



General Certificate of Secondary Education
2013–2014

Science: Single Award

Unit 1 (Biology)

Foundation Tier

[GSS11]

ML

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 down the right-hand side of pages indicate the marks awarded to each question or part question.

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

Centre Number

71

Candidate Number

| For Examiner's use only | |
|-------------------------|-------|
| Question Number | Marks |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |

Total Marks

1 (a) Complete the table below.

Choose your answers from:

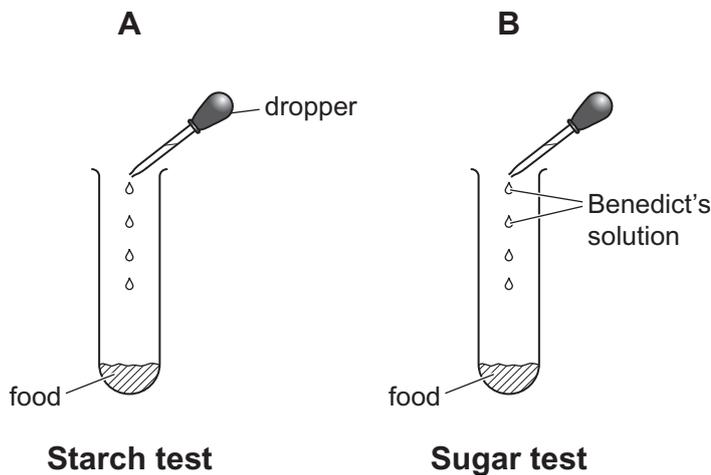
to give us energy : fat : for strong teeth and bones

fibre : protein

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

[3]

(b) Look at the diagrams below. They show two food tests.



(i) What is the solution used to test for starch in diagram **A**?

_____ [1]

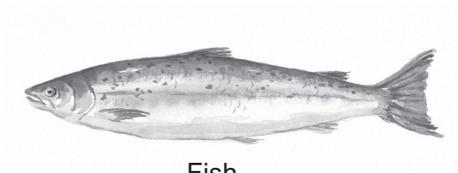
(ii) What colour shows that starch is present in diagram **A**?

_____ [1]

(iii) An orange-red colour shows that sugar is present in diagram **B**. After the Benedict's solution is added, what must be done to give this colour change?

_____ [1]

(c) Look at the pictures below. They show foods that are good sources of either vitamin **C** or **D**.



Fish

© Digital Vision / Thinkstock



Eggs

© iStockphoto / Thinkstock



Lemon

© iStockphoto / Thinkstock



Kiwi

© iStockphoto / Thinkstock

(i) Fill in the table to show which of these foods contain each vitamin.

| Vitamin | Foods |
|----------|-------|
| C | |
| | |
| D | |
| | |

[2]

(ii) Give **one** function for vitamin **C** in the body.

Put a circle round the correct answer.

strengthens teeth and bones : **prevents scurvy**

good for eyesight

[1]

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

- 2 (a) Look at the photograph below. It shows a boy rolling his tongue. People either can or cannot roll their tongue.

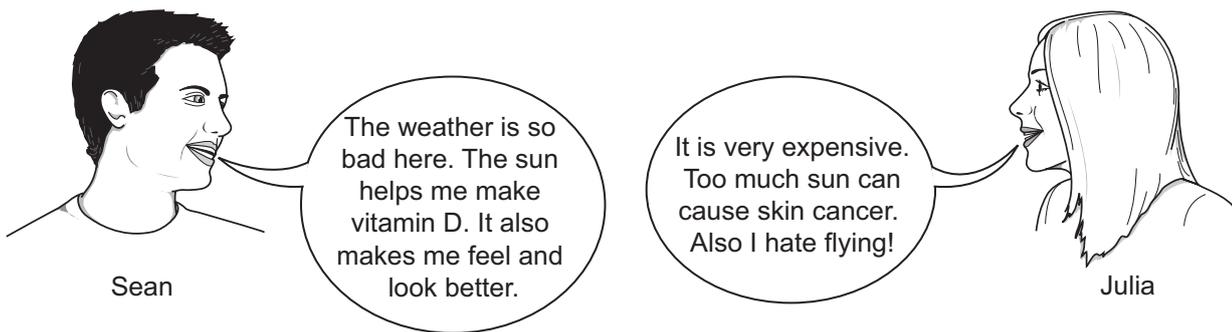


© Cordelia Molloy / Science Photo Library

What is the type of variation that tongue rolling shows?

_____ [1]

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



Write down one **health** reason for, and one **health** reason against, Sean and Julia going to Majorca for their holidays. Only use the information Sean and Julia have given.

For _____

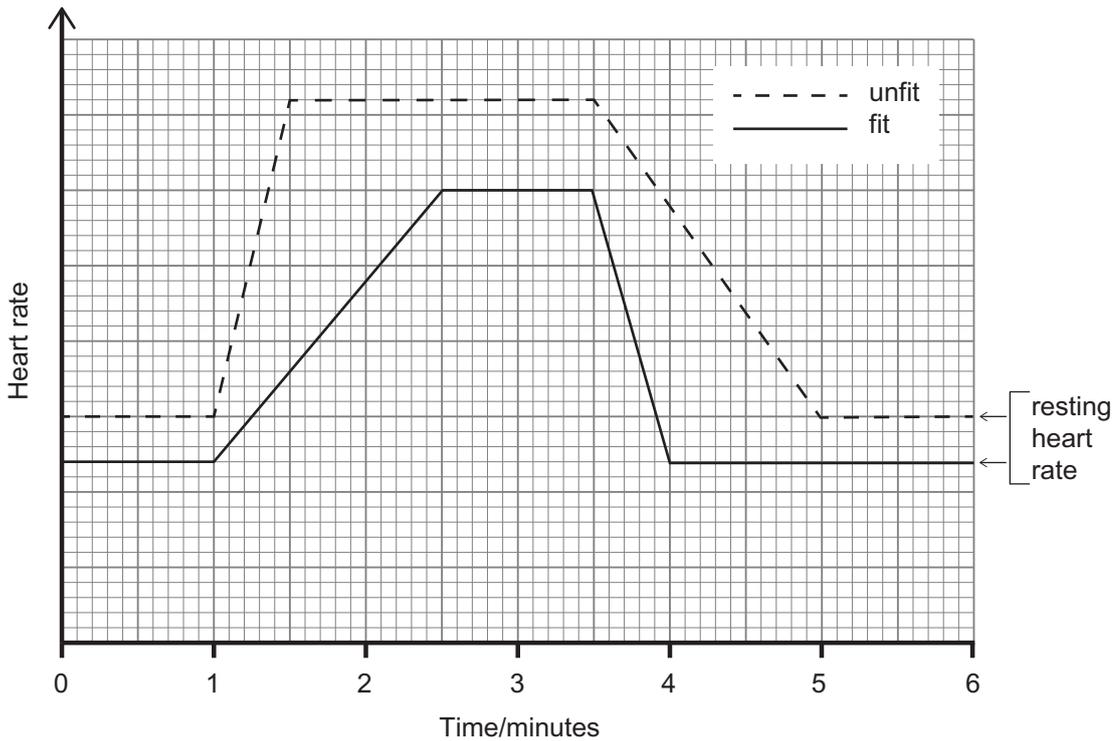
Against _____ [2]

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

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(Questions continue overleaf)

3 Look at the graph below. It shows how exercise affects the heart rate of a student who is fit and a student who is unfit.



(a) Use the graph to answer parts (i) and (ii).

(i) At what time did the students start to exercise?

_____ minute(s) [1]

(ii) Write down **two** differences between the heart rates of the fit student and the unfit student.

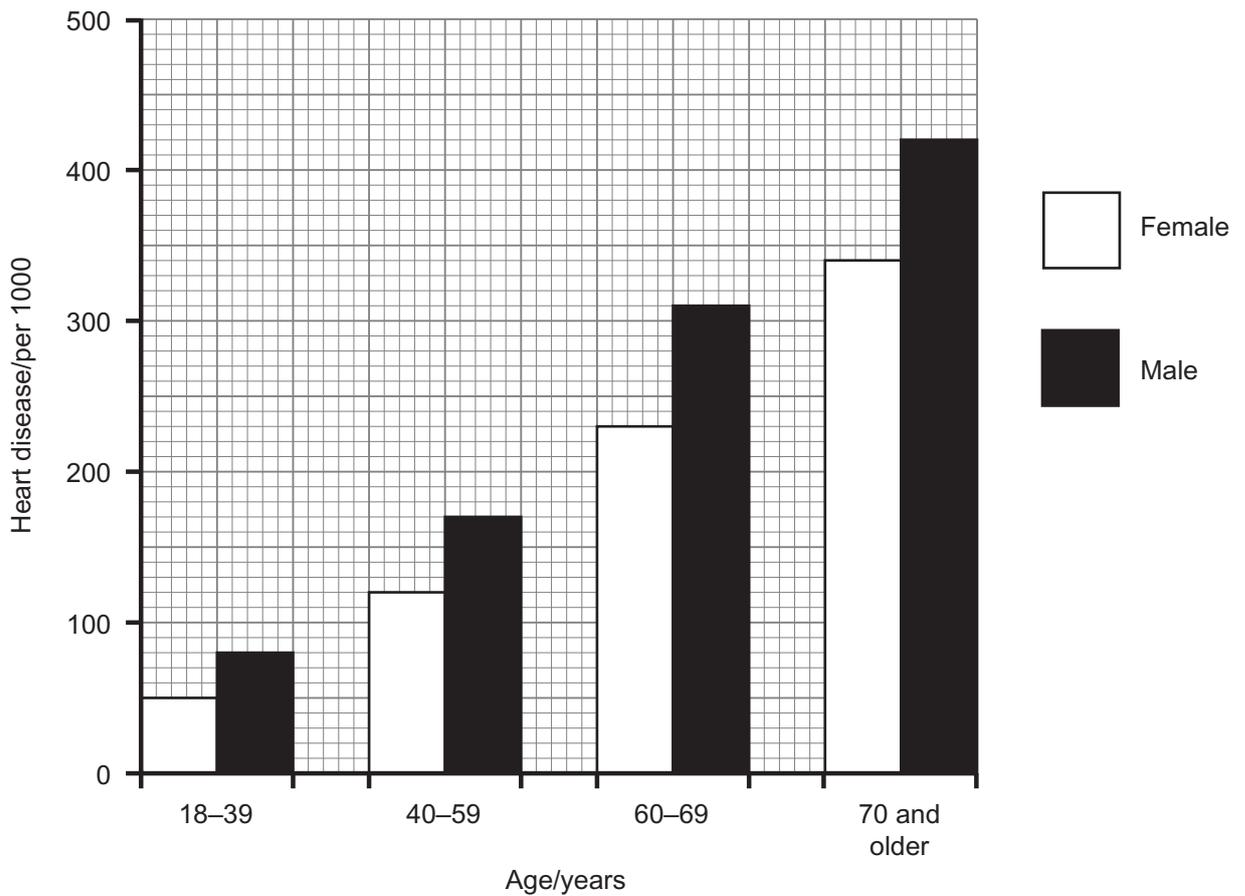
1. _____

2. _____

_____ [2]

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

(b) Look at the graph below. It shows the results of a survey on heart disease in different age groups.



Write down **two** trends shown by the information in the graph.

1. _____

 2. _____

- [2]

(c) Write down **two** reasons why the treatment of heart disease is very expensive.

1. _____

 2. _____

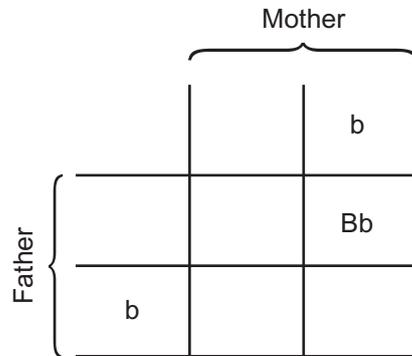
- [2]

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

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 below to show the gametes of the parents and the genotypes of the children.



[2]

(ii) What percentage of the children may have brown eyes?

Choose from the numbers below.

25

50

75

100

_____ % [1]

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

(b) Look at the diagram below. It shows a section of DNA.



© iStockphoto / Thinkstock

(i) What is the name of the shape of DNA?

Choose from:

ladder : spiral : double helix

[1]

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

[1]

(iii) What are small sections of chromosomes called?

Choose from:

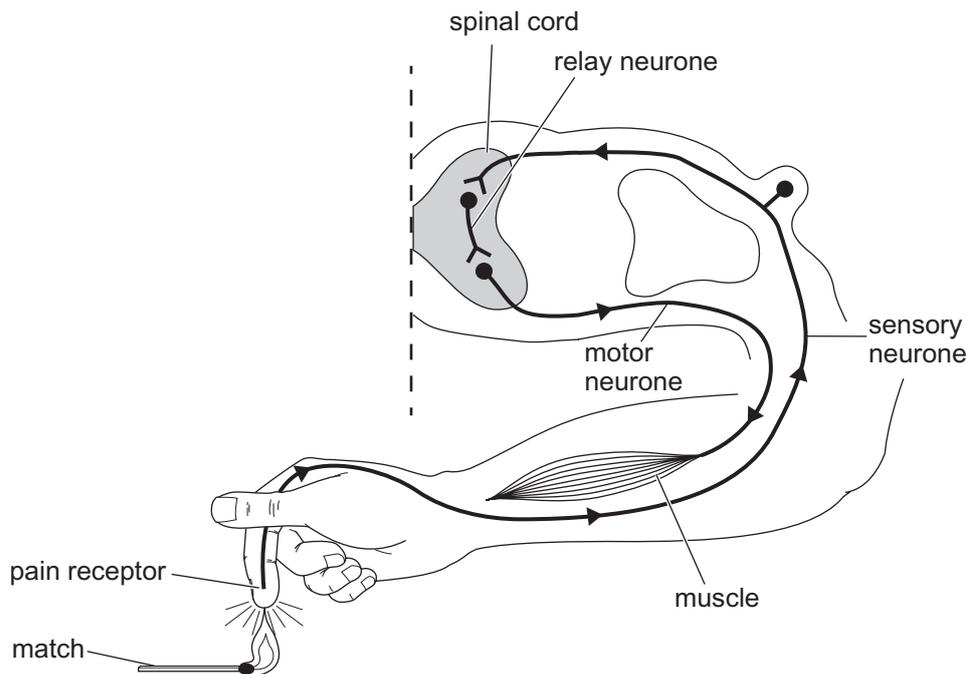
codes genes cells

[1]

Examiner Only

Marks Remark

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



Look at the list below. It 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) Use the letters **A**, **B**, **C**, **D** and **E** to put the steps in the correct order. The first one has been done for you.

 C → _____ → _____ → _____ → _____ [2]

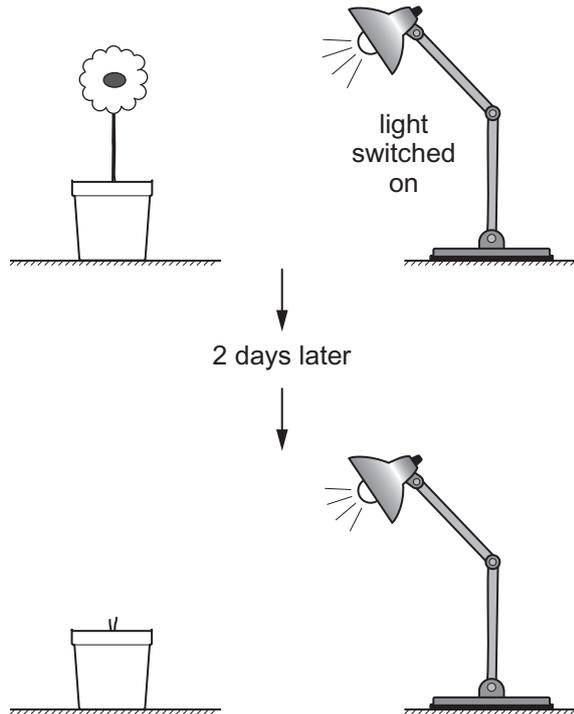
- (ii) Why is the nerve impulse carried to the spinal cord but **not** the brain?

_____ [1]

Examiner Only

Marks Remark

(b) Look at the diagram below. It shows a plant growing in bright light.



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

(ii) What name is given to the plant's response to light?

[1]

(iii) What controls this response in plants?

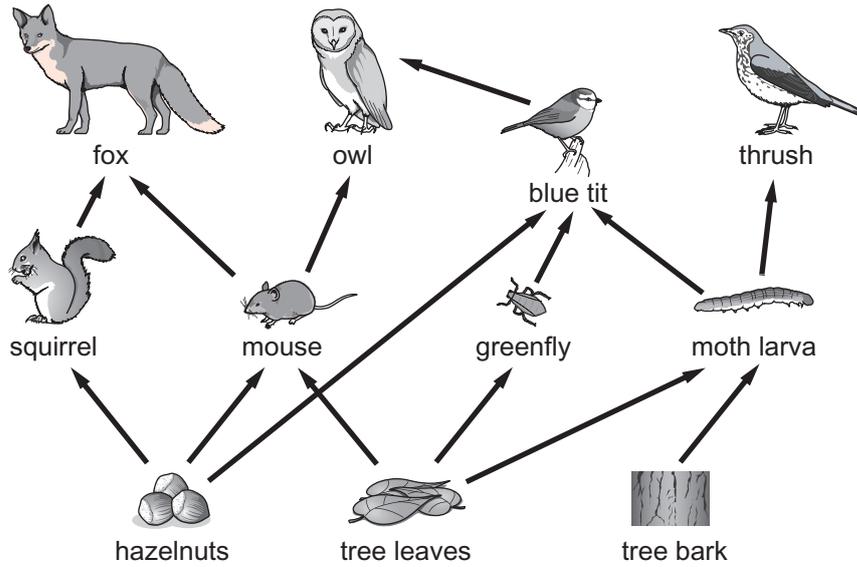
Choose from:

carbon dioxide : water : hormones

_____ [1]

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

6 (a) Look at the diagram below. It shows a food web.



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(i) Use the diagram to complete a food chain containing **four** organisms in the boxes below.

 →

 →

 →

[2]

(ii) What is the name of **one** primary consumer from this food web?

[1]

(b) Write down what might happen to the number of squirrels if the fox numbers go down. Explain your answer.

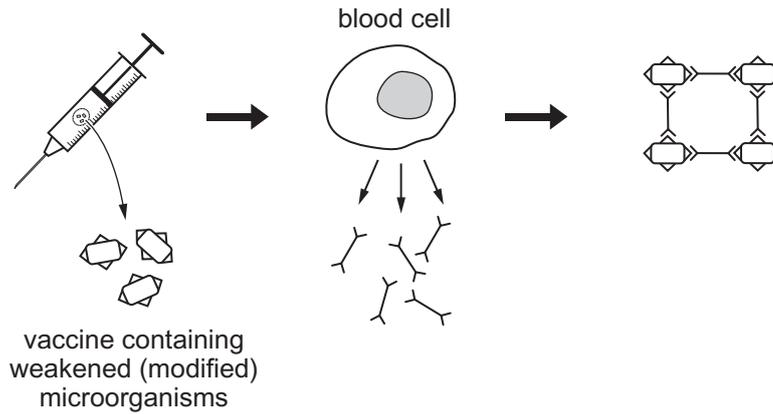
[2]

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

| | |
|--|--|
| | |
|--|--|

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7 Look at the diagram below. It summarises how a vaccine works.



(a) Use the diagram and your knowledge to describe how vaccinations protect against disease.

[3]

(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. Write down **two** reasons why it is necessary to carry out testing on humans.

1. _____

2. _____

[2]

(ii) Write down **one** reason why many people are against testing on animals.

[1]

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

Look at the table below. It 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) Use the information provided to suggest **two** reasons why this company is more interested in developing 'other medical drugs' rather than antibiotics and painkillers.

1. _____

2. _____

_____ [2]

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

_____ [2]

Examiner Only

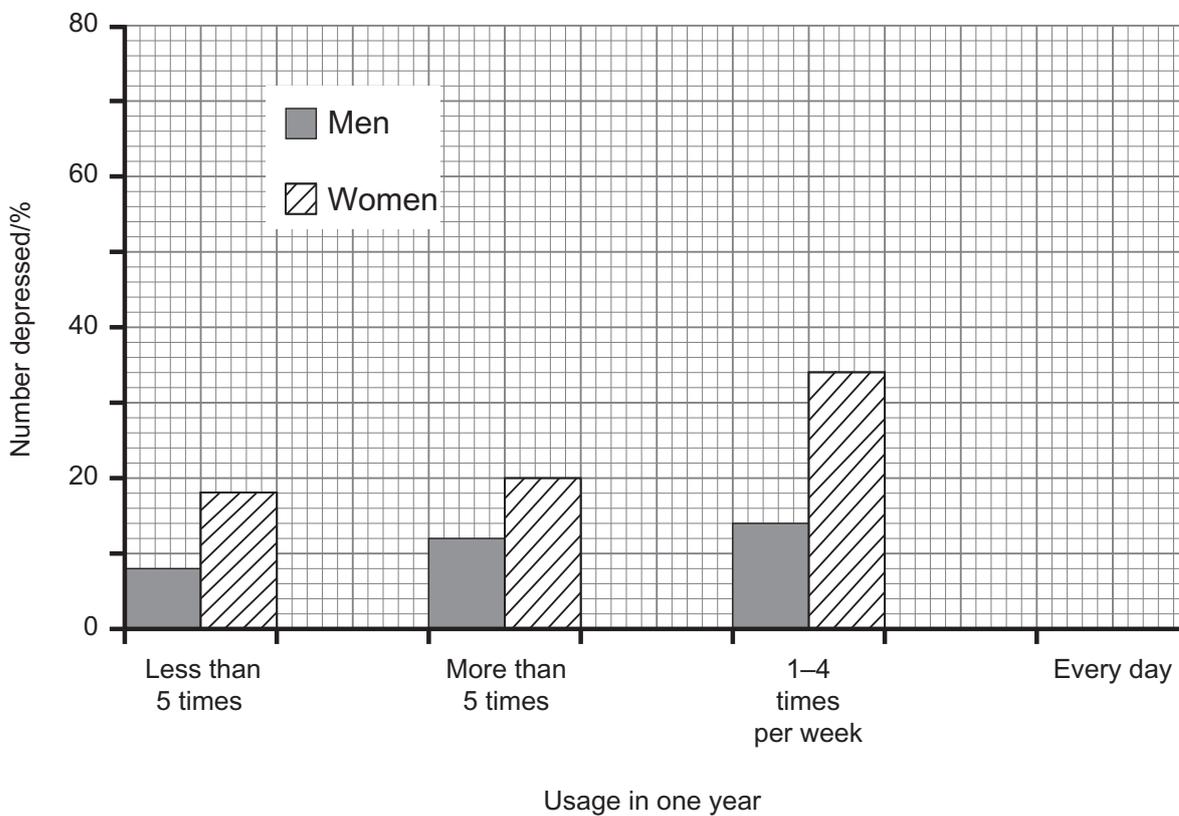
Marks Remark

- 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. The results are shown in the table 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) Use the information in the table to complete the bar chart below.



[1]

Examiner Only

Marks Remark

- (b) A quarter ($\frac{1}{4}$) of the males in the investigation used cannabis **every day** of the year. Calculate the **number** of men who became depressed.

Show your working out.

_____ [2]

- (c) How do the results show that doctors are correct in linking depression to cannabis use?

_____ [1]

- (d) Alcohol is a legal drug. Alcohol can have an effect on a person's health. Write down **one** harmful effect alcohol can have on a person and **one** harmful effect it can have on society.

Person _____

Society _____

_____ [2]

| Examiner Only | |
|---------------|--------|
| Marks | Remark |
| | |

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

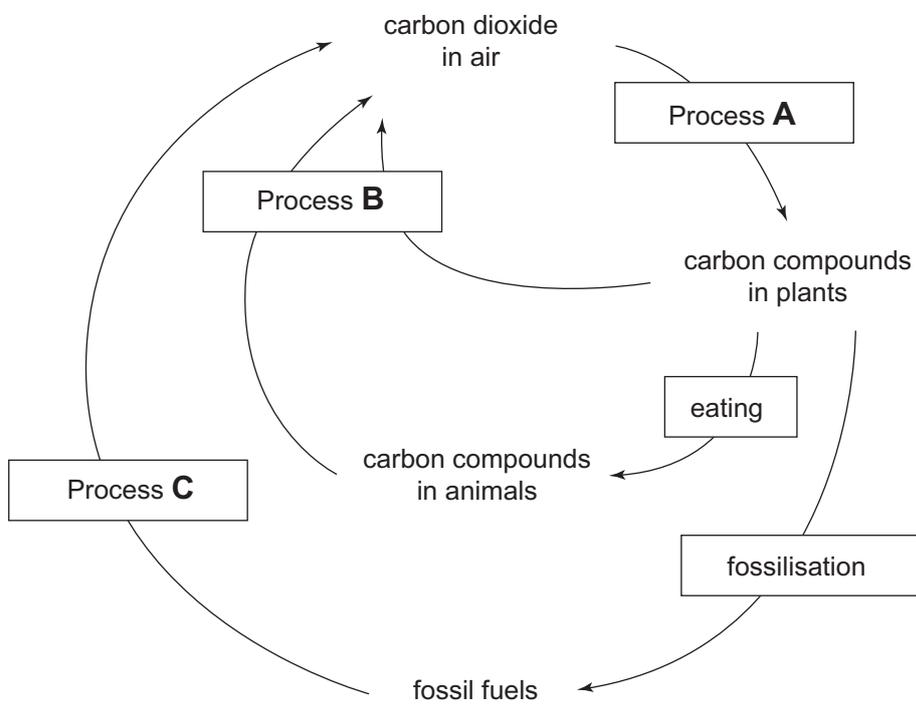
(i) What is meant by abiotic?

_____ [1]

(ii) Apart from temperature, name **one** abiotic factor that could be used to measure the rate of global warming.

_____ [1]

(b) Look at the diagram below. It shows a simple carbon cycle.



Use the diagram and your knowledge to explain the carbon cycle.

Your answer should include:

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

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|---------------|--------|
| Marks | Remark |
| | |

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