



Centre Number

71	
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Candidate Number

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General Certificate of Secondary Education  
2014–2015

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**Science: Single Award**

Unit 1 (Biology)

Foundation Tier

[GSS11]

MV18

WEDNESDAY 12 NOVEMBER 2014, MORNING

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**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**

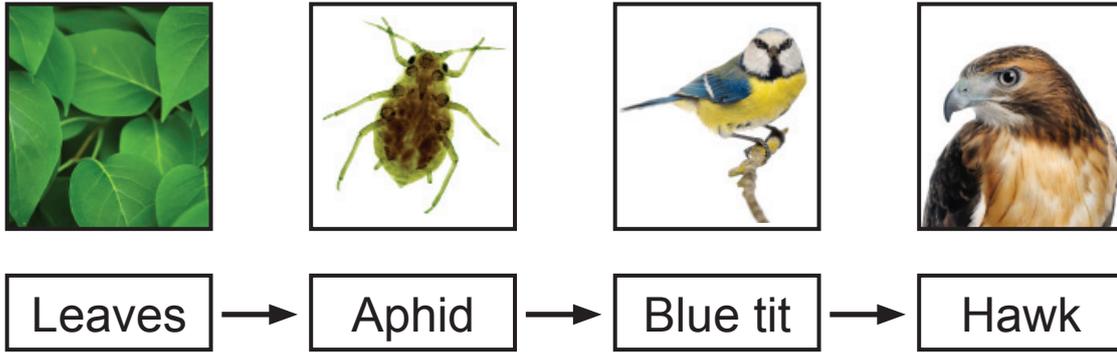
The total mark for this paper is 60.

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**.

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1 (a) Shown below is a simple food chain.



(i) From the food chain name the:

producer \_\_\_\_\_

secondary consumer \_\_\_\_\_ [2 marks]

(ii) What is the original source of energy in all food chains? [1 mark]

\_\_\_\_\_

(iii) What do the arrows in a food chain tell us? [1 mark]

\_\_\_\_\_

(b) Suggest what could happen to the number of aphids if the blue tit numbers **increased**. [1 mark]

\_\_\_\_\_

2 (a) The labels below are from two different foods, **A** and **B**.

Food A/100 g	
Energy	215 kJ
Protein	1.6 g
Carbohydrates (of which sugars)	6.4 g 1.0 g
Fat (of which saturates)	1.9 g 0.8 g
Fibre	1.2 g

Food B/100 g	
Energy	2073 kJ
Protein	2.2 g
Carbohydrates (of which sugars)	47.3 g 37.7 g
Fat (of which saturates)	30.1 g 9.0 g
Fibre	4.4 g

(i) Give **two** reasons why eating too much of food **B** may cause a person to gain weight. [2 marks]

1. \_\_\_\_\_

2. \_\_\_\_\_

(ii) Name the food group which changes Biuret reagent from blue to lilac.

Circle the correct answer. [1 mark]

**fat**

**fibre**

**protein**

(b) Complete the table below. [2 marks]

Choose from:

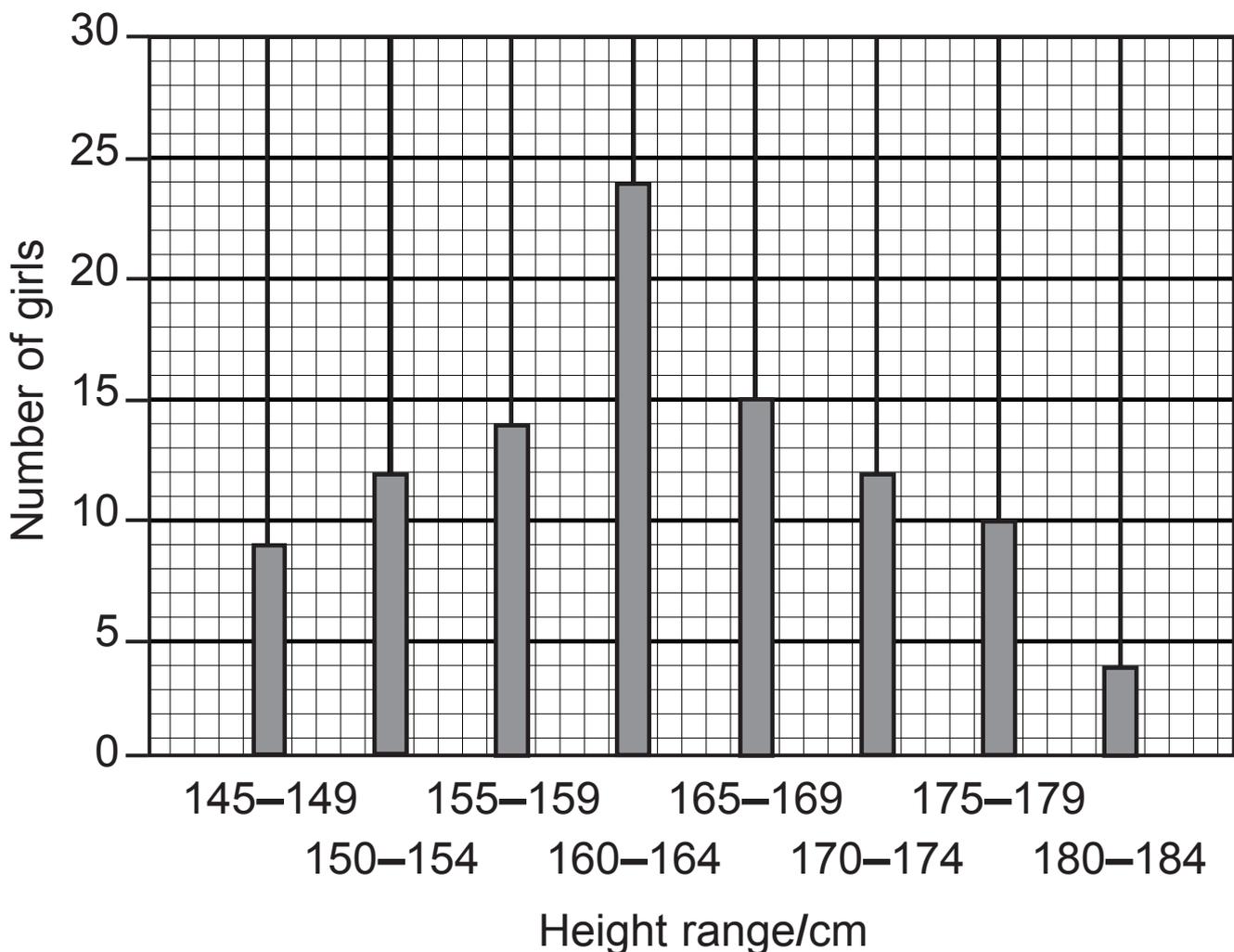
**for strong teeth and bones : iron : prevents scurvy : fat**

<b>Food group</b>	<b>Function in the body</b>
	to help the red blood cells carry oxygen
calcium	

- 3 (a) Some pupils investigated the variation in height of 16-year-old girls in their school.

The results are shown in the table and bar chart below.

Height range/cm	Number of girls
145–149	9
150–154	12
155–159	14
160–164	24
165–169	15
170–174	12
175–179	
180–184	4



Use this information to answer the following questions.

(i) How many girls were in the height range 175–179 cm? [1 mark]

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(ii) What was the total number of girls measured in the investigation? [1 mark]

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(iii) What is the most common height range of 16-year-old girls in the school? [1 mark]

\_\_\_\_\_ cm

(b) What type of variation does height show? [1 mark]

Choose from:

**continuous**

**discrete**

**discontinuous**

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- 4 (a) Shown below are the main substances found in cigarette smoke.



- (i) Which substance named above can cause cancer? [1 mark]

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- (ii) Cancer is caused by a mutation. Complete the sentence below to describe what a mutation is. [2 marks]

Choose from:

**different      random      cells      chromosomes**

A mutation is a \_\_\_\_\_  
change in the structure or number of  
\_\_\_\_\_.

(iii) Carbon monoxide is a gas that takes the place of oxygen in red blood cells.

Using this information and your knowledge, explain fully why many smokers are often short of energy when active. [2 marks]

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(b) Stopping smoking is one lifestyle change that can help reduce the risk of heart disease.

(i) Give one other **lifestyle** change to help reduce the risk of heart disease. [1 mark]

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The table below gives information about deaths from heart disease and numbers of smokers in Northern Ireland between 2006 and 2010.

Year	Number of deaths from heart disease	Number of smokers
2006	2554	470 000
2007	2493	425 000
2008	2410	350 000
2009	2300	322 000
2010	2200	300 000

(ii) Doctors think that smoking can lead to heart disease.

How does the table suggest this? [1 mark]

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(iii) Calculate how many more people died from heart disease in 2006 compared to 2010. [2 marks]

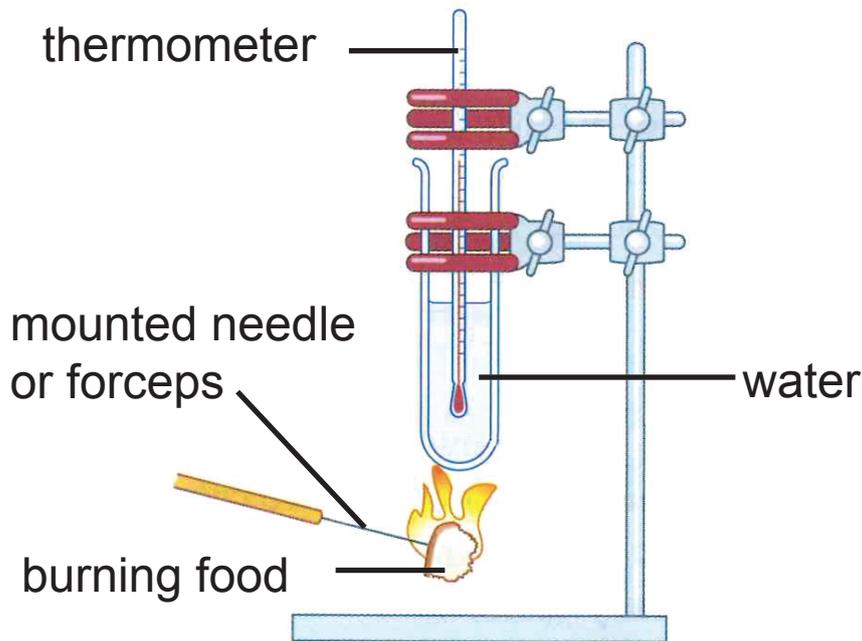
(Show your working out.)

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**(Questions continue overleaf)**

- 5 (a) The diagram shows how to investigate the energy content of foods.



Below are the main steps in the investigation but **not** in the correct order.

- A Hold the food in a Bunsen burner flame until it catches fire
- B Measure out  $20 \text{ cm}^3$  of water into a boiling tube and record the temperature
- C As soon as the food has burnt away completely, record the final temperature
- D Weigh out 1.5 g of the first food
- E Once the food is burning hold it 2 cm from the bottom of the boiling tube

- (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]

**D** → \_\_\_\_\_ → \_\_\_\_\_ → \_\_\_\_\_ → \_\_\_\_\_

- (ii) Using the information above, give **two** things that were done to make the investigation a fair test. [2 marks]

1. \_\_\_\_\_

2. \_\_\_\_\_

- (iii) Some of the energy in the food does not heat the water. Suggest **one** reason for this. [1 mark]

\_\_\_\_\_  
\_\_\_\_\_

- (b) (i) Complete the word equation below to show the process by which energy is released from food (glucose). [1 mark]

Choose from:

**nitrogen** : **carbon dioxide** : **starch**

oxygen + glucose →  + water + energy

- (ii) Name the process by which energy is released from food. [1 mark]

\_\_\_\_\_

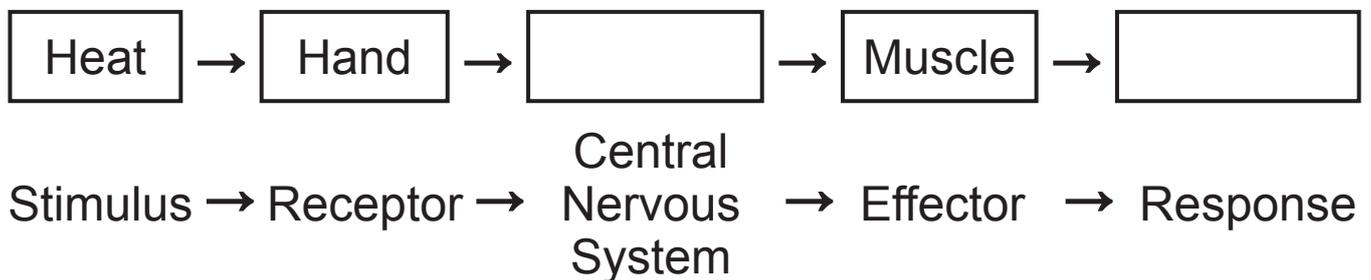
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6 (a) Mark put his hand on a hot iron. His nervous system responded and the muscle in his arm contracted to pull his hand away. This is an example of a reflex action.

(i) State **one** advantage of a reflex action. [1 mark]

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(ii) Using the information above and your knowledge, complete the following flow chart. [2 marks]

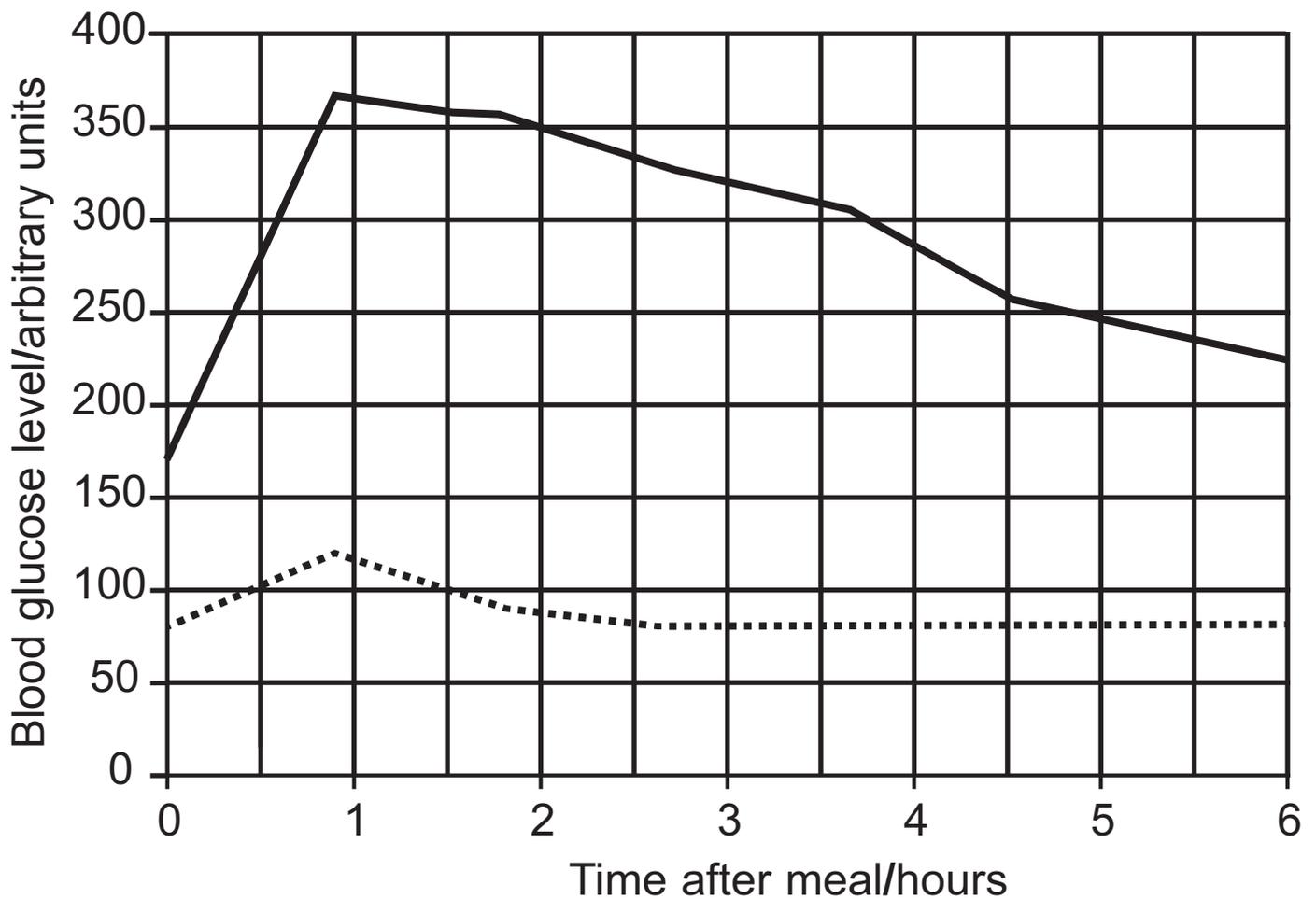


(b) Hormones also bring about responses in the body.

State **two** differences between hormones and the nervous system. [2 marks]

1. \_\_\_\_\_
2. \_\_\_\_\_

(c) The graph below shows the blood glucose levels of two people after a meal – one with diabetes and one without diabetes.



— Person with diabetes  
..... Person without diabetes

(i) Give **two** differences between the graph for the person with diabetes and the graph for the person without diabetes. [2 marks]

1. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

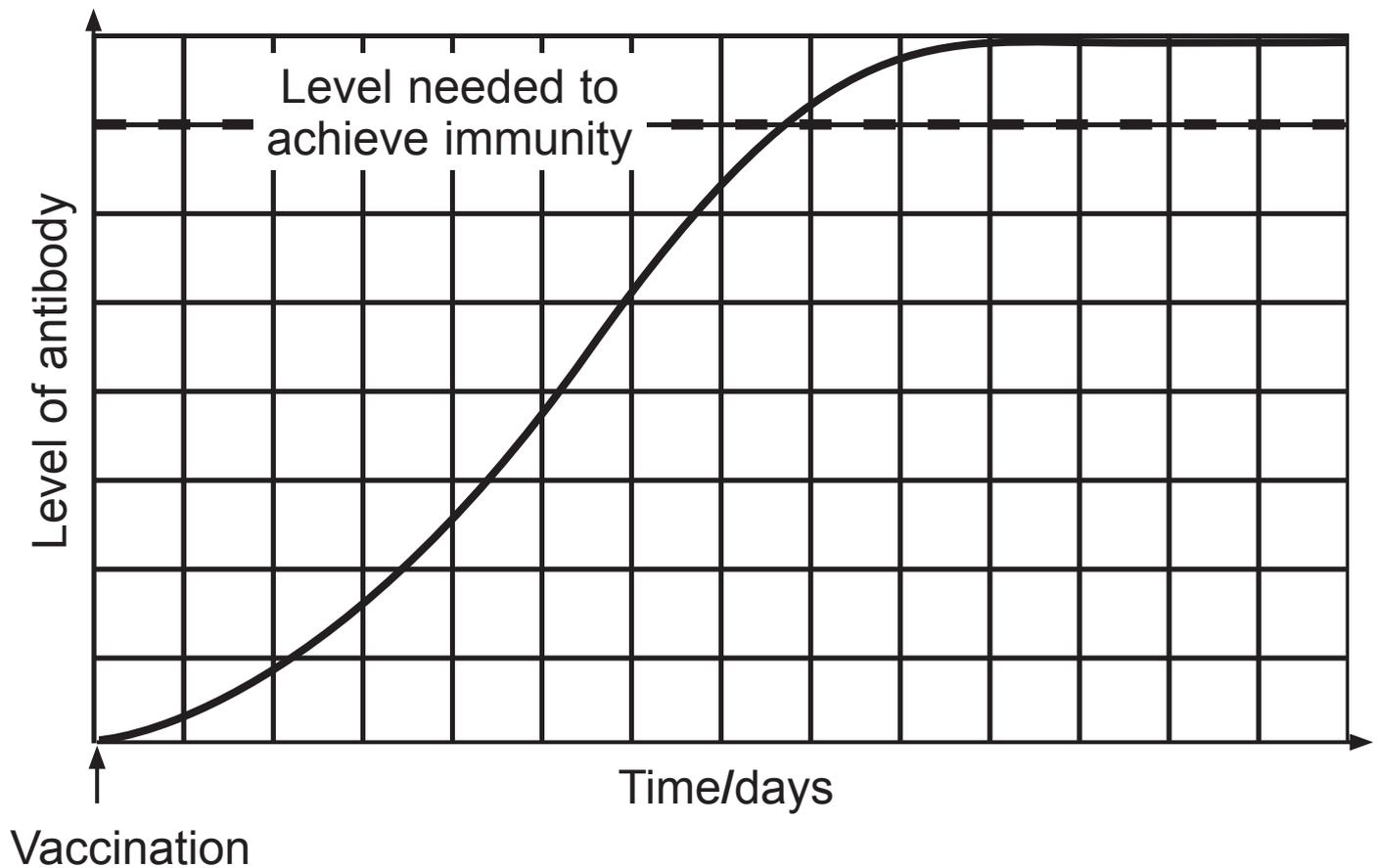
\_\_\_\_\_

\_\_\_\_\_

(ii) Insulin is the hormone that controls blood glucose levels. Name the part of the body that produces insulin. [1 mark]

\_\_\_\_\_

- 7 (a) The graph below shows how antibody level changes after we have been given a vaccination.



- (i) Suggest why there is a time delay between being given the vaccination and achieving immunity.  
[1 mark]

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- (ii) Using the graph above, give **two** pieces of evidence that show the immunity achieved is active immunity.  
[2 marks]

1. \_\_\_\_\_

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2. \_\_\_\_\_

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**(b)** All 2- and 3-year-old children in Northern Ireland are now offered a flu vaccination. The vaccine contains weakened live microorganisms.

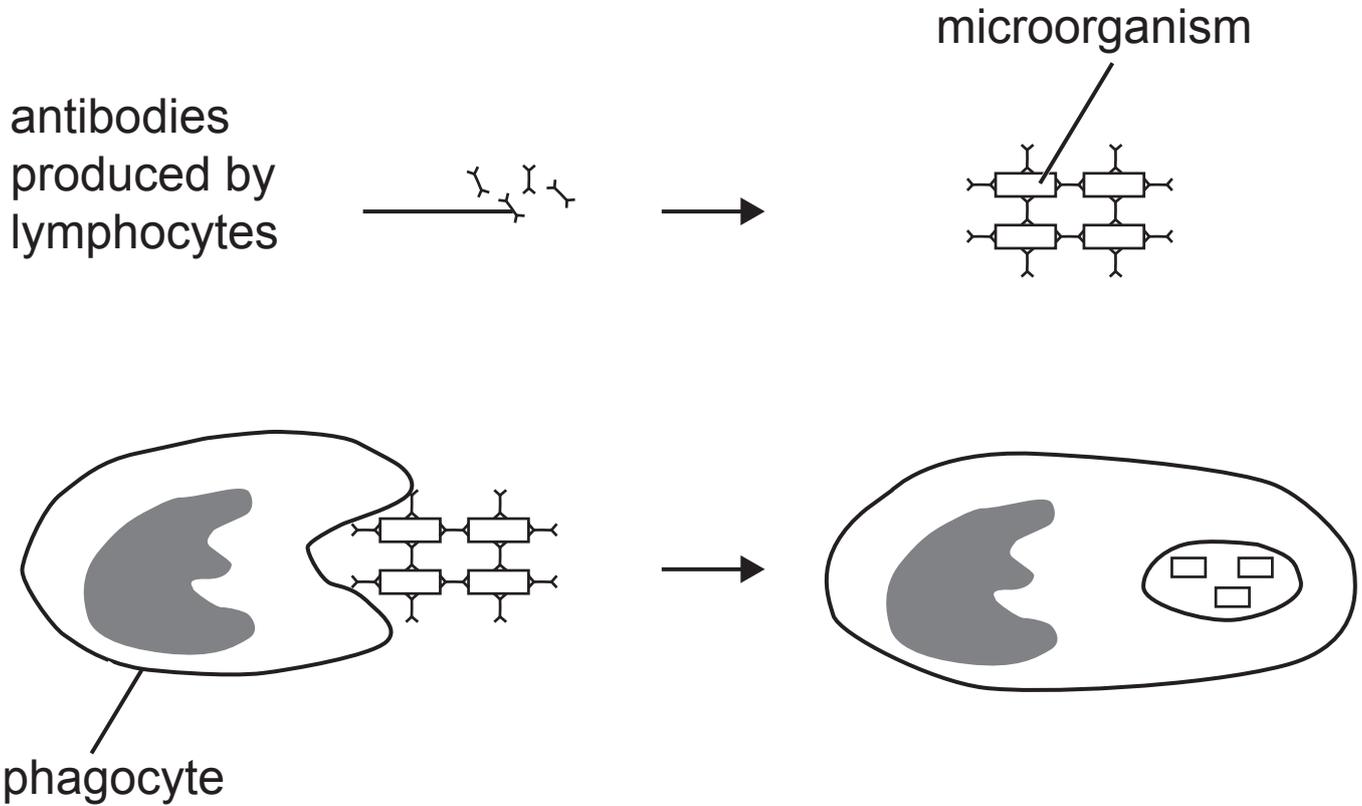
**(i)** Explain why the microorganisms are weakened.  
[1 mark]

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**(ii)** The microorganisms in the vaccine still have the structures on their surface which stimulate an immune response.  
What are these structures called? [1 mark]

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(iii) Using the diagrams below and your knowledge, explain fully how the different types of white blood cell (lymphocytes and phagocytes) deal with microorganisms. [3 marks]



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**(Questions continue overleaf)**

- 8 (a) MRSA is known as a superbug because it is resistant to many antibiotics. The table below shows the number of deaths from MRSA in a hospital in Northern Ireland between 2005 and 2012.

Year	Number of deaths
2005	18
2006	19
2007	20
2008	31
2009	15
2010	8
2011	6
2012	4

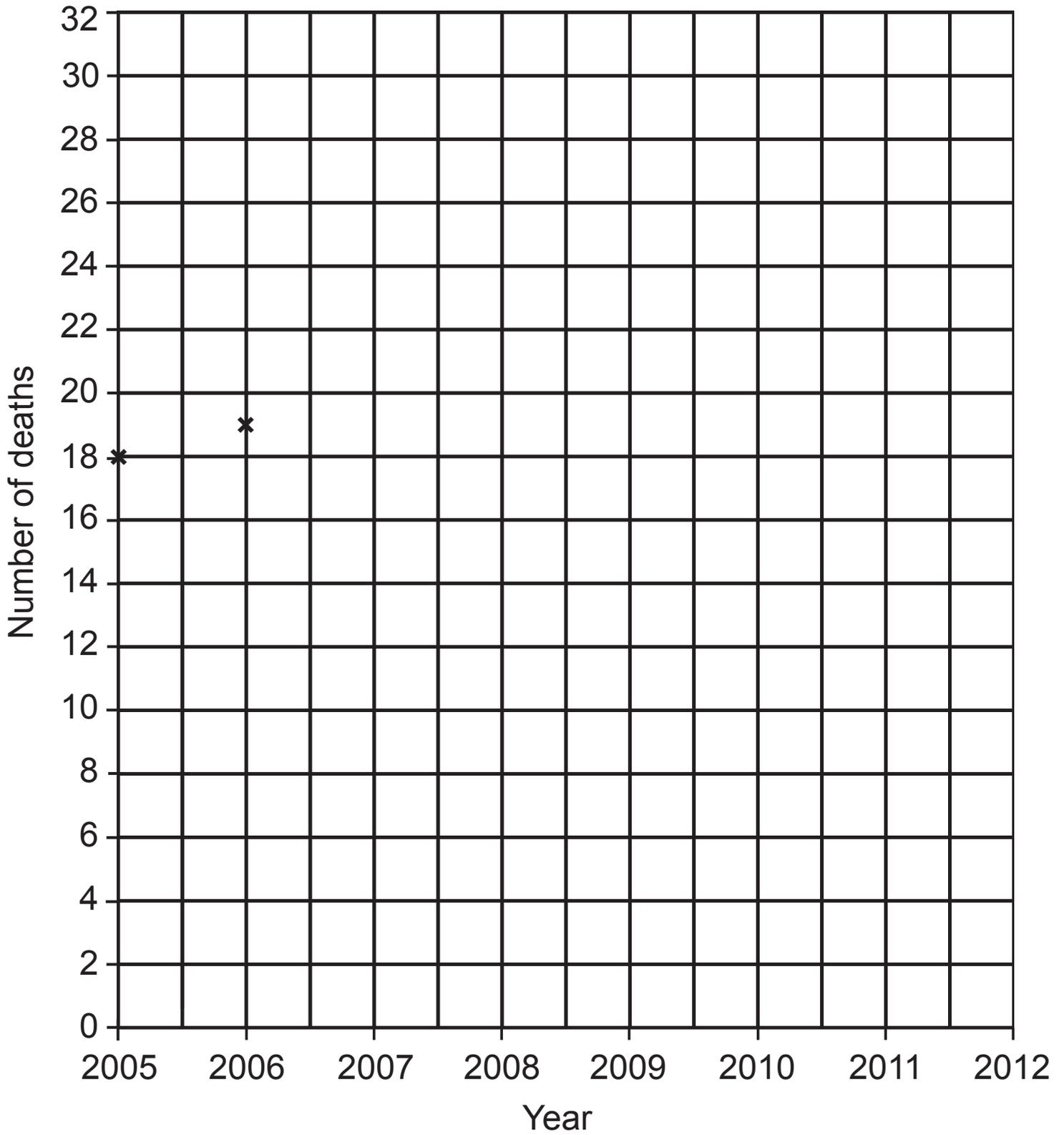
- (i) Complete a line graph of these results on the grid opposite. [3 marks]
- (ii) Describe fully the trend shown by these results. [2 marks]

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(b) Explain fully why antibiotics are not used to treat the cold or flu. [2 marks]

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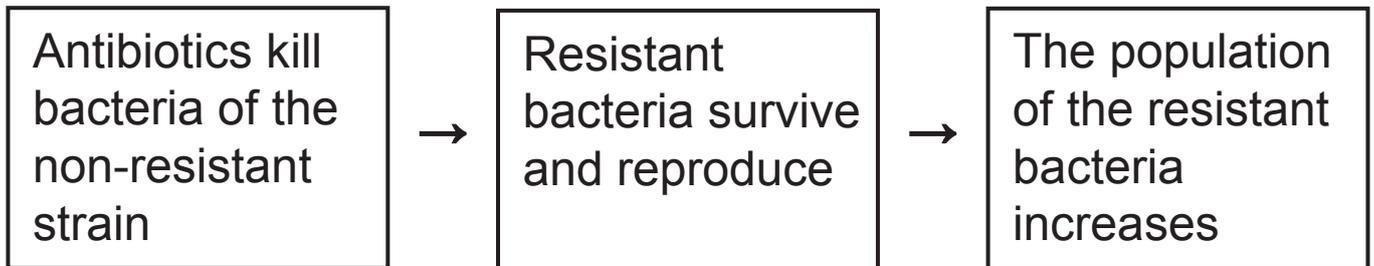
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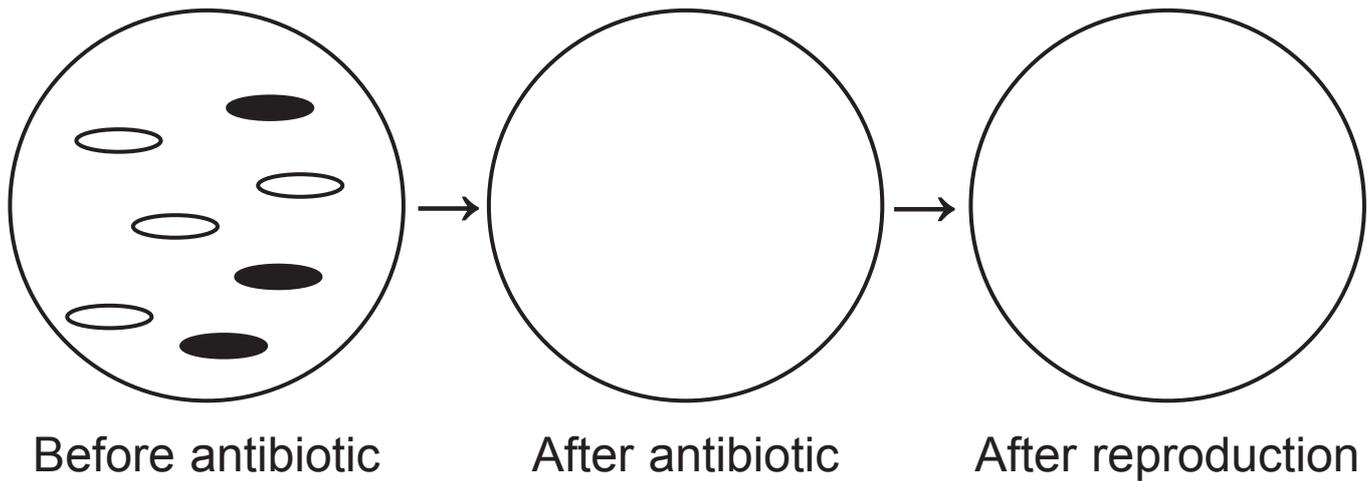
(c) Antibiotic resistance is brought about by mutations in bacteria.

The main steps in the development of resistance are:

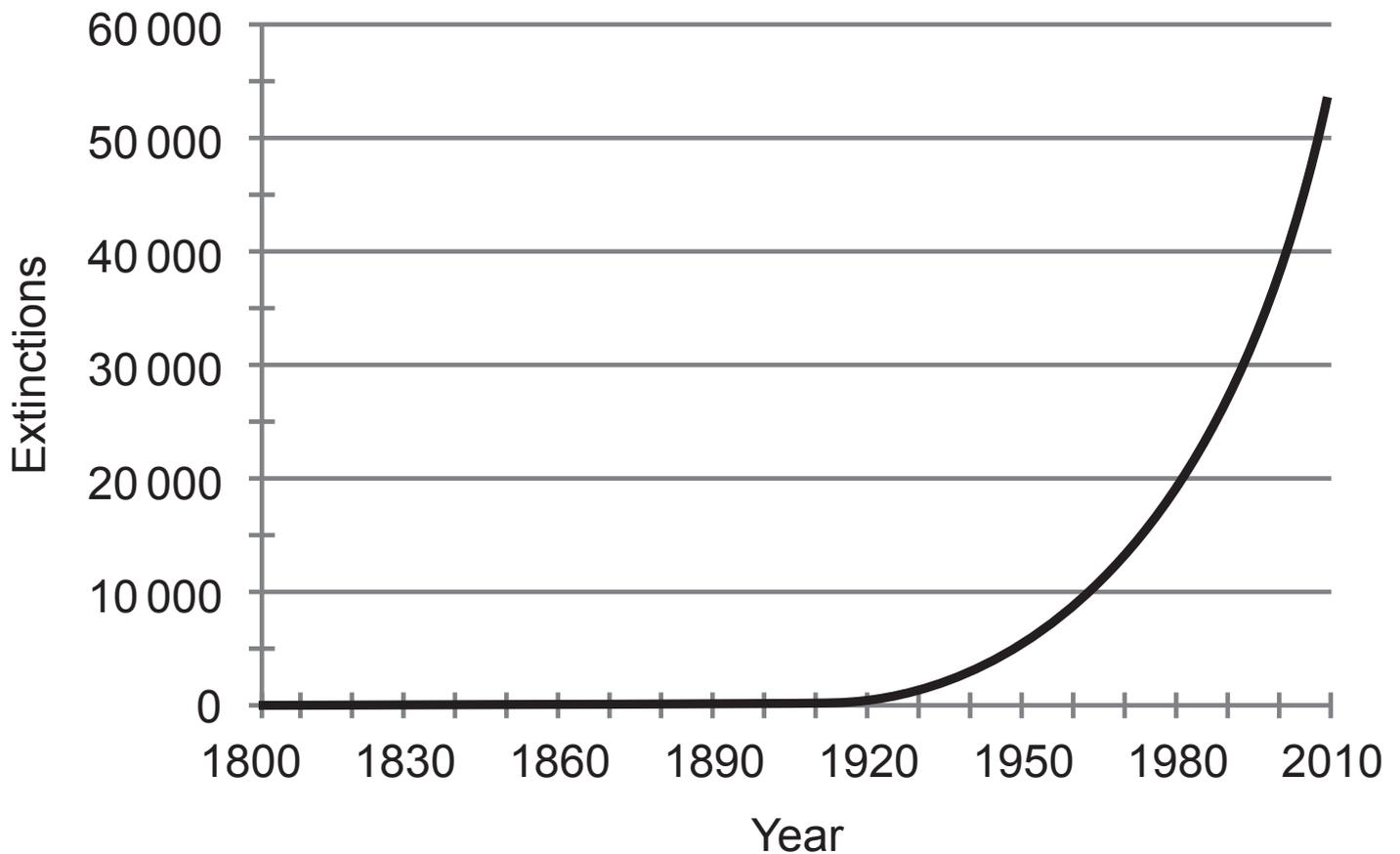


Using this information, complete the diagram below showing the change in bacteria over time. [1 mark]

-  Non-resistant bacteria
-  Resistant bacteria



- 9 The following graph shows the number of species extinctions since the year 1800.



Describe and explain the results shown by the graph.  
[6 marks]

Your answer should include:

- a definition of extinction
- reasons why some species are becoming extinct
- ways to help prevent them becoming extinct.



## SOURCES

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Pg 3, Q1Aphid photo © Steve Gschmeissner / Science Photo Library

Pg 3, Q1Blue tit photo © iStock / Thinkstock

Pg 3, Q1Hawk photo © iStock / Thinkstock

Pg 8 Q4 image of packet of cigarettes © iStock / Thinkstock

Pg 26, Q9 Graph shows the number of species extinctions since the year 1800 Source: <http://www.whole-systems.org/extinctions.html>

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Question Number	Marks
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<b>Total Marks</b>	
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