Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

Biology/Additional Science

Unit B2: The Components of Life

Foundation Tier

Friday 1 March 2013 – Morning **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 ▶

P41956A

1/1/1/1/

P 4 1 9 5 6 A 0 1 2 0

PEARSON

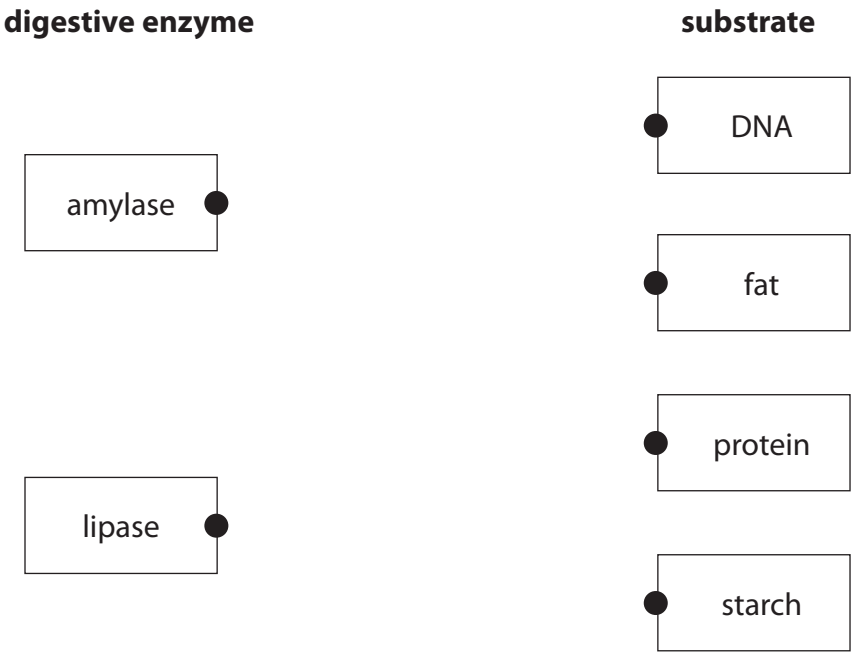
Answer ALL questions

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 ☒.

Digestive enzymes

1 (a) Draw **one** straight line from each digestive enzyme to its substrate.

(2)



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

Pepsin is an enzyme that digests protein into

(1)

☒ **A** amino acids

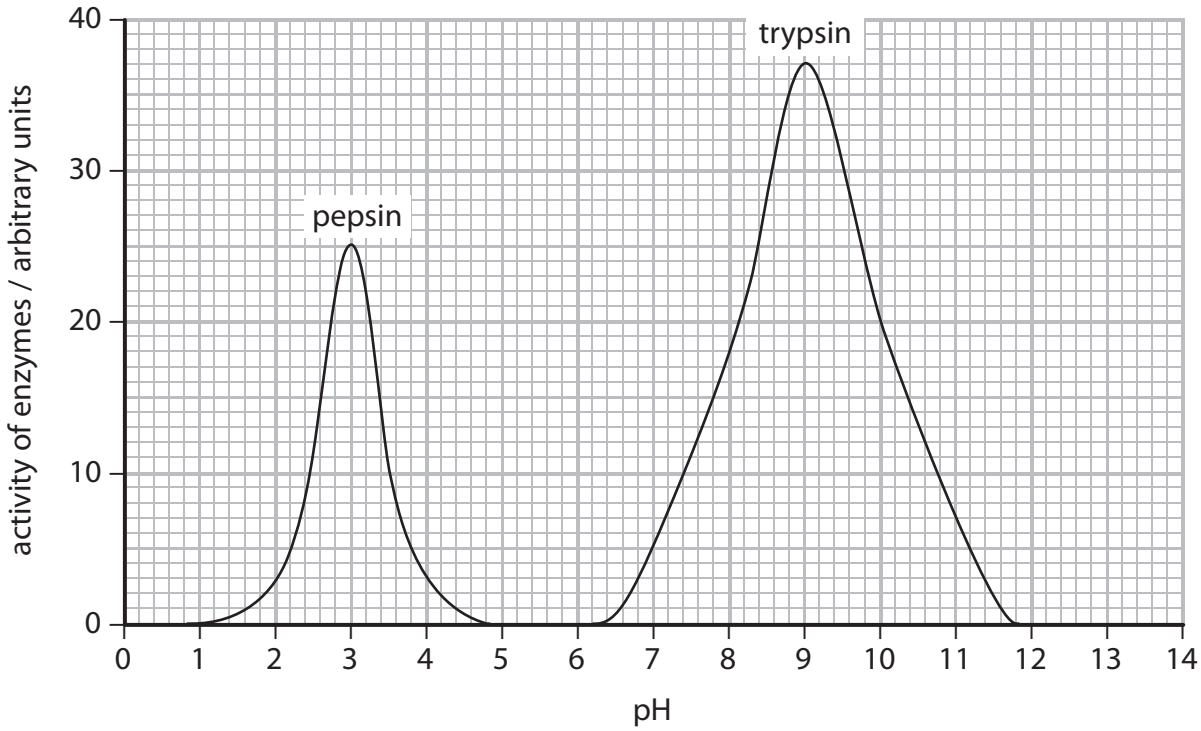
☒ **B** fatty acids

☒ **C** glucose

☒ **D** glycerol

(ii) An experiment was carried out to investigate the effect of pH on the activity of pepsin and another enzyme called trypsin.

The graph shows the results of the experiment.



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

The graph shows that

(1)

- ☒ **A** pepsin only works at a pH of 3
- ☒ **B** pepsin has an optimum pH of 3
- ☒ **C** trypsin only works at a pH of 3
- ☒ **D** trypsin has an optimum pH of 3

(iii) Using the graph, describe **two** ways in which the activity of pepsin is different to the activity of trypsin.

(2)

1 .....

.....

2 .....

.....

(iv) Explain why the activity of trypsin is different at pH 11 compared to pH 9.

(2)

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(Total for Question 1 = 8 marks)

Useful bacteria

2 (a) Some foods contain prebiotics.

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

The active ingredients in prebiotics are

(1)

☒ **A** lactic acids

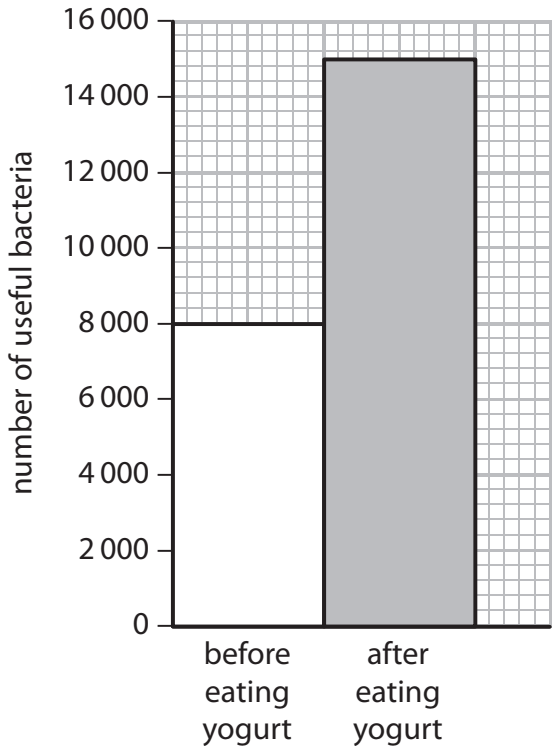
☒ **B** oligosaccharides

☒ **C** stanol esters

☒ **D** starch

(b) The graph shows the number of useful bacteria in part of the digestive system of a person before and after eating yogurt.

The yogurt contained prebiotics.



(i) Calculate the difference between the number of bacteria present in the digestive system before and after the yogurt was eaten.

(2)

..... useful bacteria

(ii) Describe the effect on the number of useful bacteria after eating yogurt containing prebiotics.

(1)

.....

.....

(c) Bacteria are microscopic organisms.

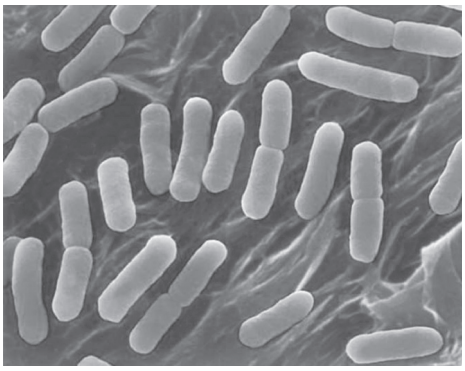
(i) State a part of the light microscope that magnifies the bacteria.

(1)

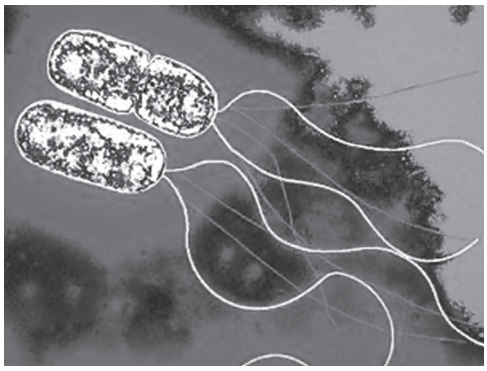
.....

Photograph A was taken using a light microscope and photograph B was taken using an electron microscope.

Photograph A



Photograph B



(ii) Describe **two** advantages of using an electron microscope to view bacteria.

(2)

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.....

(iii) Name **one** structure of the bacterial cell that can be seen in the image from the electron microscope.

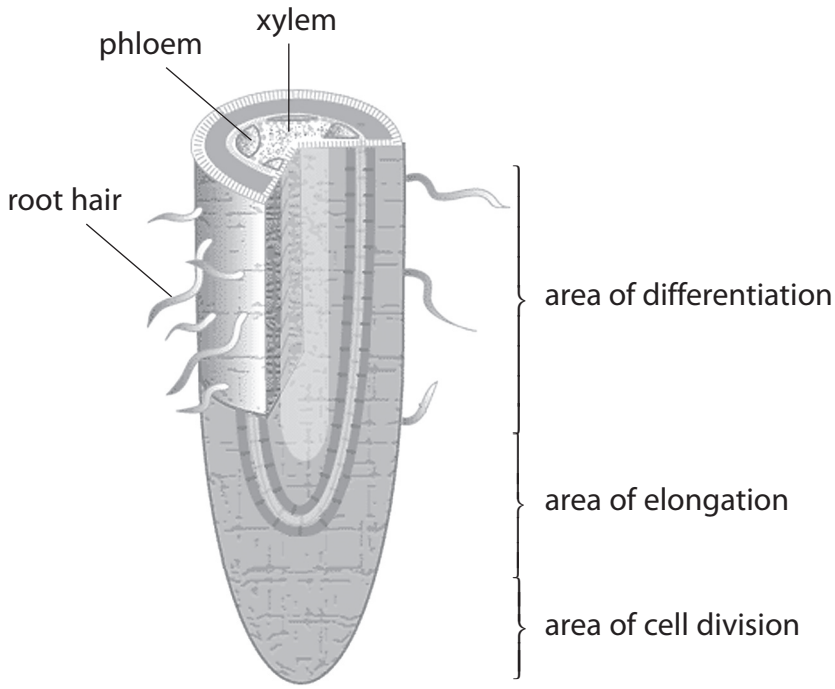
(1)

.....

(Total for Question 2 = 8 marks)

Plant growth

3 (a) The diagram shows a section through a plant root.



(i) State the type of cell division taking place in the root.

(1)

.....

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

During cell elongation the root cells are

(1)

☒ **A** branching

☒ **B** getting longer

☒ **C** getting smaller

☒ **D** photosynthesising

(iii) Describe what happens to the root cells during cell differentiation.

(2)

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.....

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(b) A student investigated the growth of tomato plants over a two-month period.

(i) In one investigation, three tomato plants were grown without fertiliser.

The increase in the height of each plant, after two months, is shown in the table.

Increase in height of tomato plants / cm		
plant 1	plant 2	plant 3
9.8	10.5	10.0

Calculate the mean increase in the height of these plants.

(2)

answer = ... cm

(ii) In a second investigation, another three tomato plants each had a different fertiliser, **A**, **B** or **C**, added to their soil.

The mean increase in the height of each plant, after two months, is shown in the table.

	Fertiliser		
	A	**B**	**C**
increase in height of tomato plant / cm	20.4	14.6	10.6

Describe the effect of these fertilisers on the height of the tomato plants.

(2)

.....

.....

.....

.....

(iii) The student thought that fertilisers might also affect the growth of tomato plants in other ways.

Suggest **two** other measurements of the plant the student could make to test this idea.

(2)

1 .....

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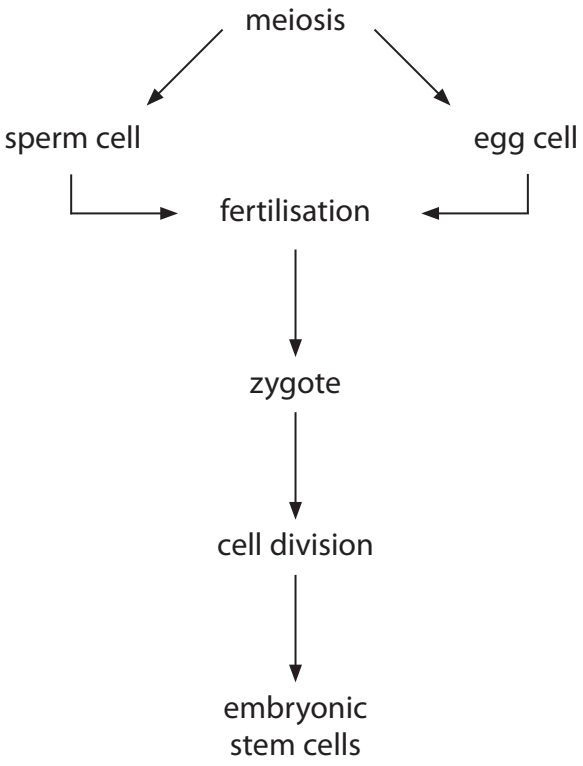
2 .....

.....

(Total for Question 3 = 10 marks)

Stem cells

4 The diagram shows how embryonic stem cells are produced.



(a) (i) Describe how the cells produced by meiosis are different from body cells.

(2)

.....

.....

.....

.....

(ii) Describe what happens to the sex cells during fertilisation.

(2)

.....

.....

.....

.....

(b) Suggest **one** advantage and **one** disadvantage of using embryonic stem cells in scientific research.

(2)

(c) The diagram shows a section of a DNA molecule.

(i) Describe the structure of a DNA molecule.

(3)

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

A gene is a section of DNA that codes for a

(1)

☒ **A** chromosome

☒ **B** plasmid

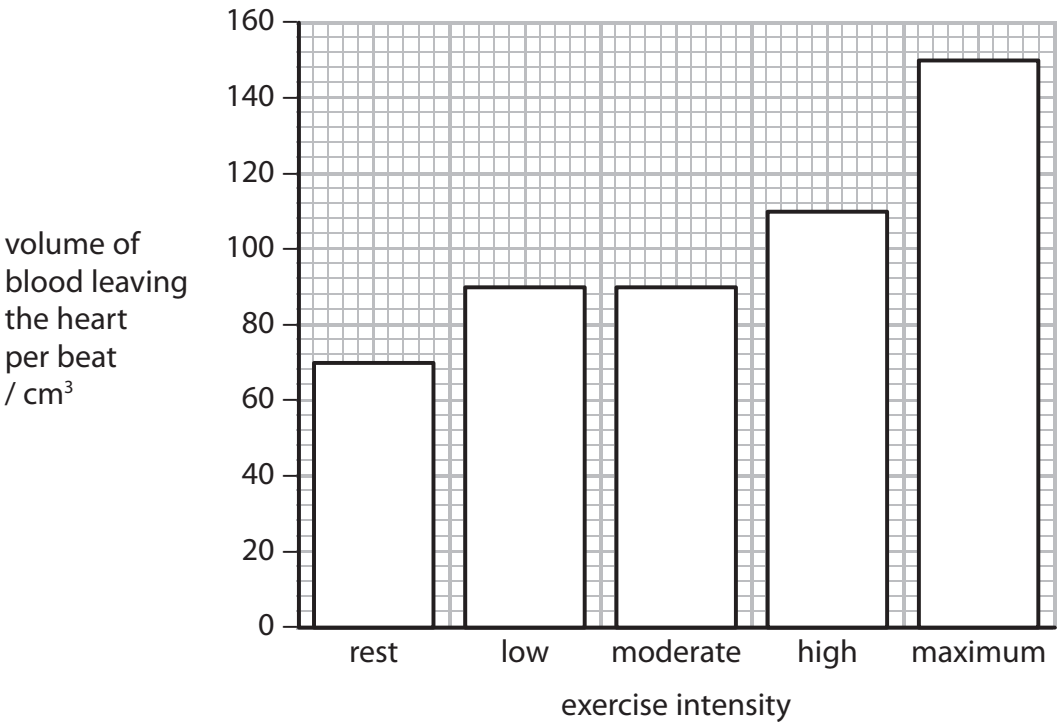
☒ **C** protein

☒ **D** sugar

(Total for Question 4 = 10 marks)

Exercise and blood flow

5 The graph shows the effect of exercise intensity on the volume of blood leaving the heart per beat.



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

The difference between the volume of blood leaving the heart at rest and the volume of blood leaving the heart at maximum exercise intensity is

(1)

☒ **A** 70 cm^3

☒ **B** 80 cm^3

☒ **C** 90 cm^3

☒ **D** 150 cm^3

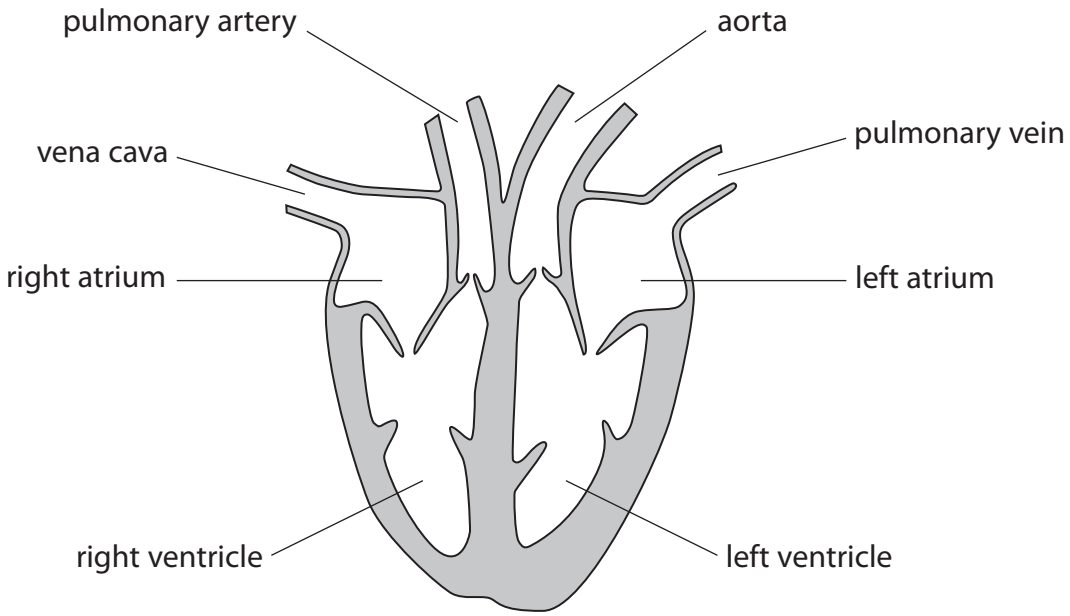
(ii) Using information in the graph, describe the effect of different levels of exercise intensity on the volume of blood leaving the heart.

(2)

(iii) Explain why it is important to have a change in blood flow to muscles during exercise.

(3)

*(b) The diagram shows a heart.



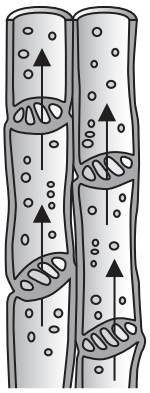
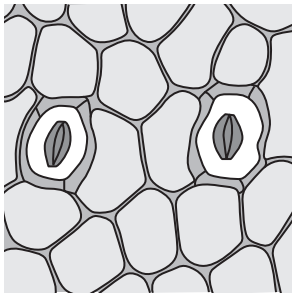
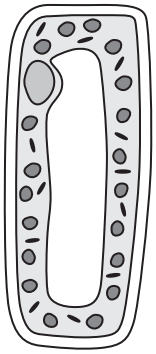
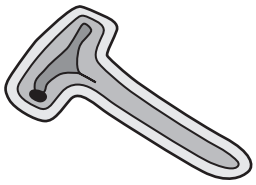
Explain how the structures of the heart are related to their function.

(6)

(Total for Question 5 = 12 marks)

Transport in plants

6 (a) The diagrams show different structures found in a plant.

			
A	**B**	**C**	**D**

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

Stomata are shown in structure

(1)

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

(ii) Explain how structure **C** is adapted for photosynthesis.

(2)

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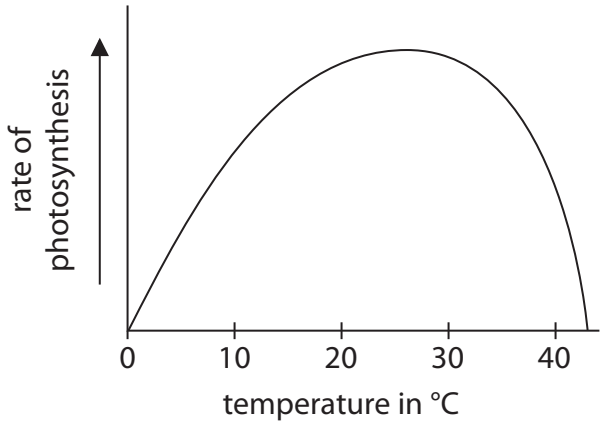
(b) The graph shows the effect of temperature on the rate of photosynthesis.



(i) State the optimum temperature for photosynthesis.

(1)

.....

(ii) Temperature can be a limiting factor.

Describe how another limiting factor could affect the rate of photosynthesis.

(2)

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.....

*(c) Describe how water enters plants from the soil and is transported to the leaves.

(6)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

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