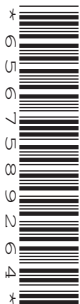CANDIDATE
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CENTRE
NUMBER

CANDIDATE
NUMBER

**ENVIRONMENTAL MANAGEMENT**

**0680/11**

Paper 1

**October/November 2016**

**1 hour 30 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.

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 **13** printed pages and **3** blank pages.

International Examinations

**[Turn over**

1    (a)  Look at the graph below, which shows the amount of ozone in the stratosphere layer of the atmosphere over the Antarctic between 1960 and 2015.
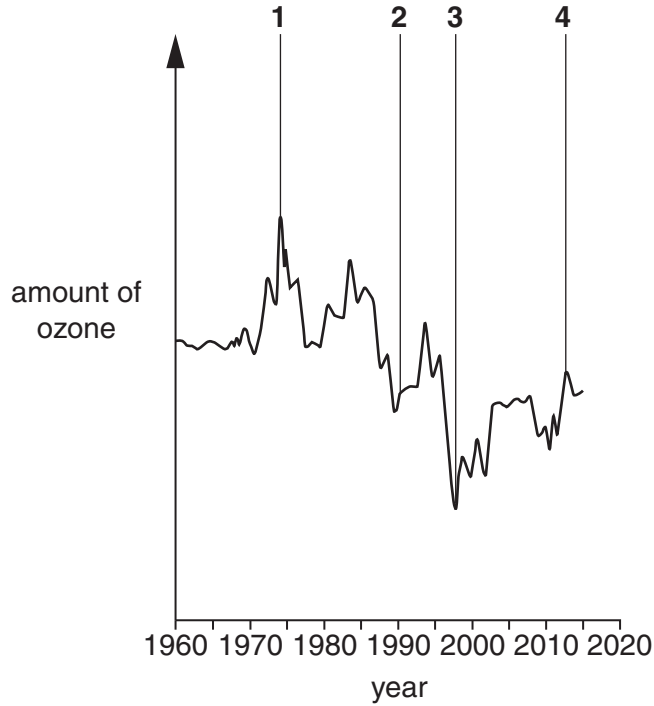


(i)  Describe the main trend in the amount of ozone between 1960 and 1997, and between 1997 and 2015.

between 1960 and 1997 ...................................................................................................

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between 1997 and 2015 ...................................................................................................

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[2]

(ii)  Give reasons for the trend between 1997 and 2015.

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A reduction of the amount of ozone in the atmosphere has caused a 'hole' in the ozone layer over the Antarctic. The drawings show the size of this 'hole' at four dates between 1960 and 2015.

'hole' in the
ozone layer



| A | B | C | D |
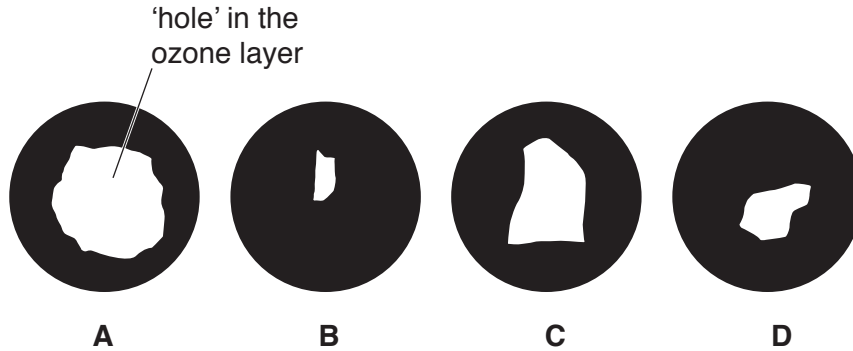
**(iii)** Match the drawings to the numbers on the graph by completing the table below. One has been done for you.

| number on graph | drawing letter |
|-----------------|----------------|
| 1 | |
| 2 | |
| 3 | |
| 4 | **D** |

[2]

**(iv)** Explain why the ozone layer in the stratosphere is important.

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**(b)** Acid rain is caused by gases, such as sulfur dioxide, from factories and power stations.

Explain why acid rain may affect countries even when they have few factories and power stations.

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 **[Turn over**

**2** Look at the graph below, which shows actual and predicted world population growth.
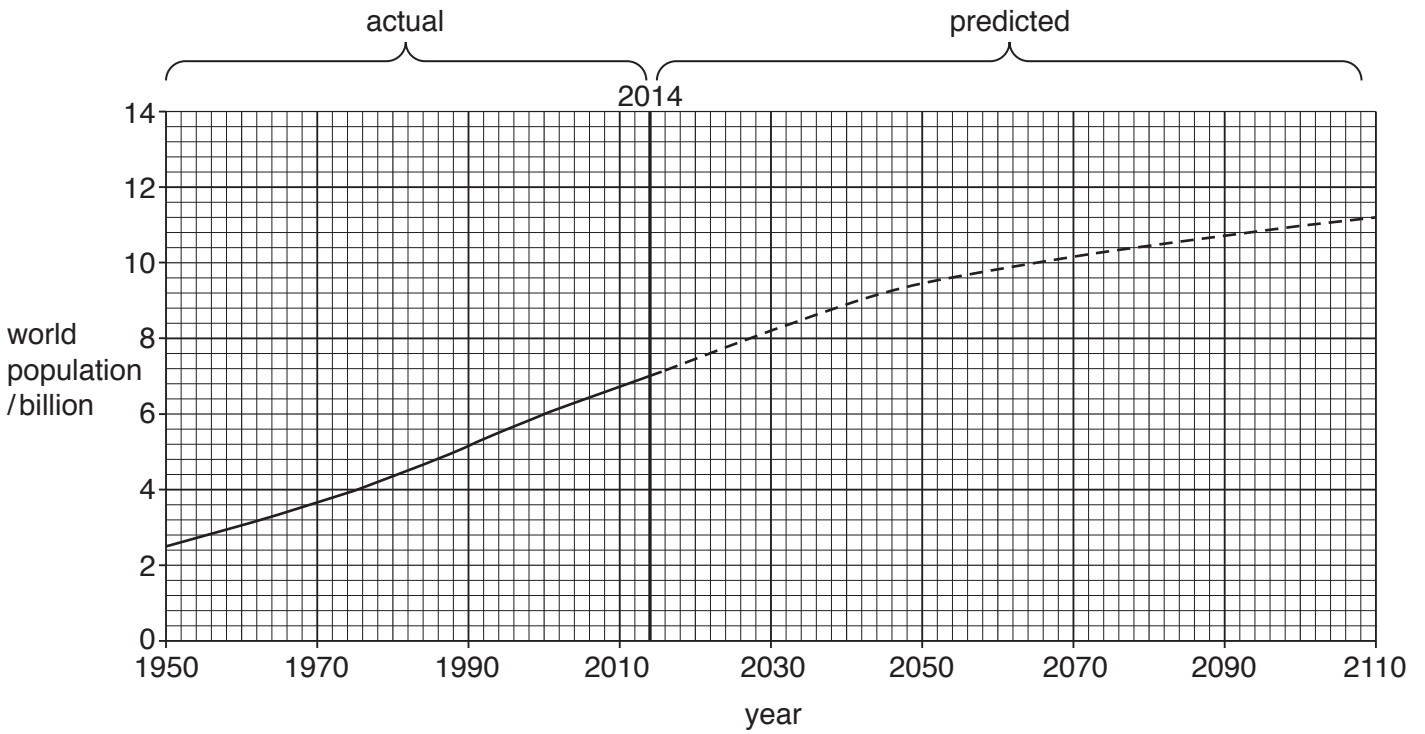


**(a) (i)** State the predicted growth in population between 2014 and 2050 shown by the graph.

Space for working.

.................................................billion [1]

**(ii)** The predicted population for 2100 could be either 10% bigger or 10% smaller than that shown on the graph. Calculate these two values.

Space for working.

value if 10% bigger ....................................................billion

value if 10% smaller ....................................................billion

[2]

(iii) Describe **two** impacts of population growth on the natural environment.

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(b) Describe **two** strategies for managing population growth.

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 **[Turn over**

**3** Look at the graphs below, which show changes from the average temperature of the Sea of Japan and the yellowtail fish catch off the coast between 1965 and 2005.
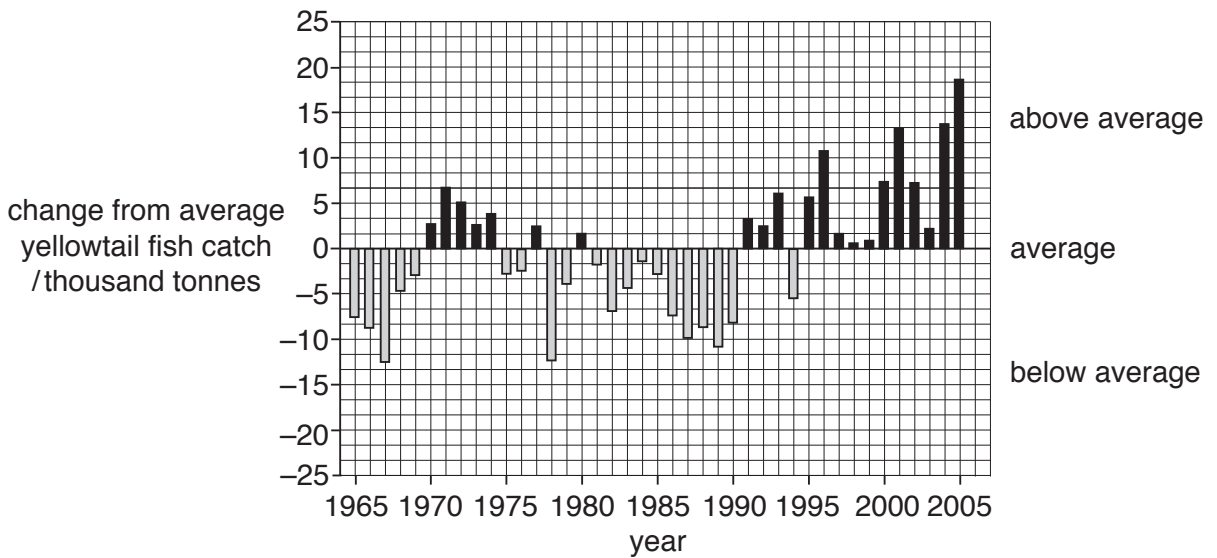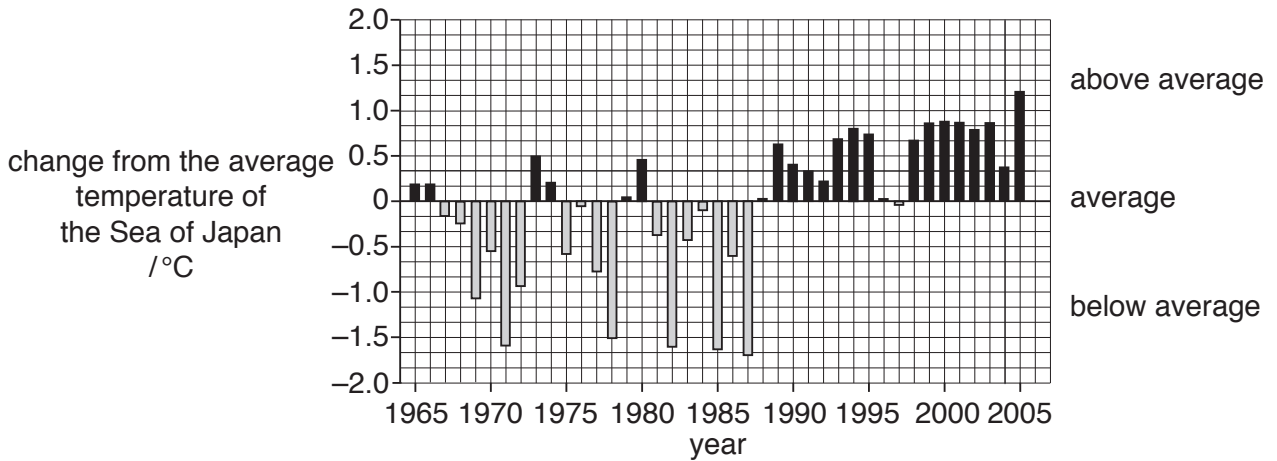


**(a) (i)** State the year with the highest yellowtail fish catch.

..................................... [1]

**(ii)** How many degrees below average was the temperature of the Sea of Japan in 1978?

.....................................°C [1]

**(iii)** A scientist thinks that the yellowtail fish catch is lower when the sea temperature is lower. To what extent do the graphs support this?

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**(b)** Look at the map below, which shows some ocean currents and areas of shallow water around Japan.
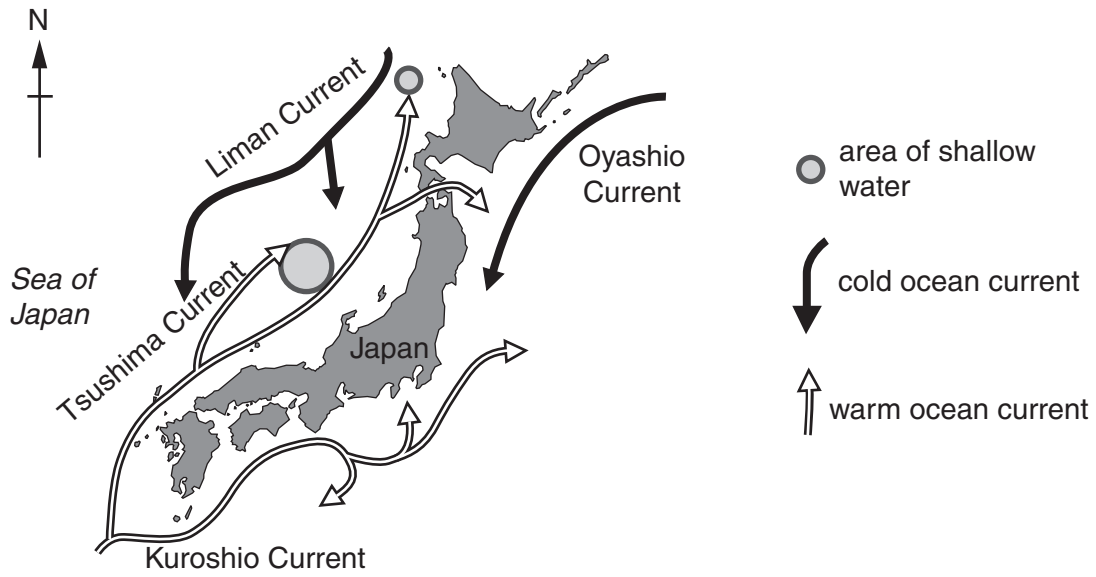


Explain, using the map and your own knowledge, why some of the world's richest fishing grounds are found off the coast of Japan.

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**(c)** Suggest **two** strategies for sustainable management of ocean fisheries.

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**4 (a)** Coal is a fossil fuel.

Explain how coal was formed.

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**(b)** The table below and bar graph opposite show the reserves of shale gas and other natural gases in 10 countries.

| country | shale gas / arbitrary units | other natural gases / arbitrary units |
|---|---|---|
| China | 1115 | 120 |
| Argentina | 800 | 12 |
| Algeria | 707 | 160 |
| United States | 665 | 320 |
| Indonesia | 580 | 150 |
| Canada | 573 | 68 |
| Mexico | 545 | 17 |
| Australia | 437 | 40 |
| Russia | 285 | 1680 |
| Brazil | 240 | 14 |

**Key**
🗗 shale gas
■ other natural gases
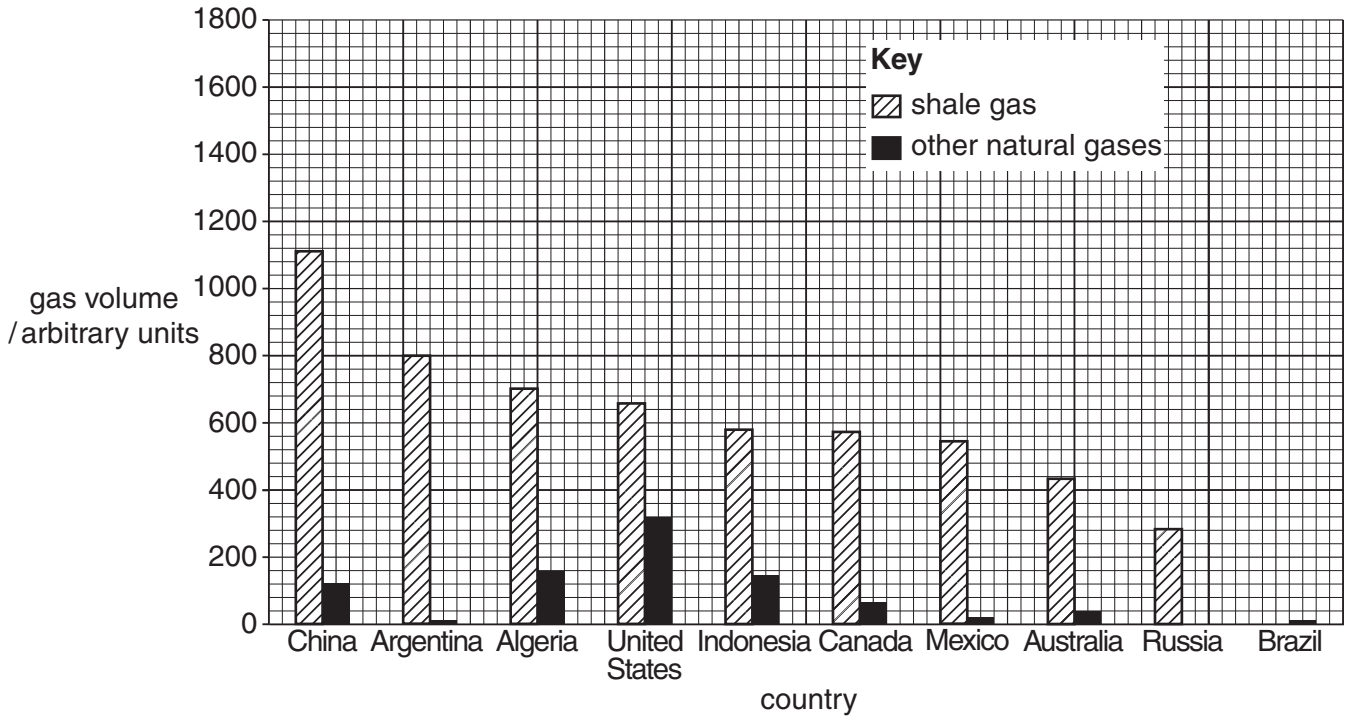
- **(i)** Complete the bar graph for Russia and Brazil using information from the table and the key. [1]

- **(ii)** Some countries are starting to extract shale gas.

  Which country would have the largest percentage increase in its available gas when it starts to extract shale gas? Circle your choice. [1]

  **Argentina**          **Australia**          **Brazil**          **Mexico**          **Russia**

- **(iii)** Explain your answer to **(b)(ii)**.

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**(c)** Fossil fuels will eventually be used up.

Explain how fossil fuels can be made to last longer.

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**5 (a)** State the meaning of the term *biodiversity*.

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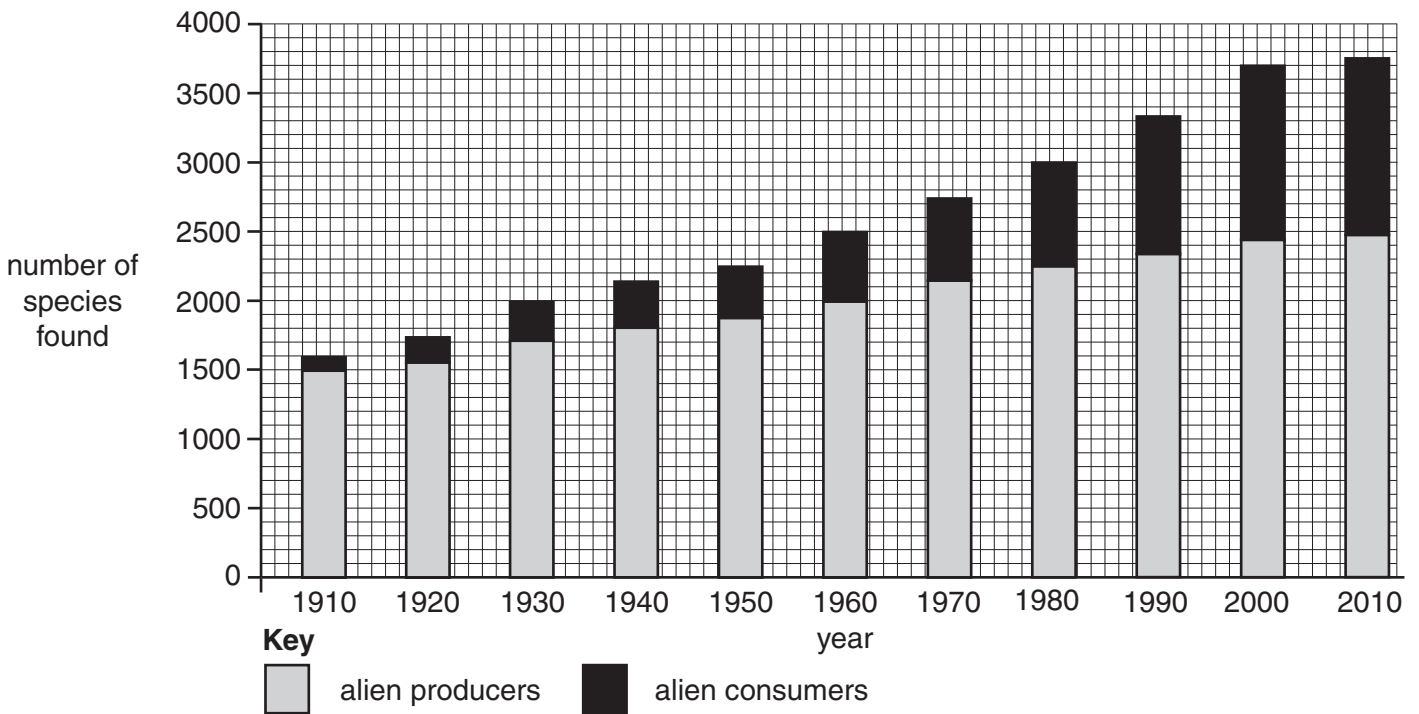
**(b)** The introduction of species from other parts of the world (alien species) into Europe is a problem.

Look at the graph below, which shows the number of alien species found in Europe.



**Key**
- alien producers
- alien consumers

**(i)** How many species in total have been introduced into Europe between 1910 and 2010?

.............................................species [1]

**(ii)** Compare the trends shown by alien producers and alien consumers.

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**(iii)** Suggest the effect that introducing alien producers might have on food webs in an ecosystem.

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**(iv)** Suggest how the introduction of alien species could be reduced.

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6  The table below shows climate data for four locations.

| location | P | Q | R | S |
|---|---|---|---|---|
| latitude | 3°N | 10°N | 15°N | 20°N |
| average January temperature /°C | 26 | 24 | 22 | 21 |
| average June temperature /°C | 28 | 30 | 33 | 34 |
| rainfall /mm | 2000 | 850 | 450 | 110 |
| number of dry months | 0 | 6 | 9 | 11 |

(a) (i)  State the range of temperature between January and June at location **R**.

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(ii)  Using the information in the table, describe the change in temperature and rainfall from location **P** to location **S**.

temperature ..................................................................................................................................

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rainfall ...........................................................................................................................................

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[4]

(b) (i)  Suggest problems for crop farming at location **R**.

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(ii)  Suggest a solution to **one** of the problems in **(b)(i)**.

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**(c)** For a developing country, explain **one** advantage and **one** disadvantage of using land to grow biomass for fuel.

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