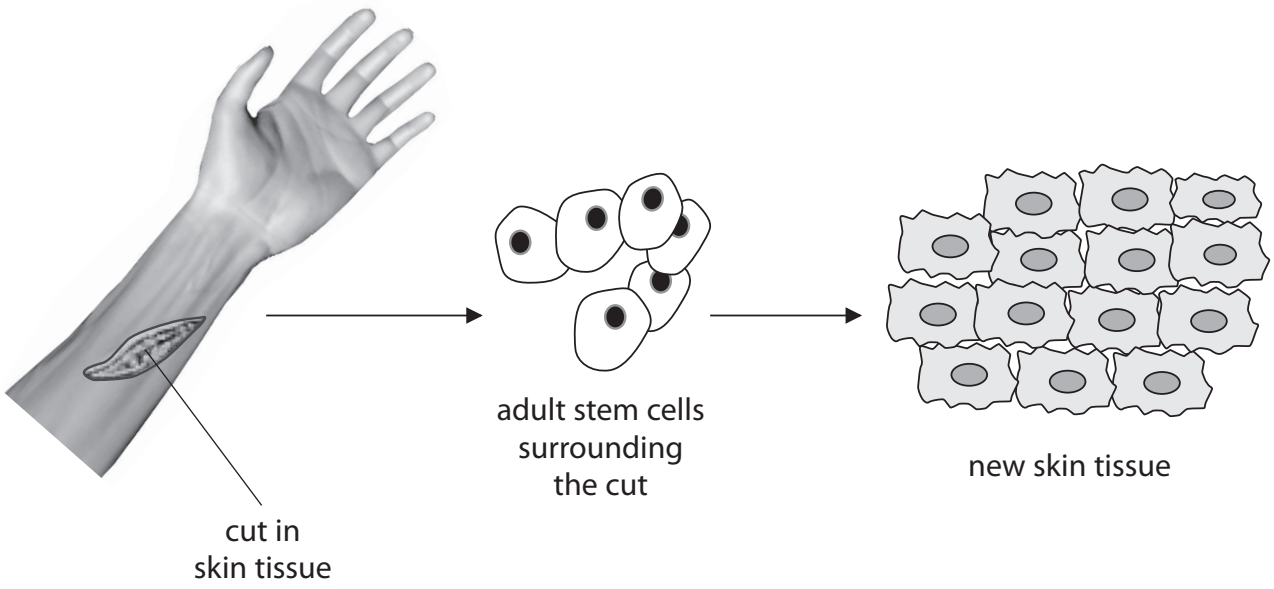
.....

(Total for Question 2 = 8 marks)

Growth of living organisms

3 (a) The diagram shows the cells involved in the repair of skin tissue.



(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

A tissue is a group of

(1)

- ☒ **A** stem cells dividing
- ☒ **B** sex cells dividing
- ☒ **C** organs working together
- ☒ **D** similar cells working together

(ii) Suggest how stem cells produce new tissue.

(2)

.....

.....

.....

.....

(iii) Complete the sentence by putting a cross (☒) in the box next to your answer.

The process that releases energy for the growth and repair of damaged body tissue is

(1)

☒ **A** digestion

☒ **B** photosynthesis

☒ **C** respiration

☒ **D** transpiration

(b) Mass can be used to measure the growth of babies.

The table shows the mass of baby X and baby Y from birth to 24 months.

	mass / kg	
age / months	**baby X**	**baby Y**
0	2.5	3.4
6	6.4	8.0
12	7.8	9.6
18	9.0	11.0
24	10.8	12.2
mass gained		8.8

(i) Calculate the mass gained by baby X from birth to 24 months.

(2)

mass gained = ... kg

(ii) Suggest **one** way, other than mass gained, that can be used to measure the growth of babies.

(1)

.....

(c) Carbohydrates provide energy for growth.

Use words from the box to complete the sentences.

(3)

amino acids	amylase	large intestine	protease
proteins	small intestine	stomach	sugars

Carbohydrates are broken down by ..... into

simple ..... .

Glucose is absorbed into the blood through villi found in the

..... .

(Total for Question 3 = 10 marks)

Structure of DNA

4 (a) Use words from the box to complete the sentences.

(3)

carbon	chromosome	double
gene	triple	hydrogen

A DNA molecule consists of two coiled strands that form a ..... helix.

The strands are held together by ..... bonds between the bases.

A ..... is a section of a DNA molecule that codes for a specific protein.

(b) Which **two** scientists were the first to build a 3D model of a DNA molecule?

Put a cross (☒) in the box next to your answer.

(1)

☒ **A** Franklin and Crick

☒ **B** Franklin and Wilkins

☒ **C** Watson and Crick

☒ **D** Watson and Wilkins

(c) (i) DNA gives instructions to make proteins.

Describe how two proteins can be different shaped molecules.

(2)

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.....

.....

.....

(ii) Some proteins are not the correct shape.

Suggest what may have happened to the DNA to cause a protein to form the wrong shape.

(2)

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.....

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.....

(iii) Complete the sentence by putting a cross (☒) in the box next to your answer.

Some proteins are enzymes.

Enzymes are

(1)

☒ **A** biological catalysts

☒ **B** functional foods

☒ **C** haploid gametes

☒ **D** respiring cells

(d) State the term used to describe organisms that have identical DNA.

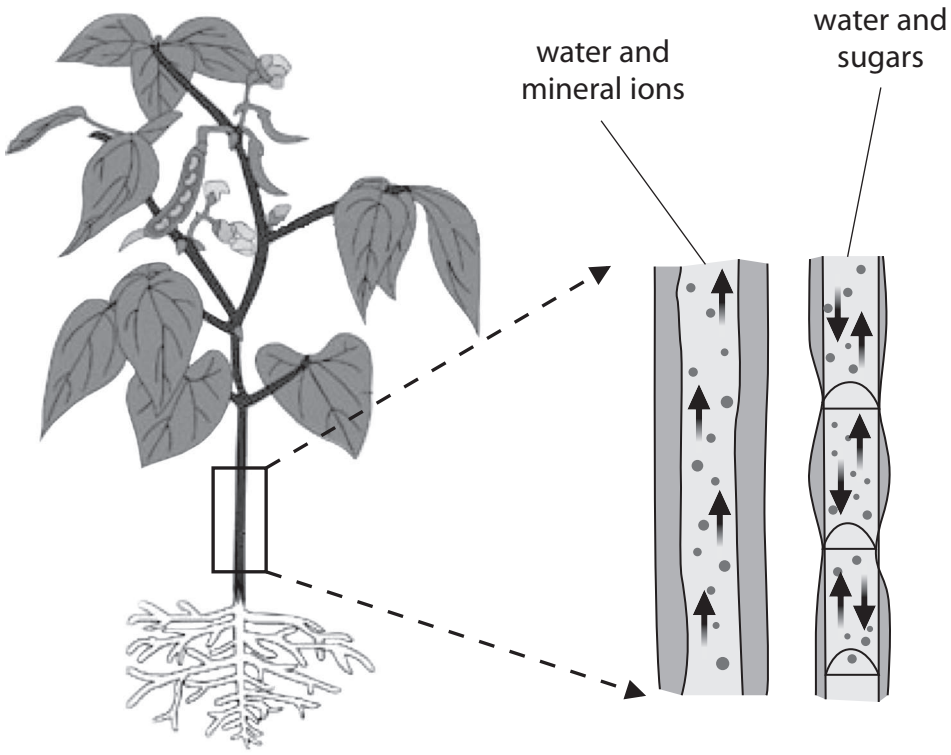
(1)

.....

(Total for Question 4 = 10 marks)

Transport of materials

5 (a) The diagram shows two vessels found in the stems of plants.



(i) Name the vessel that transports water and mineral ions through the plant.

(1)

.....

(ii) Energy is needed to transport sugars through the plant.

Which cell component supplies energy that can be used for the transport of sugars through the plant?

Put a cross (☒) in the box next to your answer.

(1)

☒ **A** cell wall

☒ **B** mitochondria

☒ **C** nucleus

☒ **D** vacuole

(b) The table shows how the percentage of a person's blood that goes to each body part changes when they exercise.

	percentage of blood delivered to each part (%)	
body part	**at rest**	**during exercise**
brain	17	5
liver	27	7
muscles	15	66

(i) Suggest why the percentage of blood going to each of the body parts changes when a person exercises.

(3)

.....

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.....

.....

.....

.....

(ii) Muscle cells can carry out anaerobic respiration during exercise.

State a disadvantage of anaerobic respiration.

(1)

.....

.....

*(c) Describe how the circulatory system transports substances around the body.

(6)

(Total for Question 5 = 12 marks)

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Question 6 is on the next page

Genetic modification (GM)

6 Maize is a crop plant that has been genetically modified.

(a) Suggest how maize is genetically modified.

(2)

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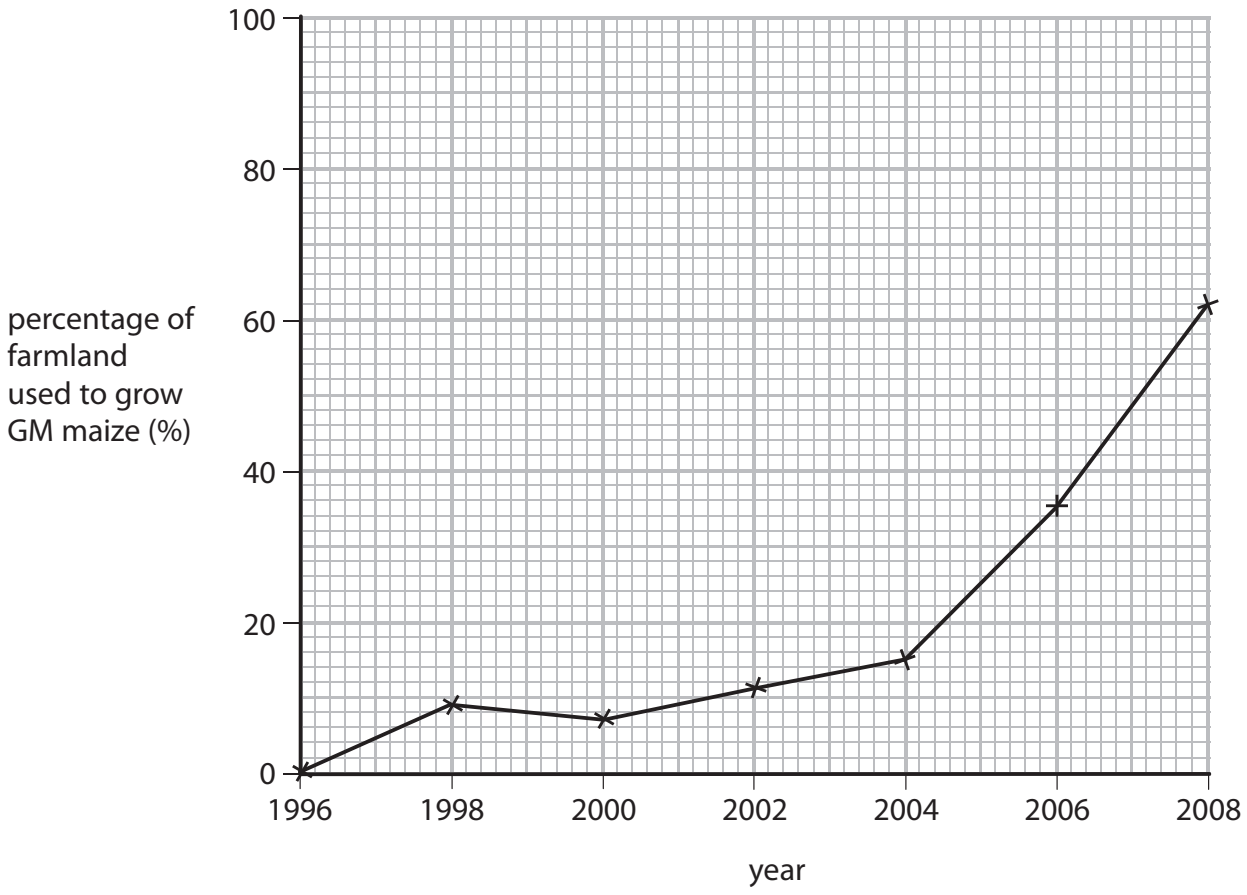
(b) The graph shows how the percentage of farmland used to grow genetically modified (GM) maize has changed from 1996 to 2008.



(i) Calculate the change in the percentage of farmland used to grow GM maize from 2004 to 2008.

(2)

answer = ...

(ii) Describe the changes in the percentage of farmland used to grow GM maize between 1996 to 2008.

(2)

*(c) Discuss the advantages and disadvantages of the use of GM organisms.

(6)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

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