Cambridge O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

0606218673

ENVIRONMENTAL MANAGEMENT **5014/11**

Paper 1 **October/November 2016**

2 hours 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

Write your answers in the spaces provided on the Question Paper.
All questions in Section A carry 10 marks.
Both questions in Section B carry 40 marks.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **24** printed pages.

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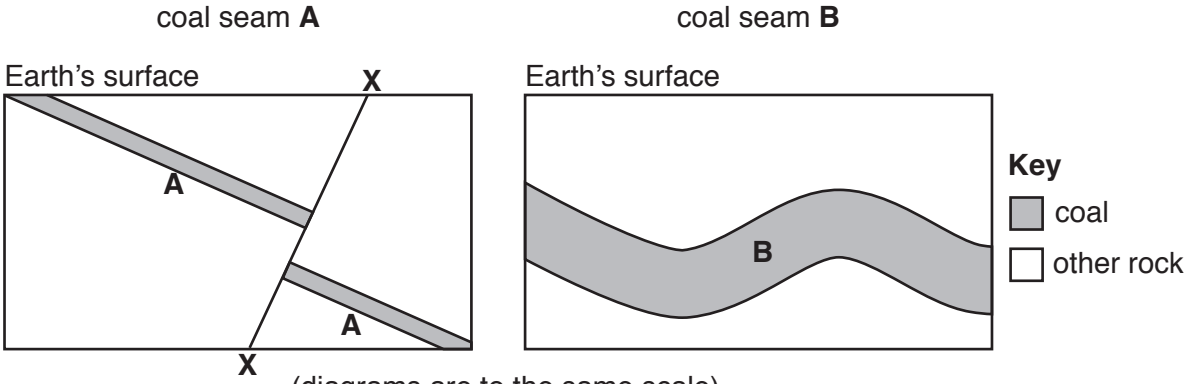
CAMBRIDGE International Examinations

Section A

Answer **all** the questions.

1 **(a)** Look at the diagrams, which show two coal seams, **A** and **B**. Both seams have been affected by earth movements.



(diagrams are to the same scale)

(i) Name the geological feature shown by **X–X** on the diagram of coal seam **A**.

.....[1]

(ii) State how the geological feature in the diagram of coal seam **B** was formed.

.....

.....[1]

(iii) Suggest **one** advantage and **one** disadvantage of each coal seam for mining.

advantage of coal seam **A** .....

.....

disadvantage of coal seam **A** .....

.....

advantage of coal seam **B** .....

.....

disadvantage of coal seam **B** .....

.....

[4]

(b) Place **one** tick in each table to identify the correct statements. [2]

statement	tick (✓)
coal is an igneous rock	
coal is a metamorphic rock	
coal is a sedimentary rock that formed on the land	
coal is a sedimentary rock that formed on the sea bed	

statement	tick (✓)
the main content of coal is carbon	
the main content of coal is nitrogen	
the main content of coal is oxygen	
the main content of coal is uranium	

(c) Explain why some people believe that it is better to generate electricity using nuclear energy than by using coal.

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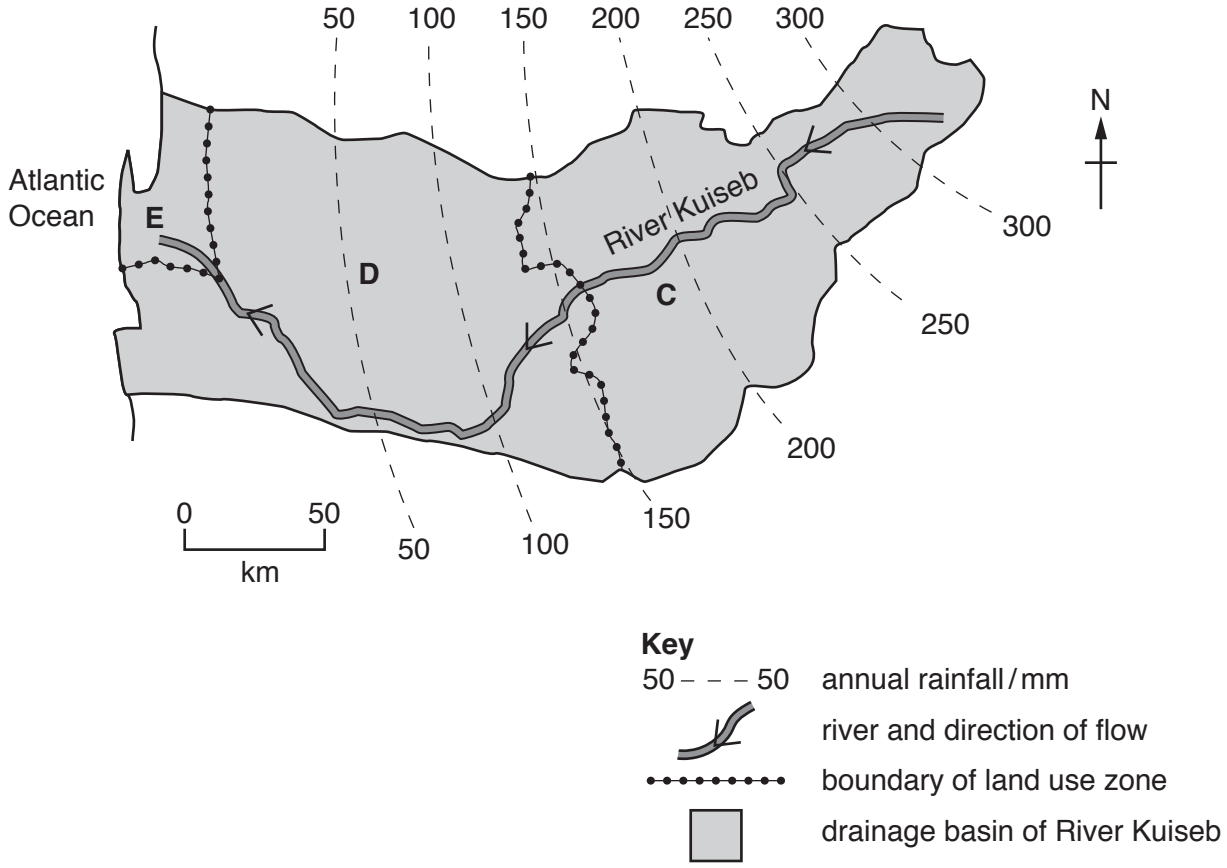
.....[2]

2 **(a)** The area drained by a river is known as a drainage basin. Look at the map, which shows the drainage basin of the River Kuiseb in the hot Namib desert of southern Africa.



(i) Describe the annual rainfall in the River Kuiseb drainage basin.

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.....[2]

(ii) The map shows that the drainage basin is divided into three land use zones, **C**, **D** and **E**, for water management. The table shows water users in each zone.

		water users	
letter of zone	land use zone	human population	other users
C	upper basin	4000	commercial livestock farms, wildlife farms
D	middle basin	350	tourism, wildlife parks
E	lower basin	75 000	industry, mining, tourism

Use the table of water users to complete the table below to show the different demands for water use in the drainage basin. [2]

demand for water	letter of zone
highest	.....
medium	.....
lowest	.....

(iii) Suggest why the amount of water that some users can take from the river is controlled.

.....

.....

.....

.....[2]

(iv) State which of the three areas, **C**, **D** or **E**, should be given as much water as possible to meet its demands. Give a reason for your answer.

area .....

reason .....

.....
[1]

(b) **(i)** Describe strategies for supplying more water in the area where it is most needed.

.....

.....

.....

.....[2]

(ii) State **one** way in which people can conserve water.

.....

.....[1]

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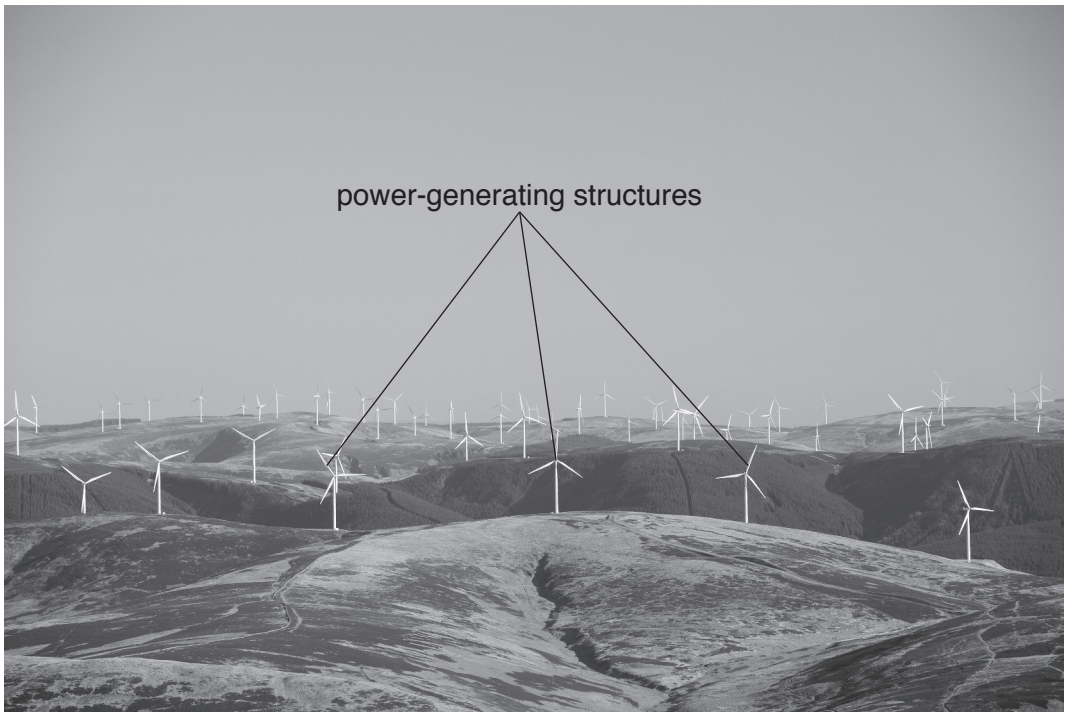
3 **(a)** Look at the photograph, which shows power-generating structures.



(i) Name the source of the power being generated.

.....[1]

(ii) Describe the site used for the power-generating structures.

.....

.....[1]

(iii) Give **one** advantage of this site for generating this type of power.

.....

.....[1]

(iv) Draw and label a simple diagram of a typical power-generating structure of the type shown in the photograph. [3]

(b) **(i)** In the past, the area shown in the photograph was affected by acid rain.
Suggest why the local people could do nothing to prevent this problem.

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.....[3]

(ii) Describe **one** way in which the natural environment could have been affected by acid rain.

.....

.....[1]

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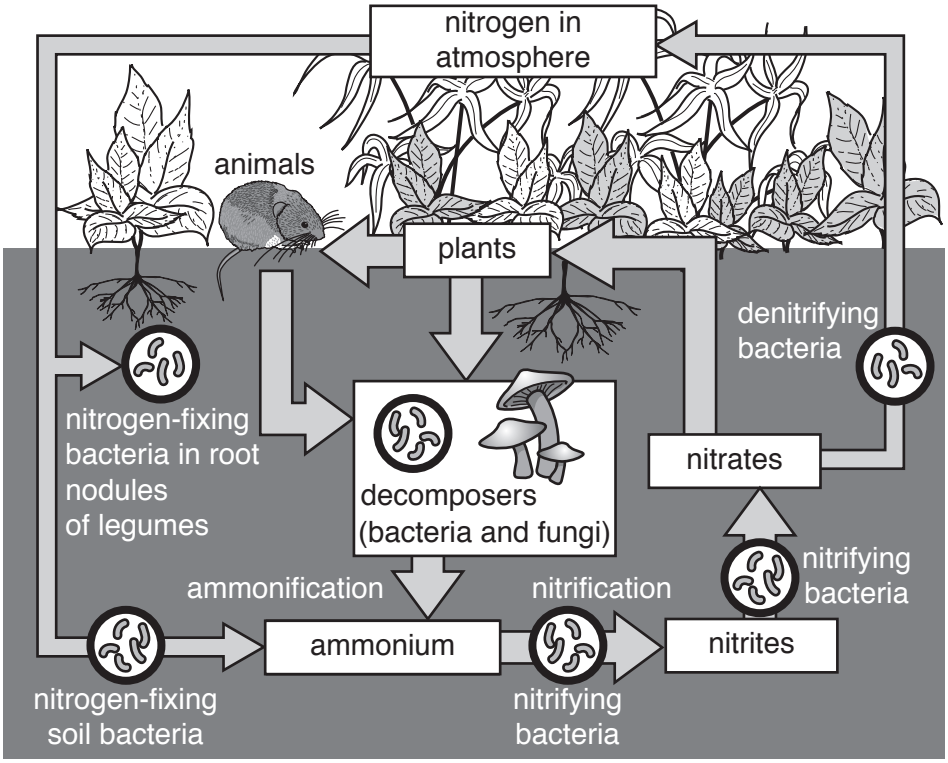
4 The nitrogen cycle is important in an ecosystem. Look at the diagram, which shows the nitrogen cycle. Use the diagram to answer the questions that follow.



(a) **(i)** Name the type of bacteria that directly add nitrogen to the atmosphere.

.....[1]

(ii) Name the substance that is converted into nitrites.

.....[1]

(iii) Explain the role of animals in the nitrogen cycle.

.....

.....[1]

(b) In an ecosystem, the water cycle is also important.

Describe changes that will occur in a wetland ecosystem as a result of it being drained.

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.....[3]

(c) Suggest arguments that could be made to support the draining of wetlands.

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.....[4]

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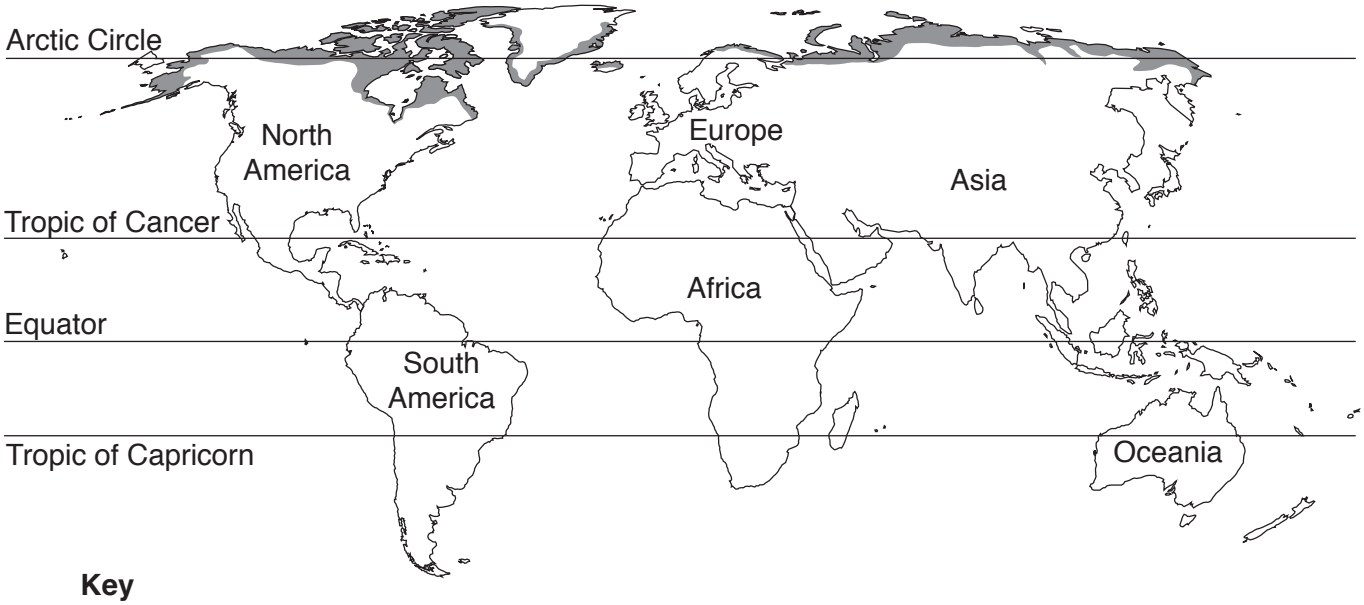
Section B

Answer **both** questions.

5 **(a)** Look at the map below, which shows the tundra biome.



Key

tundra biome

(i) Describe the distribution of the tundra biome shown on the map.

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.....

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.....

.....[3]

(ii) Increases in greenhouse gases are thought to cause global warming. Suggest what might happen to the area of tundra biome shown on the map if global warming continues.

.....

.....[1]

(iii) Name **two** gases that contribute to global warming. For each gas, state a human activity that is causing the amount of that gas to increase in the atmosphere.

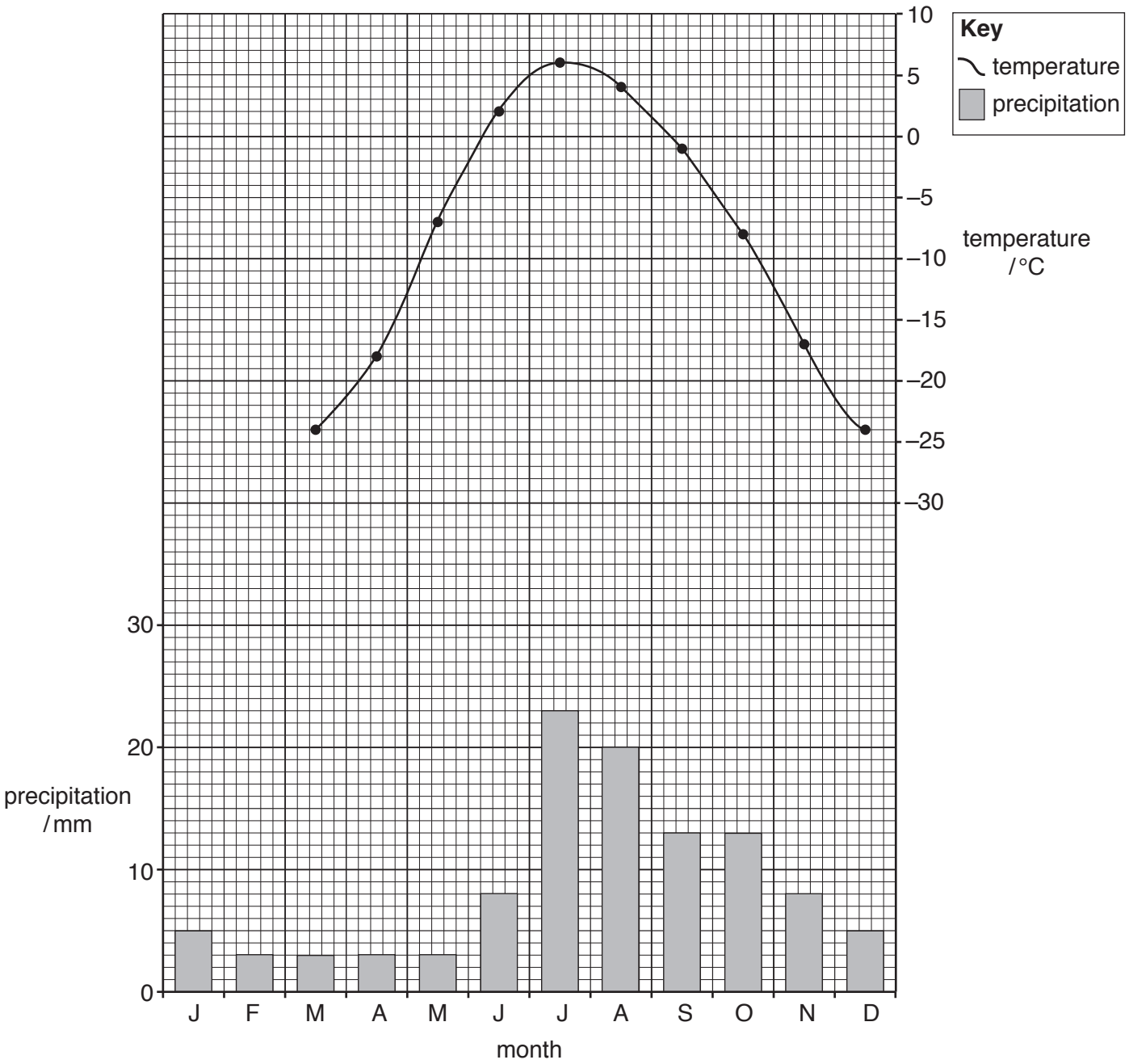
name of gas 1: .....

human activity 1: .....

name of gas 2: .....

human activity 2: .....[4]

(b) Look at the climate graph and data below, which show the temperature and precipitation for a weather station in the tundra region of Alaska.



month	J	F	M	A	M	J	J	A	S	O	N	D
temperature / °C	–26	–28	–24	–18	–7	2	6	4	–1	–8	–17	–24
precipitation / mm	5	3	3	3	3	8	23	20	13	13	8	5

(i) Using the data in the table, complete the temperature line graph for January and February. [2]

(ii) Look again at the climate graph and data on page 12 and complete the information in the table below. [3]

number of months below freezing	..... months
the month with the highest precipitation	.....
annual temperature range	..... °C

(iii) The tundra climate has very cold winters and cool summers and there is little precipitation. Most precipitation falls as snow. It is also windy and there is little daylight in the winter.

Describe and explain **two** ways in which plants have adapted to survive these harsh conditions.

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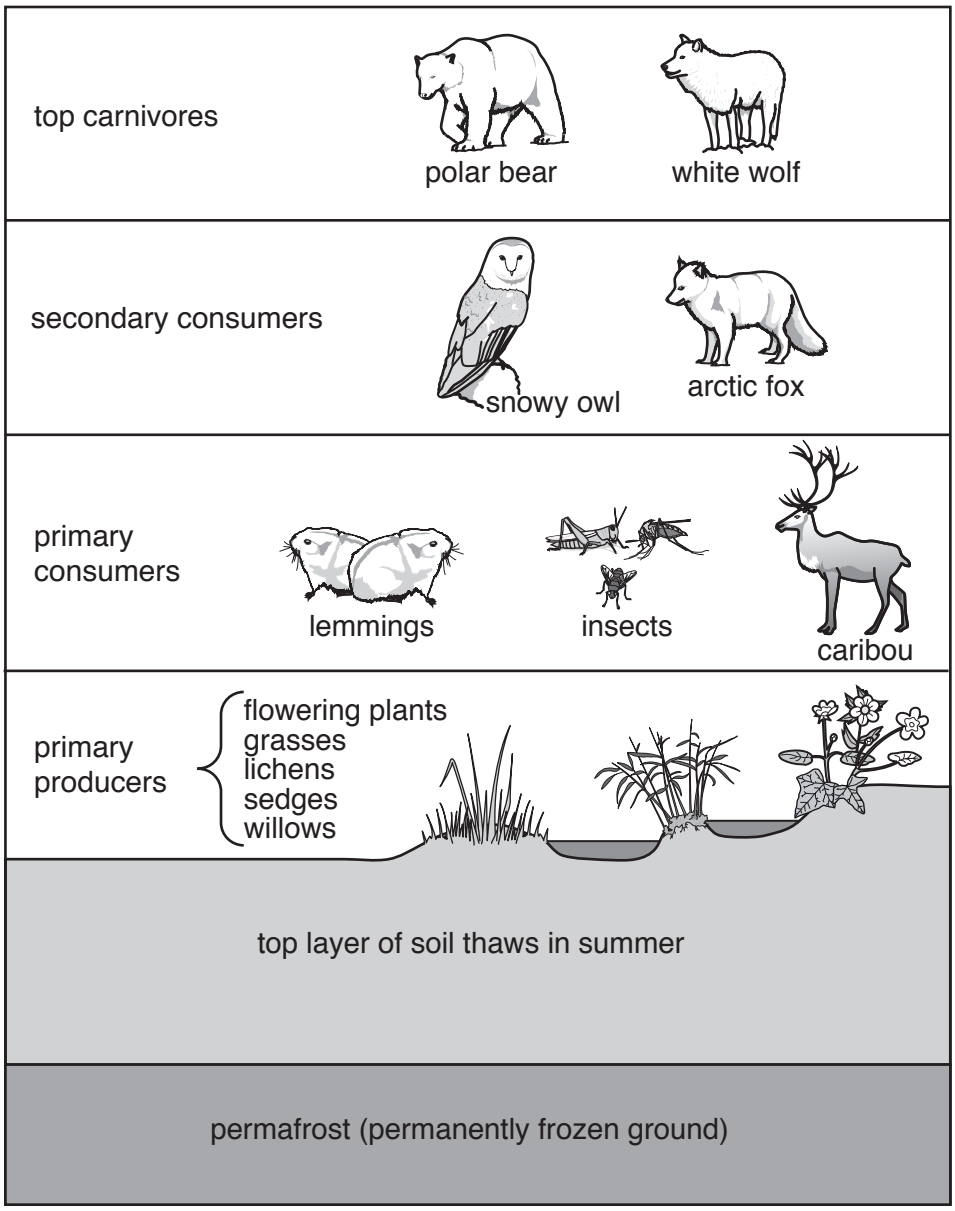
.....[4]

(c) Look at the diagram below, which shows part of a tundra ecosystem.



(i) State what is meant by the term *consumer*.

.....

.....[1]

(ii) Read the information in the text box.

Some animals are moving further north into tundra regions as a result of global warming. One example is the red fox, which is a secondary consumer.

Suggest ways in which the tundra ecosystem could be affected by the movement of the red fox.

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.....[4]

(d) In 1968 a large oil field was discovered in the Alaskan tundra.

(i) Explain how the oil was formed.

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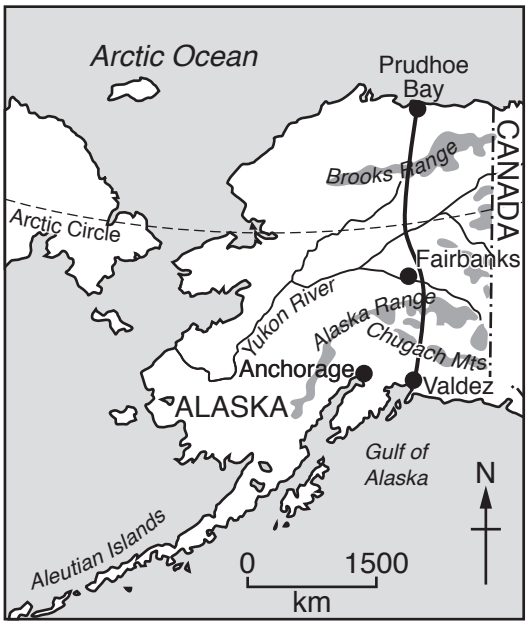
.....[3]

(ii) Look at the map below, which shows information about oil in Alaska. Use information from the map to complete the paragraph below.



Key

- ● settlement
- international boundary
- route of pipeline
- highland
- river

In 1968 oil was discovered in northern Alaska. A pipeline was built to transport the oil. The pipeline runs from .... in the north to ..... on the south coast of Alaska. Here the oil is taken away to markets by supertankers. The pipeline crosses the ..... River and passes close to the town of Fairbanks. In total the pipeline is 1241 km long. [3]

(iii) Suggest why the pipeline was built rather than transporting the oil from the north of Alaska by sea in supertankers.

.....

.....[1]

(e) Look at the photograph, which shows an oil pipeline in Alaska, and read the information.

vegetation grows very slowly

caribou breed close to the pipeline

ground below surface remains frozen all year

oil in the pipeline is warm

caribou migrate across the region to search for food

animals, such as bears and wolves, live in the region

pipelines can leak

(i) Suggest why there were concerns that building the pipeline could damage the environment.

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.....[3]

(ii) In some places the pipeline was raised above the ground. Suggest **two** reasons why the pipeline was raised above the ground.

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.....[2]

(f) Fossil fuels such as oil have provided much of the world's energy in the past.

Suggest reasons why some countries are developing alternative sources of energy but other countries are continuing to rely on fossil fuels.

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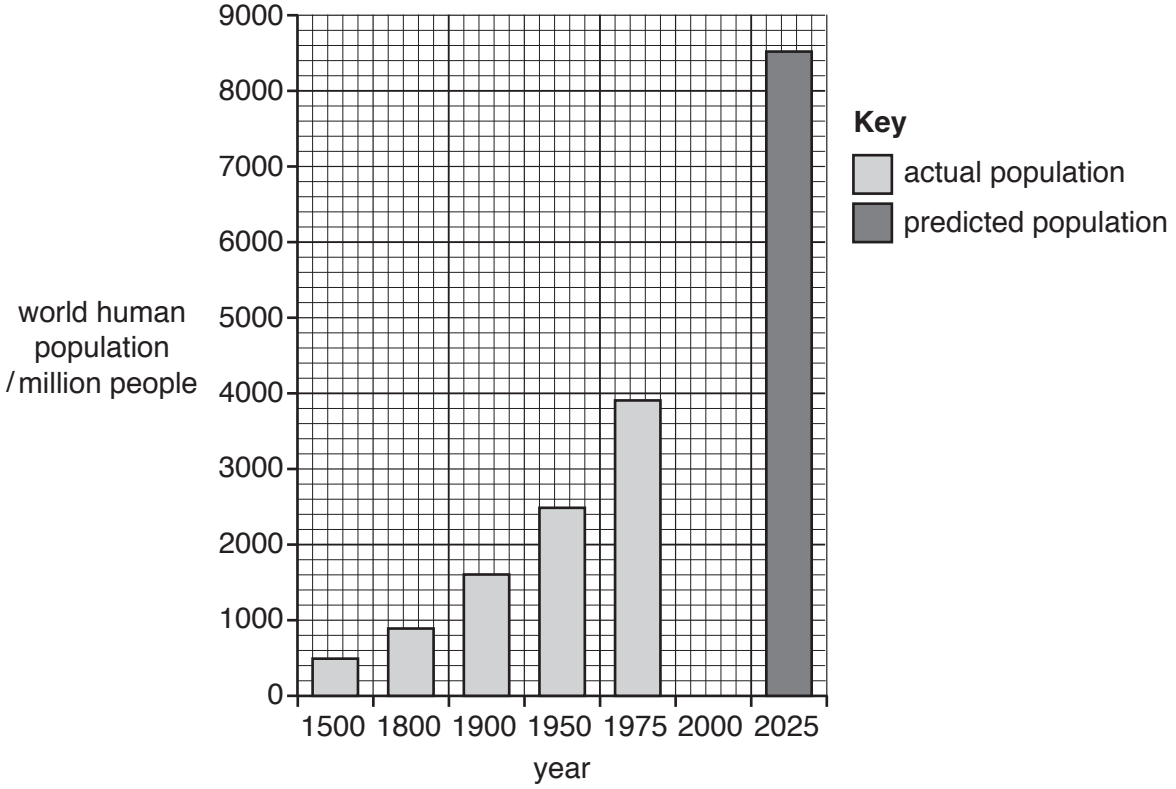
.....[6]

6 **(a)** Look at the bar graph below, which shows world human population growth.



(i) The world human population in the year 2000 was 6000 million people.

Complete the bar graph for the year 2000. [1]

(ii) State the predicted world human population for the year 2025.

.....[1]

(iii) Suggest reasons for the rapid growth of the world human population since the year 1800.

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.....[5]

(b) Population growth is a cause of deforestation.

(i) Look at the photograph, which shows an area of tropical rainforest that is being cleared.

Using the photograph and your own knowledge, explain why areas of tropical rainforest such as this are being cleared.

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.....[5]

(ii) Look at the table below, which shows the amount of tropical rainforest cleared in South America in four different years.

year	amount of tropical rainforest cleared / km^2
2003	25 247
2006	14 109
2009	7464
2012	4571

Calculate the difference between the amount of tropical rainforest cleared in 2003 and 2012.

Space for working.

..... km^2 [1]

(iii) Describe the trend in the amount of rainforest cleared in South America. Use data from the table to support your answer.

.....

.....

.....

.....[2]

(iv) Suggest a reason to explain the trend identified in **(b)(iii)**.

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.....[1]

(c) **(i)** Suggest how deforestation can increase global warming.

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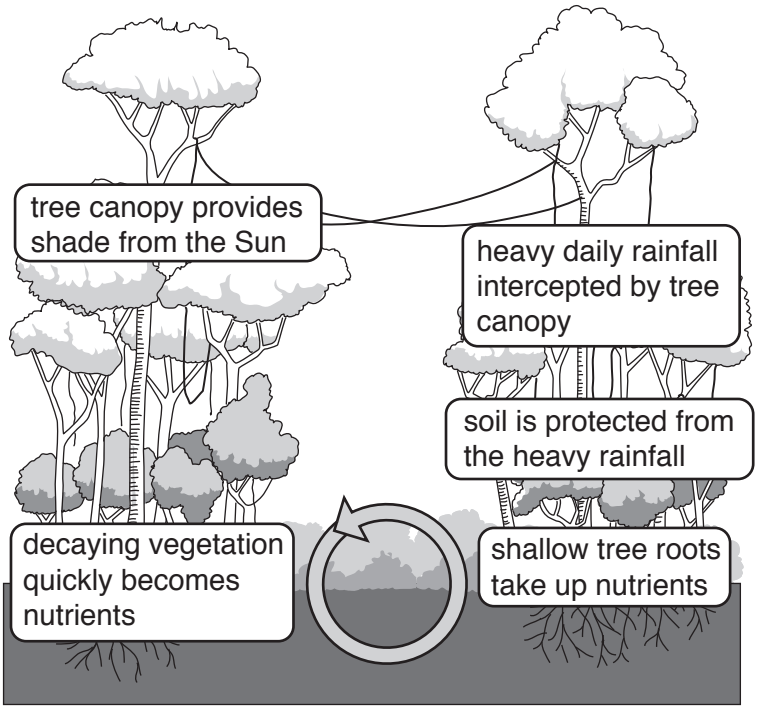
.....[3]

(ii) Look at the diagram.



Using the diagram and your own knowledge, explain how deforestation would affect the soil of the tropical rainforest.

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.....[4]

(d) Deforestation results in the destruction of habitats. Suggest other ways in which human activity can result in the destruction of habitats.

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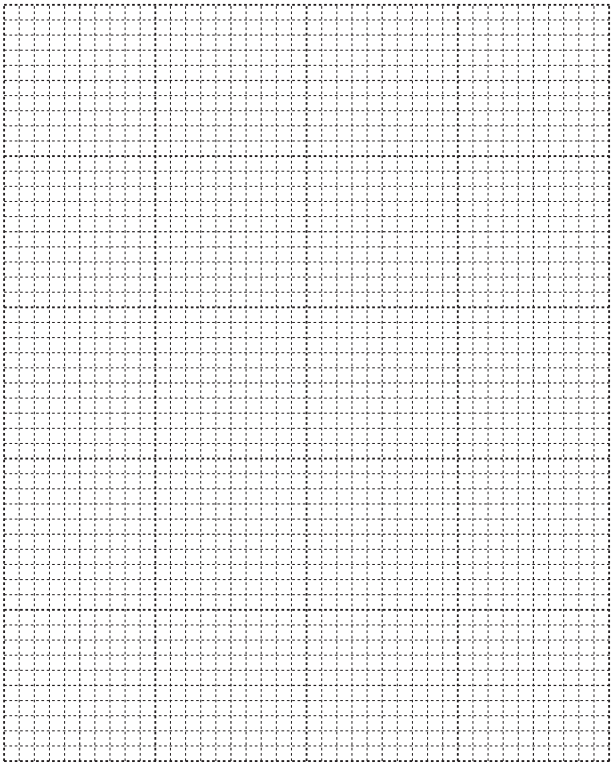
.....[4]

(e) National parks are set up to protect habitats. Look at the table below, which shows the number of national parks in some countries in East Africa.

country	number of national parks
Ethiopia	13
Kenya	23
Malawi	9
Uganda	10

(i) Draw a bar graph on the grid below to show the information in the table. [4]



(ii) Name the country with the highest number of national parks.

..... [1]

(iii) Suggest why some countries have more national parks than other countries.

.....

.....[1]

(iv) Name **one** strategy, other than national parks, that can be used to conserve the biodiversity of an ecosystem.

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.....[1]

(f) Describe the strategies that can be used to manage forests and their resources in a sustainable way.

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.....[6]

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