

New
Specification

Rewarding Learning

General Certificate of Secondary Education
2012–2013

Centre Number

71

Candidate Number

Double Award Science: Biology

Unit B1

Foundation Tier

[GSD11]



MONDAY 12 NOVEMBER 2012, AFTERNOON

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 Question **3(d)(i)**.

For Examiner's
use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	

Total
Marks

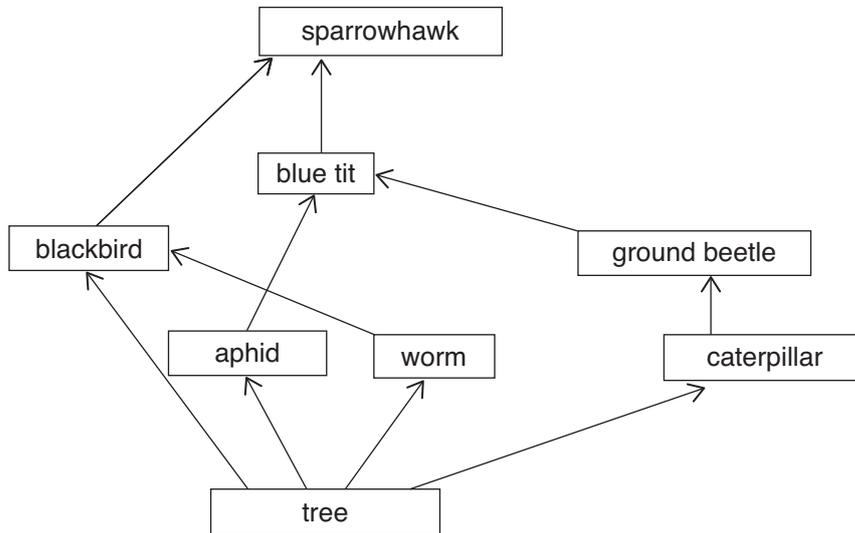
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1 (a) What is the meaning of the term ecosystem?

_____ [2]

(b) Part of a food web for a woodland ecosystem is shown below.



(i) What is the source of energy for this food web?

_____ [1]

(ii) Name the producer in the food web.

_____ [1]

(iii) Name a primary consumer in the food web.

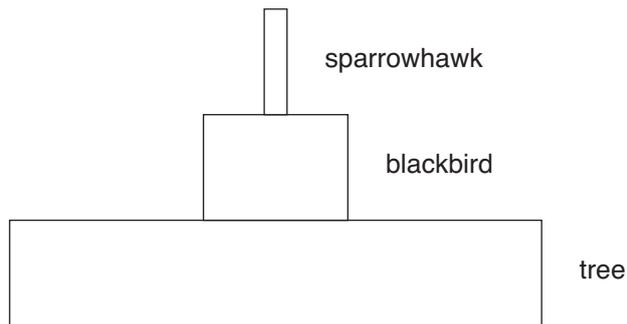
_____ [1]

(iv) At what trophic level is the ground beetle feeding?

_____ [1]

Examiner Only	
Marks	Remark

- (d) A pyramid of energy is another way of representing the flow of **energy** in a food chain. The diagram below shows a pyramid of energy for a food chain in the food web shown in part (b).



Give **two** reasons why there is less energy available to the sparrowhawk than is available to the blackbird in the food chain.

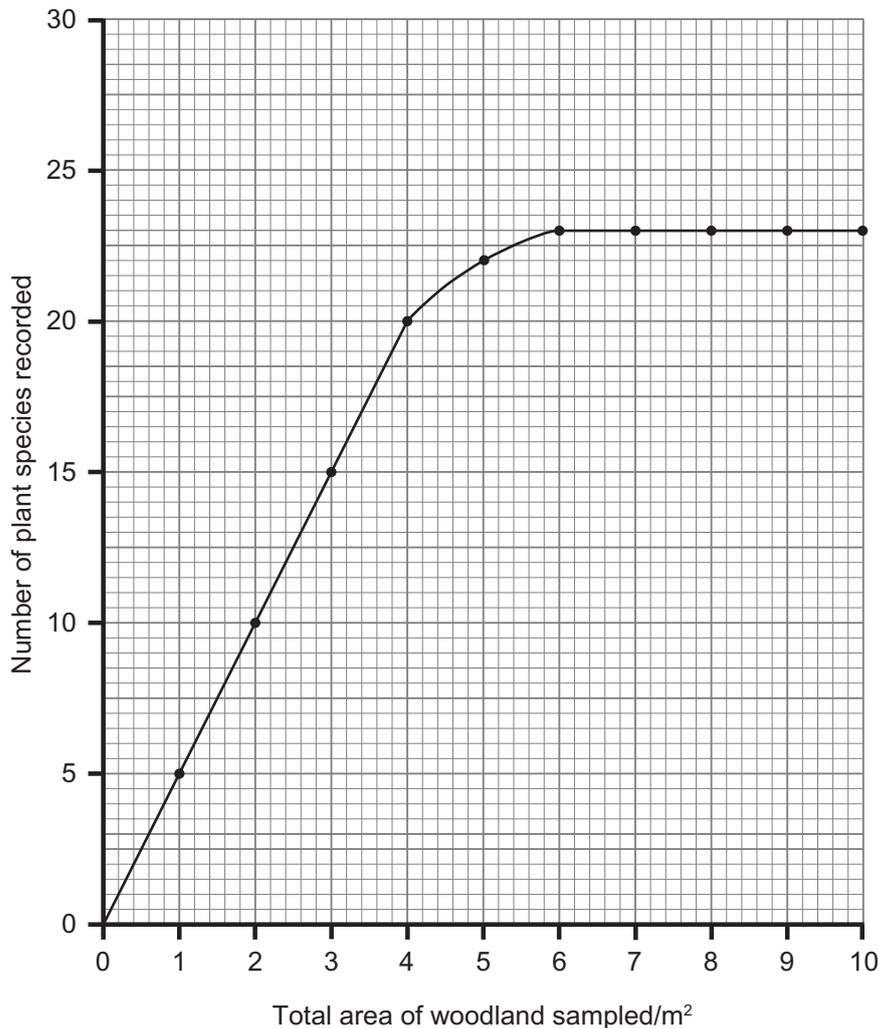
1. _____

2. _____

_____ [2]

Examiner Only	
Marks	Remark

- 2 Pupils carried out an experiment to find the average number of plant species in woodland. The graph shows the relationship between the number of plant species recorded and the total area of woodland sampled.



- (a) Describe the trend shown in the graph.

 [2]

- (b) Use the results in the graph to suggest the minimum area of woodland the pupils should sample to find the total number of plant species present in the woodland.

_____ m² [1]

Examiner Only	
Marks	Remark

- (c) One technique used to manage woodland is called **coppicing**. This involves cutting down tall, overgrown trees to ground level.

It encourages new growth of shoots from the cut stumps, eventually thickening the woodland.

Photograph A below shows a woodland **(A)** that has been coppiced.



© Dr Jeremy Burgess / Science Photo Library

Photograph B below shows a woodland **(B)** that has not been coppiced.



© Simon Fraser / Science Photo Library

Examiner Only	
Marks	Remark

Some months after woodland A had been coppiced, the pupils carried out a study to find the average number of plant species/m² growing on the woodland floor (i.e. ground) in the two woodlands. Their results are shown in the table.

Woodland	Average number of plant species/m ²
A	17
B	10

- (i) Describe how the pupils would have determined the average number of plant species in a woodland.

[3]

- (ii) Suggest why the average number of plant species/m² was much higher in woodland **A**.

[1]

Examiner Only

Marks Remark

3 (a) Complete the table about food tests.

Food type	Reagent used to carry out food test	Initial colour of reagent	Final colour for a positive result
Fat		Clear	
Protein			Purple

[4]

(b) Explain why obesity levels have increased greatly in the United Kingdom and many other countries in recent years.

[2]

(c) Name the component of an unhealthy diet that can cause high blood pressure. _____

diabetes. _____

[2]

Examiner Only	
Marks	Remark

5 Two adaptations of respiratory surfaces in animals are a large surface area and a moist surface.

(a) Explain the importance of these adaptations to animals.

Large surface area _____

Moist surface _____

_____ [2]

(b) Give **two** other adaptations of respiratory surfaces in animals.

1. _____

2. _____ [2]

Examiner Only

Marks

Remark

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(Questions continue overleaf)

6 (a) Explain the ecological term habitat.

_____ [1]

(b) The table shows the percentage of different invertebrate groups present on the ground, in the vegetation and in the air above the vegetation in a grassland.

Area where found	Invertebrate group/%			
	Spiders	Flies	Beetles	Bees
On the ground	67	20	7	30
In the vegetation	33	37	52	26
In the air	0	43	41	44
Total	100	100	100	100

© J W Garvin taken from *Skills in advanced biology. Vol. 1 Dealing with data* by J W Garvin, published by Stanley Thornes Ltd, 1986

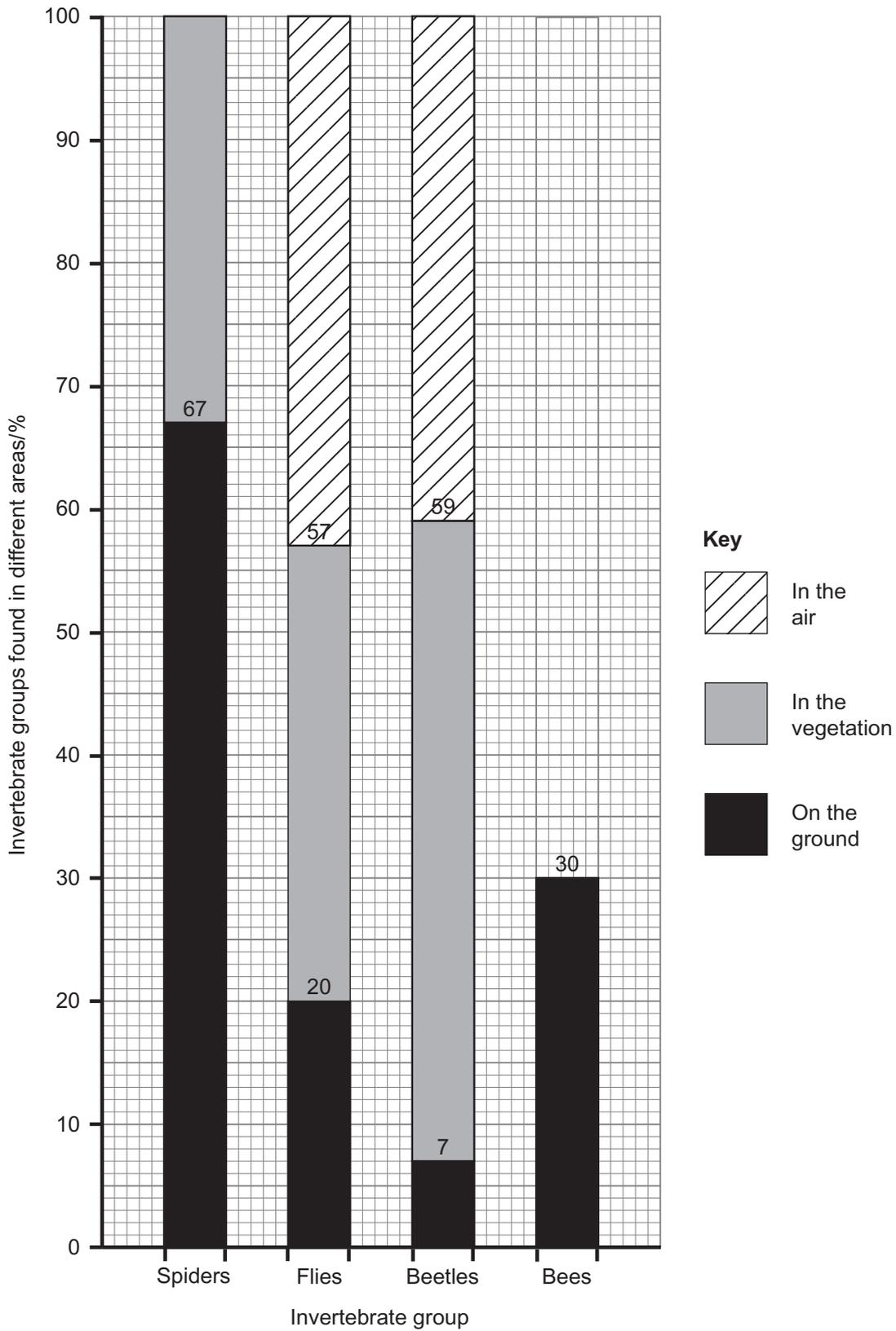
Suggest a suitable sampling method for collecting invertebrates

on the ground. _____

in the vegetation. _____ [2]

Examiner Only	
Marks	Remark

(c) Complete the bar chart to include the figures for the bees.



[2]

Examiner Only	
Marks	Remark

(d) Use the bar chart to state which invertebrate group cannot fly.

_____ [1]

(e) Yellowhammers are small birds found mostly in the east of Northern Ireland. The yellowhammer chicks feed on insects, while the adult birds feed on barley and wheat seeds.

If the grassland, referred to in part (b), was sprayed with an insecticide (a chemical that kills insects), explain the impact on the population of yellowhammers.

_____ [3]

Examiner Only	
Marks	Remark

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- 7 The table gives information on some sources and amounts of greenhouse gas (GHG) emissions in the United Kingdom for the years 2000 and 2010.

Source	Amount of GHG emissions/ million tonnes		Percentage change, 2000–2010
	2000	2010	
Generating Electricity	220	205	
Transport	120	114	–5
Business	110	90	–18
Residential	91	89	–2
Agriculture	58	51	–12

© Crown Copyright - Department of Energy and Climate Change

- (a) Complete the information in the table by entering the missing value.
(Show your working.)

[2]

- (b) Describe the general trend for the amounts of GHG emissions for all sources over the period 2000–2010.

_____ [1]

Examiner Only	
Marks	Remark

- (c) The table below shows the cost of generating electricity from different sources in the United Kingdom and shows whether the source produces carbon dioxide.

Carbon dioxide is a greenhouse gas. Scientific research suggests that an increase in levels of carbon dioxide leads to global warming.

Source	Cost per unit of electricity/p	Carbon dioxide produced
Gas	2.2	Yes
Coal	2.5	Yes
Wind	5.5	No
Wave	6.6	No

© RenewableUK

Use the information in the table to argue why there is controversy about using renewable energy (wind and wave) as a solution to global warming.

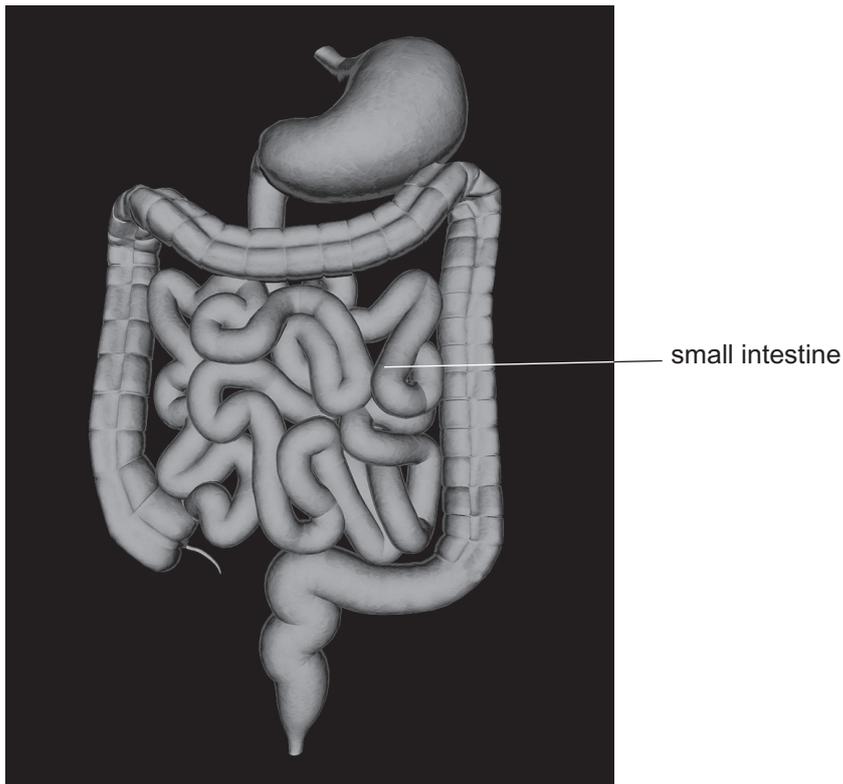
[3]

Examiner Only	
Marks	Remark

8 (a) Describe and explain the function of digestive enzymes.

[2]

(b) The image shows part of the digestive system.



© PASIEKA / Science Photo Library

(i) Using only the information in the image give **one** adaptation of the small intestine for absorption.

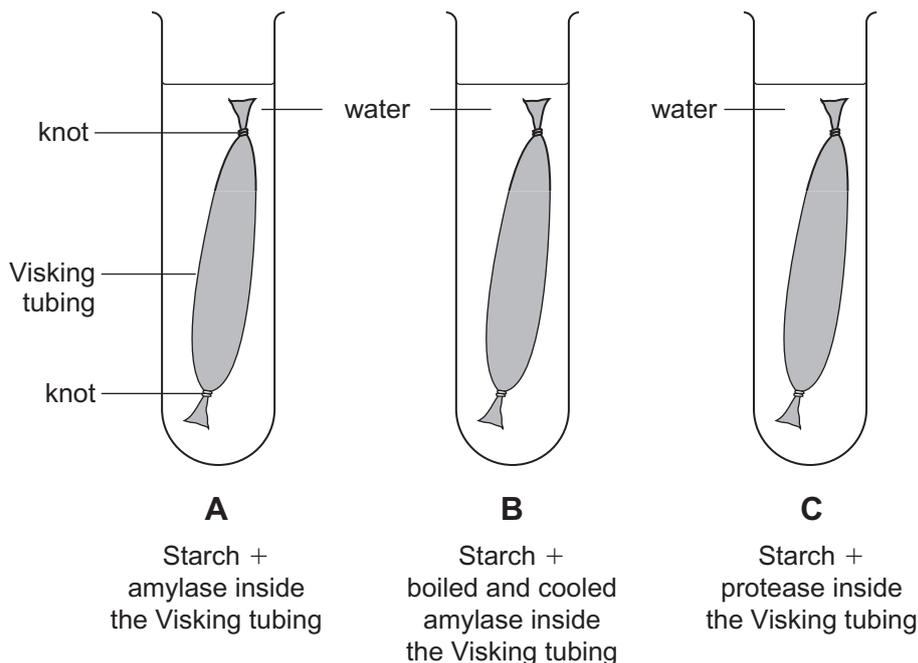
[1]

(ii) Give another adaptation of the small intestine for absorption, that is **not** shown in the diagram.

[1]

Examiner Only	
Marks	Remark

- (c) The diagram shows apparatus and materials used by a student to investigate the effect of two digestive enzymes, amylase and protease, on starch.



Visking tubing allows small molecules (e.g. glucose) to pass through but not large molecules (e.g. starch).

The experimental set-up was left for 30 minutes. The student then carried out the Benedict's test on the liquid outside the Visking tubing in each of the boiling tubes **A**, **B** and **C**.

- (i) Describe and explain the result the student obtained for the liquid in

tube **A** _____

tube **B** _____

_____ [4]

- (ii) Explain why there was a negative result for the Benedict's test in tube **C**.

_____ [1]

Examiner Only

Marks Remark

THIS IS THE END OF THE QUESTION PAPER

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