



Centre Number

71	
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Candidate Number

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General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

MV18

MONDAY 24 FEBRUARY 2014, MORNING

TIME

1 hour, plus your additional time allowance.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.
Answer **all nine** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in question **9(b)**.

1 (a) Complete the table below. [3 marks]

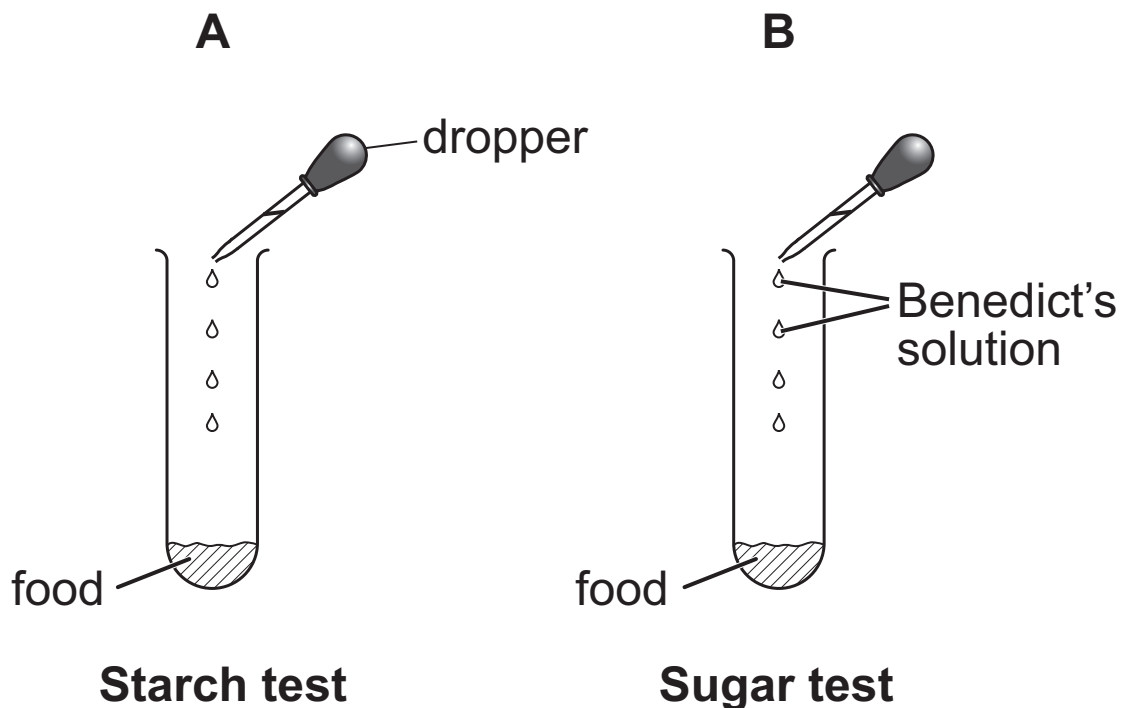
Choose from:

to give us energy : fat : for strong teeth and bones

fibre : protein

Food group	Function in the body
	growth and repair
carbohydrate	
	prevents constipation

(b) The diagrams below show two food tests.

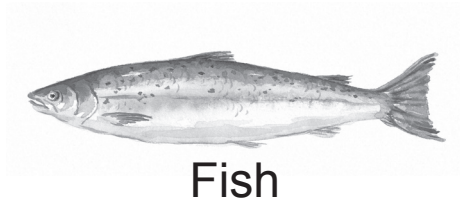


(i) Name the solution used to test for starch in diagram **A**. [1 mark]

(ii) What colour shows that starch is present in diagram **A**? [1 mark]

(iii) An orange-red colour shows that sugar is present in diagram **B**. What is done after adding the Benedict's solution to give this colour change? [1 mark]

(c) The pictures below show foods which are good sources of either vitamin **C** or **D**.



(i) Complete the table to show which of these foods contain each vitamin. [2 marks]

Vitamin	Foods
C	
D	

(ii) Give **one** function for vitamin **C** in the body. [1 mark]

Circle the correct answer.

strengthens teeth and bones : **prevents scurvy**

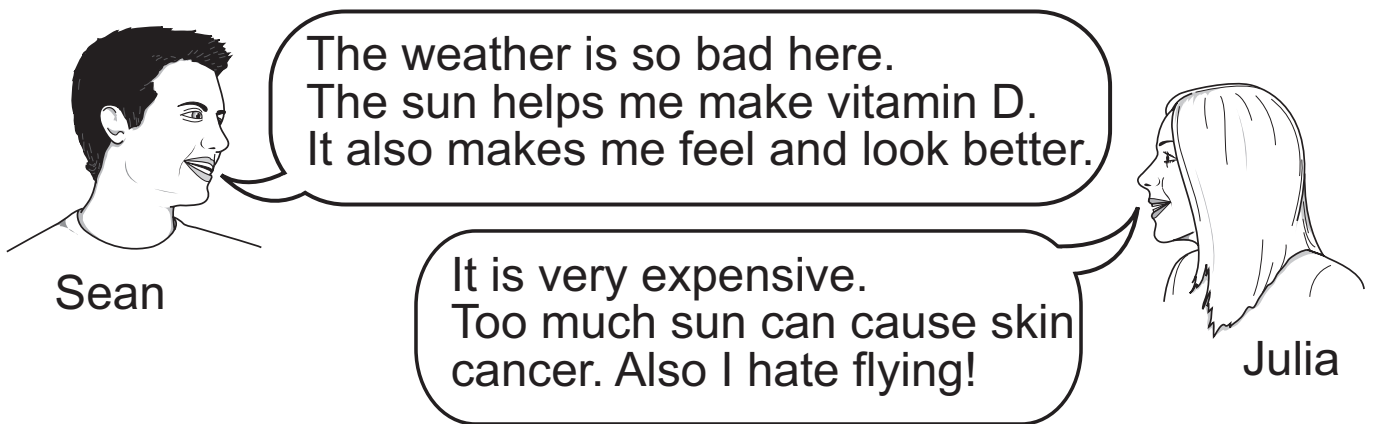
good for eyesight

- 2 (a) The photograph below shows a boy rolling his tongue. Humans either can or cannot roll their tongue.



Name the type of variation that tongue rolling shows.
[1 mark]

- (b) Sean and Julia are discussing whether to go to sunny Majorca for their holiday this year.

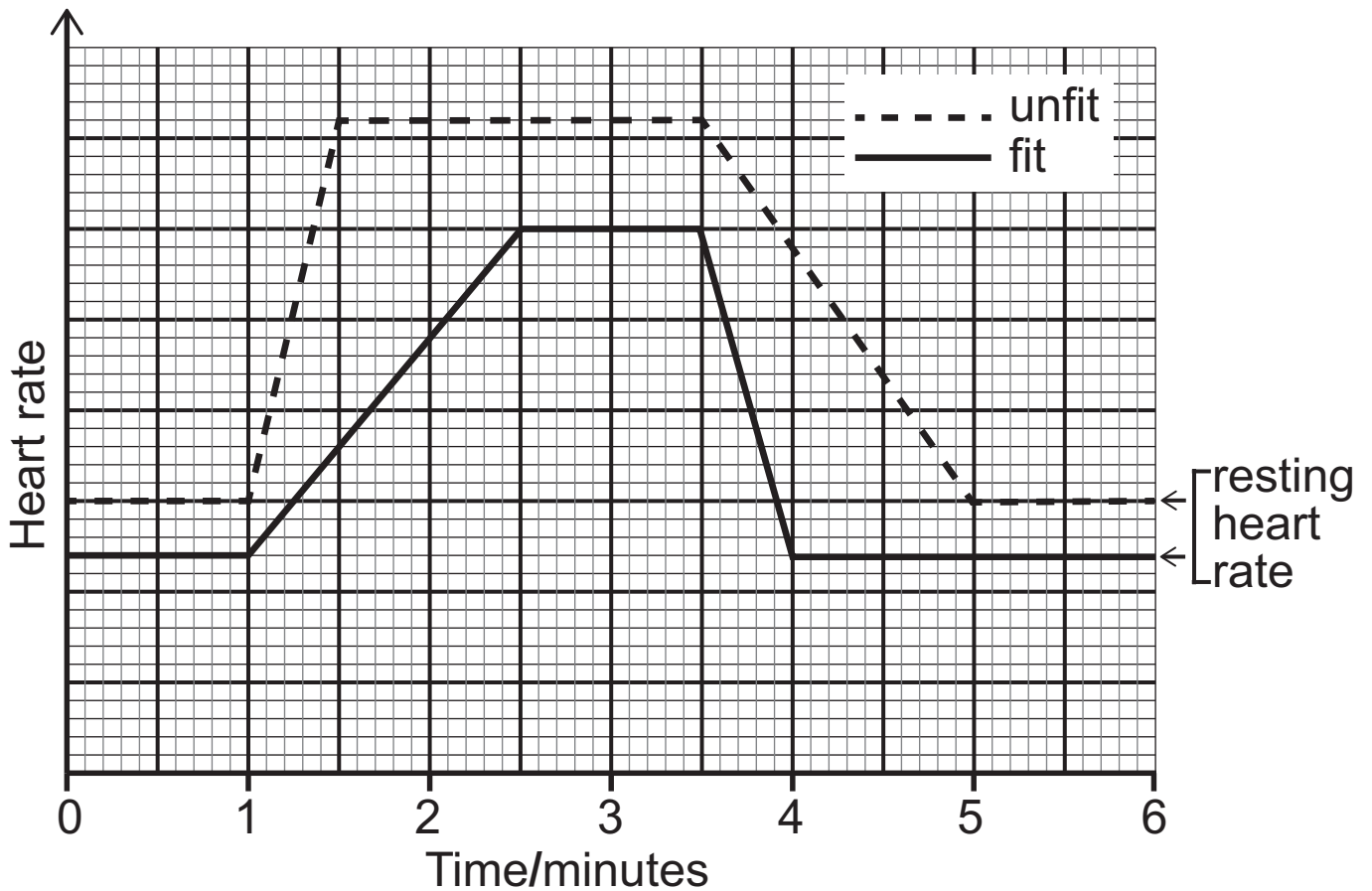


Using only the information provided, give one **health** reason for, and one against, Sean and Julia going to Majorca for their holidays. [2 marks]

For _____

Against _____

3 The following graph shows how exercise affects the heart rate of a student who is fit and a student who is unfit.



(a) Using the graph answer parts (i) and (ii).

(i) At what time did the exercise start? [1 mark]

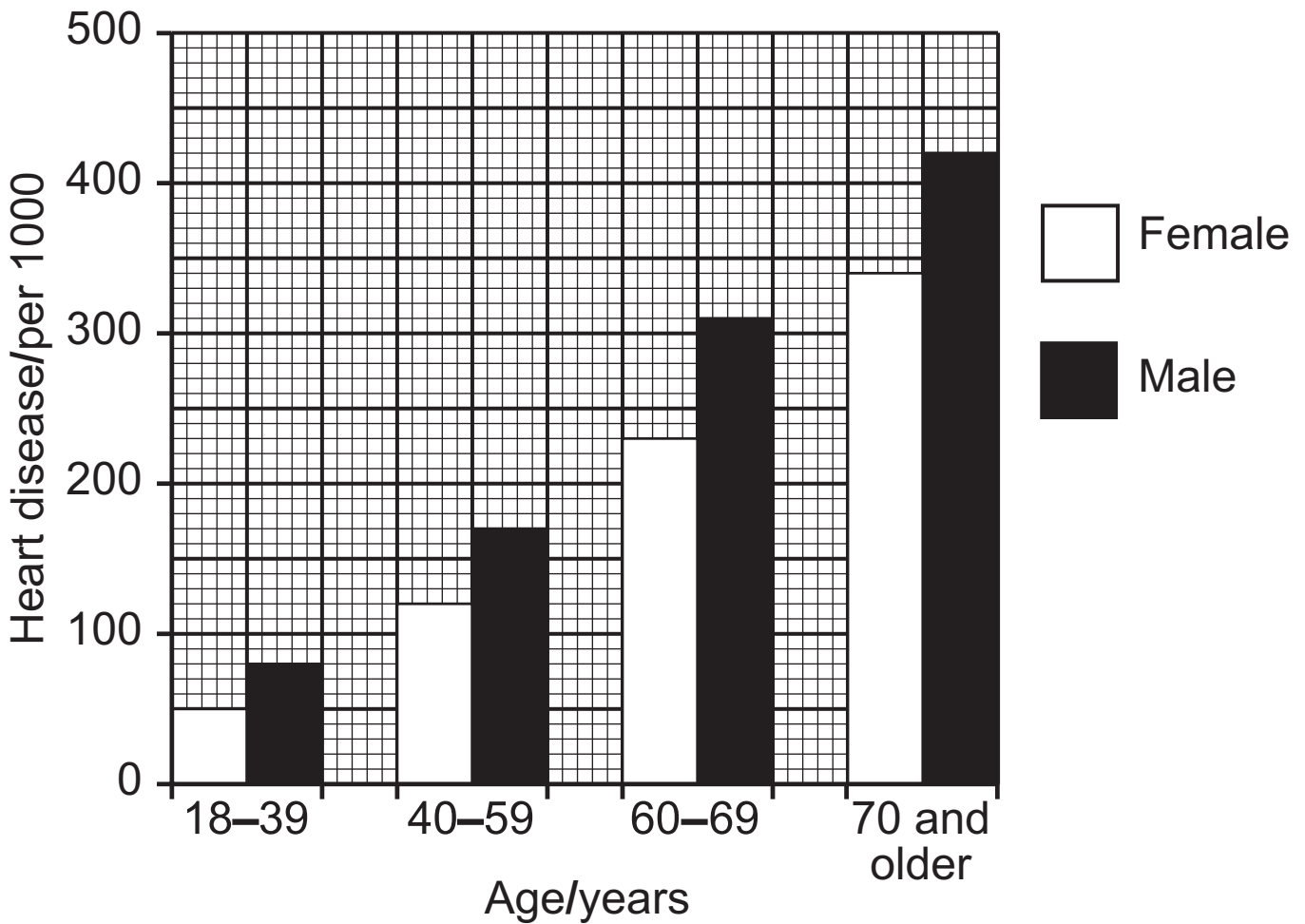
_____ minute(s)

(ii) State **two** differences between the heart rates of the fit student and the unfit student. [2 marks]

1. _____

2. _____

(b) The graph below shows the results of a survey on heart disease in different age groups. [2 marks]



Give **two** trends shown by the information in the graph.

1. _____

2. _____

(c) Suggest **two** reasons why the treatment of heart disease is very expensive. [2 marks]

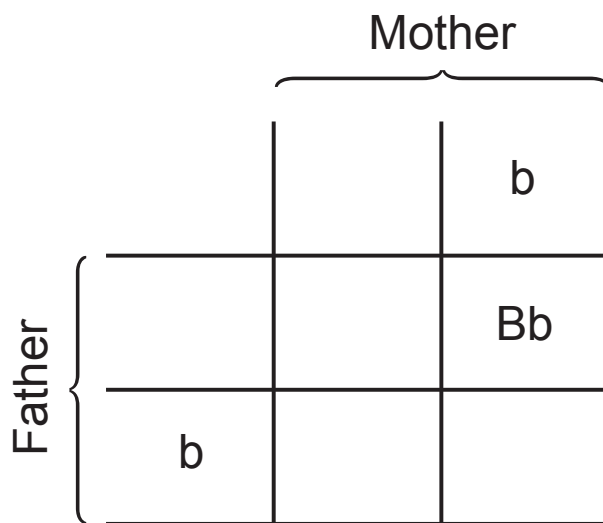
1. _____

2. _____

4 (a) A person's eye colour is inherited from his/her parents.

A **mother** with the genotype (**bb**) has blue eyes and a **father** with the genotype (**Bb**) has brown eyes. Brown (B) is dominant to blue (b).

(i) Complete the Punnett square to show the gametes of the parents and the genotypes of the children.
[2 marks]



(ii) What percentage of the children may have brown eyes? [1 mark]

Choose from:

25 **50** **75** **100**
_____ %

(b) The diagram below shows a section of DNA.



(i) What name is given to the shape of DNA? [1 mark]

Choose from:

ladder : spiral : double helix

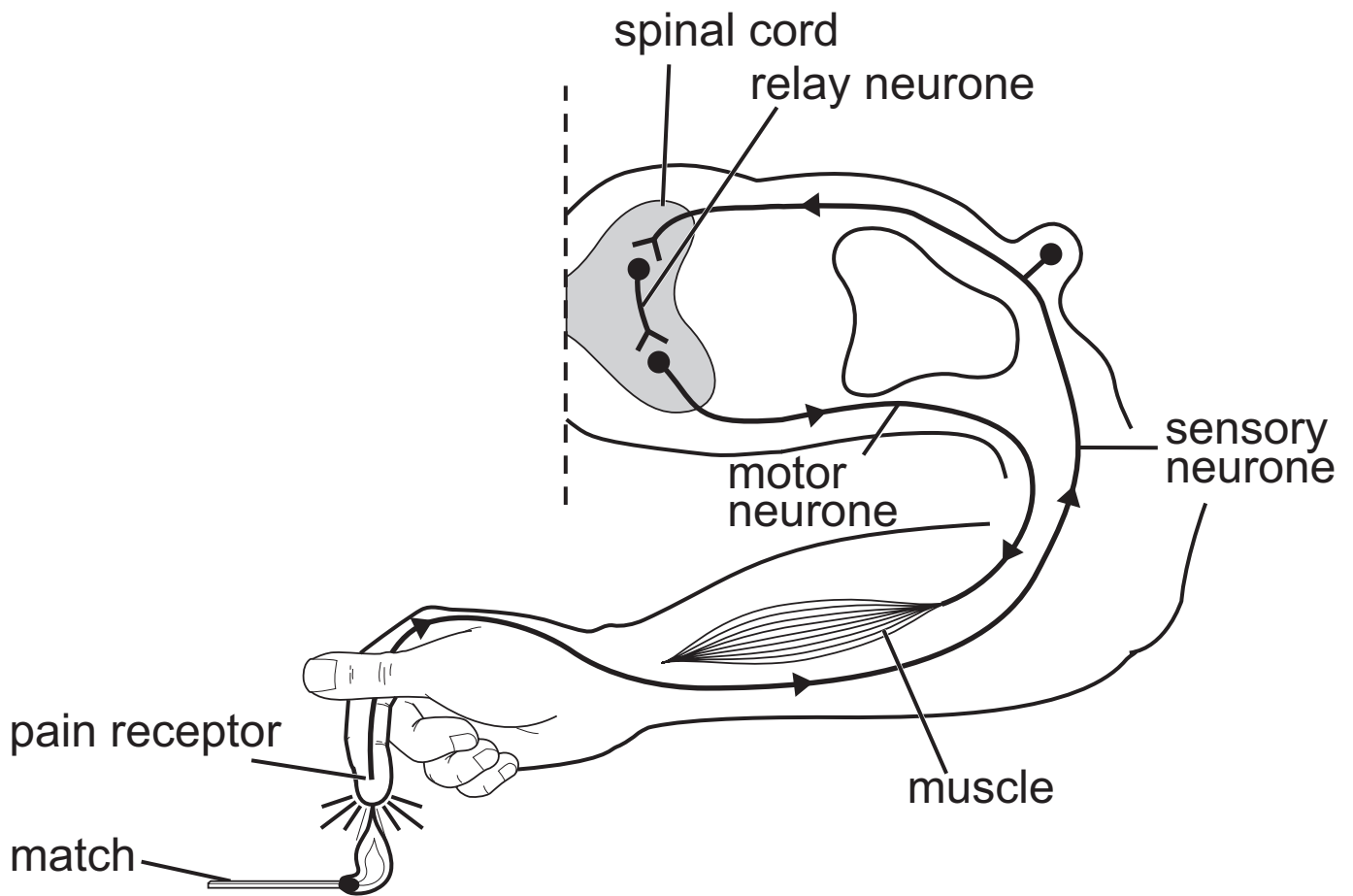
(ii) DNA is formed into chromosomes. Name the part of the cell where chromosomes are found. [1 mark]

(iii) What are small sections of chromosomes called? [1 mark]

Choose from:

codes genes cells

- 5 (a) Reflex actions are very quick. For example, you pull your hand away from a hot flame without thinking.



The list below gives the steps in a reflex action but **not** in the correct order.

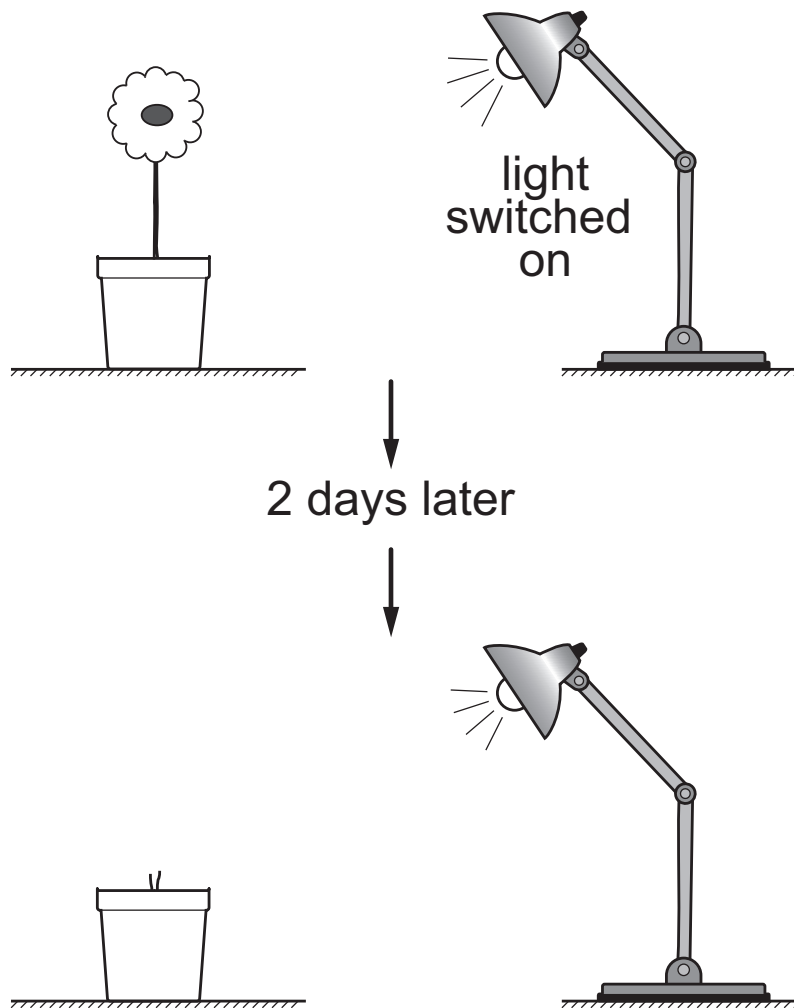
- A** Sensory neurone carries nerve impulse to the spinal cord
- B** Muscle bends arm
- C** Pain receptor in finger feels heat
- D** Relay neurone carries impulse from sensory to motor neurone
- E** Motor neurone carries impulse to muscle

(i) Using the letters **A**, **B**, **C**, **D** and **E** put the steps in the correct order. The first one has been done for you. [2 marks]

 C → → → →

(ii) Suggest why the nerve impulse is carried to the spinal cord but **not** the brain. [1 mark]

(b) The diagram below shows a plant growing in bright light.



(i) Complete the diagram to show how this plant responds to light after 2 days. [1 mark]

(ii) What name is given to the plant's response to light? [1 mark]

(iii) What controls this response in plants? [1 mark]

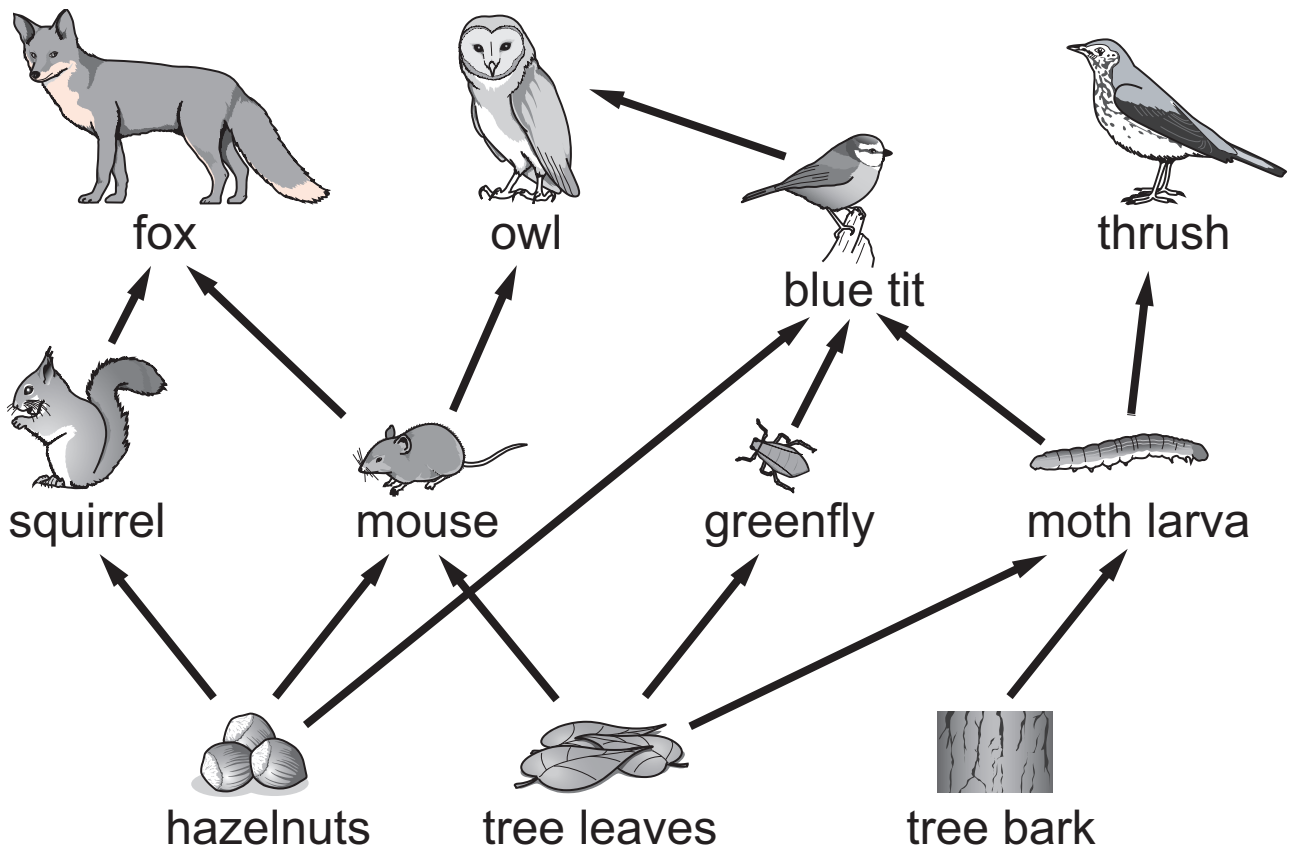
Choose from:

carbon dioxide : water : hormones

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(Questions continue overleaf)

6 (a) The diagram below shows a food web.



(i) Using the diagram, complete a food chain containing **four** organisms in the boxes below. [2 marks]

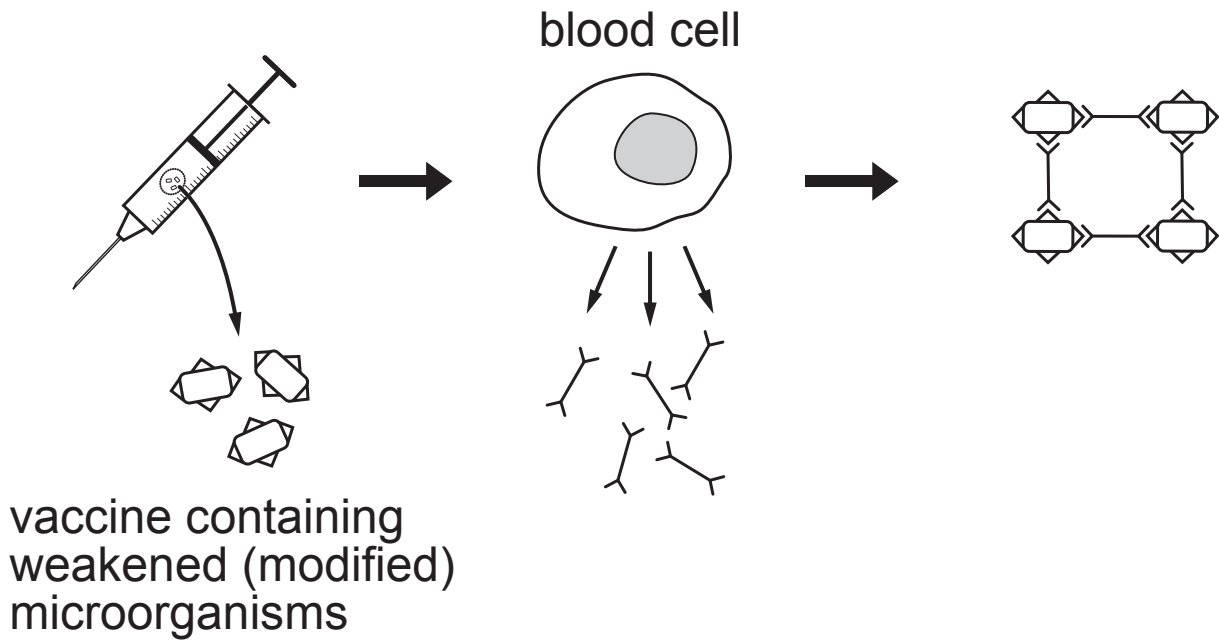
→ → →

(ii) Name **one** primary consumer from this food web.
[1 mark]

(b) Suggest what might happen to the number of squirrels if the fox numbers go down. Explain your answer. [2 marks]

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7 The diagram summarises how a vaccine works.



(a) Using the diagram and your knowledge describe how vaccinations protect against disease. [3 marks]

(b) Before a vaccination is licensed for use it goes through a number of trials (in vitro, animal and clinical).

(i) Clinical trials test the drug on human volunteers. Give **two** reasons why it is necessary to carry out testing on humans. [2 marks]

1. _____

2. _____

(ii) Suggest **one** reason why many people are against testing on animals. [1 mark]

The table below shows information about the development and production of different drugs by a company.

	Antibiotics	Painkillers	Other medical drugs
Cost of producing drug/million pounds	7.4	7.5	4.9
Time to produce drug/years	9.5	6.5	6.5
Profit per drug/million pounds	2.1	2.9	4.2
Number of drugs in development	2	4	7

(c) Using the information provided, suggest **two** reasons why this company is more interested in developing 'other medical drugs' rather than antibiotics and painkillers. [2 marks]

1. _____

2. _____

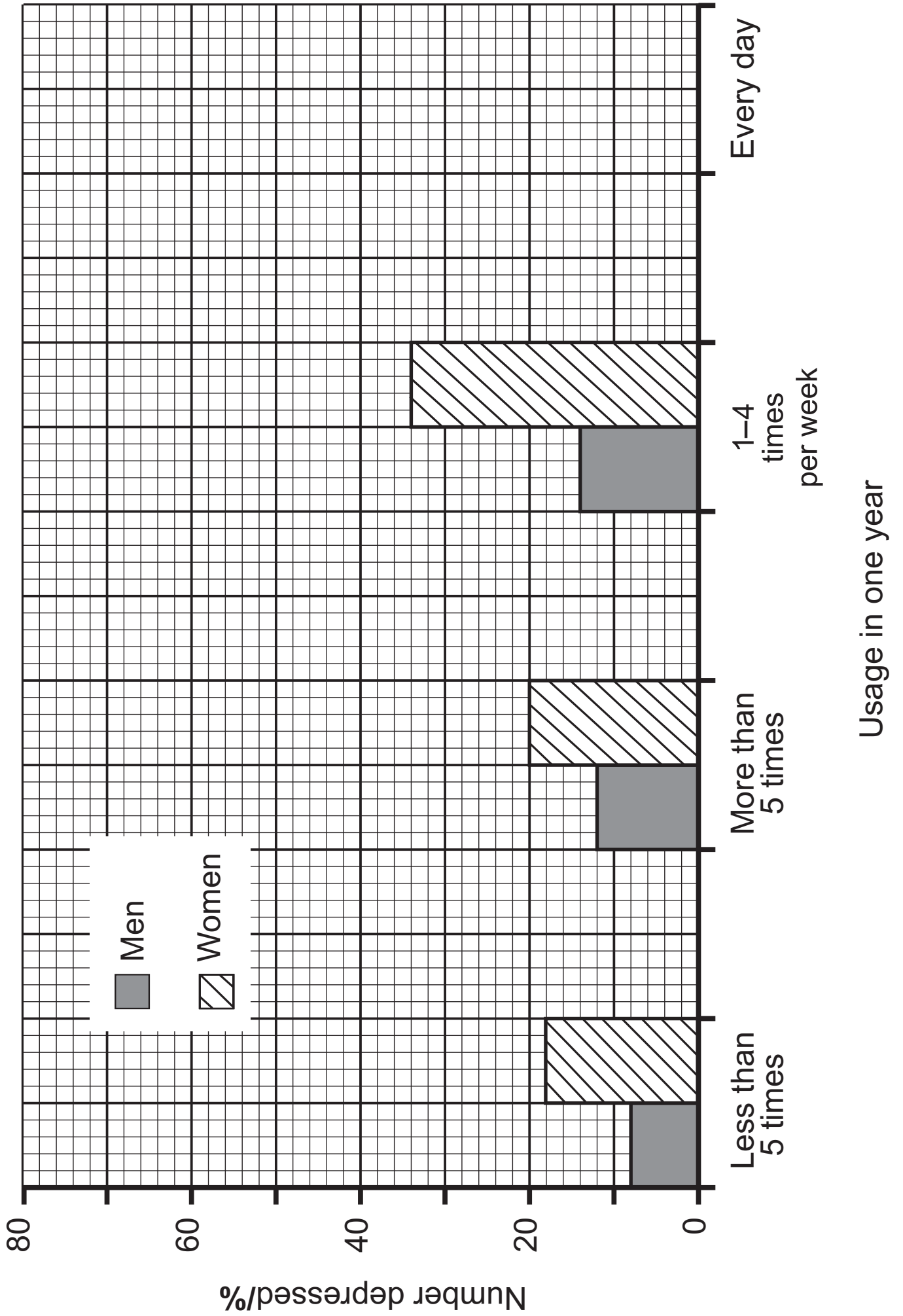
(d) Explain fully why some antibiotics have become less effective in recent years. [2 marks]

- 8 Cannabis is the most widely used illegal drug in Britain. Some doctors think that taking cannabis can lead to depression.

Doctors investigated the use of cannabis by 800 males and 800 females who had used the drug. The results are shown below.

Usage in one year	Men who became depressed/%	Women who became depressed/%
Less than 5 times	8	18
More than 5 times	12	20
1–4 times per week	14	34
Every day	20	67

- (a) Using the information in the table complete the bar chart opposite. [1 mark]



- (b) A quarter $\left(\frac{1}{4}\right)$ of the males in the investigation used cannabis **every day** throughout the year. Calculate the **number** of men who became depressed because of this. [2 marks]

(Show your working out.)

- (c) Explain how the results suggest that doctors are correct in linking depression to cannabis use. [1 mark]

(d) Unlike cannabis, alcohol is a legal drug. However, it can still have an effect on a person's health. Give **one** harmful effect alcohol can have on a user and **one** harmful effect it can have on society. [2 marks]

User _____

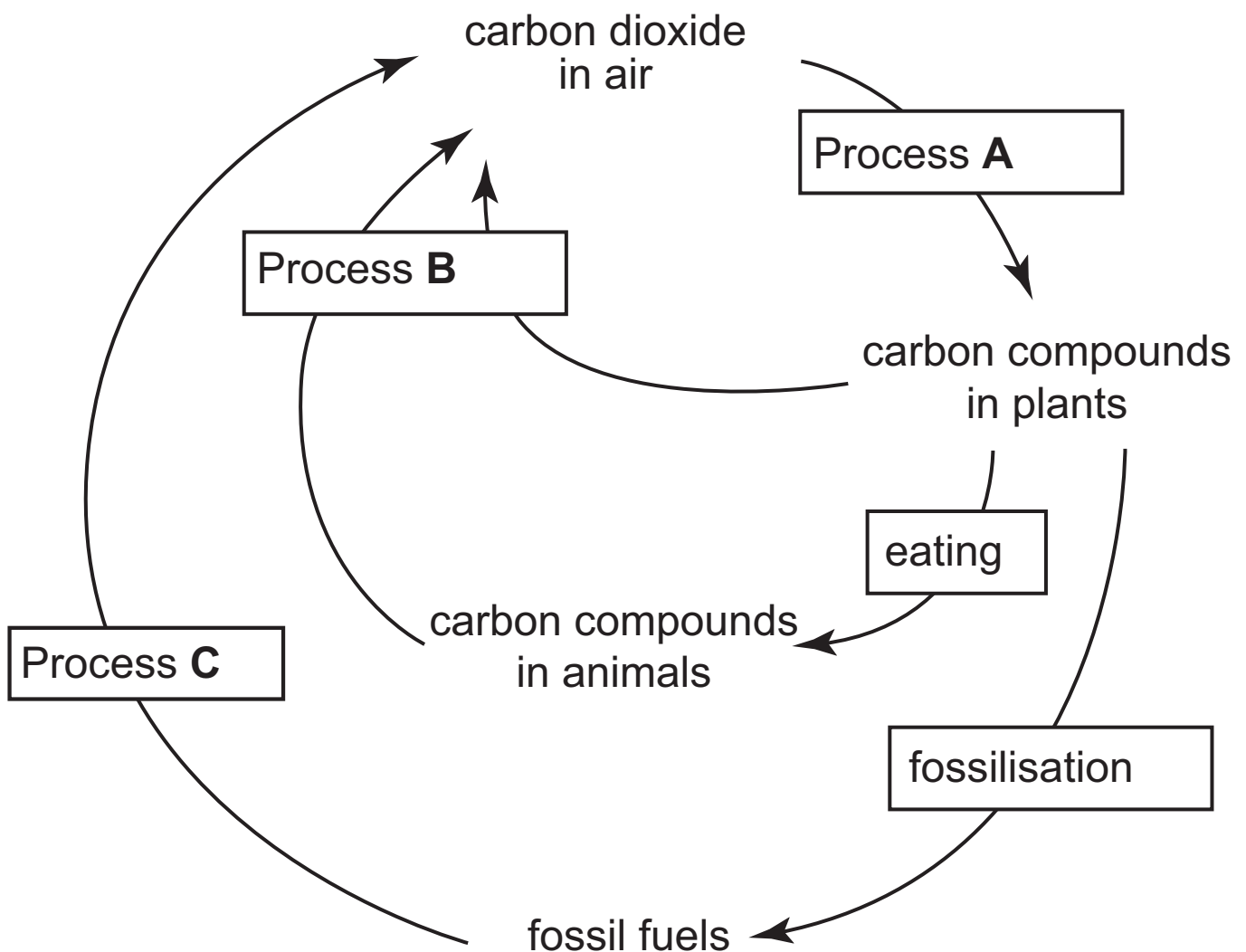
Society _____

9 (a) Abiotic factors can be used to measure the rate at which global warming is occurring.

(i) What is meant by the term 'abiotic'? [1 mark]

(ii) Apart from temperature, name **one** abiotic factor which could be used to measure the rate of global warming. [1 mark]

(b) The diagram below shows a simple carbon cycle.



Using the diagram and your knowledge, explain the carbon cycle. [6 marks]

Your answer should include:

- the names of the processes labelled **A**, **B** and **C**,
- and how it has become unbalanced causing increased levels of carbon dioxide.

In this question you will be assessed on your written communication skills including the use of specialist scientific terms.

THIS IS THE END OF THE QUESTION PAPER

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Question Number	Marks
1	
2	
3	
4	
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6	
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8	
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Total Marks	

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