UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

8519930150

ENVIRONMENTAL MANAGEMENT **5014/12**

Paper 1 **May/June 2012**

2 hours 15 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.

Answer **all** questions.
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.

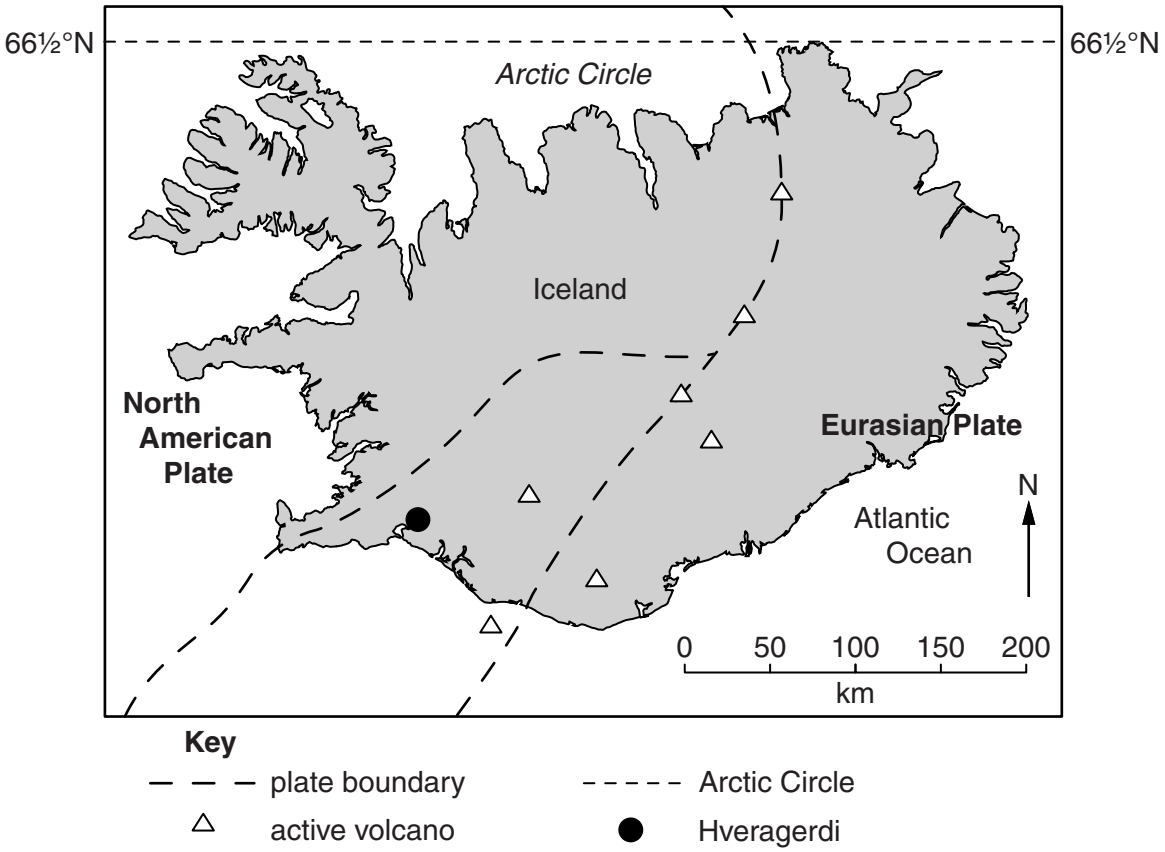
For Examiner's Use	
1	
2	
3	
4	
5	
6	
Total	

This document consists of **23** printed pages and **1** blank page.

Section A

For Examiner's Use

1 **(a)** Look at the map showing the location of Iceland on a constructive (divergent) plate boundary.



(i) On the map, draw arrows to show the likely directions of movement of the two named plates. [1]

(ii) At Hveragerdi, tropical fruit and vegetables are grown in hothouses heated by steam and hot water which rise from hot rocks. Explain why there are hot rocks near the surface in Iceland.

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.....[2]

(iii) Iceland is located close to the Arctic Circle. How many kilometres due south of the Arctic Circle is Hveragerdi? Circle the nearest answer to your measurement.

225 250 275 300 [1]

(iv) Why is the use of rising hot water in hothouses of great economic benefit at this high latitude?

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.....[1]

(v) Suggest two other different uses of the hot water and steam.

1 .....

2 .....[2]

(b) Describe the possible disadvantages of living near a plate boundary.

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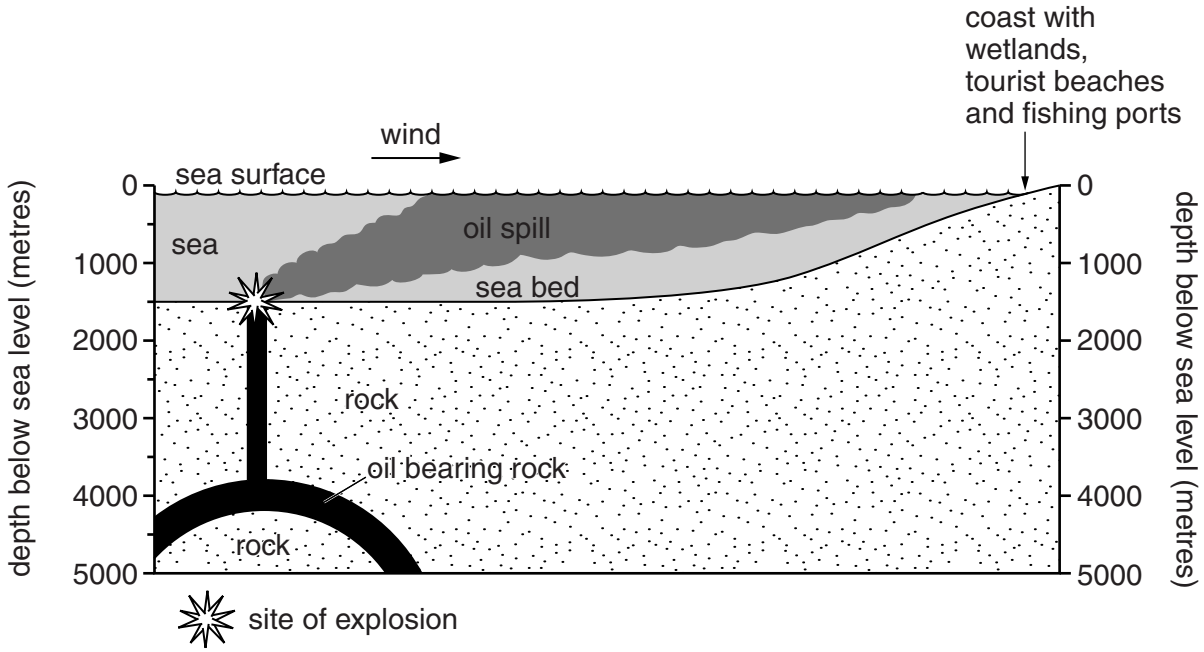
For Examiner's Use

2 **(a)** The diagram shows the results of an explosion at an oil well on the sea bed in the Gulf of Mexico in April 2010.



(i) How did the location of this well make this oil leak very difficult to stop?

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.....[1]

(ii) Explain how the oil spill from the sea bed reached the coast.

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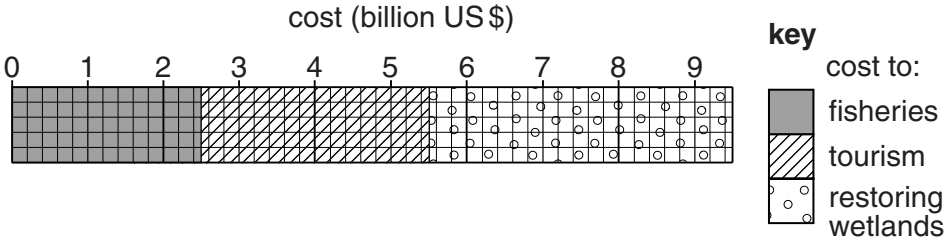
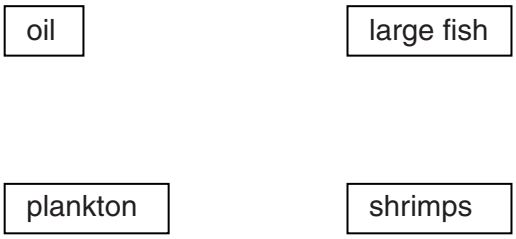
(iii) The divided bar graph shows the estimated costs which resulted from this oil spill.



What is the estimated cost of restoring the wetland ecosystems?

..... billion US $ [1]

(b) (i) Animal plankton take in the oil. Add arrows to the diagram below to show how the oil spreads to other organisms in the food chain.



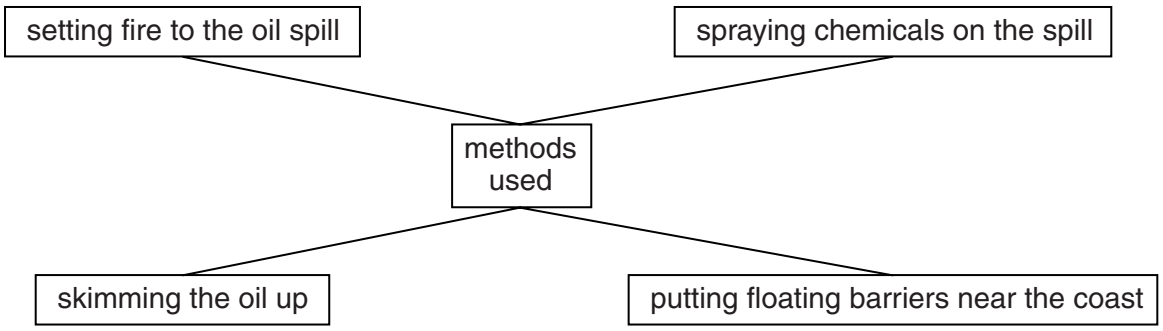
[1]

(ii) State **two** other ways in which ecosystems are damaged by oil spills.

1 .....

2 .....[2]

(c) Look at the diagram showing methods used to prevent this oil spill from reaching the coasts of the USA.



For **three** of these methods suggest how each can help to reduce the impact of an oil spill.

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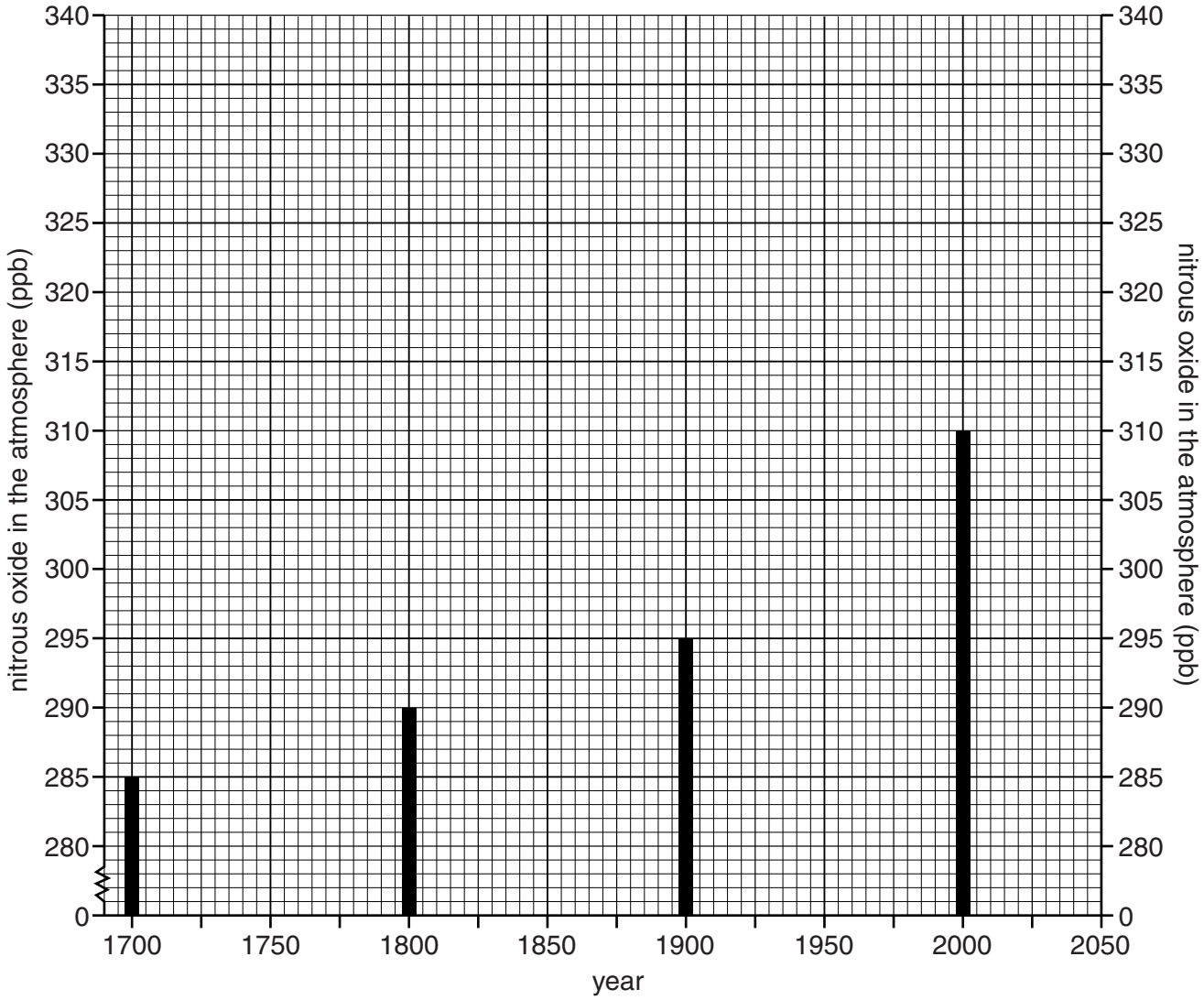
For Examiner's Use

3 **(a)** The bar graph shows amounts of nitrous oxide in the atmosphere at one hundred year intervals from 1700.

(i) The expected amount of nitrous oxide in the atmosphere in 2030 is 340 parts per billion (ppb).
Add a bar to the diagram to show this. [1]



(ii) What is significant about what the graph shows?

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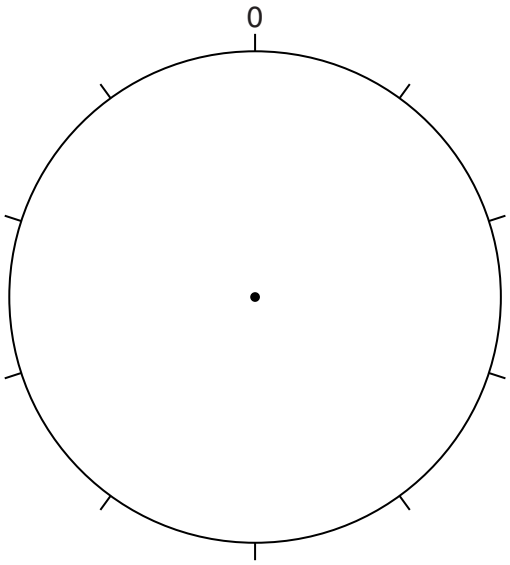
.....[1]

(iii) Natural sources supply 76% of the nitrous oxide in the atmosphere and the remainder is from human activities. Show this on the pie graph below.



[1]

(b) Explain different ways in which oxides of nitrogen can reach the atmosphere as a result of:

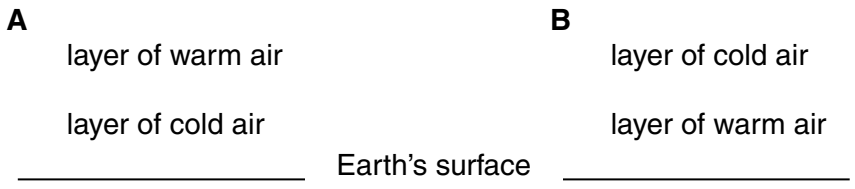
(i) commercial agriculture .....

.....[1]

(ii) transport .....

.....[1]

(c) Look at the diagram of different temperature conditions in the atmosphere.



(i) Which diagram shows a temperature inversion? Explain your answer.

diagram letter .....

reason .....[1]

(ii) Explain how a temperature inversion can lead to an increase in atmospheric pollution.

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.....[1]

(d) Suggest reasons why farmers may prefer to use inorganic fertilisers rather than organic ones.

For Examiner's Use

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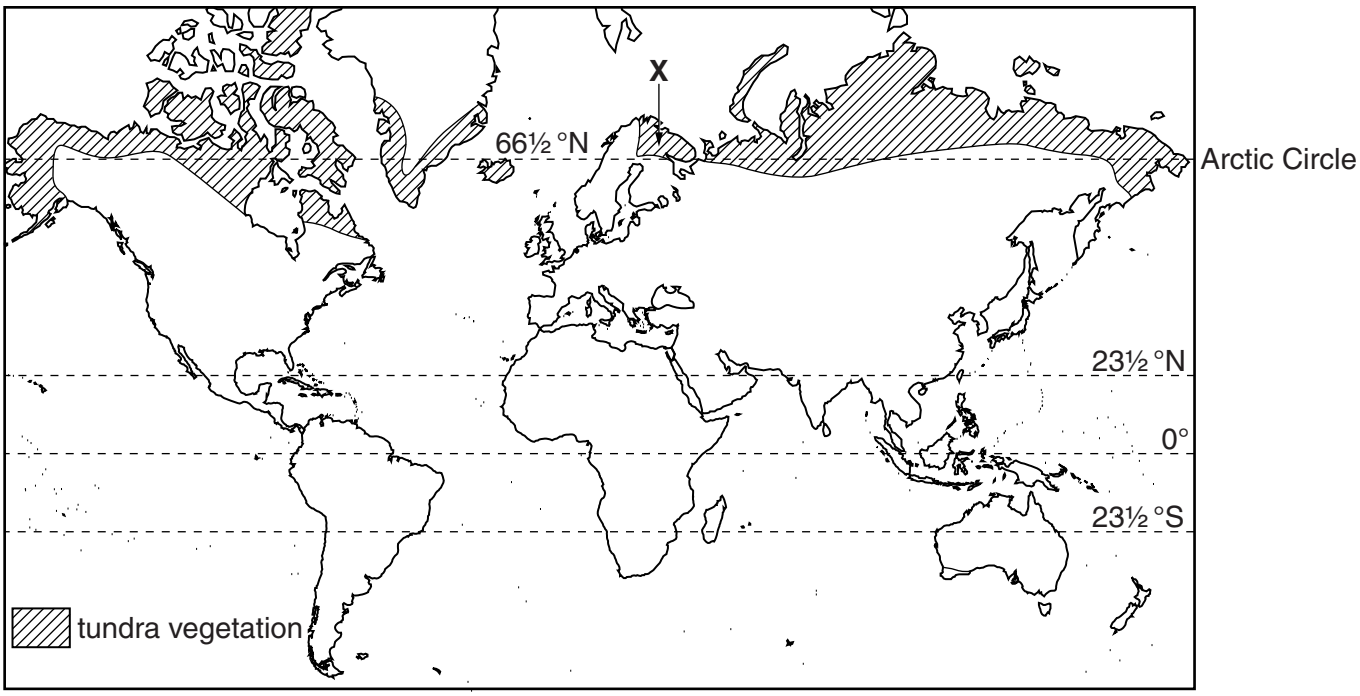
4 **(a)** The map shows the distribution of tundra vegetation which is in an area where the environment is difficult for plant growth.



Describe the distribution of tundra vegetation shown on the map.

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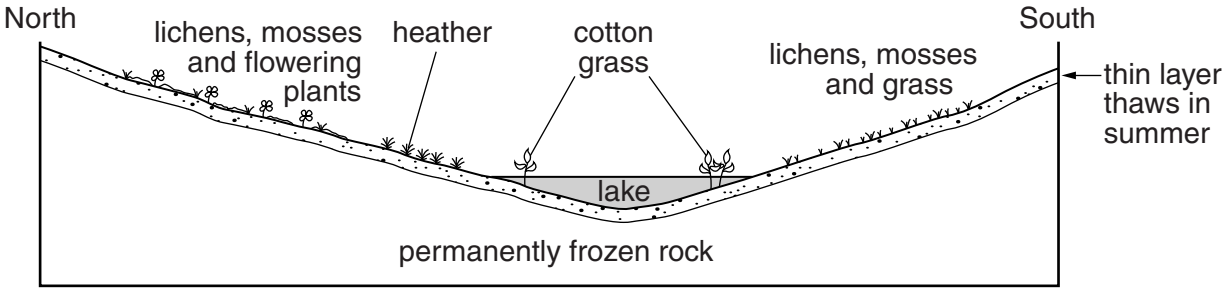
.....[3]

(b) Look at the cross section of a valley in the tundra showing vegetation in the summer.

For Examiner's Use



(i) Use the information on the diagram to explain the term *plant community.*

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.....[1]

(ii) How and why is the vegetation on the south facing slope different from that on the north facing slope?

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.....[2]

(iii) Describe the roots of plants in the tundra.

.....[1]

(c) For centuries, nomadic pastoralists have roamed with their reindeer herds in area X on the world map on page 8. Tourism is now increasing in the western part of area X.
Suggest why the nomadic pastoralists might have a variety of opinions about the increase of tourism.

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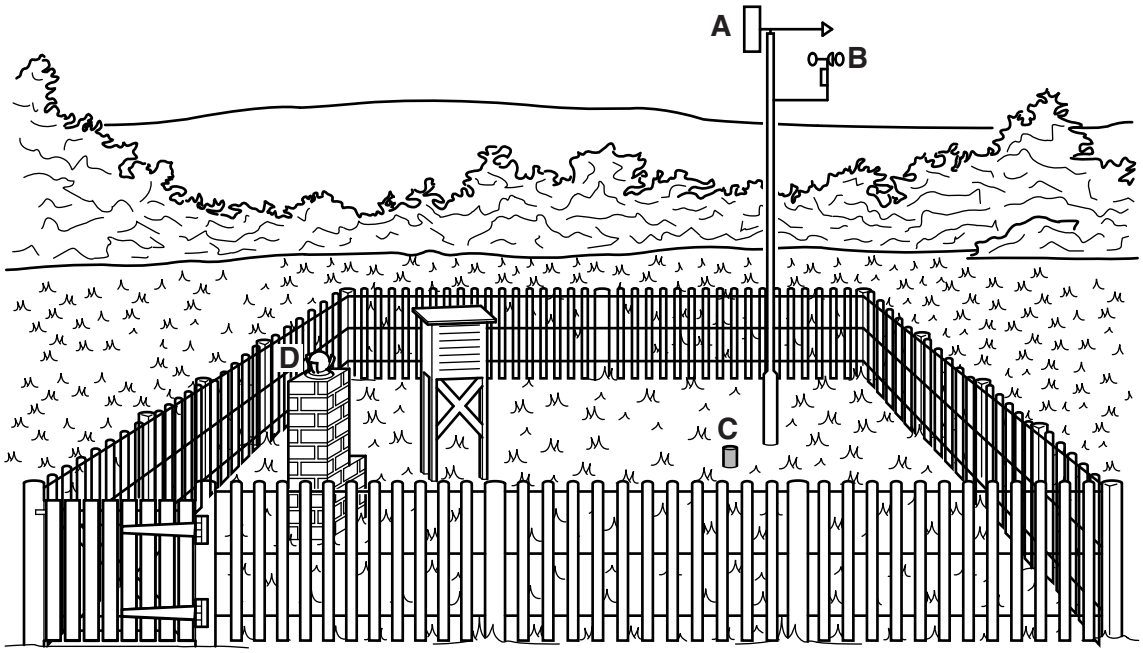
Section B

For Examiner's Use

5 **(a)** Look at the sketch of a weather station.



(i) Name the weather elements recorded by the instruments marked **A**–**D**.

A .....

B .....

C .....

D ..... [4]

(ii) Describe how the highest and lowest temperatures of the day are measured and recorded at a weather station.

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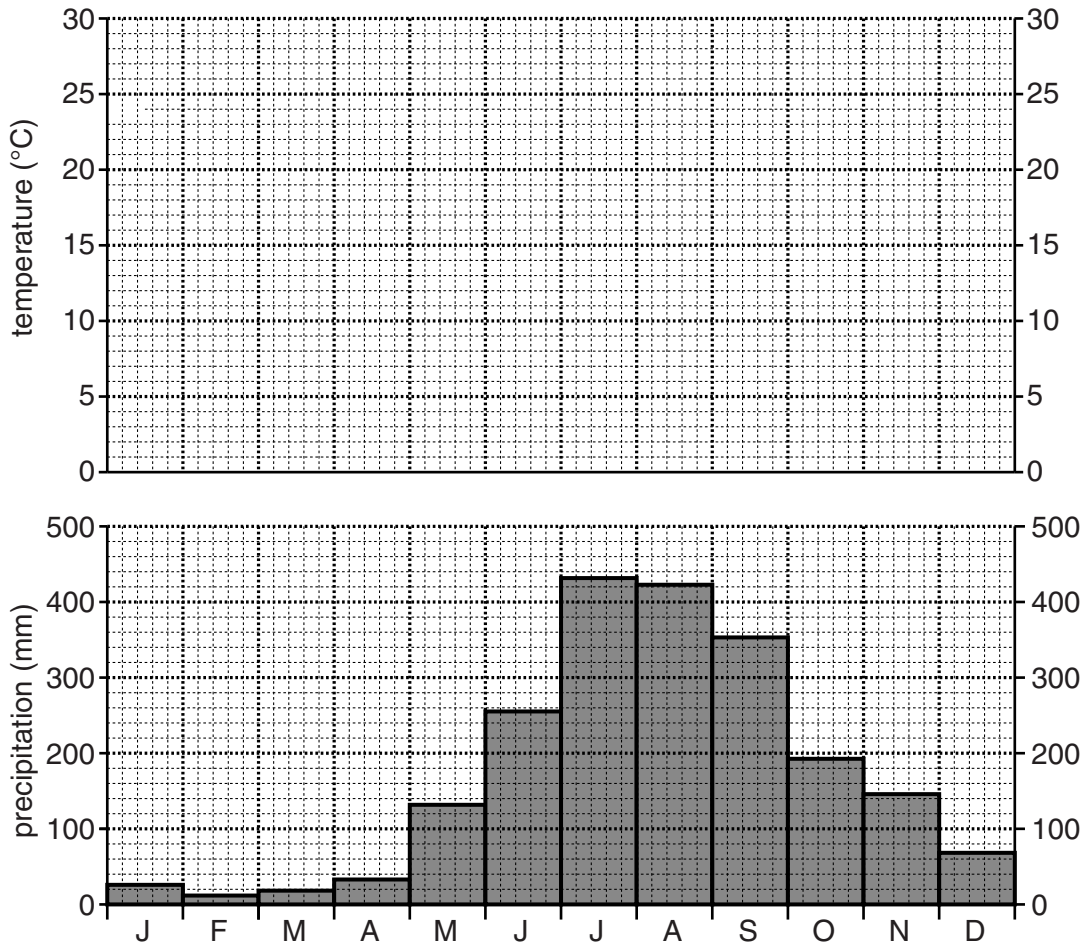
(b) Look at the climate graph for Manila in the Philippines in East Asia.

For Examiner's Use

Average temperature and precipitation in Manila (latitude 14 °N)



(i) Complete the climate graph by plotting these monthly temperature values for Manila using a line graph.

	J	F	M	A	M	J	J	A	S	O	N	D
°C	25	26	27	29	29	28	27	27	27	27	26	25

[3]

(ii) State the annual temperature range in Manila (the difference between the highest and lowest monthly temperatures).

.....[1]

(iii) Describe what the graph shows about the distribution of rainfall during the year in Manila.

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.....[2]

(iv) Suggest a reason why the temperature in June and July is lower than in April, although the sun is shining from a higher angle in the sky in mid-summer.

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.....[1]

(c) (i) Farming in the Philippines is dominated by crop growing. Describe how the climate is favourable for crop growing.

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(ii) Rice is the most important food crop grown in the Philippines, the staple food in most of the country. Along with corn (maize) it accounts for half of the total crop area. Another quarter of cropland is planted with coconuts, an important export earner. Smaller amounts of sugar cane and pineapples are also exported.

From the crops named, give **one** example of a subsistence crop and **one** example of a commercial crop in the Philippines.

subsistence crop .....

commercial crop ..... [1]

(iii) What are the main differences between subsistence and commercial types of farming?

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.....[2]

(iv) The system of farming often used for growing crops such as coconuts and sugar cane is plantation farming.
Describe some of the distinctive characteristics of plantation farming.

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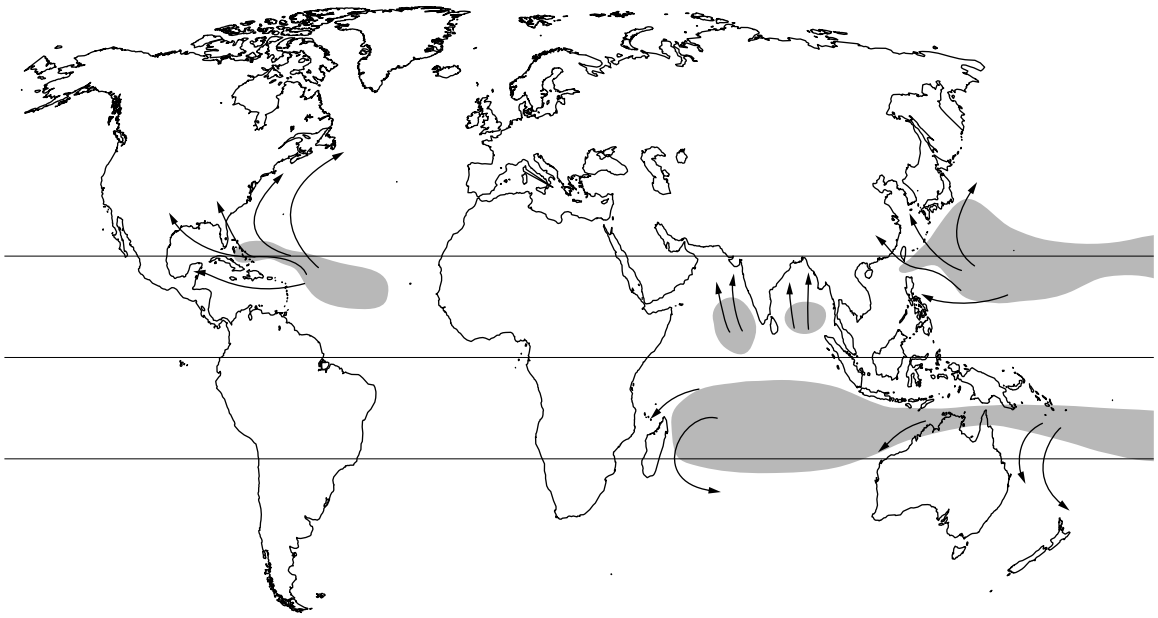
(d) Look at the world map showing main areas of formation and tracks (directions of movement) of cyclones.

For Examiner's Use

Cyclones: main areas of formation and tracks followed



Key: Main areas of formation of cyclones — Main tracks followed

(i) Describe where the main areas of cyclone formation are located.

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(ii) What is similar about the tracks followed by cyclones as they move away from the areas of formation?

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.....[2]

(iii) The main months of the year for the formation of tropical cyclones in the northern hemisphere are between July and November. Give the reasons for this.

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.....[2]

(e) Read the information about two cyclones in East Asia in 2009. Cyclones which form in the South China Sea are called typhoons.

For Examiner's Use

Philippines – average income per head per year US$1,040

Typhoon Ketsana September 2009
- nearly 300 deaths
- heaviest rains for over 40 years
- floods affected over 80 percent of Manila, the capital city
- large parts of Laguna in eastern Manila, where more than 300,000 people live in shanty towns, were still flooded 12 days later

Comment – vast flooding was largely the result of insufficient and inadequate drainage

General comment – high numbers of deaths every year from cyclones creates a cycle of poverty; people are constantly recovering from previous cyclones, making it more difficult for them to afford to take preventative measures ready for the next one

Japan – average income per head per year US$36,170

Typhoon Melor October 2009
- 2 deaths from falling trees
- at least 27 people injured
- gusts of wind up to 198kph were recorded
- violent winds damaged homes and uprooted trees; heavy rains increased the risk of landslides

Comment – after warnings from the Weather Office, many people were evacuated into shelters by the Disaster Management Agency before the cyclone arrived

General comment – the threat of natural disasters in developed countries like Japan encourages technological improvement to make the effects of the next cyclone less damaging than those of previous cyclones

(i) Explain why cyclones, like these two Asian typhoons, are dangerous for people and can lead to considerable loss of life and injury.

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(ii) The UN (United Nations) estimates that

- total numbers of people affected by cyclones each year in the Philippines and Japan are similar,
- 17 times more people die in the Philippines from cyclones than in Japan.

With the help of the information given in the boxes, explain as fully as you can why more people die in the Philippines from the effects of cyclones than in Japan.

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For Examiner's Use

(iii) Is it ever going to be likely that all deaths from cyclones can be avoided? Explain your view about this.

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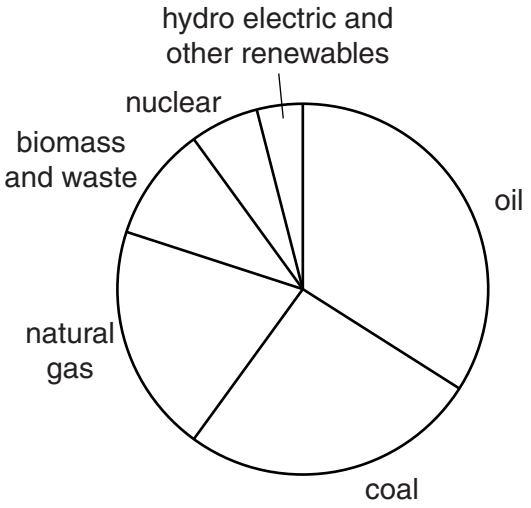
[Total: 40 marks]

[Turn over

6 **(a)** Look at the graph showing the importance of different energy sources in 2009.

World energy consumption by source (2009)



(i) On the graph, shade in the sectors showing energy from fossil fuels. [1]

(ii) Describe what the graph shows about the importance of fossil fuels for world energy consumption in 2009.

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.....[2]

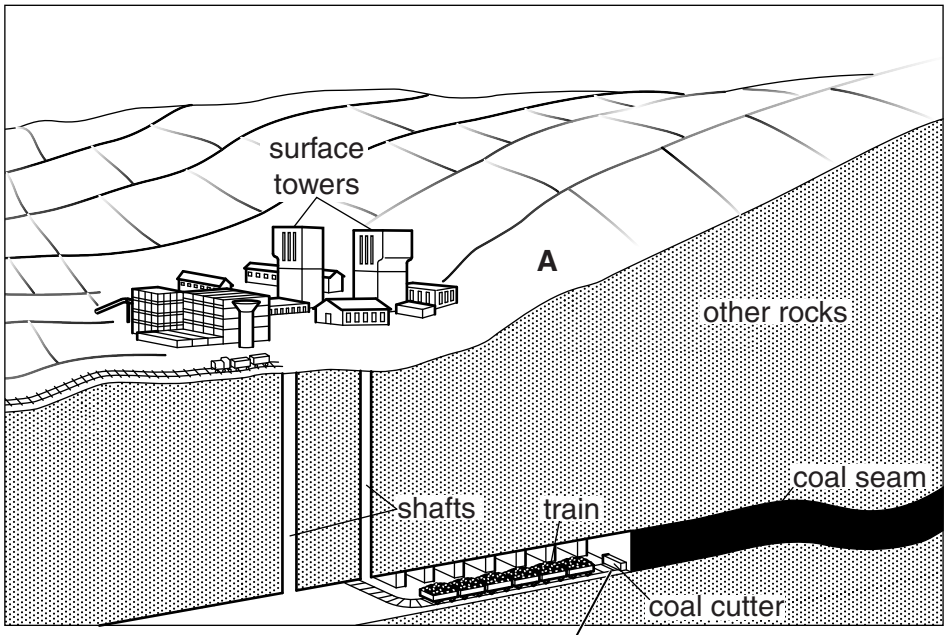
(iii) Approximately what percentage of total world energy consumption in 2009 came from coal?

.....[1]

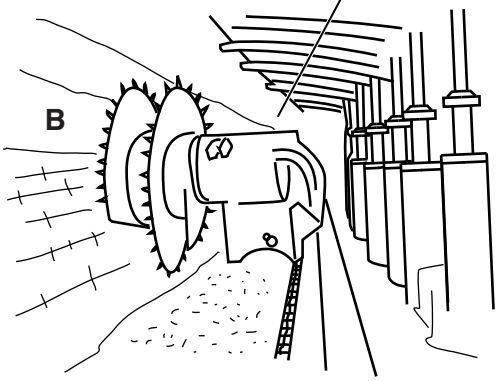
(b) Look at the diagrams which show one method used for mining coal.

For Examiner's Use

Coal mine



Coal cutter



(i) What is the purpose of the shafts and towers shown on diagram A?

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.....[2]

(ii) Using both diagrams, describe how the coal is being mined.

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(iii) Would you describe this as an old or a modern coal mine? Explain your answer.

For Examiner's Use

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.....[2]

(c) Mining is dangerous work. Read this newspaper report about what happened in a Chinese coal mine in March 2010.

123 workers trapped by flooding

The vast Wangjialing coal mine in northern China is estimated to have 2.3bn tonnes of coal reserves, including over 1 billion tonnes of proved reserves. Yesterday underground water rushed into the mine where 261 people were working. Only 138 managed to escape the flood waters.

China's coal mines are well known for being some of the world's most dangerous. Earlier this month, 25 people died in a coal mine fire in central China. Last November, 108 men were killed when an explosion blasted through a coal mine belonging to another state owned company. 2009 was a bad year; there were two other explosions which killed more than 50 workers.

Safety standards are often ignored to try to meet the ever rising demand for coal. Coal supplies 70 per cent of China's energy needs.

(i) State the four different reasons for the loss of life in China's coal mines, mentioned in the newspaper report.

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.....[2]

(ii) Explain why the dangers of working in opencast coal mines are less than in deep mines.

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(iii) Suggest reasons why mining safety is much better in some countries than in others.

For Examiner's Use

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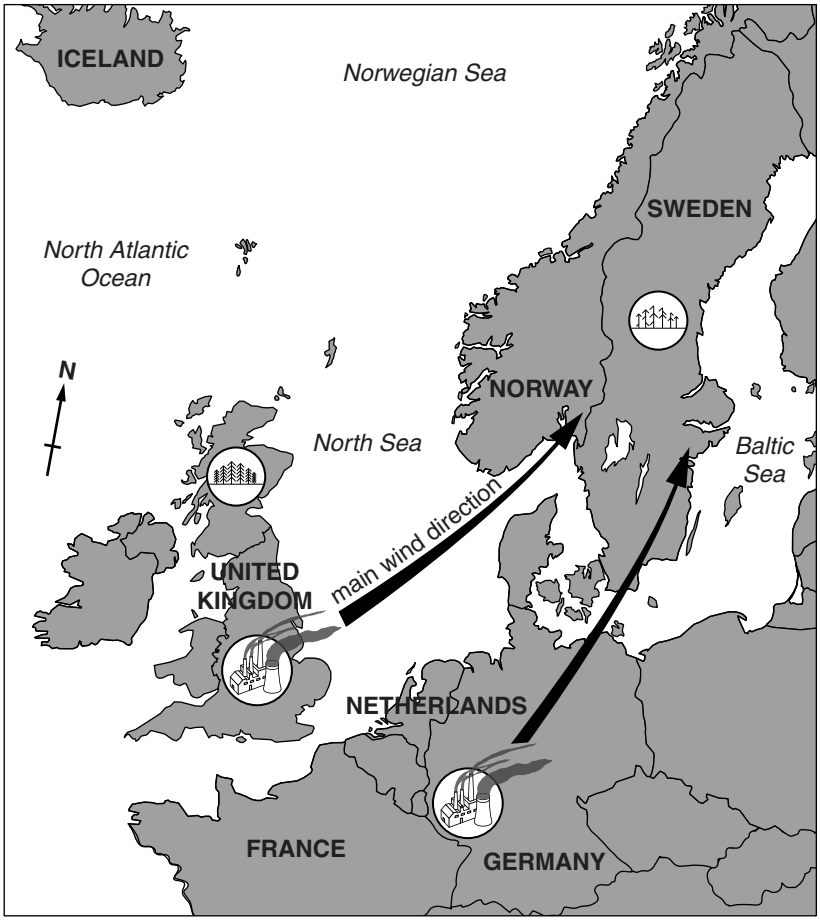
(d) (i) Coal is often said to be a dirty fuel compared with other fuels. One type of pollution, for which coal fired power stations are blamed most, is acid rain.
Name the gases from coal fired power stations which cause acid rain.

.....[2]

(ii) The map shows acid rain and its effects in part of Europe. It was most serious in the 1970s.

Acid rain in northern Europe



How does the map show that acid rain can be an international problem?

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.....[1]

(iii) Explain fully why the trees in the north of the UK on the map are shown in a different way from those in Sweden.

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(e) (i) The problem of acid rain in northern Europe is less now than it was in the 1970s. Describe what has been done to reduce the problem of acid rain pollution from coal fired power stations.

For Examiner's Use

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.....[2]

(ii) Why is finding a solution to acid rain and other types of air pollution slower because they are international problems instead of just being a national problem?

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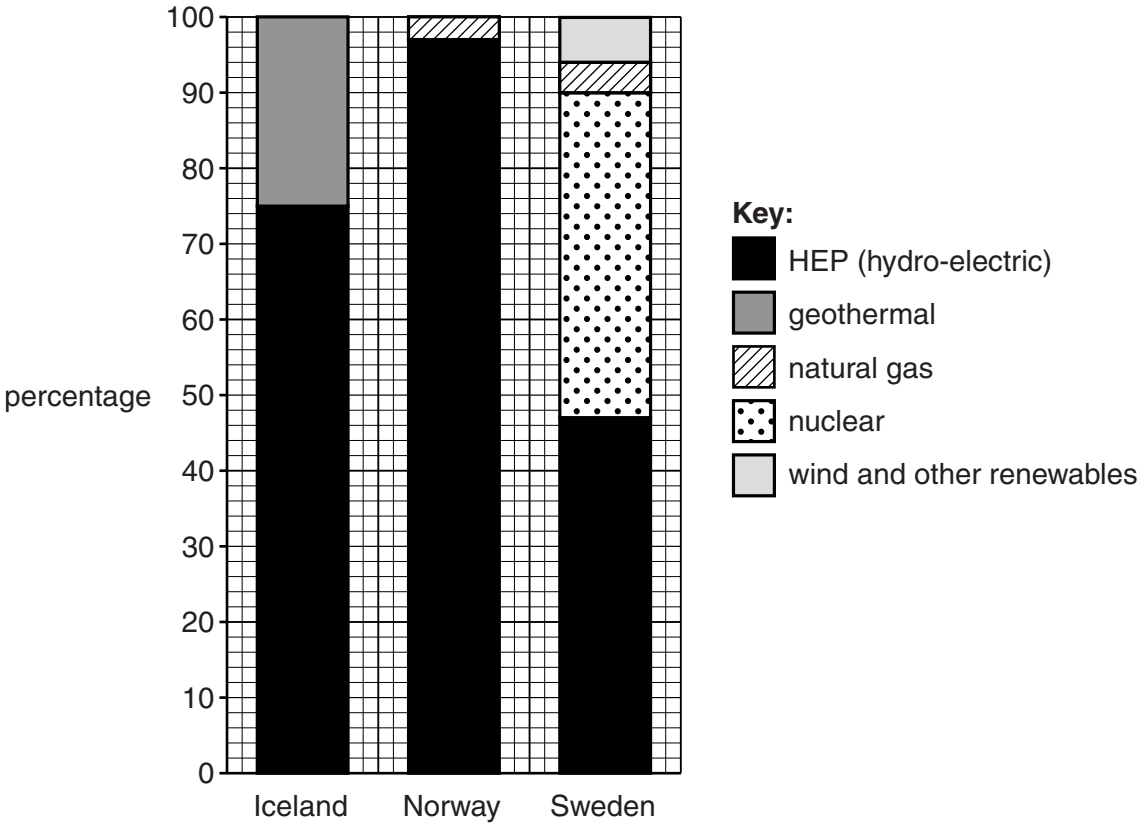
(f) Look at the divided bar graphs showing how electricity is produced in three north European countries. (They are named on the map of acid rain).

For Examiner's Use

Percentage of electricity production by source in Iceland, Norway and Sweden (2008)



(i) How much of Iceland's electricity comes from renewables?

.....[1]

(ii) Look back to the pie graph of world energy consumption in **part (a)**.

How important are renewables for electricity production in these three north European countries compared with their importance in total world energy consumption?

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(iii) Give reasons why types of renewable energy sources, and amounts used, vary greatly between different countries.

For Examiner's Use

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[Total: 40 marks]

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