New Specification

Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2011–2012

Double Award Science: Biology

Unit B1

Foundation Tier

[GSD11]

GSD11

MONDAY 27 FEBRUARY 2012
9.30 am–10.30 am

TIME

1 hour.

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 eight** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 70.
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 questions **6(c)** and **8(b)**.

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

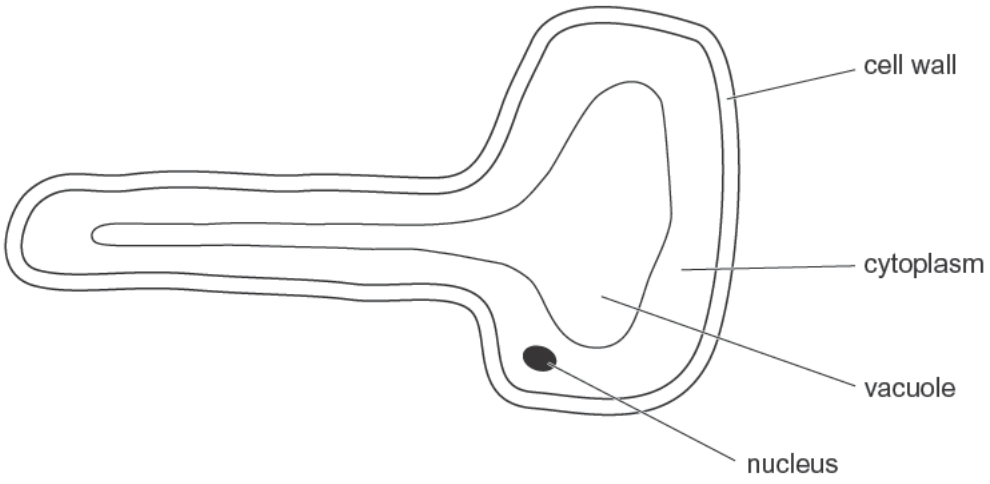
Examiner Only	
Marks	Remark

1 Complete the table, using a tick (✓) to show the feature is present or a cross (✘) to show it is absent.

Feature \ Animal Group	Annelids	Insects	Chordates
Backbone			
Chaetae			
Exoskeleton			

[3]

2 The diagram below shows a root hair cell.



(a) Using the diagram, describe how the root hair cell is adapted for absorbing minerals from the soil.

_____ [1]

(b) Complete the table to state the functions of the minerals in plants.

Mineral	Function
Calcium	
Nitrogen	
Magnesium	

[3]

Photograph 1 shows farmyard manure which is a natural fertiliser.
Photograph 2 shows a farmer spreading artificial fertiliser.

1

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2

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(c) Use the photographs and your knowledge to describe **two** advantages and **two** disadvantages of a farmer using farmyard manure (FYM) compared to artificial fertilisers.

Advantages

1. _____

_____

2. _____

_____

Disadvantages

1. _____

_____

2. _____

_____ [4]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

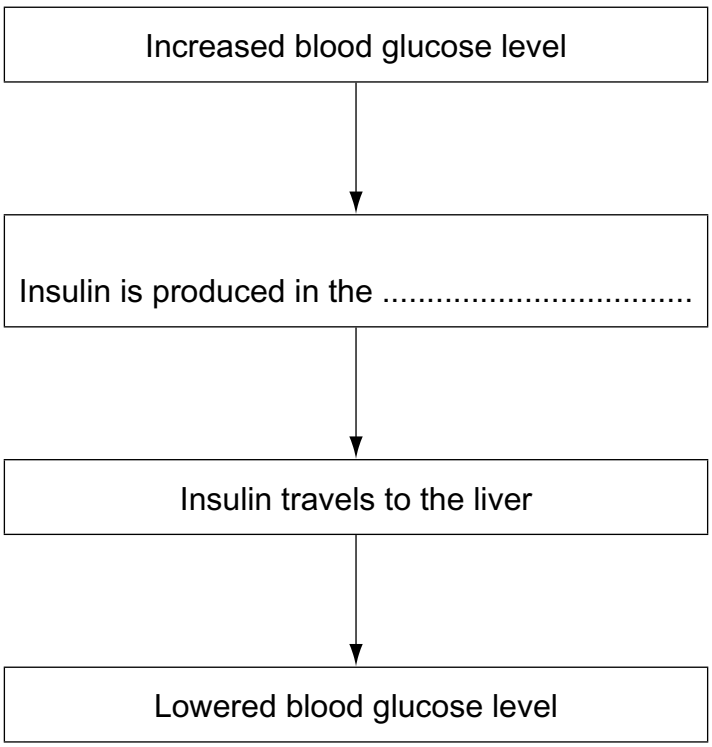
3 Insulin is a hormone found in the body.

(a) What is a hormone?

_____

_____ [2]

(b) Complete the flow diagram to show how insulin acts to lower blood glucose level.



[1]

(c) Describe two effects that insulin has in the liver resulting in a lowered blood glucose level.

1. _____

2. _____ [2]

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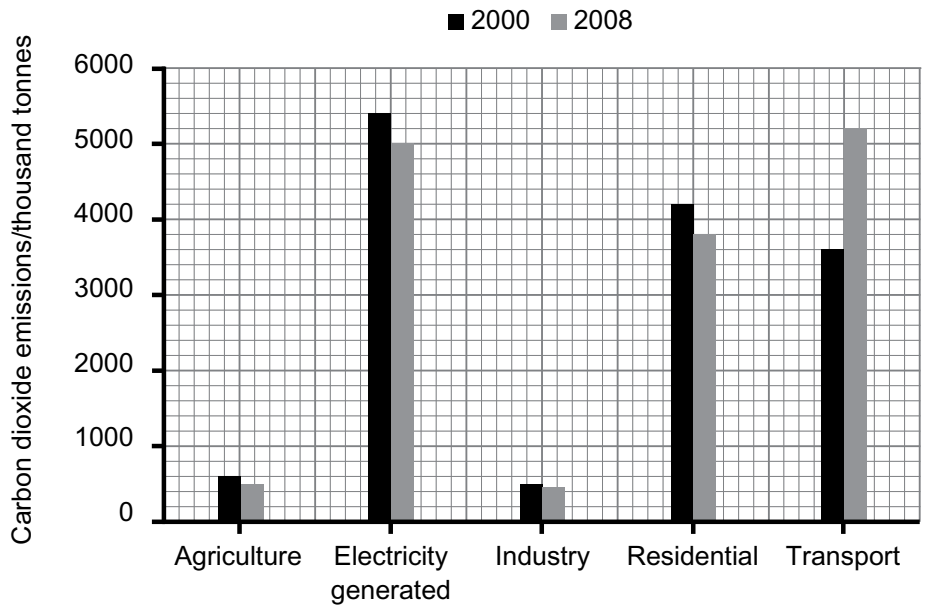
Examiner Only	
Marks	Remark

4 Graph A shows the carbon dioxide emissions from various sources in Northern Ireland for the two years, 2000 and 2008.

Graph A



Use the information in Graph A and your knowledge to answer the following questions.

(a) (i) Name the **three** main sources of carbon dioxide emissions.

_____ [1]

(ii) 4200 thousand tonnes of carbon dioxide were produced from the "residential" source in 2000. This had fallen to 3800 thousand tonnes in 2008. Calculate the percentage decrease in carbon dioxide produced.

(Show your working out.)

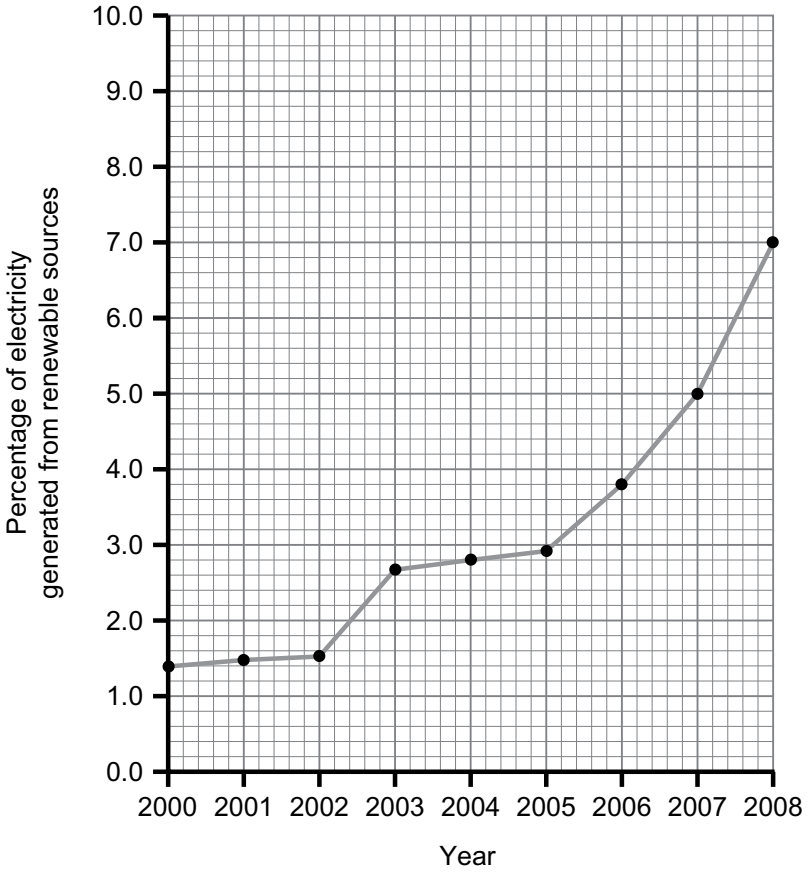
_____% [2]

(iii) Suggest a reason for the decrease in carbon dioxide emissions between 2000 and 2008 in the "residential" source.

_____ [1]

Graph B shows the percentage of electricity generated from renewable sources in Northern Ireland between 2000 and 2008.

Graph B



(iv) Describe and explain the relationship between the trend in **Graph B** and the level of carbon dioxide emissions from electricity generation between 2000 and 2008 (as shown in **Graph A**).

_____

_____

_____

_____ [3]

Examiner Only

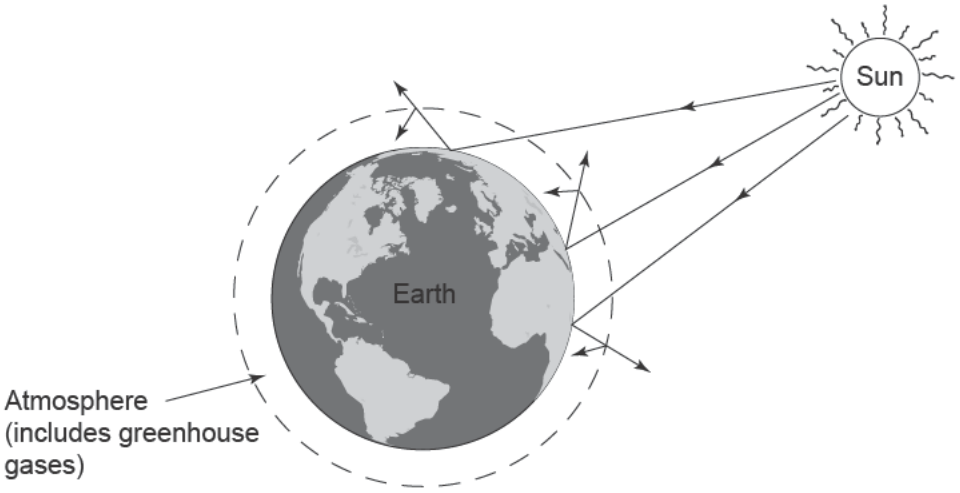
Marks	Remark

Examiner Only	
Marks	Remark

(b) The carbon dioxide level in the atmosphere is an example of an abiotic factor. What is meant by an **abiotic factor**?

_____ [1]

(c) The diagram shows how global warming occurs.



Use the diagram and your knowledge to explain how an increase in carbon dioxide levels leads to an increase in global warming.

_____

_____

_____ [2]

(d) Explain why it is important to monitor the levels of carbon dioxide in the air.

_____ [1]

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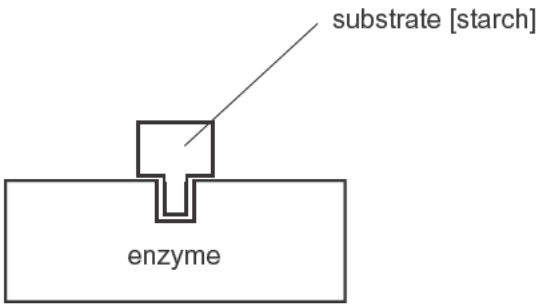
(Questions continue overleaf)

Examiner Only	
Marks	Remark

5 **(a)** State the function of an enzyme.

_____ [1]

(b) The diagram shows how an enzyme acts on a starch molecule.



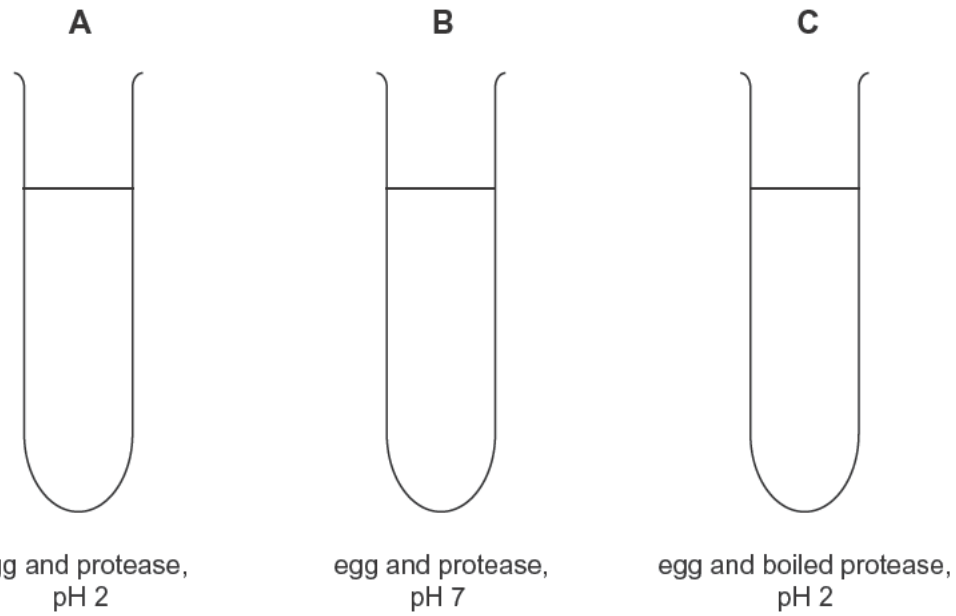
(i) Name the enzyme shown.

_____ [1]

(ii) Name this model of enzyme action.

_____ [1]

(c) Jenny set up an experiment to test the effect of a protease enzyme from the stomach on egg (protein), under different conditions as shown in the diagram.



She took small samples from the test tubes at five minute intervals and carried out the Biuret test on the samples. Her results are shown in the table.

	Colour		
Time/minutes	**Test tube A**	**Test tube B**	**Test tube C**
0	Purple	Purple	Purple
5	Blue	Purple	Purple
10	Blue	Purple	Purple
15	Blue	Purple	Purple
20	Blue	Blue	Purple

Explain Jenny's results for test tubes **A**, **B** and **C**.

(i) Test tube A _____

_____ [2]

(ii) Test tube B _____

_____ [2]

(iii) Test tube C _____

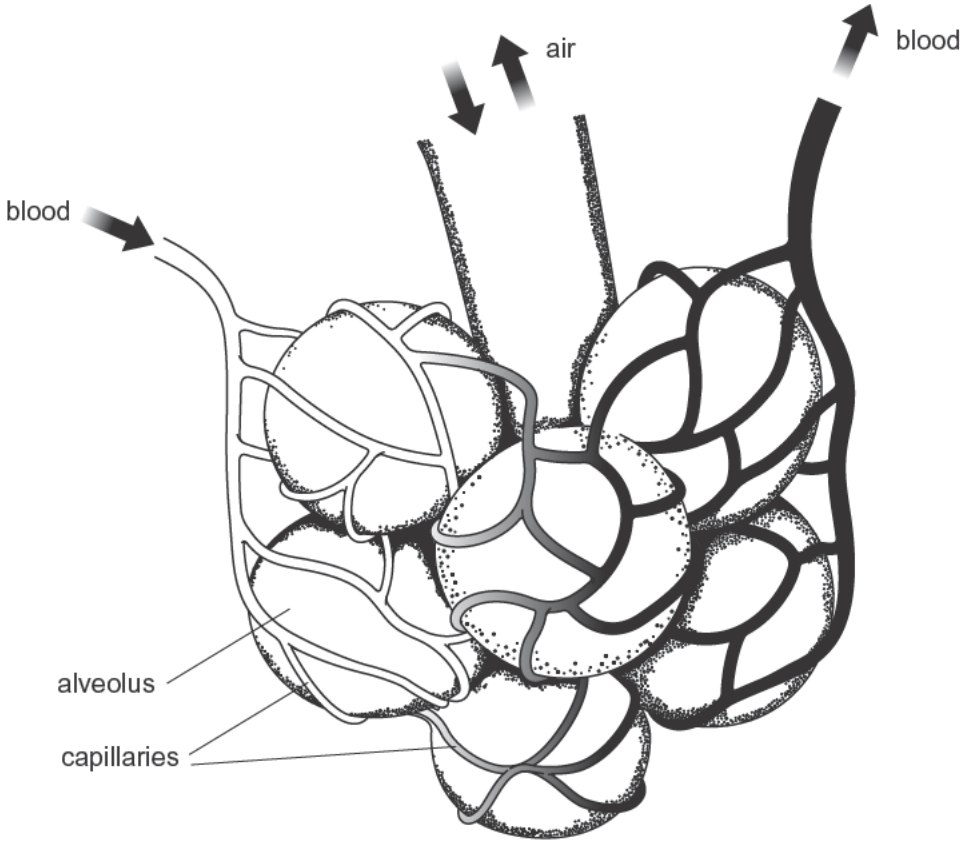
_____ [2]

Examiner Only

Marks	Remark

Examiner Only	
Marks	Remark

6 The diagram shows a number of alveoli in the lungs. Gas exchange occurs across the surface of each alveolus.



(a) Use the information in the diagram and your knowledge to help you answer the following questions.

(i) Describe how a large surface area is achieved by the alveoli and explain the benefit of this large surface area.

_____

_____ [2]

(ii) State two **other** features of the alveoli that help gas exchange.

1. _____

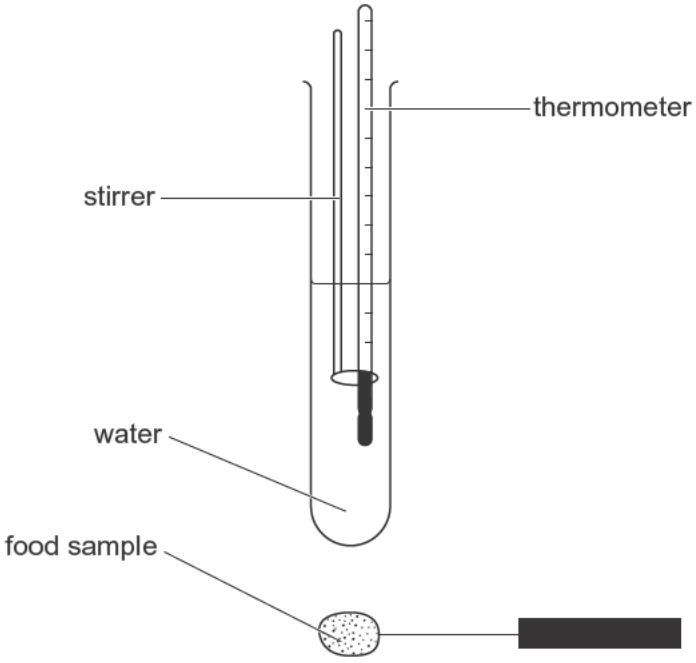
2. _____ [2]

(b) Complete the word equation for aerobic respiration.

	+		→	carbon dioxide	+	water	+	energy

[2]

(c) The energy released from different foods can be compared using the apparatus shown in the diagram.



Describe how you would use this apparatus and any additional materials to compare the energy released from equal masses of biscuit and cheese.

Outline at least one variable, apart from mass of food, that needs to be controlled in this experiment to ensure valid results (a fair test).

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

[6]

Examiner Only

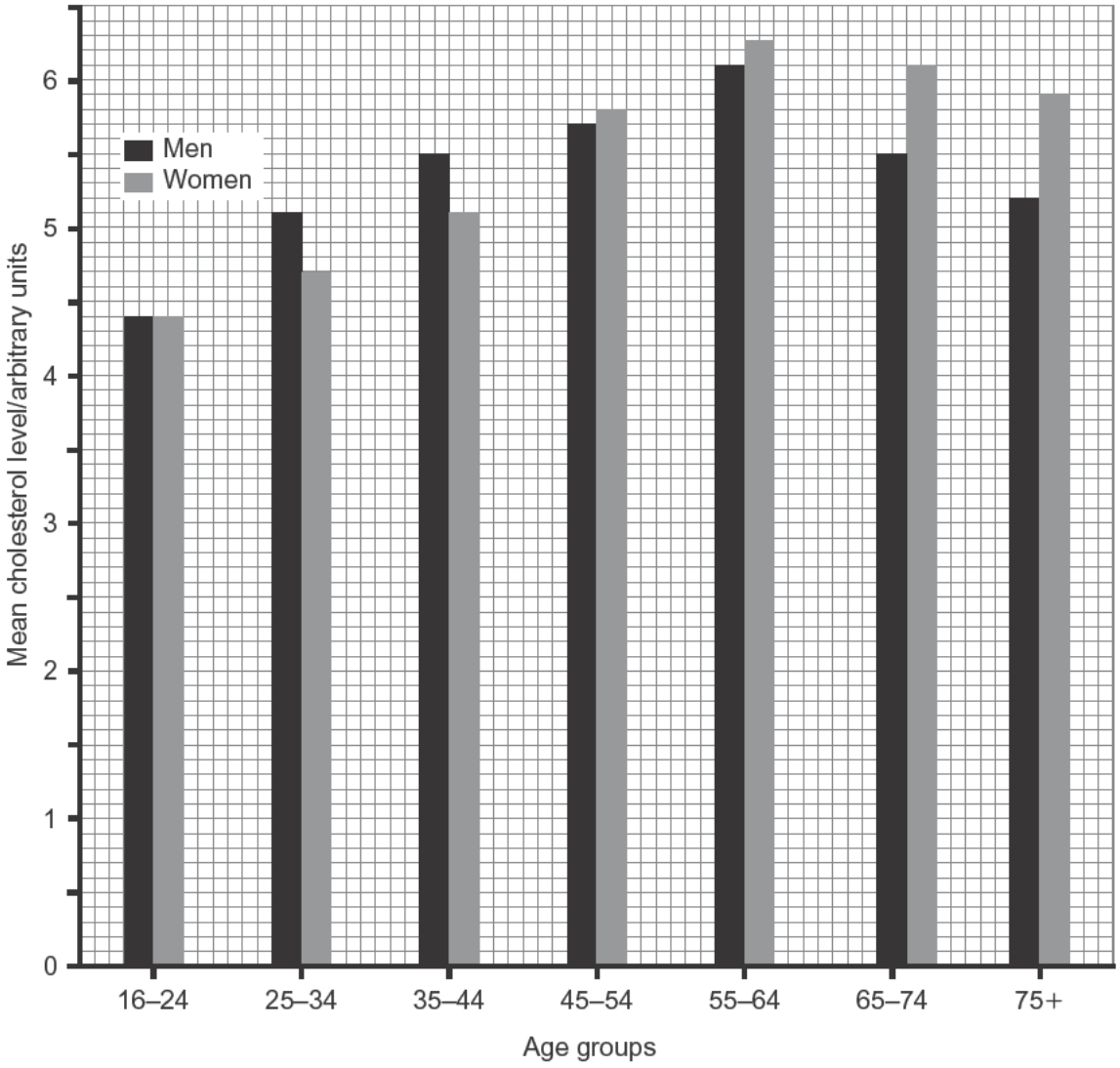
Marks	Remark

Examiner Only	
Marks	Remark

7 Cholesterol is a fatty substance. A build up of cholesterol can result from eating a fat-rich diet. It can result in circulatory illnesses such as heart disease and strokes.

Graph X shows the mean cholesterol levels for men and women in Northern Ireland in various age groups.

Graph X



(a) Describe **three** trends in Graph X.

1. _____

_____

2. _____

_____

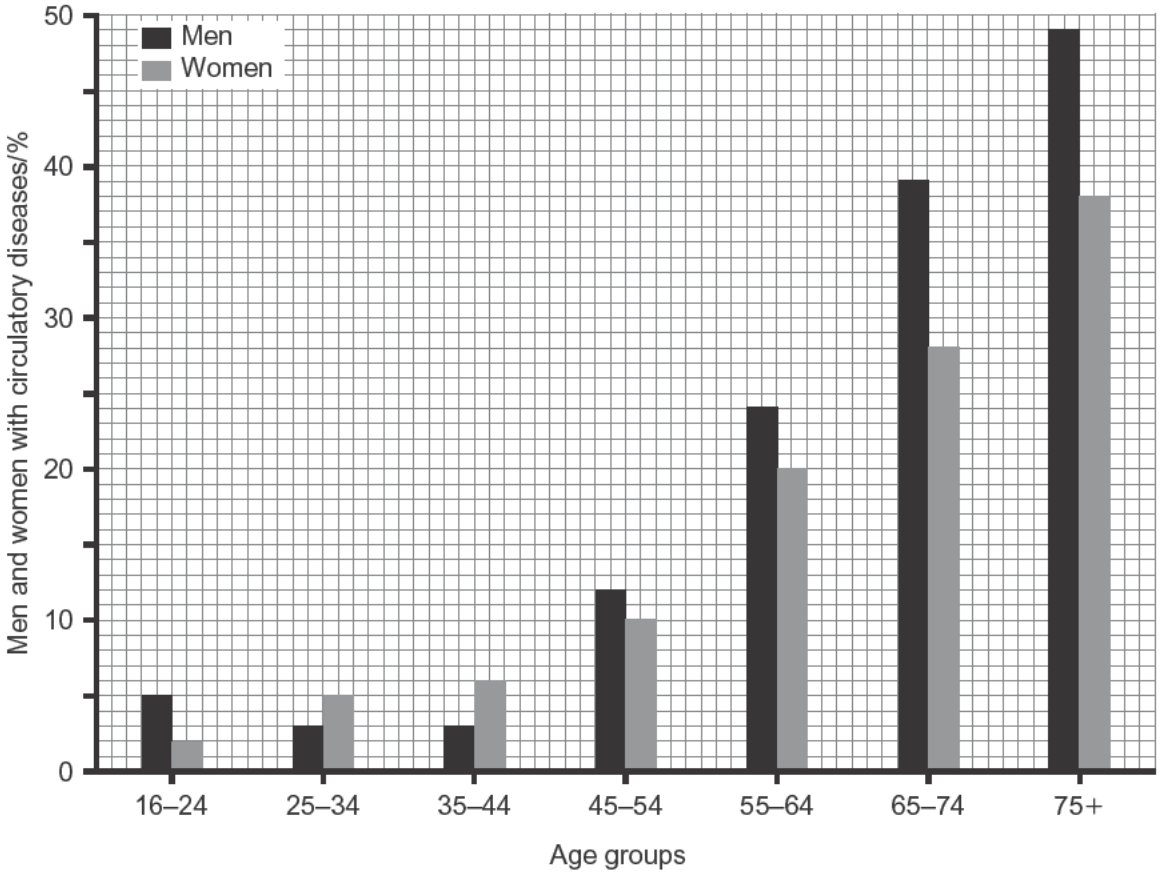
3. _____

_____ [3]

Examiner Only	
Marks	Remark

(b) Graph Y shows the percentage of men and women with circulatory illnesses (heart attacks and strokes) in different age groups in Northern Ireland.

Graph Y



Using the information in **Graphs X** and **Y**, describe the relationship between mean cholesterol levels and the occurrence of circulatory illnesses (heart attacks and strokes) for people up to the age of 64.

_____

_____

_____

_____ [2]

(c) An unhealthy diet can result in circulatory illnesses such as heart disease and strokes. State **two** other impacts of an unhealthy diet on general health.

1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

8 The photographs show two different types of grassland that are open and not shaded.

Source: Principal Examiner

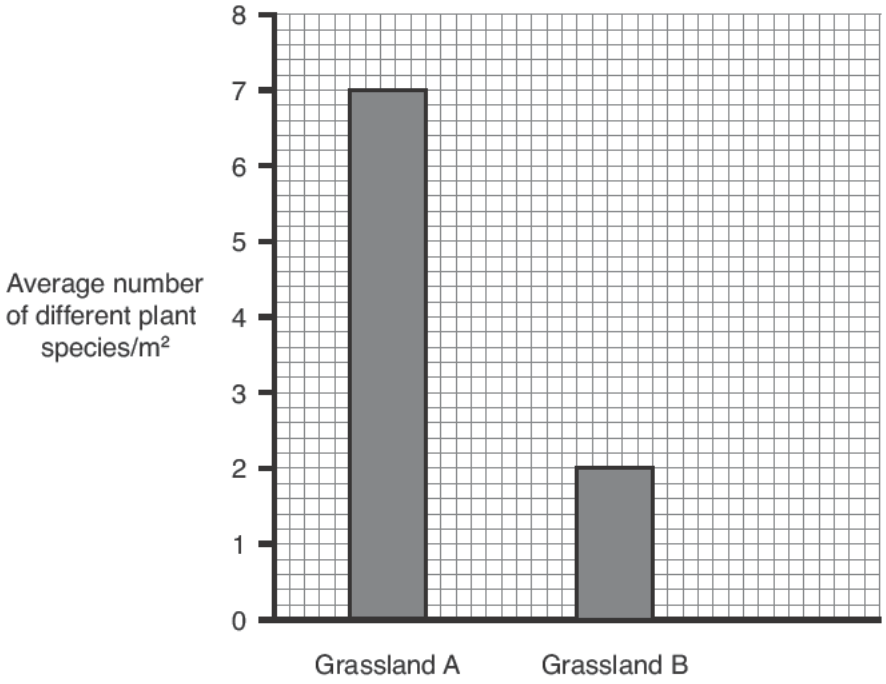
Grassland A

Source: Principal Examiner

Grassland B

The bar chart shows the results obtained by a class during an investigation in Grasslands A and B.

The pupils estimated the number of different plant species in a 1 m^2 quadrat.



(a) (i) Use the bar chart to describe why Grassland A has the higher biodiversity.

_____ [1]

(ii) Suggest **one** environmental factor that could account for the difference in the results between the two grasslands.

_____ [1]

(b) Describe how the pupils would have carried out this investigation and explain how they would have obtained these results.

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

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____ [6]

Examiner Only	
Marks	Remark

(c) Flowers are sources of a sugary substance called nectar. Butterflies visit flowers to feed on the nectar.

A sample of butterflies in each grassland was captured and the number of each species counted. The results are shown in the table.

Butterfly species	Grassland A	Grassland B
Meadow Brown	21	0
Large White	17	2
Red Admiral	8	0
Ringlet	7	1

(i) Name the sampling equipment used to capture the butterflies.

_____ [1]

(ii) Use the photographs and the bar chart (on page 16) to explain the difference in the number of butterflies captured in Grasslands A and B.

_____

_____

_____ [2]

Examiner Only

Marks	Remark

(d) A rose bush growing in Grassland A was examined and 78 caterpillars were counted feeding on its leaves. Two robins were observed feeding on the caterpillars.

(i) Use this information to sketch a pyramid of numbers for this food chain in the space below. Label each trophic level with the name of the organism.

[2]

(ii) In the space below sketch a pyramid of biomass for this food chain. Label each trophic level with the name of the organism.

[2]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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