UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

4099603547

ENVIRONMENTAL MANAGEMENT **0680/11**

Paper 1 **May/June 2013**

1 hour 30 minutes

Candidates answer on the Question Paper.

Additional Materials: Ruler

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 a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Electronic calculators may be used.

Answer **all** questions.
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.

For Examiner's Use	
1	
2	
3	
4	
5	
6	
Total	

This document consists of **19** printed pages and **1** blank page.

Answer **all** the questions.

1 (a) (i) What is the difference between weather and climate?

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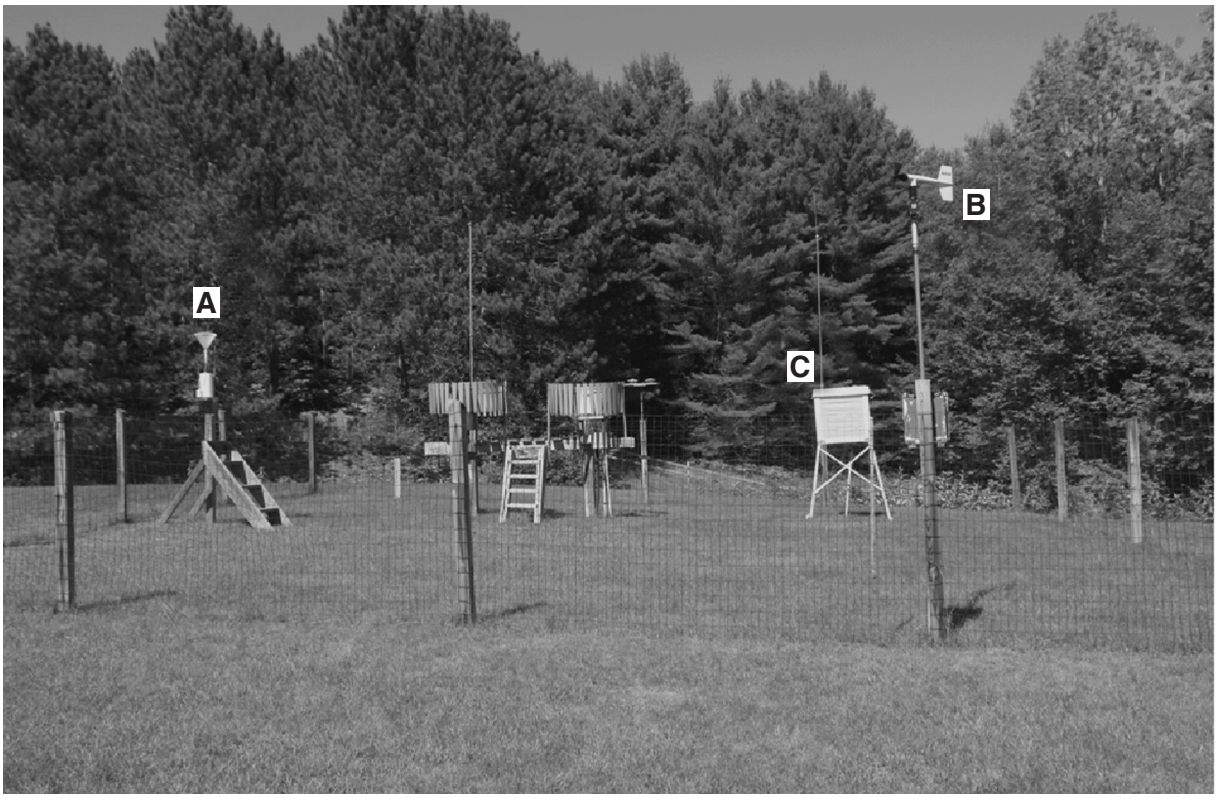
.....[2]

(ii) The photograph below shows a weather station.



A is a rain gauge, which would be sited differently in most weather stations.

Describe where it is usually sited.

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.....[1]

(iii) Which element of the weather is being measured and recorded by the labelled **B**?

B ..... [1]

(iv) Name **one** instrument found in **C** and give reasons why it is placed there.

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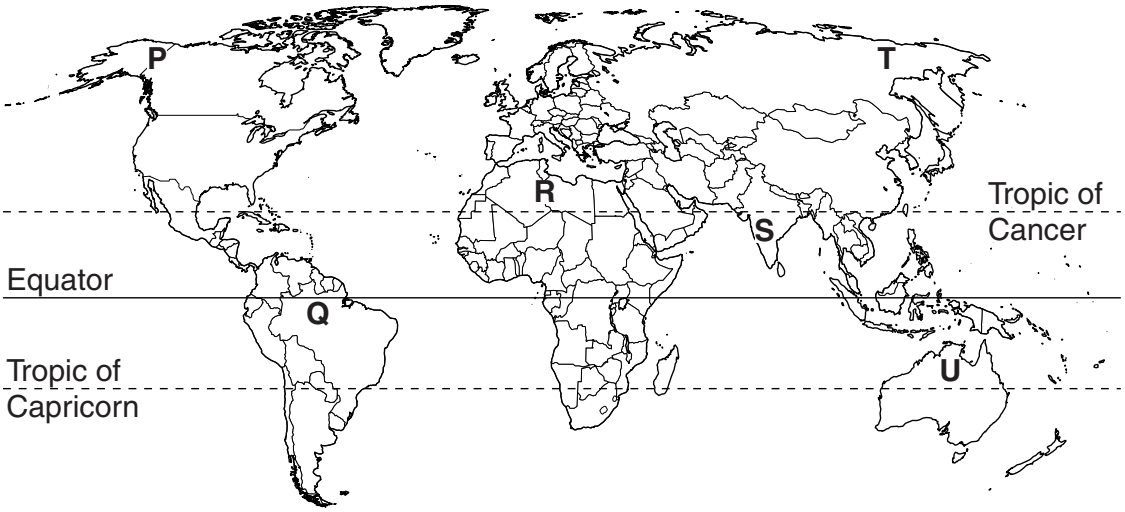
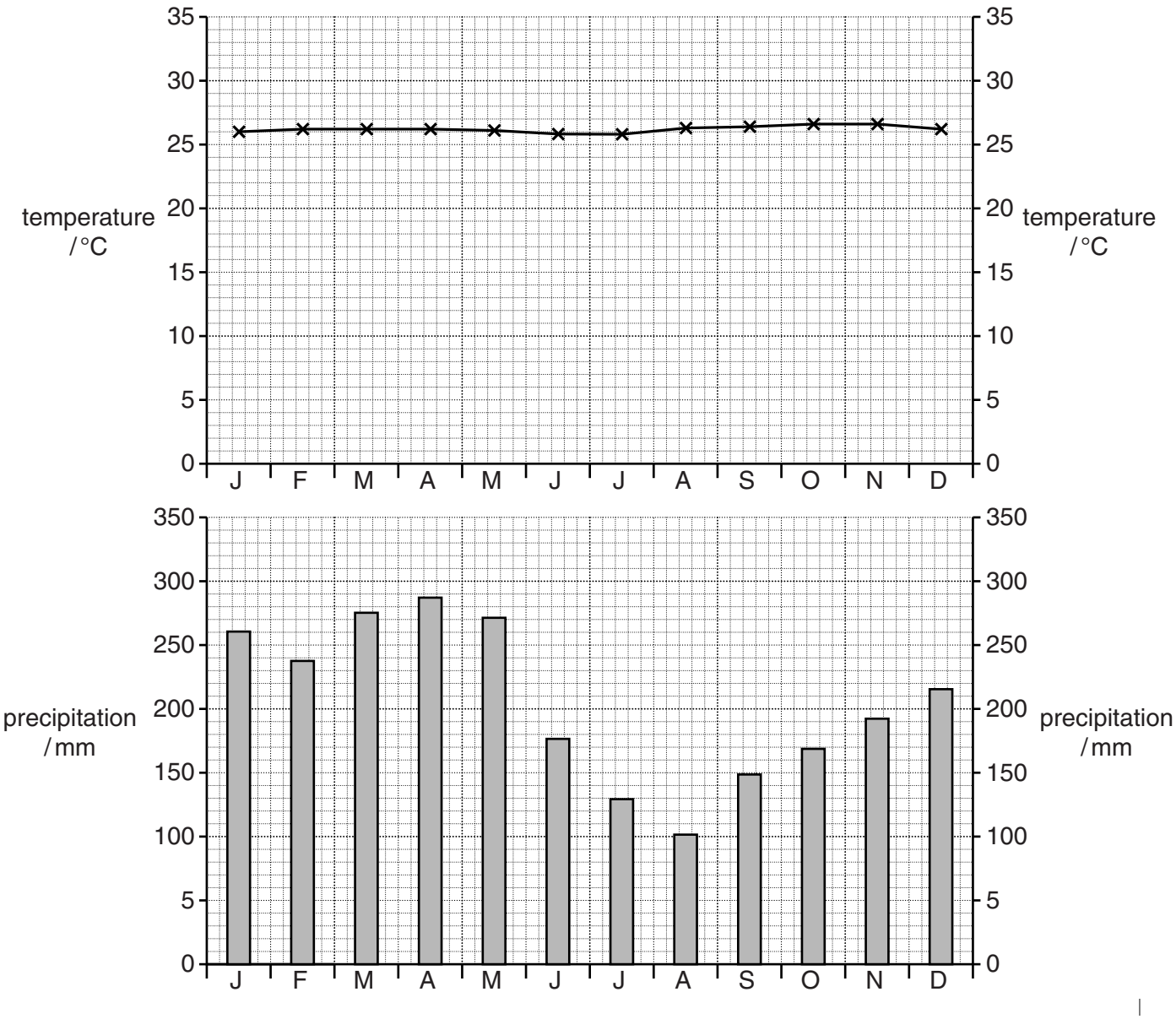
.....[3]

(b) The map shows six places marked with letters **P** to **U**.



Look at the climate graph.



Give the letter, **P**, **Q**, **R**, **S**, **T** or **U**, for the place on the map with this type of climat
reasons for your answer.

letter ……

reasons .....

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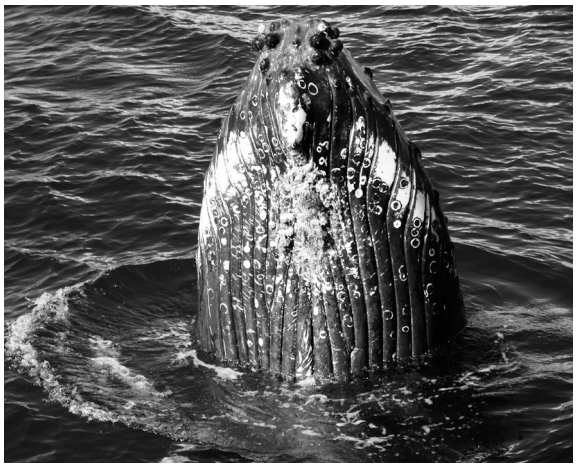
.....[3]

[Total: 10]

2 **(a)** Look at this information board on the edge of a marine reserve off the NE coast USA.

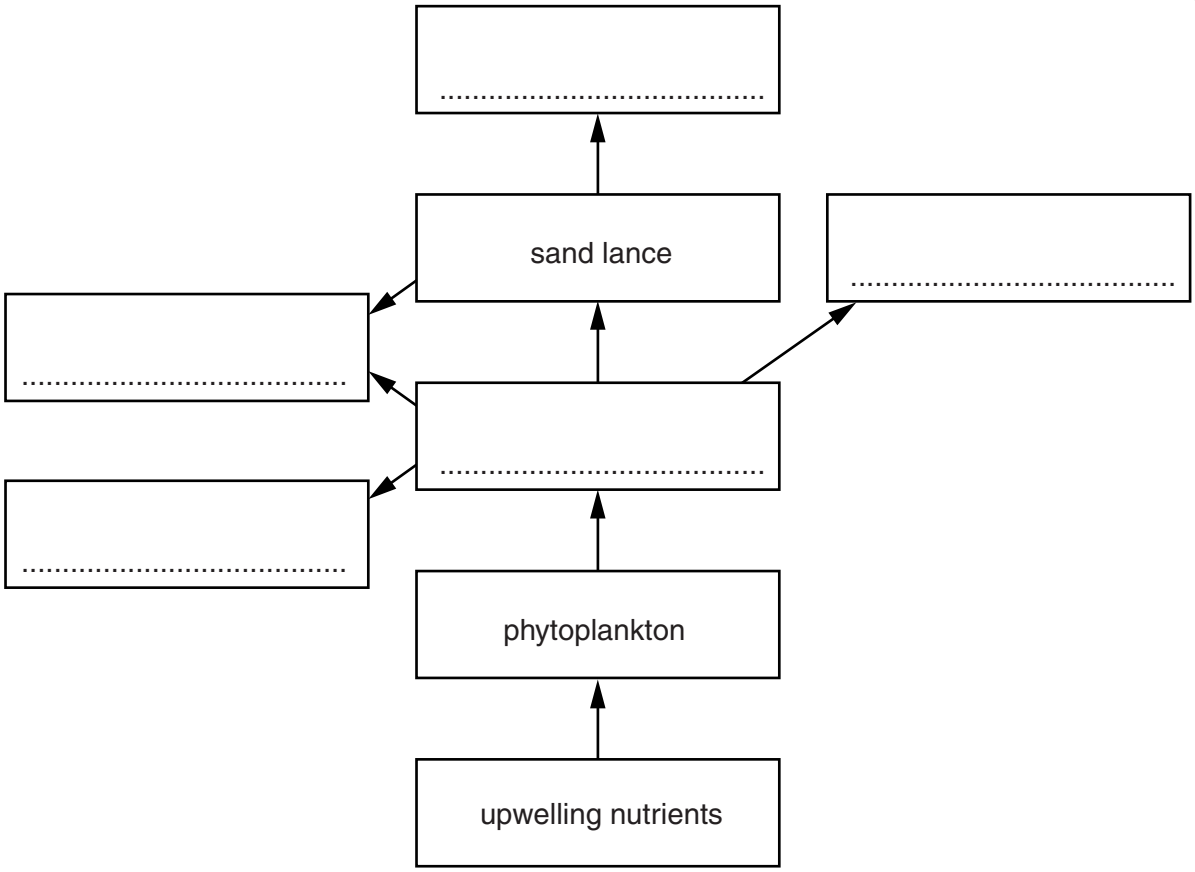
Food Webs in the Stellwagen Bank

Phytoplankton (microscopic plants) take advantage of upwelling nutrients to multiply rapidly in the sunlit waters, Zooplankton (tiny marine animals) eat the populations of phytoplankton. Many marine animals such as whales, basking sharks, sand lance and storm petrels feed on the zooplankton. Most of the smaller fish species, such as sand lance, are eaten by seabirds, humpback, fin and minke whales, so all members of the food web benefit from the upwelling.



A humpback whale, which feeds on krill (part of the zooplankton) and small fish.

(i) Complete the food web diagram for the Stellwagen Bank.



Your answers should give a complete food web. [3]

(ii) One area of the world where upwelling nutrients support a large ocean fishery is off the coast of Peru.

Why do nutrients rise into surface waters here?

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.....[1]

(iii) In certain years this fishery for anchovies collapses due to El Nino.

Explain how El Nino causes this.

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(b) Rich marine habitats such as the Stellwagen Bank and the coastal waters off Peru have great biodiversity. Habitat destruction causes a loss of biodiversity and therefore loss of genetic variation (genetic depletion).

Explain why genetic depletion is a problem.

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.....[3]

[Total: 10]

Question 3 begins on page 10.

3 **(a)** The impact of humans on the Earth has increased over the last 2000 years due t… rise in the population and in people's consumption of natural resources.

State and explain **two** factors which are leading to the rise in population.

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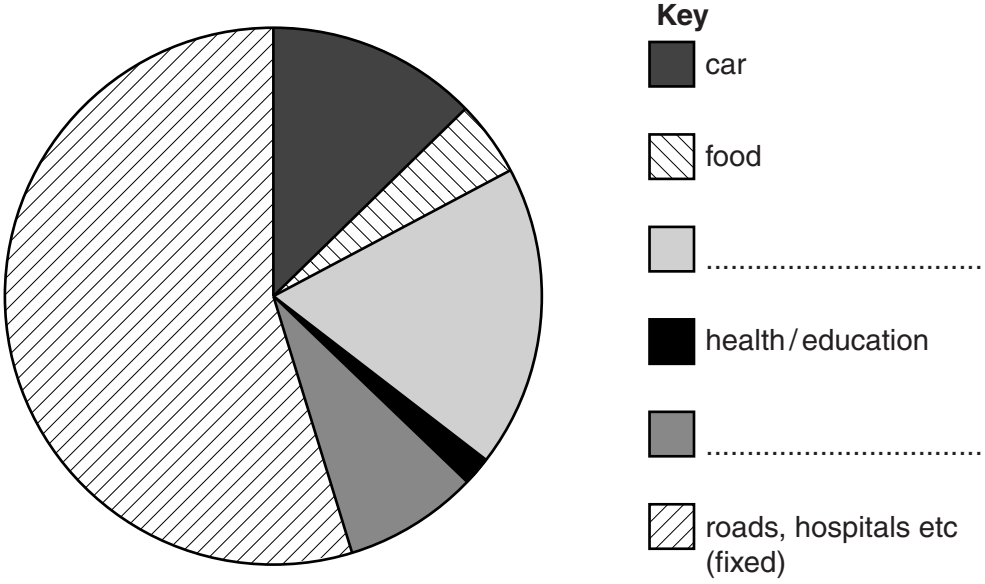
(b) A measure of the impact of a person on the Earth is the ecological footprint. This is made up of some *variable* factors and some which are *fixed*, such as provision of roads and hospitals. The table shows the variable factors in the footprint of a person (person **X**) who lives in the UK (average winter temperature, 4 °C) and:

- owns a car,
- goes overseas for holidays,
- lives in a three bedroom house,
- uses electricity generated from fossil fuels,
- has roof insulation

person **X**	
lifestyle feature	**ecological footprint index**
car	1.46
food	0.48
house	2.06
health/education	0.22
holiday	0.90
total for variable factors	5.12

In addition, the ecological footprint index due to fixed factors such as provision of roads and hospitals is 6.2, so this gives person **X** an ecological footprint index of 11.32.

(i) Use the data in the table to complete the labelling of the pie chart.



Put your answers in the spaces provided. [1]

(ii) For the Earth to support 7 billion people the ecological footprint index for each person should not be greater than 3.7.

How many Earths would we need if everyone lived as person **X**?

Show your working.

number of Earths .....[1]

(iii) Using the information given, and your knowledge, describe ways in which person **X** could reduce their ecological footprint index.

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.....[4]

[Total: 10]

4 The diagram below shows how the area of the Dead Sea has changed since 1950.

1950 1972 2010

(a) (i) Describe how the Dead Sea has changed over the 60 year period.

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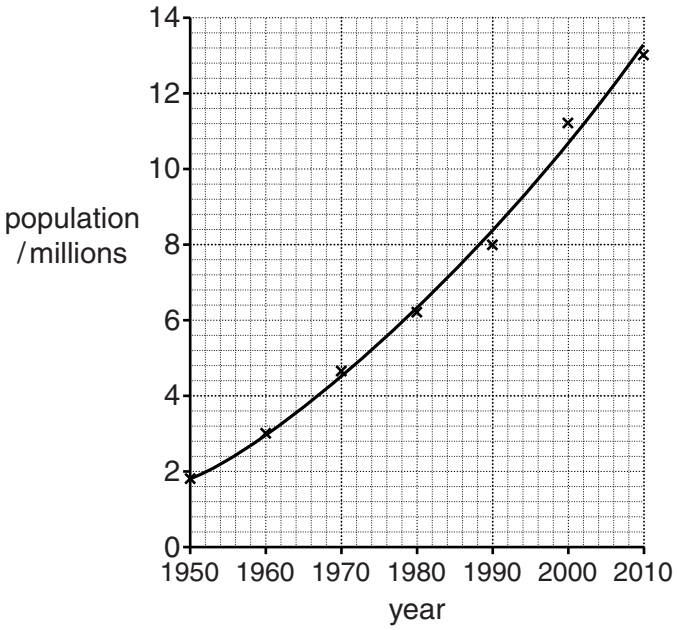
.....[2]

(ii) The graph shows what has happened to the population of the countries surro… the Dead Sea since 1950.



The Jordan River flows into the Dead Sea. The climate of the area is hot and dry most of the year.

Suggest reasons for the changes in the Dead Sea you have described in **(i)**.

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(b) Water is a very precious resource and this area suffers from water scarcity.

Explain how people could conserve and reuse water.

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.....[4]

[Total: 10]

5 Energy for use by human communities comes from either renewable or non-renewable sources.

(a) The major non-renewable energy resources are fossil fuels.

(i) Name the **three** main fossil fuels .....

.....

.....[2]

(ii) Explain why these are called fossil fuels .....

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.....[1]

(b) Non-renewable resources will eventually be used up.

There are two solutions to minimise this problem:

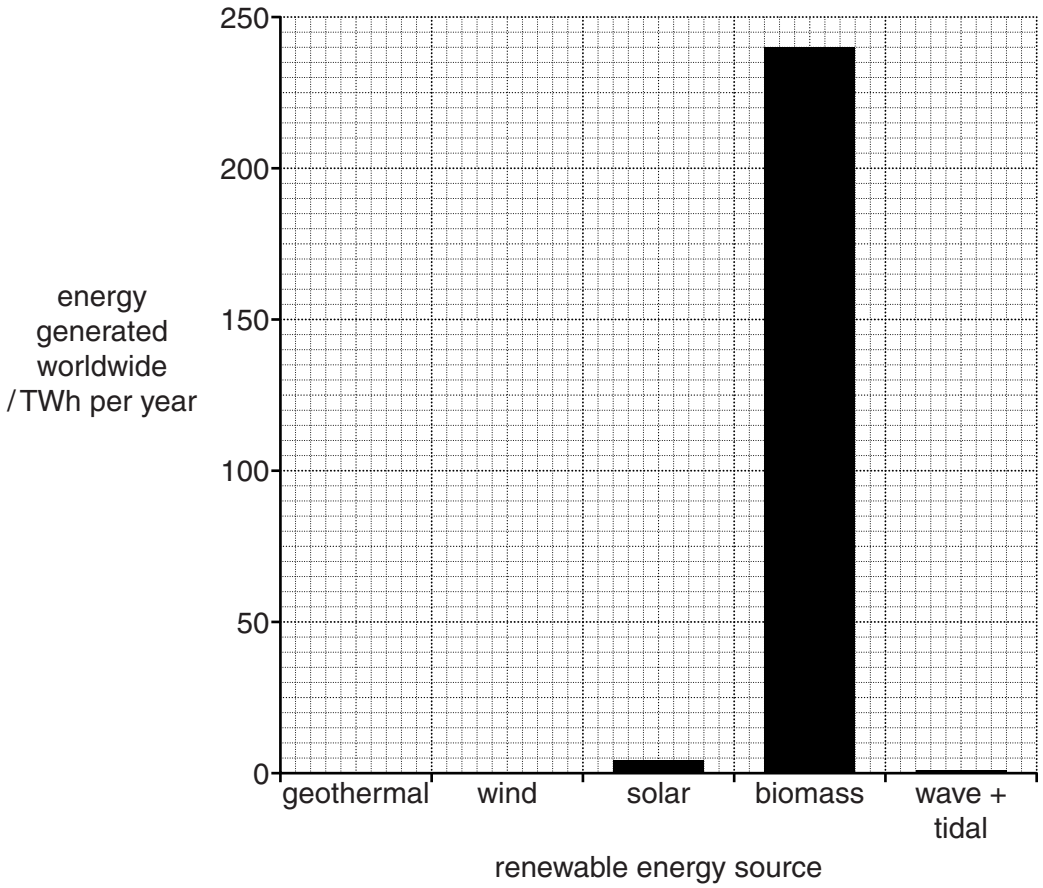
- increased efficiency in the use of fossil fuels
- new technologies

Some of the new technologies will involve the use of renewable energy sources. The table shows the energy generated from some renewable sources in 2010.

source	TWh per year
geothermal	60
wind	130
solar	4
biomass	240
wave and tidal	1
TOTAL	435

An estimate of the potential energy generation from these sources is 300 000 TWh per year.

(i) Complete the graph below for geothermal and wind power.



Your answer should give a complete bar graph. [1]

(ii) Calculate, from the information above, the percentage of the estimated pe... energy generation that we currently generate from these five energy sou... combined.

Show your working.

.....[2]

(iii) Describe and explain ways in which governments can conserve fossil fuels.

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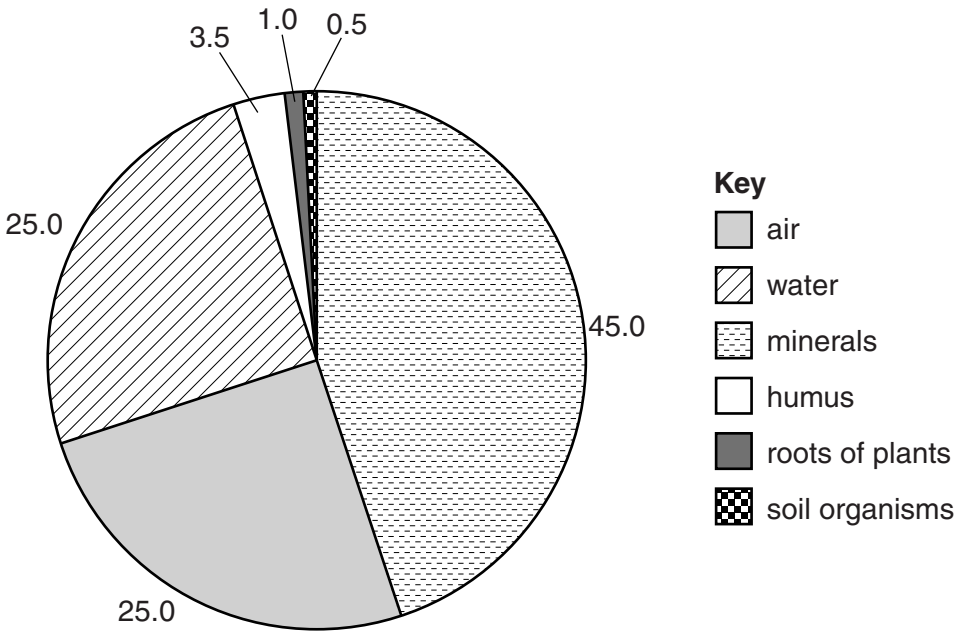
[Total: 10]

6 **(a)** Look at the pie chart showing average percentages for the composition of soil.



(i) What percentage of this soil consists of organic material?

Show your working and explain your answer.

percentage of organic matter ..... %

explanation .....

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.....[2]

(ii) State the soil component, shown on the pie chart, that is needed for each of the following processes.

photosynthesis .....

respiration .....

making proteins ..... [3]

(b) Soil can become polluted by human activity. One kind of pollution is called groun... contamination.

(i) What is groundwater?

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(ii) Explain how groundwater can become contaminated.

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(iii) How can groundwater contamination become a threat to human health?

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[Total: 10]

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