

Paper Reference(s) 5BI2F/01

Edexcel GCSE

Biology/Additional Science
Unit B2: The Components of Life
Foundation Tier

Monday 10 June 2013 – Afternoon
Time: 1 hour plus your additional
time allowance

INSTRUCTIONS TO CANDIDATES

Write your centre number, candidate number, surname, initials and your signature in the boxes below. Check that you have the correct question paper.

Centre No.					
Candidate No.					
Surname					
Initial(s)					
Signature					
Paper Reference	5	B	I	2	F / 0 1

Q41932A

PEARSON

- Use **BLACK** ink or ball-point pen.
- Answer **ALL** questions.
- Answer the questions in the spaces provided – there may be more space than you need.

MATERIALS REQUIRED FOR EXAMINATION

Calculator, ruler

ITEMS INCLUDED WITH QUESTION PAPERS

Nil

INFORMATION FOR CANDIDATES

- 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 TO CANDIDATES

- 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)

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

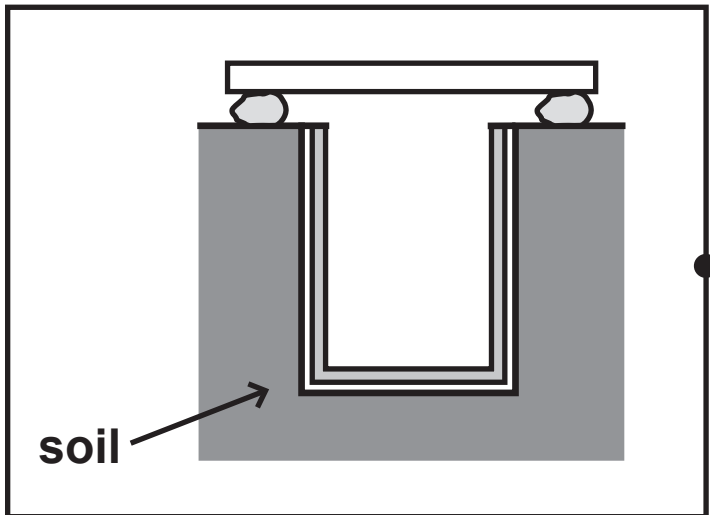
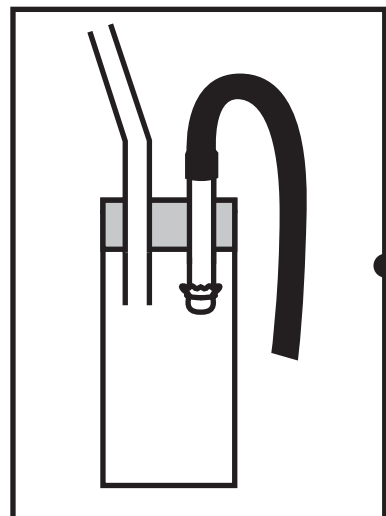
- 1 Sampling can be used to find out the type and number of living organisms in a habitat.

(Question continues on next page)

(Turn over)

- (a) (i) Draw ONE straight line from each piece of sampling equipment to its name. (2 marks)

SAMPLING EQUIPMENT



NAME

pooter

sweep net

filter funnel

pond net

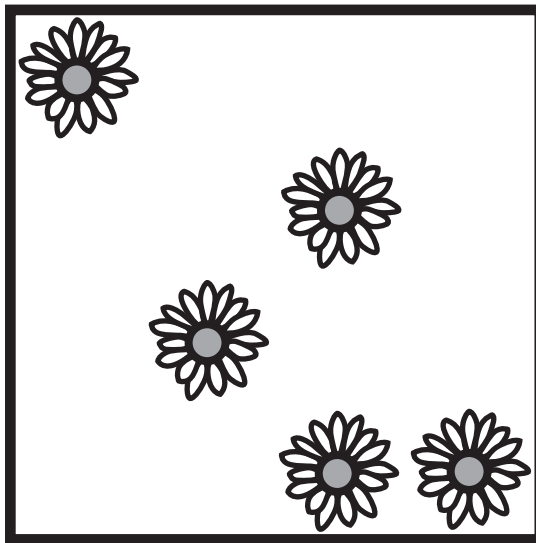
pitfall trap

(Question continues on next page)

(Turn over)

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

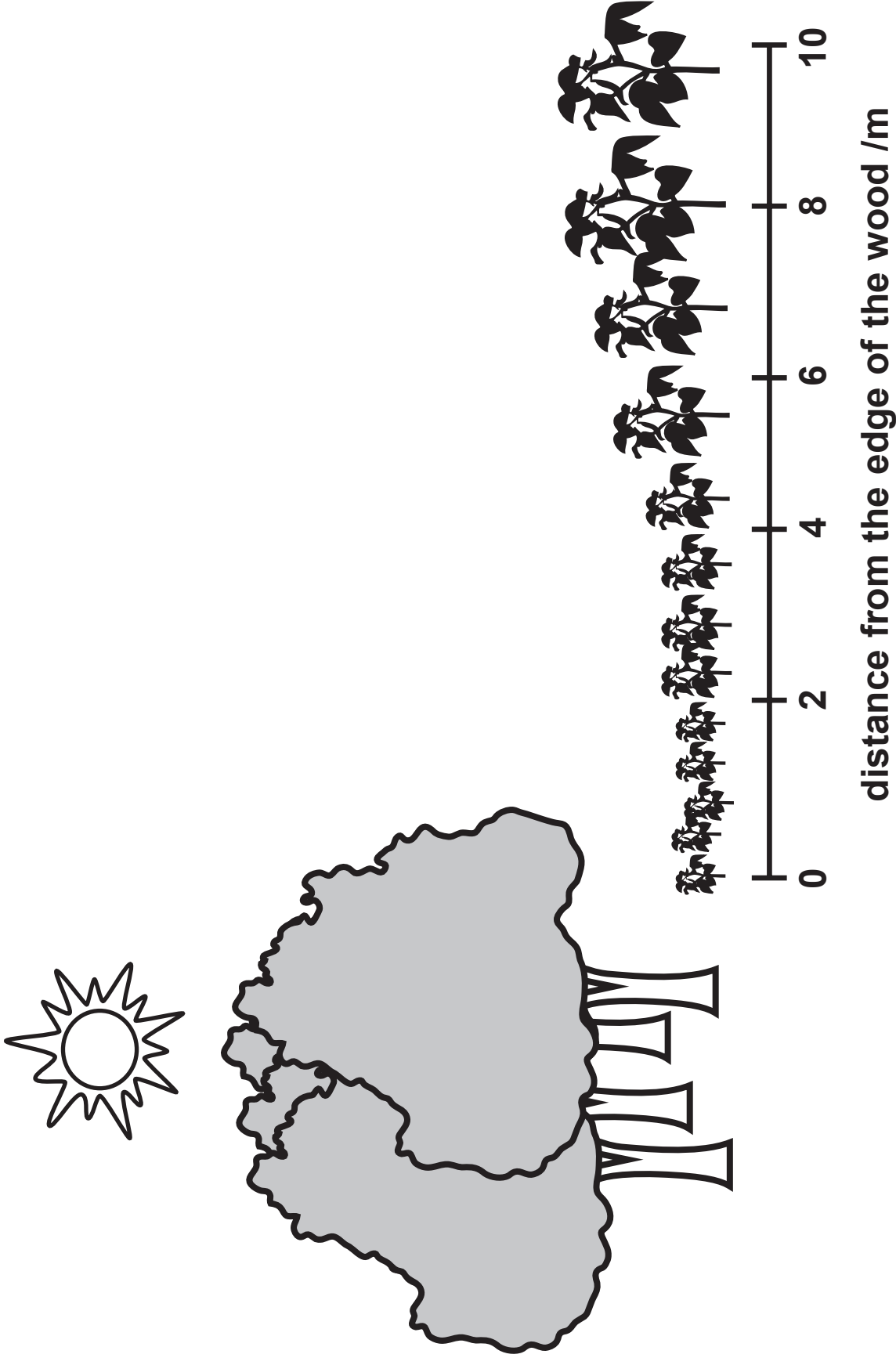
The diagram shows the number of daisies found in a 1 m^2 quadrat.



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

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.



(Question continues on next page)

(Turn over)

**Suggest why the plants get taller as the distance between the plants and the wood increases.
(2 marks)**

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

1

2

(Total for Question 1 = 8 marks)

(Questions continue on next page)

(Turn over)

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 mark)

The enzymes for fat digestion are released into the

- ☐ **A mouth**
- ☐ **B oesophagus**
- ☐ **C small intestine**
- ☐ **D stomach**

(Question continues on next page)

(Turn over)

- (ii) Complete the sentence by putting a cross ☒ in the box next to your answer. (1 mark)

An enzyme that breaks down fat is

- ☐ A amylase
- ☐ B lipase
- ☐ C pepsin
- ☐ D protease

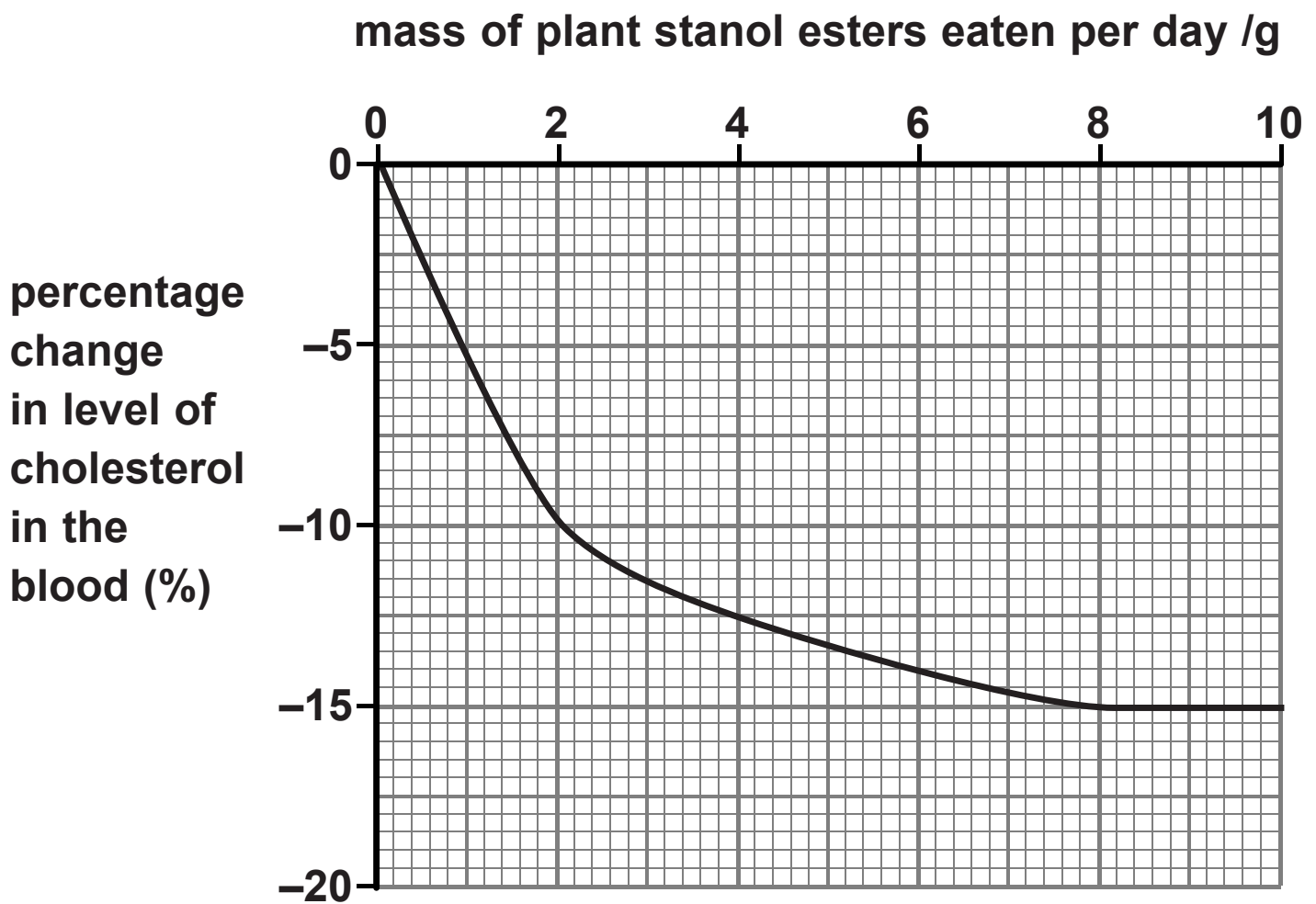
- (iii) Explain the role of the muscular wall of the oesophagus in digestion. (2 marks)

(Question continues on next page)

(Turn over)

- (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.



(Question continues on next page)

(Turn over)

- (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 marks)

answer = _____

(Question continues on next page)

(Turn over)

- (ii) Describe how the level of cholesterol in the blood changes as the mass of plant stanol esters eaten increases. (2 marks)

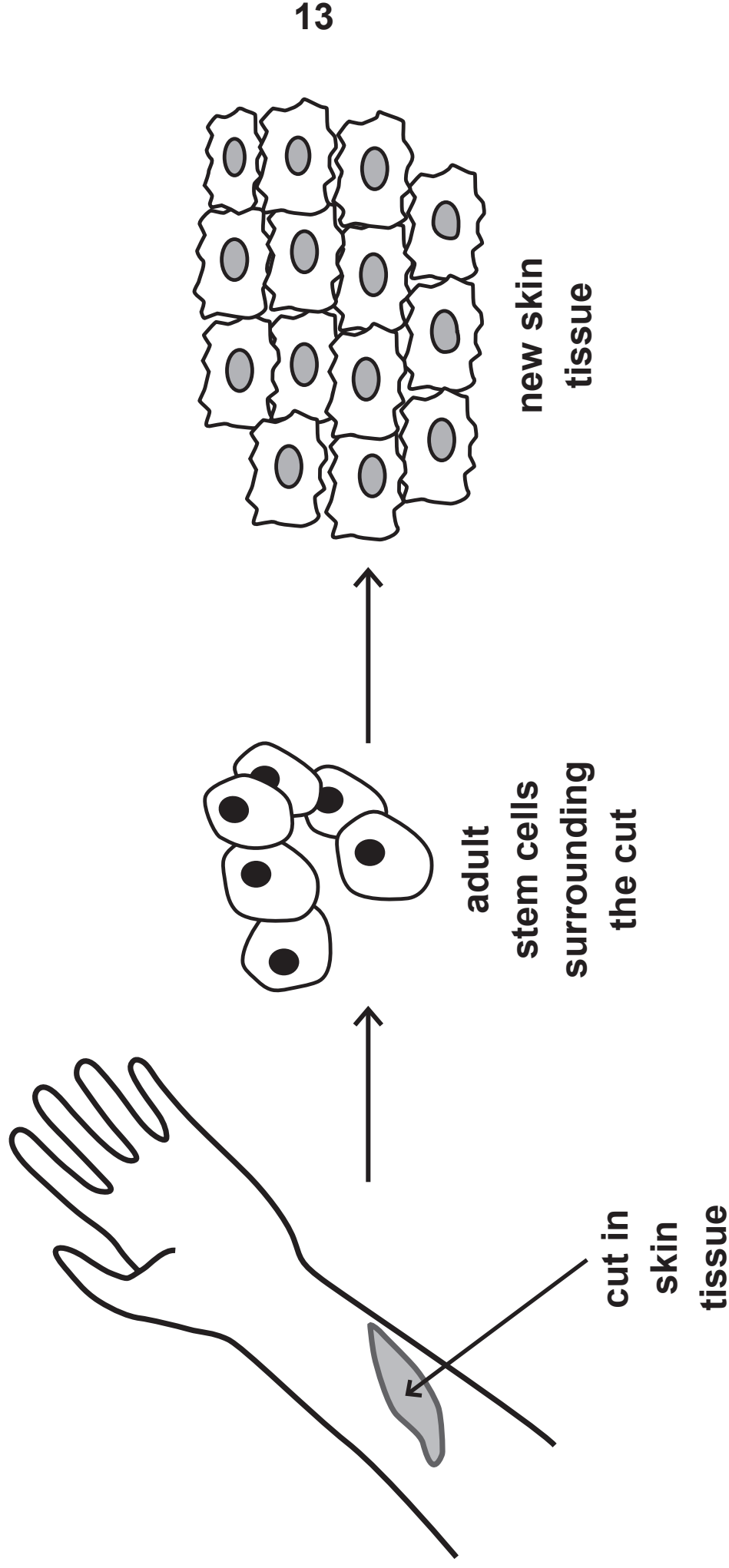
(Total for Question 2 = 8 marks)

(Questions continue on next page)

(Turn over)

GROWTH OF LIVING ORGANISMS

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



(Question continues on next page)

(Turn over)

- (i) Complete the sentence by putting a cross ☒ in the box next to your answer. (1 mark)

A tissue is a group of

- ☐ 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 marks)

(Question continues on next page)

(Turn over)

(iii) Complete the sentence by putting a cross ☒ in the box next to your answer. (1 mark)

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

- ☐ A digestion
- ☐ B photosynthesis
- ☐ C respiration
- ☐ D transpiration

(Question continues on next page)

(Turn over)

(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

(Question continues on next page)

(Turn over)

- (i) Calculate the mass gained by baby X from birth to 24 months. (2 marks)

mass gained = _____ kg

- (ii) Suggest ONE way, other than mass gained, that can be used to measure the growth of babies. (1 mark)

(Question continues on next page)

(Turn over)

(c) Carbohydrates provide energy for growth.

Use words from the box to complete the sentences. (3 marks)

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)

(Questions continue on next page)

(Turn over)

STRUCTURE OF DNA

- 4 (a) Use words from the box to complete the sentences. (3 marks)

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.

(Question continues on next page)

(Turn over)

(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 mark)**

- ☐ **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 marks)

(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 marks)**

(Question continues on next page)

(Turn over)

(iii) Complete the sentence by putting a cross ☒ in the box next to your answer. (1 mark)

Some proteins are enzymes.

Enzymes are

- ☐ 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 mark)

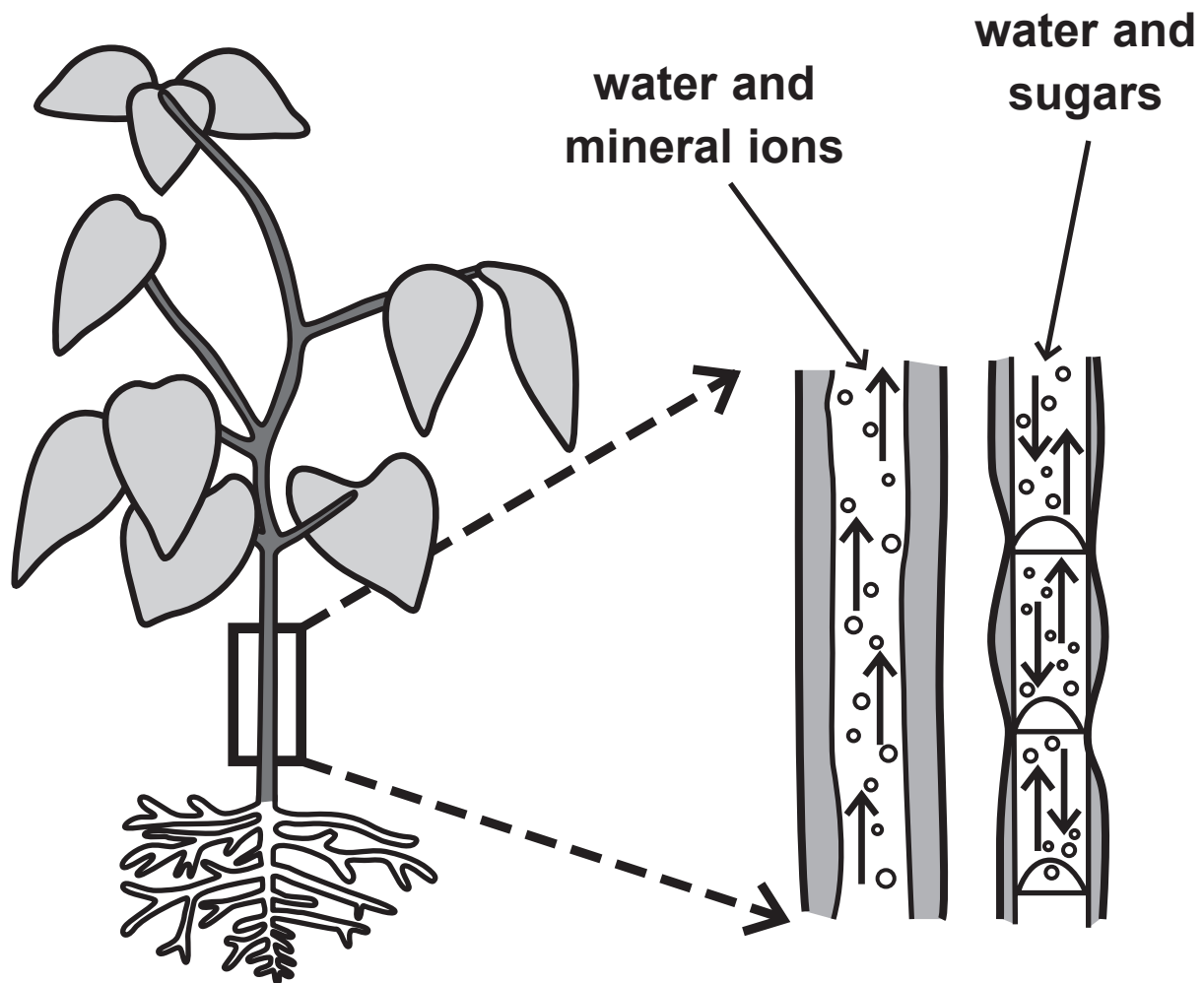
(Total for Question 4 = 10 marks)

(Questions continue on next page)

(Turn over)

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 mark)

(Question continues on next page)

(Turn over)

- (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 mark)

- ☐ A cell wall
- ☐ B mitochondria
- ☐ C nucleus
- ☐ D vacuole

(Question continues on next page)

(Turn over)

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

BODY PART	PERCENTAGE OF BLOOD DELIVERED TO EACH PART (%)	
	AT REST	DURING EXERCISE
brain	17	5
liver	27	7
muscles	15	66

(Question continues on next page)

(Turn over)

- (i) Suggest why the percentage of blood going to each of the body parts changes when a person exercises. (3 marks)

(Question continues on next page)

(Turn over)

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

State a disadvantage of anaerobic respiration.
(1 mark)

- *(c) Describe how the circulatory system transports substances around the body. (6 marks)

(Total for Question 5 = 12 marks)

(Questions continue on next page)

(Turn over)

GENETIC MODIFICATION (GM)

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

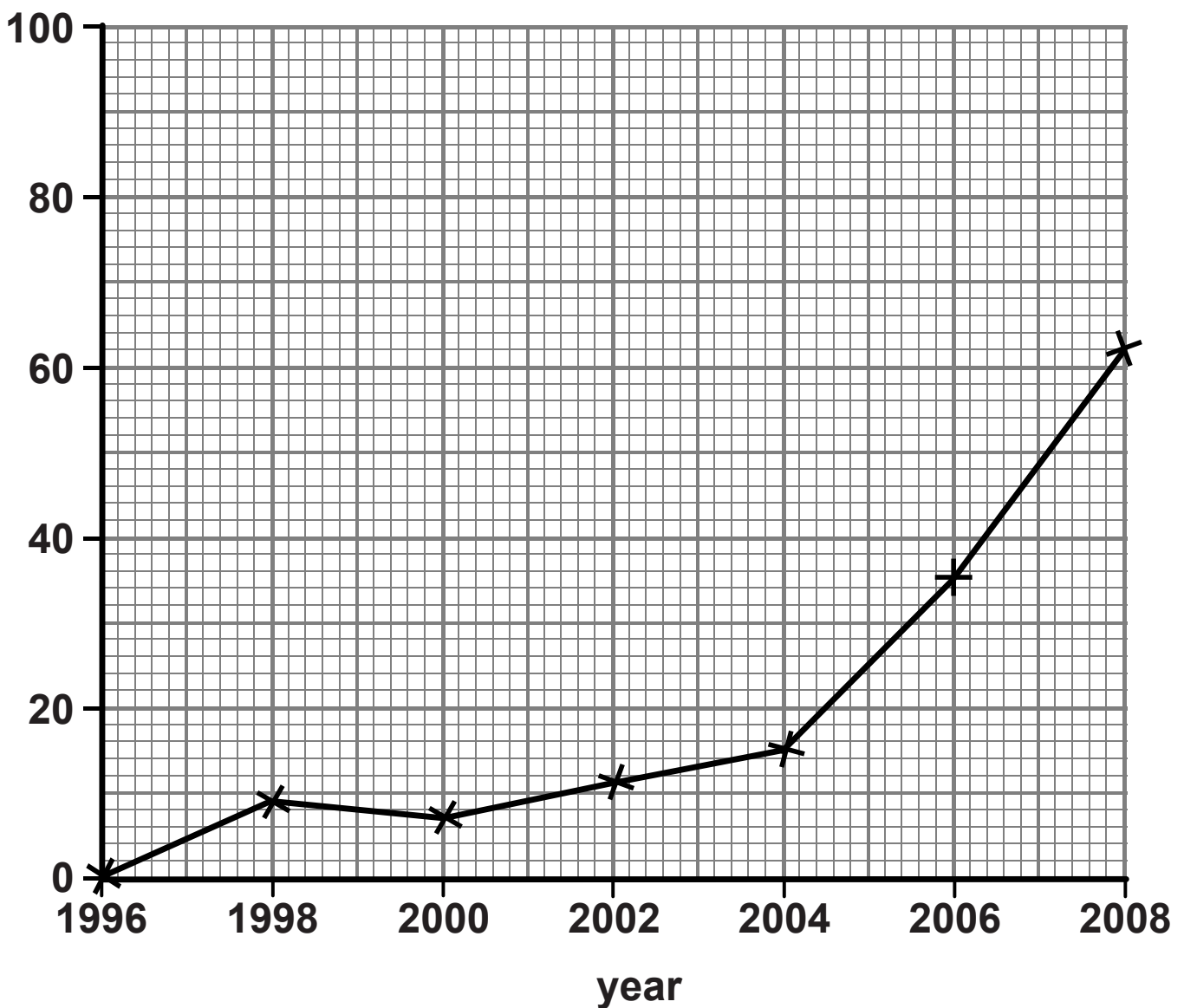
**(a) Suggest how maize is genetically modified.
(2 marks)**

(Question continues on next page)

(Turn over)

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

percentage of
farmland
used to grow
GM maize (%)



(Question continues on next page)

(Turn over)

- (i) Calculate the change in the percentage of farmland used to grow GM maize from 2004 to 2008. (2 marks)

answer = _____

- (ii) Describe the changes in the percentage of farmland used to grow GM maize between 1996 to 2008. (2 marks)

(Question continues on next page)

(Turn over)

[illegible]

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

END