FOR OFFICIAL USE

Total Marks

X055/11/01

NATIONAL QUALIFICATIONS 2012

THURSDAY, 7 JUNE
1.00 PM – 3.00 PM

MANAGING ENVIRONMENTAL RESOURCES
INTERMEDIATE 2

Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth

Day Month Year

Scottish candidate number

Number of seat

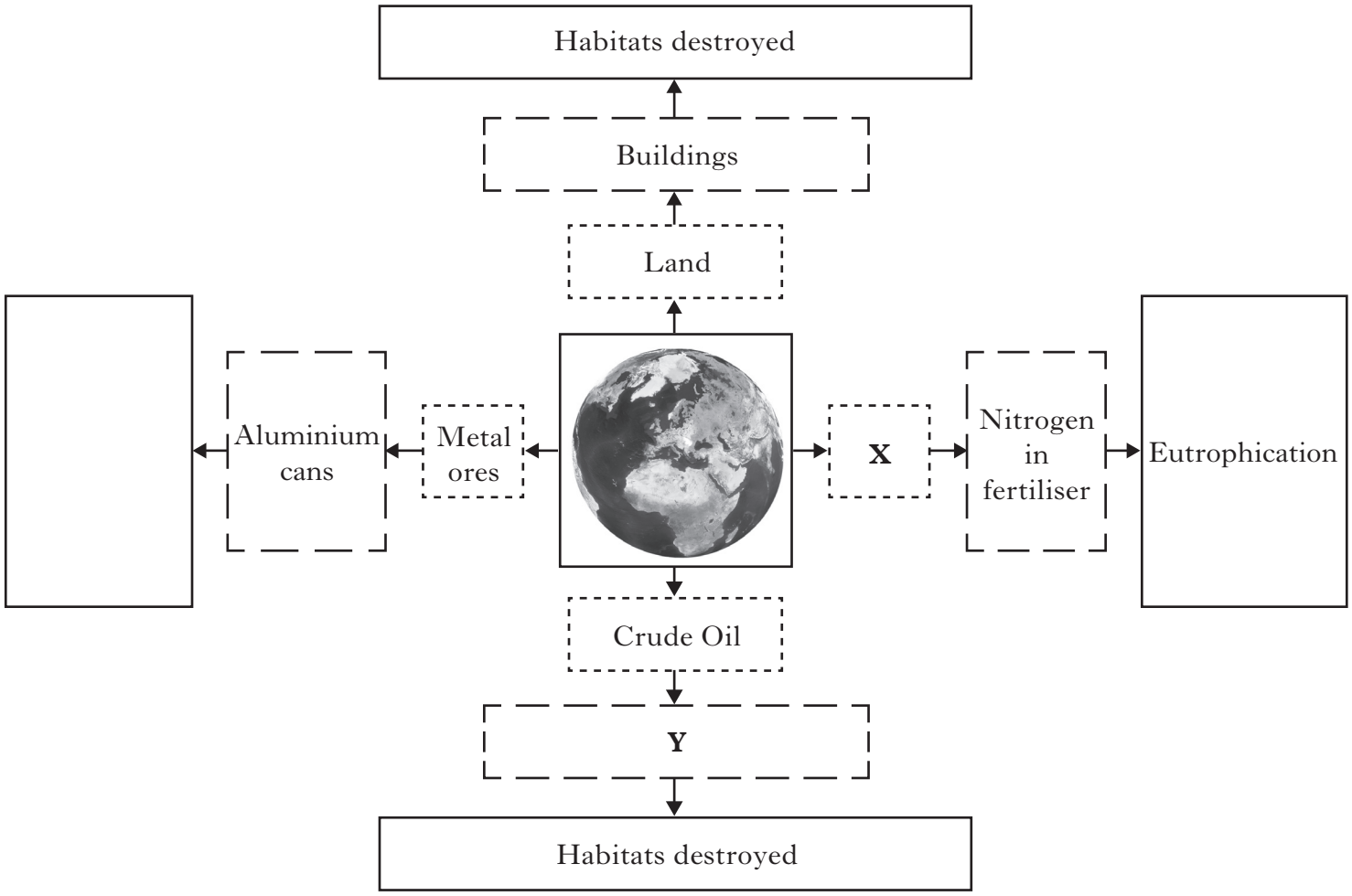
1. Attempt **all** questions in Section 1. In Section 2 there is a choice.
2. Read the whole of each question carefully before you answer it.
3. Write in the spaces provided.
4. Additional space for answers will be found at the end of the book. If further space is required, supplementary sheets may be obtained from the Invigilator and should be inserted inside the **front** cover of this book.
5. There is a separate Ordnance Survey Map Extract for use with Question 8.
6. Rough work, if any should be necessary, should be written in this book and then scored through when the fair copy has been written.
7. Before leaving the examination room you must give this book to the Invigilator. If you do not, you may lose all the marks for this paper.

SECTION 1

Answer ALL questions in the spaces provided.

Use the map extract to answer question 8.

1. (*a*) The diagram below shows the link between some natural resources, some man-made resources and some environmental issues.



Key
Natural resource ----------
Man-made resource — — —
Environmental issue ————

Marks

1. (*a*) (continued)

(i) Name the natural resource at Box X.

_____ **1**

(ii) Name the man-made resource at Box Y.

_____ **1**

(iii) Give **one** environmental issue associated with Aluminium cans.

_____ **1**

(iv) Give **two** other non-renewable resources **not** shown in the diagram.

1 _____

2 _____ **2**

(v) What is meant by a "non-renewable" resource?

_____

_____ **1**

(*b*) **Underline** the correct option to complete the description of eutrophication.

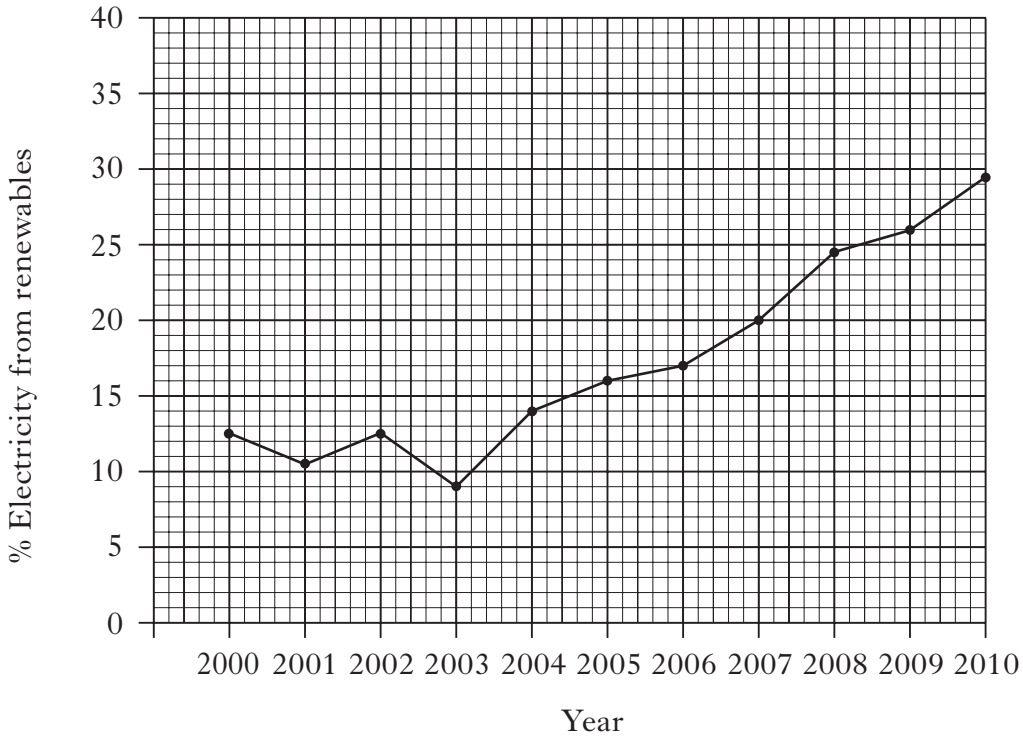
Excess fertiliser enters freshwater and *algal* / *bacterial* blooms occur.

When these organisms decay, the level of *oxygen* / *sulphur dioxide* in the water *increases*. / *decreases*. **2**

[Turn over

Marks

2. (*a*) The graph below shows the percentage of electricity produced by renewables in Scotland (2000–2010).



(i) Calculate the increase in percentage of electricity from renewables between 2000 and 2010.

Space for calculation

_____ % **1**

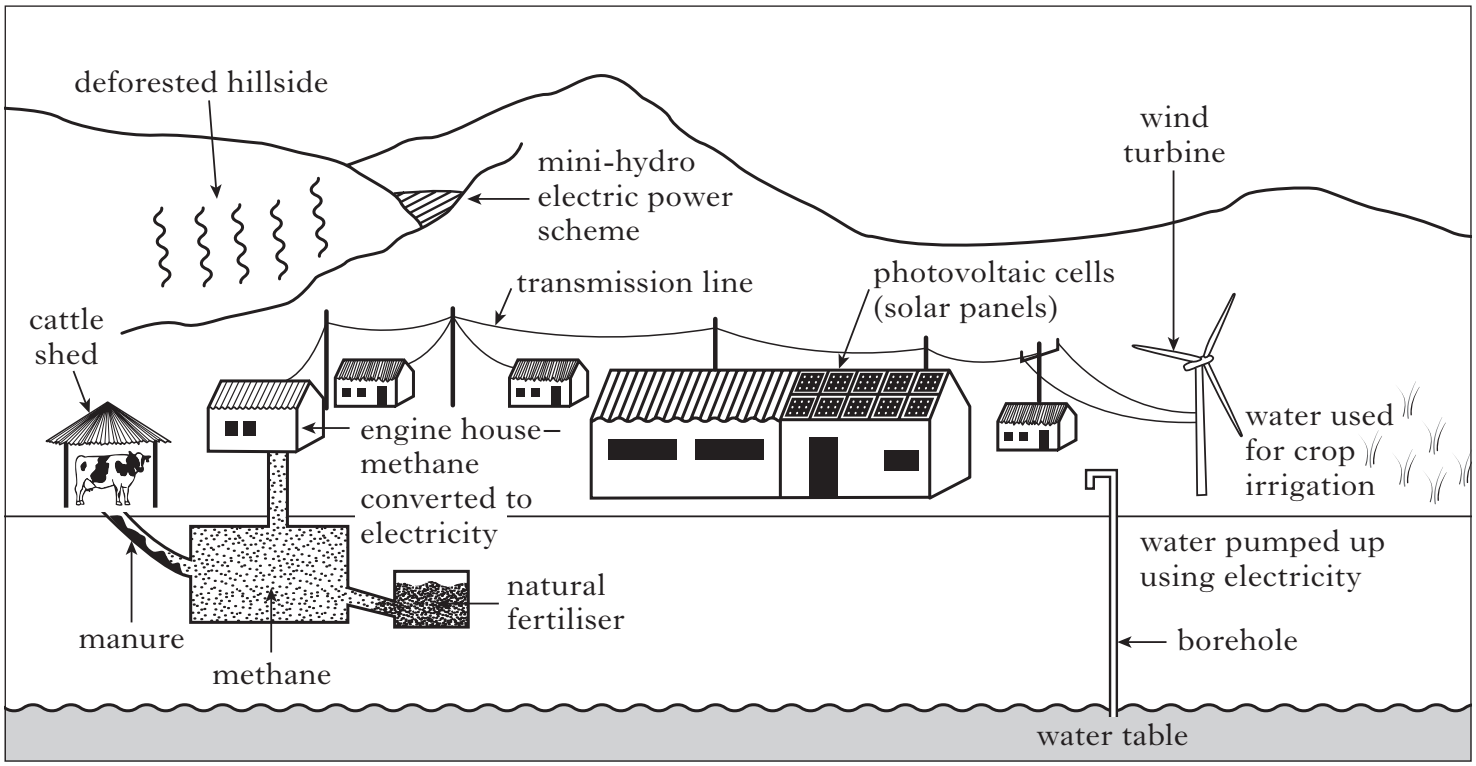
(ii) In 2007 the number of gigawatt hours (GW h) of electricity produced from renewables was 8000 GW h. The Scottish Government has set the target of 80% electricity production from renewables by 2020. Calculate the number of gigawatt hours of electricity that will be produced from renewables if the Government target is to be met and the total electricity production is the same as in 2007.

Space for calculation

_____ GW h **1**

2. (continued)

(*b*) The diagram below shows some renewable energy sources in a village in Malawi, an Economically Less Developed Country (ELDC).



DO NOT WRITE IN THIS MARGIN

Marks

Use the information in the diagram to answer the following questions.

(i) Electricity for the village is produced from renewable resources. Water is one of them.

Name **three** other renewable sources used to produce electricity.

1 _____

2 _____

3 _____ **1**

(ii) Give **two** additional benefits to agriculture gained from using renewables in this village.

1 _____ **1**

2 _____ **1**

(iii) Suggest a reason why the hillside has become deforested.

_____ **1**

Marks

2. (continued)

(*c*) Give **two** major uses of energy in an Economically More Developed Country (EMDC).

1 _____

2 _____ **1**

(*d*) Complete the table below to correctly match the country with a major energy source.

Energy Source: *biofuel* *geothermal* *nuclear*

Country	*Energy Source*
France	
Iceland	
Sweden	

1

[Turn over for Question 3 on *Page eight*

Marks

3. Read the extract below from a local authority magazine and answer the questions which follow.

Meeting National Recycling Targets

The local council has achieved Government targets by recycling 40% of our waste by March of this year. The campaign is now on to meet the next set of targets. By 2013 we need to recycle 50% of our waste, rising to 60% in 2020 and reaching 70% by 2025.

A number of recent developments will enable us to step up a gear when it comes to reducing, reusing and recycling.

- More goods can now be recycled by using your blue bin.
- More households have been issued with a burgundy bin for glass recycling.
- The kerb-side collection of green garden waste will run during the months April to October.
- Nearly every home in the local authority now has access to recycling.
- Civic Amenity sites are available at each town for recycling seven days a week for most of the year.
- A new reclamation plant used by the authority can take a wider range of goods for recycling; and in the near future a new local biogas facility will convert organic waste into electricity by anaerobic digestion.

These developments allow a wider range of goods to be recycled. Once sorted, recyclables are no longer "waste" but commodities that can be used to make new goods—from clothes and jewellery to duvet fillers. As well as achieving government targets, recycling can save the local authority and you money when it comes to Landfill Tax.

(*a*) Name **two** types of household waste that can be recycled.

_____ and _____ **1**

(*b*) Give **two** ways in which this local authority has made it easier for households to carry out recycling.

1 _____

2 _____ **1**

(*c*) Explain why garden waste is only collected between April and October.

_____

_____ **1**

Marks

3. (continued)

(*d*) Suggest **one** other way in which householders themselves can recycle green garden waste.

_____ **1**

(*e*) Give **one** example of "waste" being converted into a useful product.

_____ **1**

(*f*) Explain how a biogas facility provides a good example of sustainable development.

_____

_____

_____ **2**

(*g*) Name **one** initiative that has encouraged recycling.

_____ **1**

(*h*) Give **one** example of an energy efficiency scheme that local authorities promote.

_____ **1**

(*i*) The Landfill Tax in 2011 was £48 per tonne of waste.

Calculate the Landfill Tax which would have to be paid on 25 tonnes of waste.

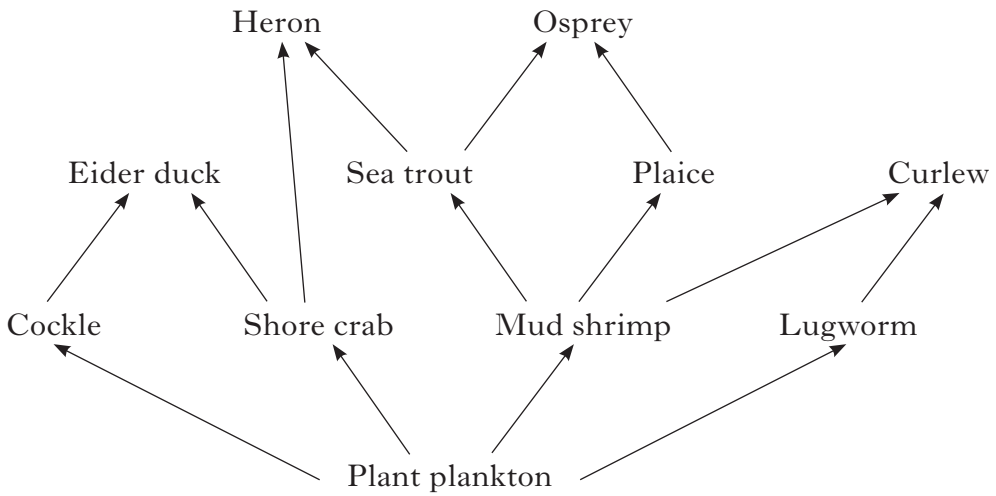
Space for calculation

Answer £ _____ **1**

[Turn over

Marks

4. The diagram below shows part of an estuarine food web.



(*a*) Use the information from the food web above to answer the following questions.

(i) How many species are herbivores?

_____ **1**

(ii) Explain why the eider duck is not in direct competition with the heron.

_____

_____ **1**

(iii) The sea eagle, a carnivore, has been reintroduced into the estuary. Predict, with a reason, what could happen to the population of eider duck.

Underline **one** of the options.

Numbers would *increase* / *stay the same* / *decrease*

Reason _____

_____ **1**

Marks

4. (continued)

(*b*) (i) Draw a pyramid of biomass to show the relationship between the osprey and plant plankton.

2

(ii) Name the source of energy for this pyramid.

_____ **1**

(iii) Give **two** ways in which energy is lost from the pyramid.

1 _____

2 _____ **2**

(*c*) Explain what is meant by a parasitic relationship and give **one** example of it.

Explanation _____

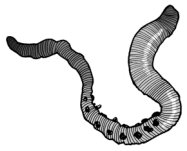
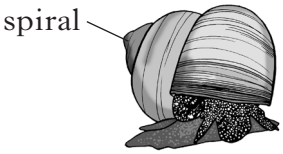
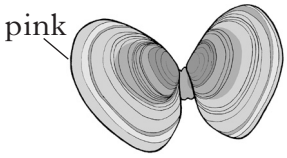
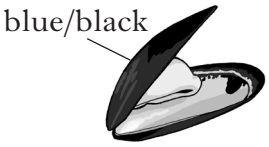
_____ **1**

Example _____ **1**

[Turn over

4. (continued)

(*d*) The table below contains information on some of the mud dwellers in the estuary.

Mud dweller	*Diagram*	*Approximate Adult Size* (cm)	*Description*
Lugworm	Segmented worm 	30	Filter feeder and lives in a U-shaped burrow.
Mud snail	Single shell 	0·6	Algal feeder and hides in mud when tide retreats.
Tellin	Shell in 2 parts 	2	Lies in mud, filter feeder or hoovers the mud surface.
Mussel	Shell in 2 parts 	Up to 10	Filter feeder, attached to stones or rocks.
Ragworm	Segmented worm 	10	Filter feeder and lives in vertical burrow.

DO NOT WRITE IN THIS MARGIN

Marks

4. (*d*) (continued)

(i) Use the information in the table on *Page twelve* to complete the key.

Key for some mud dwellers

1 { Mud dweller without a shell ..... go to 2
  { Mud dweller with a shell ..... go to 3

2 { Approximate adult size 30 cm ..... [ ]
  { Approximate adult size 10 cm ..... [ ]

3 { Spiral shell ..... [ ]
  { [ ] ..... go to 4

4 { [ ] ..... Tellin
  { [ ] ..... Mussel **3**

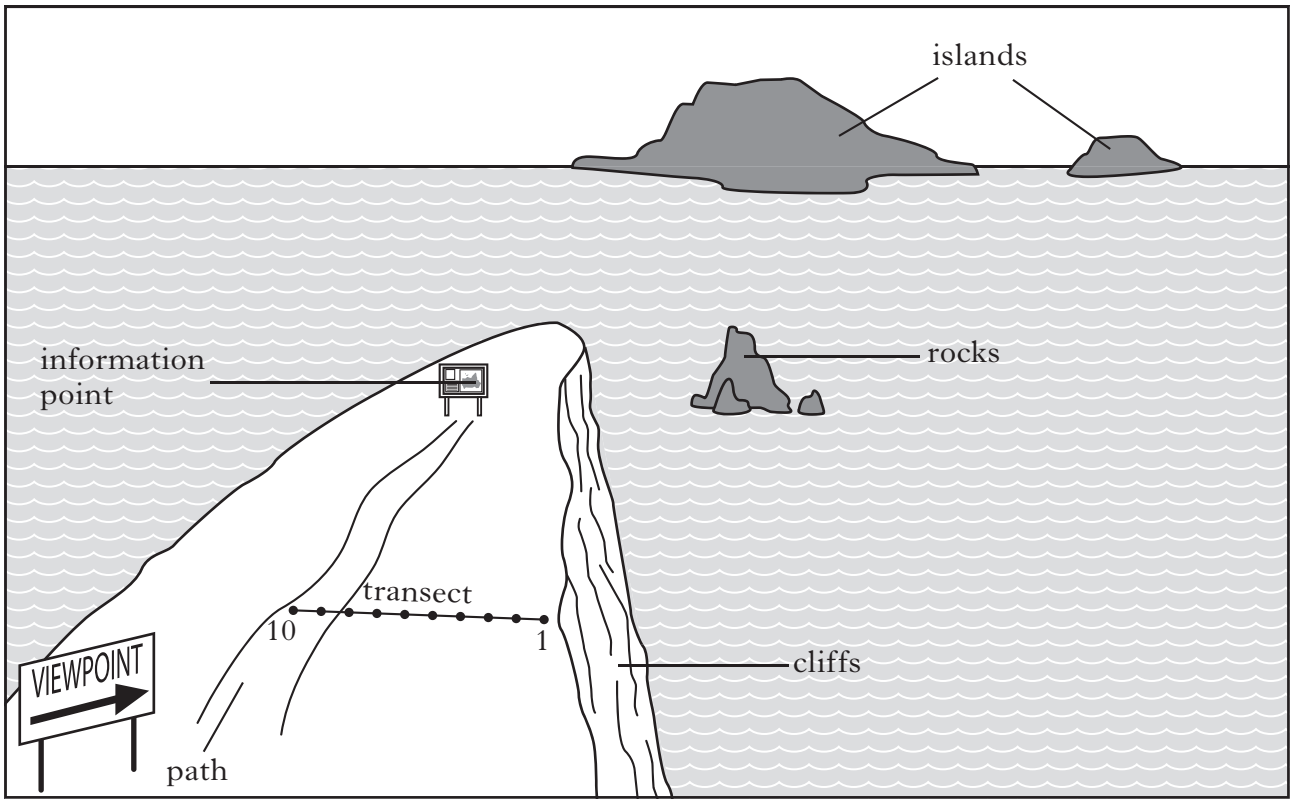
(ii) Explain why the lugworm and the ragworm occupy different niches in the estuary.

_____

_____ **1**

[Turn over

5. (*a*) Scottish sea cliffs provide a variety of habitats. Students carried out an investigation into the effects of trampling on plant species at a scenic viewpoint shown in the diagram below.



Quadrats were placed at regular sampling points along a transect from the edge of the cliff to an access path. The number of species in each quadrat was counted and the area of bare ground was estimated as a percentage. The results are shown in the table below.

Sampling point	*Number of plant species*	*Percentage area of bare ground – estimate* (%)
1 (cliff edge)	5	50
2	7	35
3	14	5
4	15	3
5	13	5
6	10	8
7	8	35
8	5	50
9 (access path)	5	55
10 (access path)	3	65

Marks

5. (*a*) (continued)

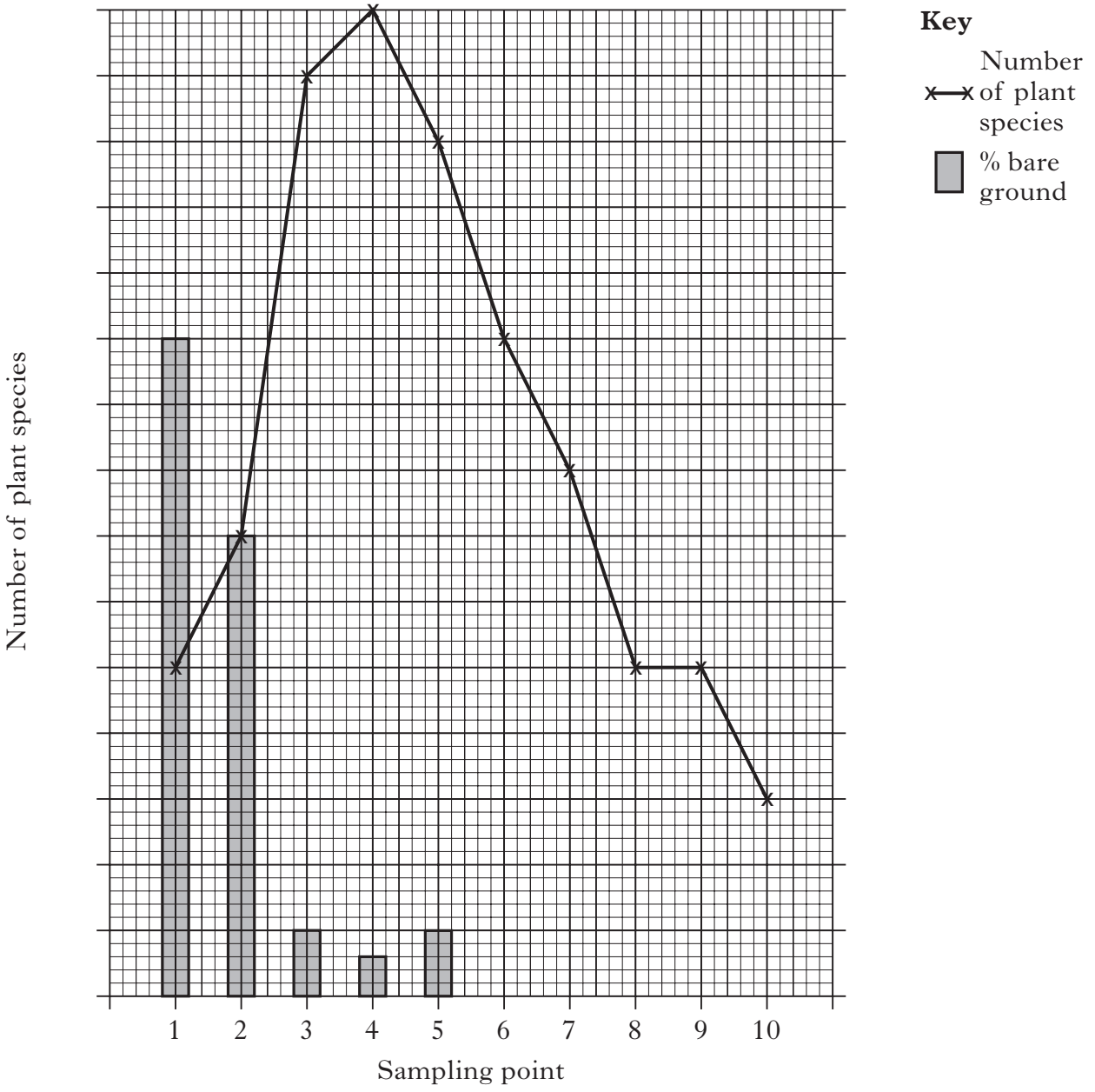
(i) Complete the graph below by adding:

1 the scale to the left *y* axis (vertical); **1**

2 the label and scale to the right *y* axis (vertical); **1**

3 bars to show the percentage of bare ground at sampling points 6 to 10. **1**

(An additional graph can be found on *Page thirty*)



(ii) Describe the relationship between the percentage of bare ground and the number of plant species.

_____

_____ **1**

DO NOT WRITE IN THIS MARGIN

Marks

5. (*a*) (continued)

(iii) A student concluded that trampling caused a reduction in the number of plant species. Do you agree with this conclusion?

(Circle) your answer and use information from the table to justify it.

Yes No

Justification _____

_____ **1**

(*b*) The soil pH was measured along the transect.

Describe how soil pH is measured reliably.

_____

_____

_____ **2**

(*c*) Name **one** other abiotic factor which influences the distribution of plant species on the sea cliff.

_____ **1**

(*d*) Suggest **one** way in which sea cliff biodiversity can be conserved.

_____

_____ **1**

[Turn over for Question 6 on *Page eighteen*

DO NOT WRITE IN THIS MARGIN

Marks

6. The diagram below gives information on the European otter (*Lutra lutra*).

Habitat

1 to 3 km along the seashore

or

5 to 20 km along the riverbank

Feeding

Eats small fish and crabs and sometimes birds, small mammals and larger fish

European otter

Threats

Road kill

Habitat destruction

Fish contaminated with pesticide

Conservation

Restoration of habitat

Breeding programmes

Other initiatives

(*a*) (i) Suggest **one** reason why the territories of otters are smaller along the seashore.

_____ **1**

(ii) Describe the niche of the otter.

_____

_____ **2**

(iii) Explain how pesticides can endanger otters.

_____

_____ **1**

Marks

6. (*a*) (continued)

(iv) Traffic causes the death of otters and many other species such as badger, deer, hedgehog, fox, frog and pheasant. Suggest **two** ways in which road kill can be reduced.

1 _____ **1**

2 _____ **1**

(v) Name **one** other measure which ensures conservation of a species.

_____ **1**

(*b*) Otters are part of the native fauna which has existed in Scotland for many, many years.

Use the following terms to complete the table below. Each term may only be used once.

Terms: *native* *naturalised* *domesticated* *feral*

Species	*Term*
Horse	
Mink	
Red squirrel	
Rhododendron	

2

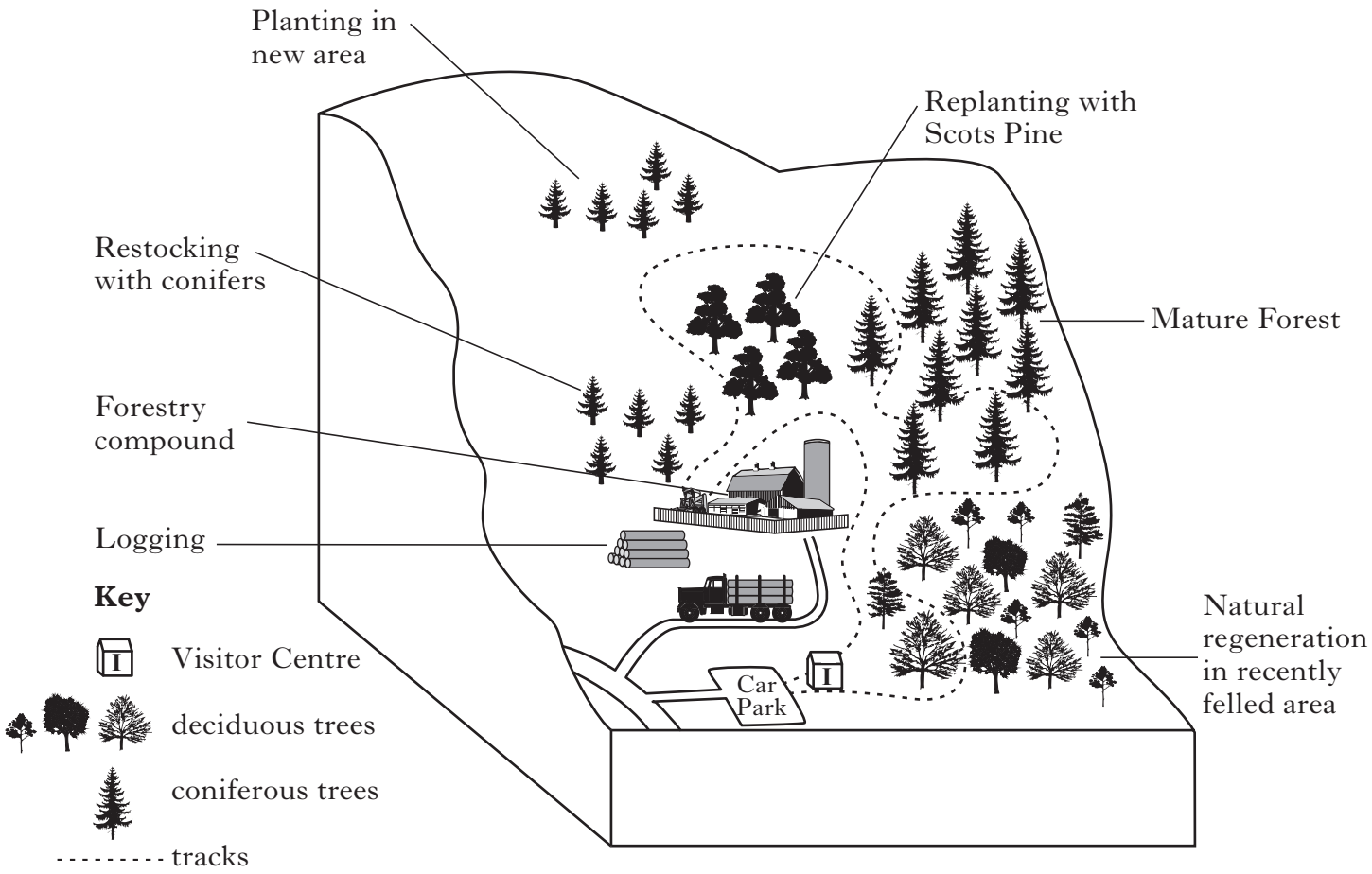
(*c*) What is meant by extinction?

_____

_____ **1**

[Turn over

7. The diagram below shows part of a working forest in Scotland.



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Marks

(*a*) Use the information from the diagram above to answer the following questions.

(i) Give the **three** different types of young tree planting.

1 _____

2 _____

3 _____ **1**

(ii) Apart from forestry, name **one** other land use.

_____ **1**

(iii) Give **one** way this forest is managed in a sustainable way.

_____ **1**

7. (*a*) (continued)

DO NOT WRITE IN THIS MARGIN

(iv) Explain how natural regeneration increases biodiversity. *Marks*

_____

_____

_____ **2**

(*b*) (i) Put the following forestry operations in the correct order.

planting *logging* *thinning* *applying fertilizer* *restocking*

Planting → [ ] → [ ] → [ ] → [ ] **1**

(ii) Give **two** uses of timber.

1 _____ 2 _____ **1**

(iii) Suggest how the working forest can benefit the health and well-being of Scottish citizens.

_____ **1**

(iv) In the past, Scotland has been deforested. Give **one** reason for this.

_____ **1**

(*c*) (i) The Scottish Forestry Strategy (SFS) has a target of 25% tree cover in Scotland by 2020.

The total area of Scotland is approximately 8 million hectares.

In 2010, 17% of Scotland was covered by trees. Calculate the area which requires planting in order to meet the SFS target.

Space for working

_____ hectares **1**

(ii) 2·7 thousand hectares were planted in 2010.

Do you think that SFS will meet its target? Give a reason for your answer.

Target met? Yes / No

Reason _____

_____ **1**

Marks

8. Use the map extract of the Grangemouth area – Extract No 1942/65 (**separate item**) to answer the following questions.

(*a*) The map extract shows several types of land use.

Complete the table using the information below.

Mineral resource/extraction

Energy industry

Agriculture

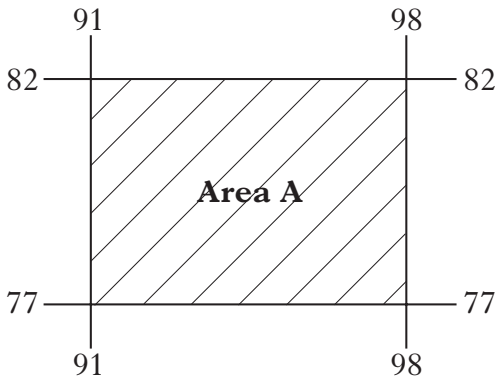
9280

9287

Land use	*Grid reference*
Residential	
	9184
Transport	
	9585
	9678

3

(*b*) Study **Area A** on the map extract.



Give **one** piece of map evidence with a six-figure grid reference to show:

1. Historical development

_____ GR _____ **1**

2. Tourist attraction

_____ GR _____ **1**

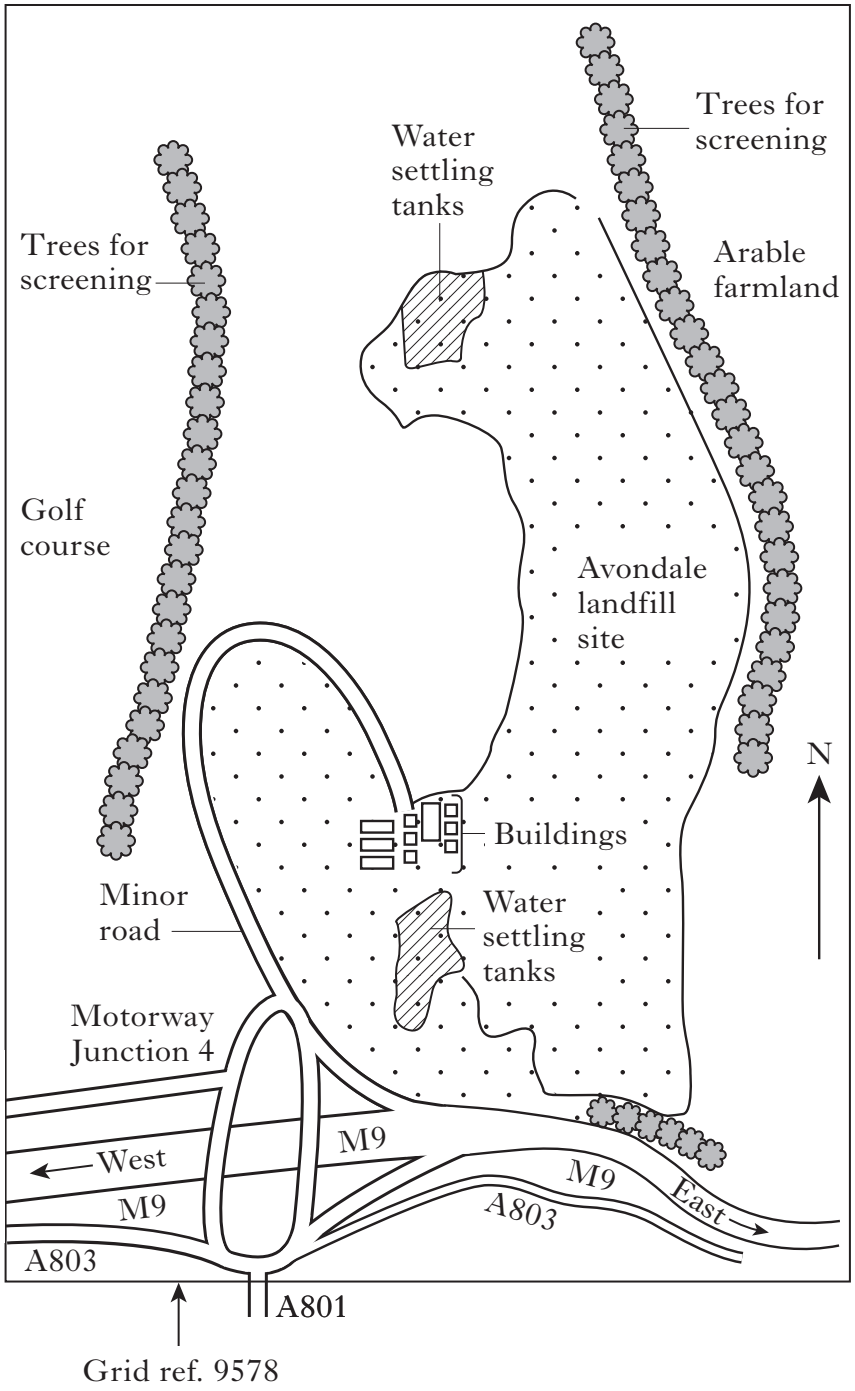
3. Recreational facilities

_____ GR _____ **1**

Marks

8. (continued)

(*c*) The sketch diagram below shows Avondale landfill site (GR 9578) which accepts household and business waste.



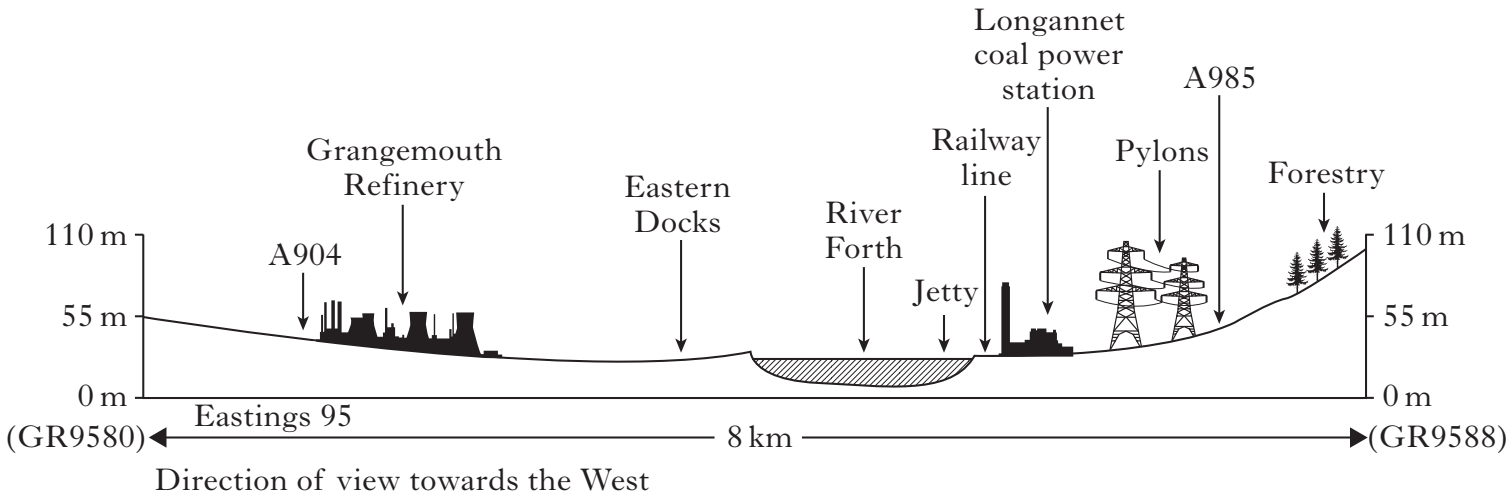
Give **one** natural feature and **one** man-made feature which have influenced the location of this landfill site.

Natural feature _____ **1**

Man-made feature _____ **1**

8. (continued)

(*d*) The cross section from GR 9580 to GR 9588 (along easting 95) shows energy industries in the River Forth estuary.



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(i) Name the **two** fossil fuels on which the energy industries depend.

1 _____

2 _____ **1**

(ii) Name the type of energy produced at Longannet.

_____ **1**

(iii) Give **one** way in which air pollution from Grangemouth Refinery is reduced.

_____ **1**

(iv) Give **two** advantages and **one** disadvantage to the local community from the location of these industries.

Advantage 1 _____

Advantage 2 _____

Disadvantage _____ **2**

(*e*) The River Forth estuary includes an area of mudflats at low tide. Estimate the area of mudflats between Kincardine on Forth Bridge (GR 9287) and the River Carron (GR 9483).

_____ square kilometres **1**

DO NOT WRITE IN THIS MARGIN

Marks

8. (continued)

(*f*) Account for the lack of housing development to the east of the A905 (GR 907840).

_____ **1**

(*g*) Describe a possible conflict of interest and its resolution between **two** named groups using the River Carron.

Group 1 _____ Group 2 _____

Possible conflict

_____

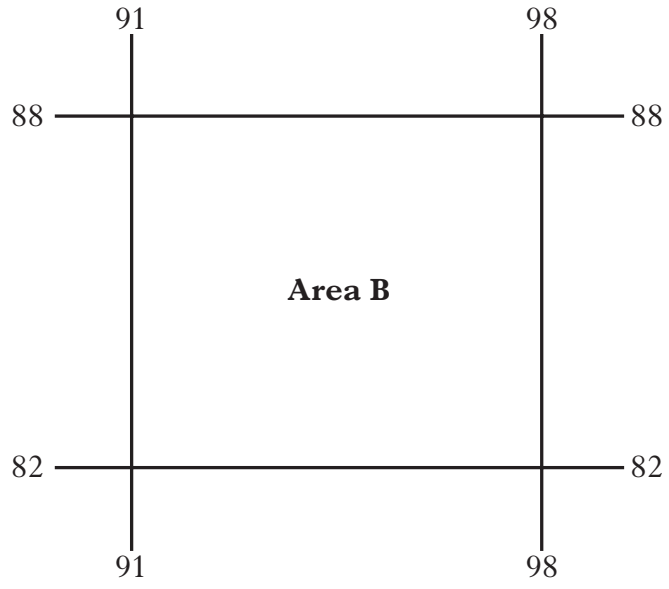
_____ **2**

Resolution

_____

_____ **1**

(*h*) Study **Area B** on the map



Describe an example of multi-use of the River Forth in **Area B**.

_____

_____

_____ **2**

[Turn over for Section 2 on *Page twenty-six*

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SECTION 2

Answer only ONE question—Option A or B or C.

Write your answers on the pages which follow.
Diagrams may be used where appropriate.

Option A

Describe **and** explain the effects on landscape and wildlife of generating electricity using:

(*a*) nuclear power; **5**

(*b*) wind power. **5**

(10)

OR

Option B

Describe the processes involved in the carbon cycle, and how carbon dioxide contributes to global warming. **(10)**

OR

Option C

Describe the contribution of natural features to agriculture and the specialisation in agriculture in an area you have studied. **(10)**

[*END OF QUESTION PAPER*]

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Marks

SPACE FOR ANSWERS

DO NOT WRITE IN THIS MARGIN

Marks

SPACE FOR ANSWERS

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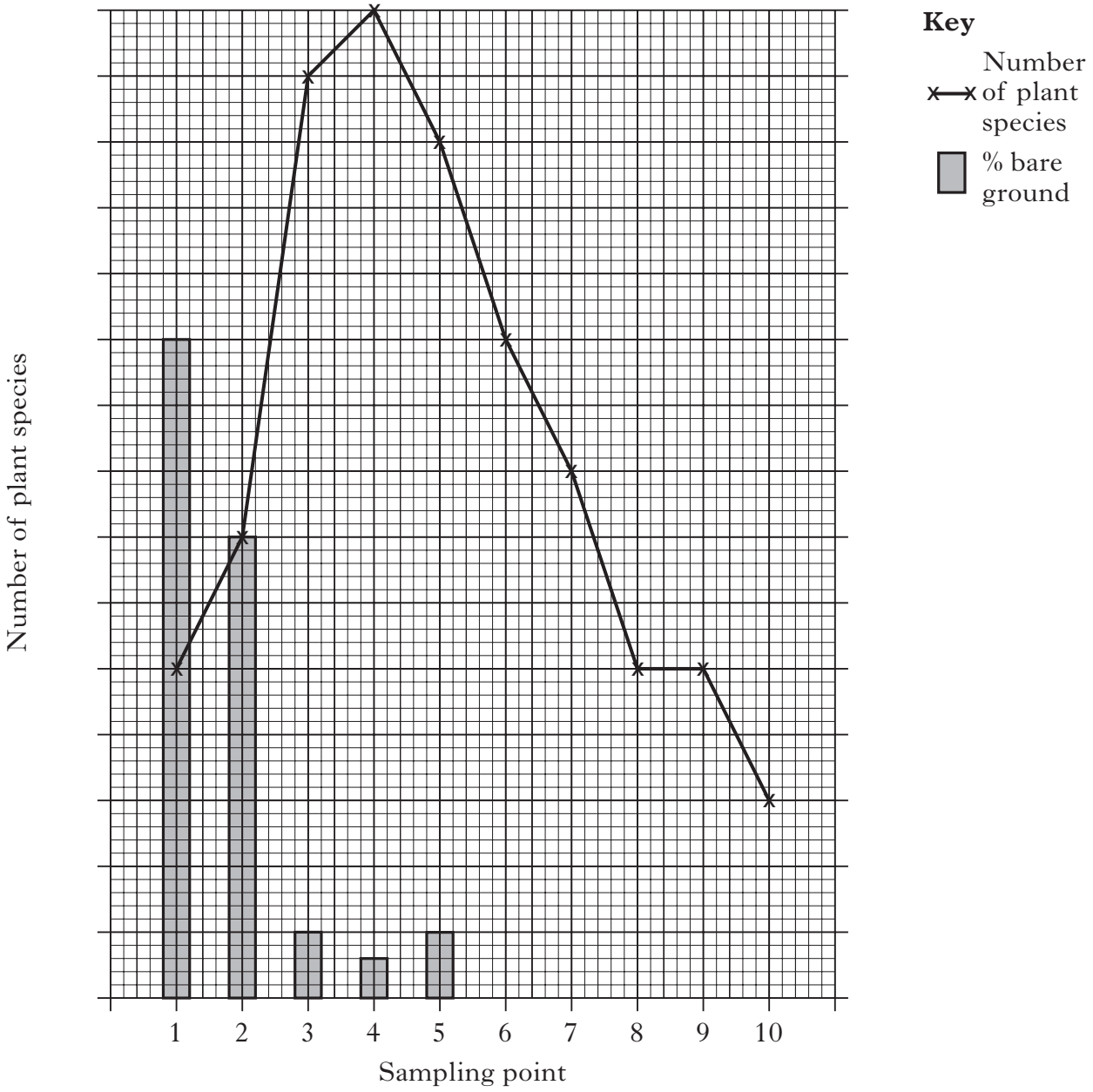
Marks

SPACE FOR ANSWERS

ADDITIONAL GRAPH FOR QUESTION 5(*a*)(i)



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