UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

ENVIRONMENTAL MANAGEMENT **5014/11**

Paper 1 **May/June 2013**

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.
Electronic calculators may be used.

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 **24** printed pages.

UNIVERSITY of CAMBRIDGE International Examinations

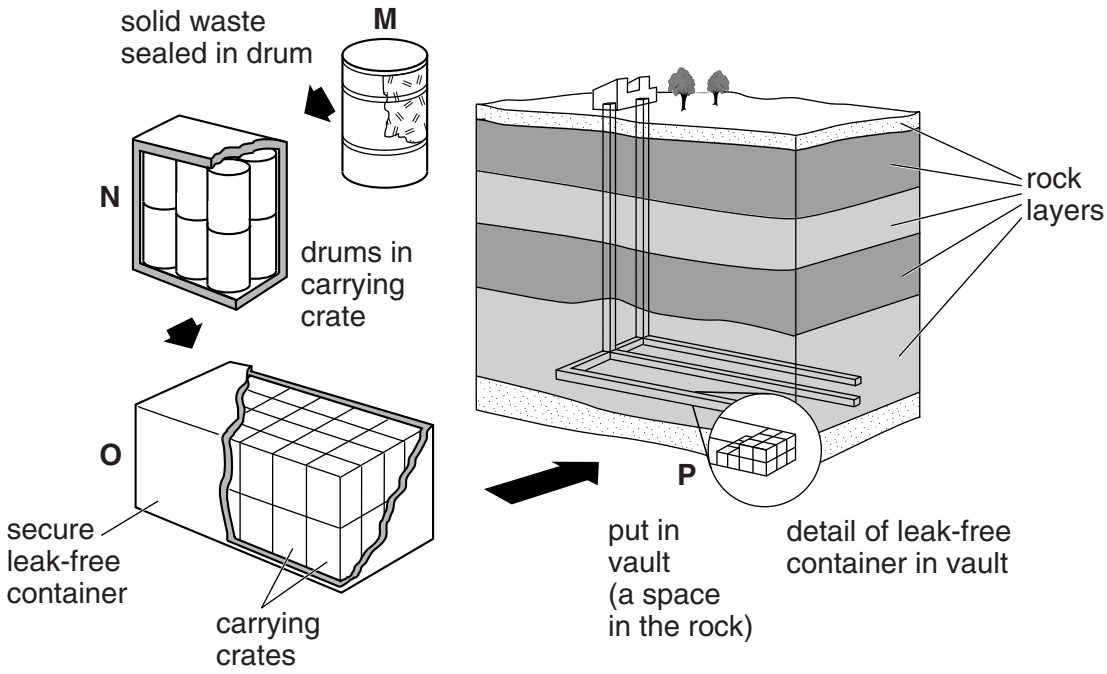
Section A

Answer **all** the questions.

For Examiner's Use

1 Look at the diagram below. **M**, **N**, **O** and **P** show one method of storing nuclear waste.

One method of storing nuclear waste



(a) (i) How many coverings are put over the nuclear waste before it is put in the vault?

.....[1]

(ii) From the diagram, describe the location of the vault where the waste will be finally stored.

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.....[2]

(iii) Explain why it is necessary to store nuclear waste in this way.

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(b) State **one** reason why some people think that nuclear power stations should not be built near plate boundaries.

For Examiner's Use

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.....[1]

(c) How can leaks from nuclear power stations in one country cause problems in another country?

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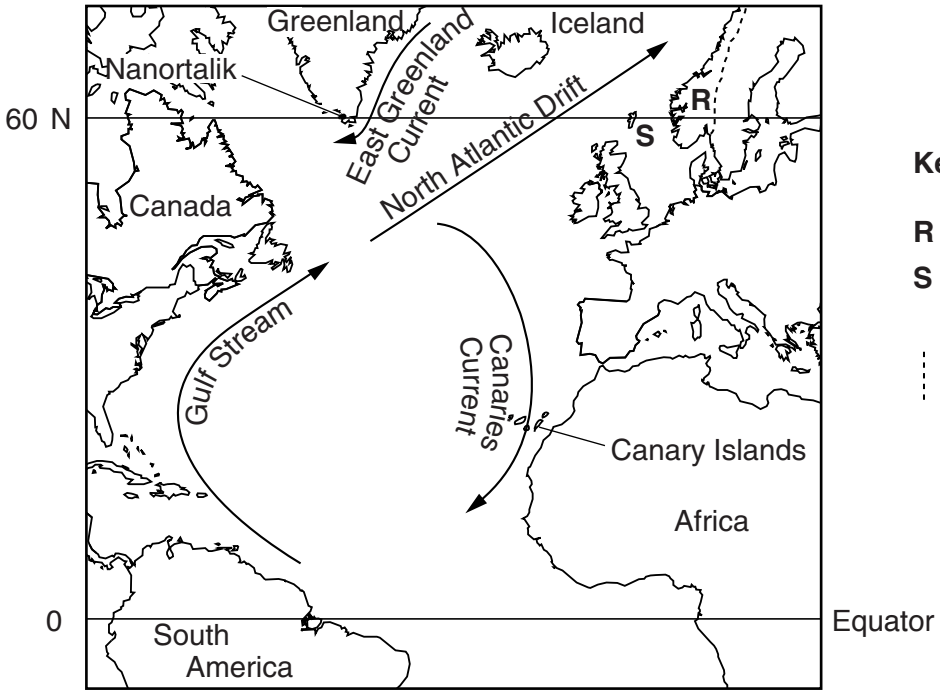
[Total: 10]

2 Look at the map which shows currents in the Atlantic Ocean. Use the map to answer the following questions.

For Examiner's Use

North Atlantic Ocean Currents



(a) (i) How does the map indicate that the Gulf Stream is a warm ocean current?

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.....[1]

(ii) The Canary Current and East Greenland Current are both cold currents. The East Greenland Current is colder. Explain why.

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.....[1]

(iii) Circle the letter **T**, **U**, or **V** to show which one of the following statements is most likely to be true.

T Nanortalik will be colder than the Shetland Islands in winter.

U The Canary Islands will be colder than Nanortalik in winter.

V The Shetland Islands will be colder than Iceland in winter.

[1]

(b) Insert the correct words to explain how and why the Canary Current affects rainfall on the nearby west coast of Africa. Choose one word from each of the following pairs:

For Examiner's Use

cooled	**condensation**	**decreases**
warmed	**evaporation**	**increases**

The moist wind from the sea is ..... as it crosses the Canary Current.

This causes ..... over the current.

In this way the Canary Current ..... rainfall on the coast of Africa. [3]

(c) Refer to the map of ocean currents on page 4.

(i) Explain why sea fishing takes place all year round off the coast of Norway but only in summer off Greenland.

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(ii) Suggest why people on the beaches of the Canary Islands sometimes pick up plastic waste from South America.

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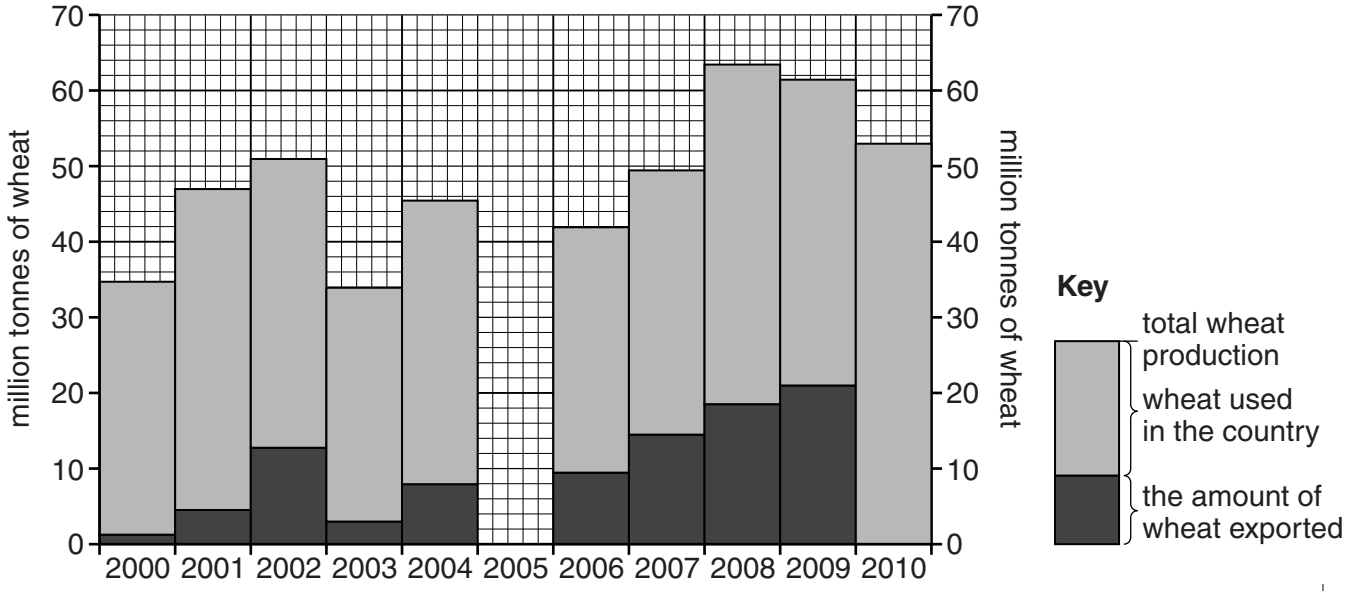
[Total: 10]

3 **(a)** Look at the graph of variations in wheat production and export in Russia from 2000 to 2010.

For Examiner's Use

Russia: wheat production and export 2000 – 2010



(i) The table gives information for 2005. Complete the graph.

wheat production (million tonnes)	48
exports (million tonnes)	10

[1]

(ii) How does the graph show that wheat production in Russia has, in general, increased over the period shown? Use values to support your answer.

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(iii) Agricultural production has increased like this in many countries. Explain why.

For Examiner's Use

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(iv) In 2010 drought decreased the total wheat crop by more than 20%. Use the graph to suggest **one** other year between 2001 and 2009 in which drought had an effect on wheat production.

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(b) The graph shows that wheat exports vary over the period shown. Suggest economic reasons to explain this.

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[Total: 10]

4 Look at the photograph taken in the Rocky Mountains of Canada.

For Examiner's Use

(a) Describe the vegetation shown on the photograph.

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(b) Explain how the types of trees seen on the photograph are adapted to the climate.

For Examiner's Use

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(c) **(i)** Describe the distribution of the forest on the photograph.

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(ii) Suggest why there is no vegetation in some parts of the land area shown on the photograph.

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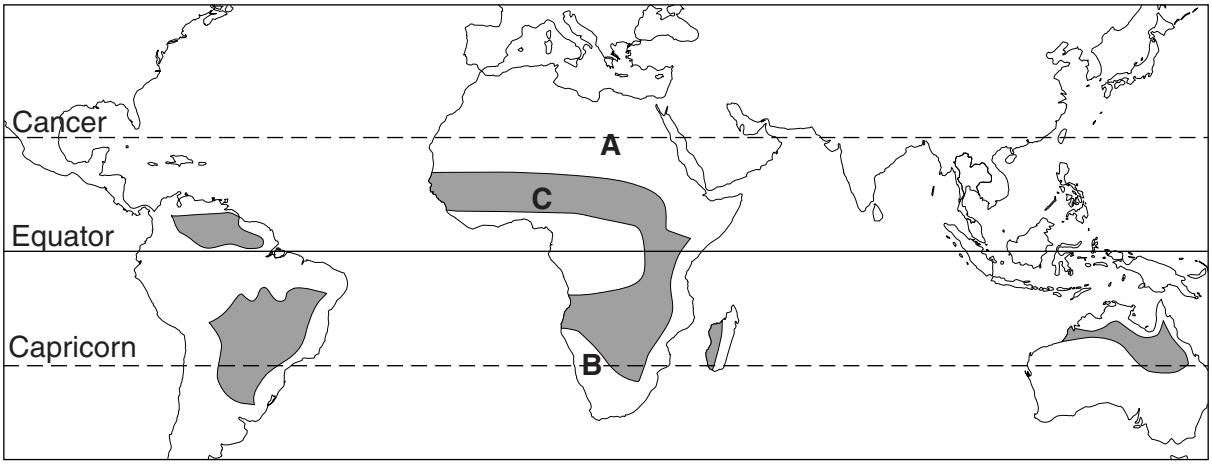
[Total: 10]

Section B

For Examiner's Use

Answer **both** questions.

5 (a) Look at the map showing the world distribution of savanna vegetation.



Key:

Savanna

(i) Name the continent with the largest area of savanna vegetation.

.....[1]

(ii) Describe the other main features of the distribution of savanna vegetation.

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.....[2]

(iii) Name the type of natural vegetation found in the areas marked **A** and **B** on the map.

.....[1]

(b) The savanna climate is tropical with a wet and dry season.

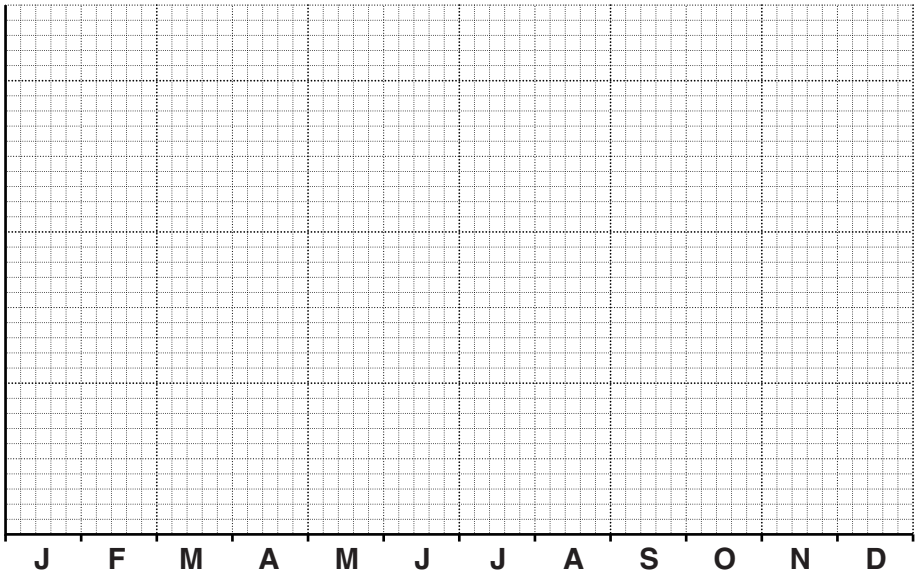
For Examiner's Use

Summary of climate in northern Nigeria
(area **C** on the map of savanna vegetation)

Temperature – mean monthly temperatures / °C											
J	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
22	24	28	31	30	28	26	25	26	27	25	22

Rainfall – averages

Wet season (May to September)	844 mm
Dry season (October to April)	26 mm
Total annual rainfall	870 mm



(i) Plot the mean monthly temperatures on the graph paper using a line graph. [3]

(ii) What percentage of total annual rainfall falls in the wet season? Circle **one** answer.

26 **54** **84** **97** [1]

(iii) Describe how the data shows that this area of savanna has a tropical climate.

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(iv) Describe how the appearance of the natural vegetation changes between wet and dry seasons in savanna lands.

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(v) Using both the temperature and rainfall data given, describe the advantages and disadvantages of a savanna climate for farmers growing crops.

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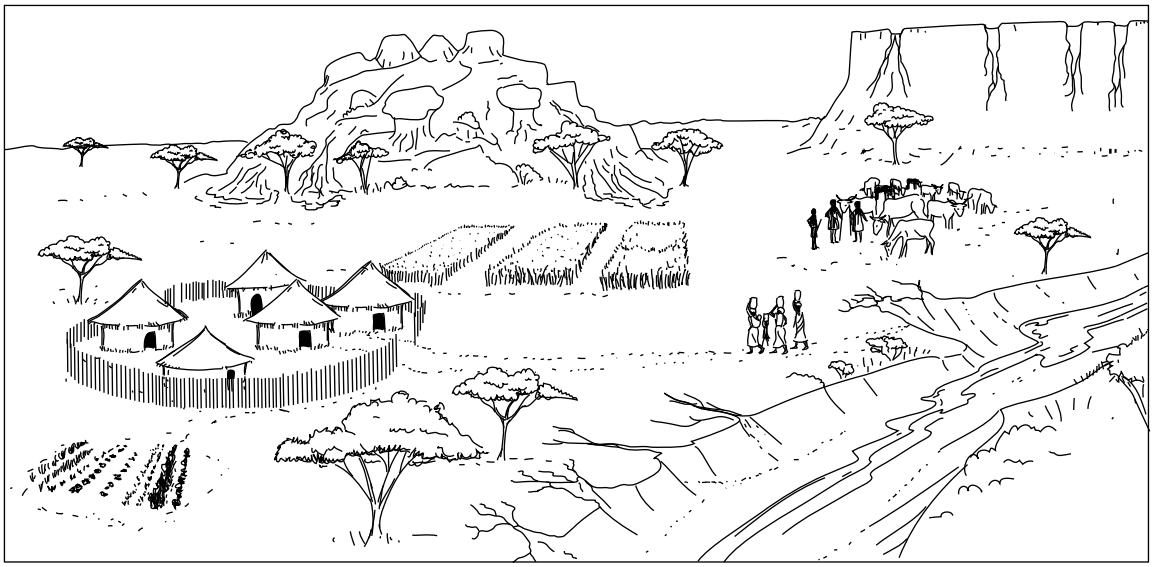
(c) Look at the sketch which shows how tribal groups use traditional subsistence farming in the savanna lands of West Africa.



(i) State the two ways in which farmers are making their living here.

1 ..... 2 ..... [1]

(ii) Looking at the sketch, describe how it shows that this is an area of traditional subsistence farming.

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.....[3]

(iii) How different would the sketch look if this was an area of modern commercial farming instead of traditional subsistence farming? Suggest **two** ways.

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.....[2]

(d) Population growth is increasing pressure on the land and the risk of soil erosion in many countries in the savanna lands of West Africa.

(i) State the evidence from the sketch which shows that this area is at high risk of soil erosion.

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.....[2]

(ii) Four strategies of soil conservation are

D tree planting **E** dry land farming

F rural development programmes **G** community participation

Choose two of these strategies. For each one, describe how it reduces the risk of soil erosion and helps with soil conservation.

Letter ....

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Letter ....

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(iii) Introducing strategies of soil conservation is difficult in areas like the one shown in the sketch on page 12. Suggest some of the difficulties.

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(iv) Give reasons why population growth continues to be high in developing countries like those in the savanna land of West Africa.

For Examiner's Use

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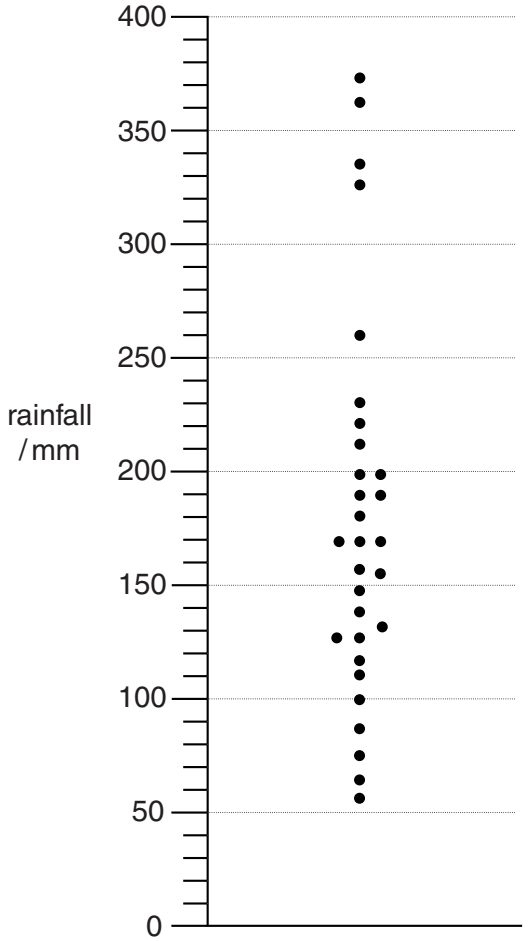
(e) Look at the rainfall diagram. It shows rainfall totals for the month of April at Kisumu in Kenya during a period of 30 years. Kisumu has a savanna climate and April is in the middle of the wet season.

For Examiner's Use

Each dot shows a rainfall total for April in one of the 30 years.

How August rainfall totals varied during a period of 30 years
Kisumu – Kenya



(i) Average (mean) monthly rainfall at Kisumu in April is 188 mm.
Show this average value on the diagram using a cross (**X**). [1]

(ii) What is the size of the difference in the amount of rainfall (in mm) between the wettest and driest months of April during this 30 year period?

..... mm. [1]

(iii) How and why do rainfall variations from year to year, like the ones shown in Kisumu, cause problems for subsistence farmers living in savanna lands?

For Examiner's Use

Refer to years with both higher and lower than average values.

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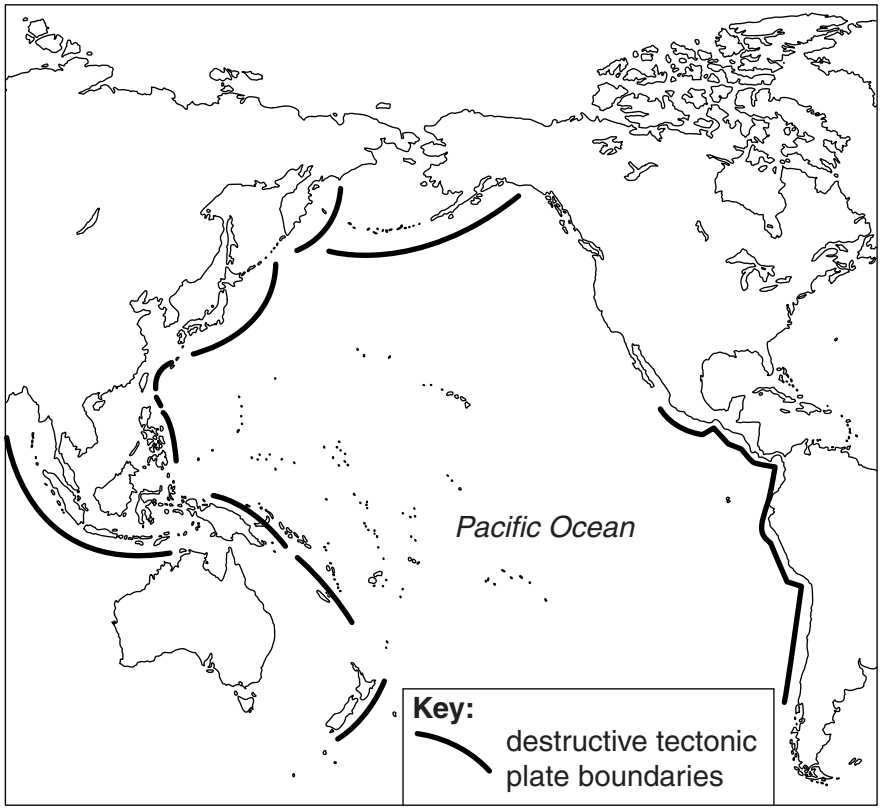
[Total: 40]

6 **(a)** Look at the map of the Pacific Ocean showing the location of destructive plate boundaries.



(i) Describe the distribution of destructive plate boundaries in the Pacific Ocean.

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.....[2]

(ii) State what is happening to the plates at destructive plate boundaries.

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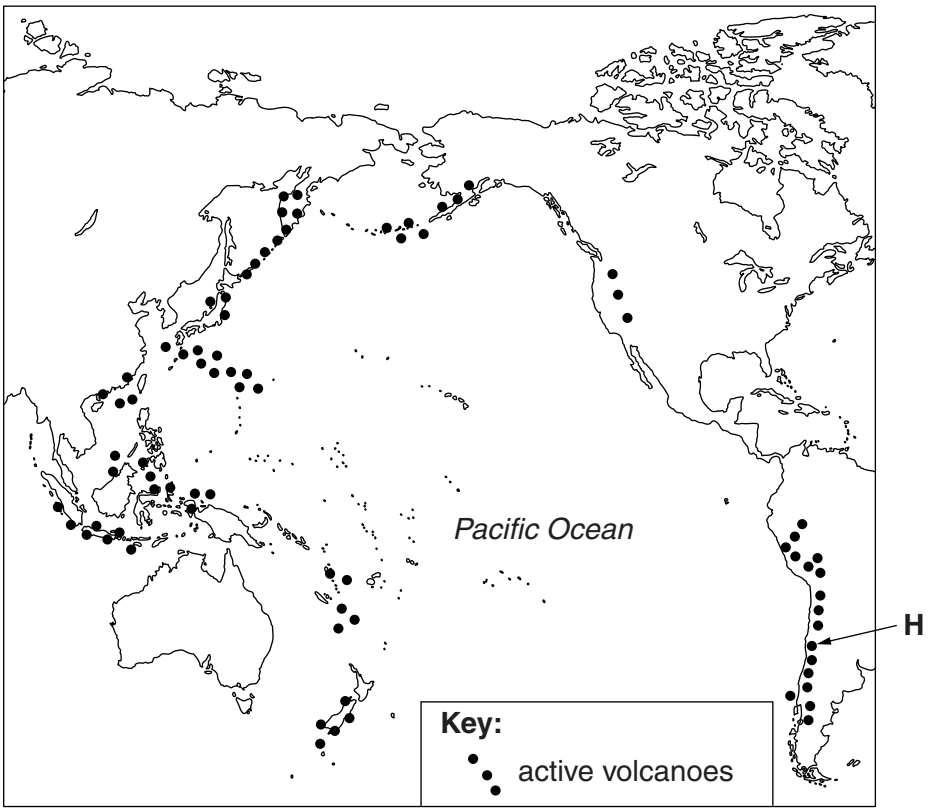
(b) Look at the map of the Pacific Ocean showing the location of active volcanoes.

For Examiner's Use



(i) Suggest why the distribution of active volcanoes in the Pacific Ocean is known as 'The Pacific Ring of Fire'.

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(ii) Explain how volcanoes are formed along destructive plate boundaries.

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(c) Read the information about a volcanic eruption in Chile in June 2011 (marked **H** on the map of active volcanoes).

For Examiner's Use

Volcano Puyehue erupts in Chile

Chile is the most volcanic country on Earth with over 3000 volcanoes, up to 80 of them active.

The eruption of the Puyehue volcano in central Chile on 4th June led to the Authorities evacuating 3,500 people to temporary shelters in safe areas. Large columns of smoke and ash, mixed with rocks, were thrown out 10 km into the air. Among the gases released were high levels of SO^2. There were no reports of any injuries. The previous eruptions from this volcano were in 1960 and 1921; these eruptions lasted for about two months.

The prevailing westerly winds took the ash cloud east over the Andes mountains into Argentina. One resident of the ski resort of Bariloche in Argentina said that 'Ash was falling like snow'. Levels of air pollution were high and people complained of sore eyes and skin, and breathing problems. They were advised to stay indoors.

Towns in central Chile, used to making money from tourists coming to see the stunning volcanic scenery, were mostly empty. The airport in Bariloche in Argentina was closed for days. This stopped high spending Brazilians from coming, at the worst time, because it was right in the middle of the main ski season.

By 11th June the ash cloud from Puyehue had reached Australia and New Zealand, over 6,000 km away. The cloud hovered in the air between 4,000 and 7000 metres closing Australia's two biggest international airports in Sydney and Melbourne. As late as 21st June, the ash cloud was still hanging around.

(i) Name all four emissions from the Puyehue volcano during its June 2011 eruption.

1 ..... 2 .....

3 ..... 4 .....

[1]

(ii) Despite this being a major volcanic eruption, no one was killed or even injured. Suggest **three** reasons for this.

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.....[3]

(iii) The economic effects of Puyehue's eruption were felt not only in Chile and neighbouring Argentina, but also thousands of kilometres away in Australia.

Why were the effects from this volcanic eruption international as well as national?

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(iv) Were these economic effects greater for the other countries than for Chile? Explain your views on this.

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(v) People living in central Chile and Bariloche complained of health problems caused by the volcano. Explain how these may have been caused.

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(d) Land close to and around the craters of active volcanoes is often barren wasteland, places where nothing will grow. One reason is the very acid ground due to frequent releases of toxic volcanic gases and liquids.

(i) The pH scale is shown below. Put a tick (✓) in **one** of the boxes to suggest the pH of a soil found in areas next to volcanic craters.

pH	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
tick one box															

[1]

(ii) State and explain **another** reason why areas on the higher slopes of active volcanoes cannot usually be used for farming.

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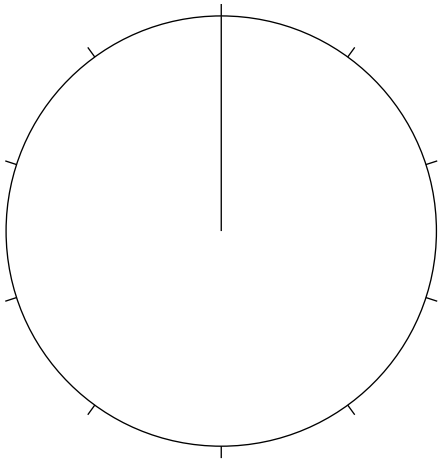
.....[2]

(iii) In areas further away from the crater, volcanic soils are some of the world's best soils for growing crops. Many of them have a loam soil texture;

33% sand: 33% clay: 34% silt

Complete the pie graph and key to show these characteristics of a loam soil texture.

Texture of a loam volcanic soil



Key:

Put your answers on the pie chart [3]

(iv) The pH scale is shown below. Put a tick (✓) in **one** of the boxes to suggest the pH of a volcanic soil with a loam texture.

pH	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
tick one box															

[1]

(v) Explain why a loam soil texture is good for crop growing.

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(e) The island of Java in Indonesia was made by volcanoes. Today it still has 45 active volcanoes. Its rich volcanic soils are some of the world's best for farming.
It has been suggested that even a stick planted in Java's volcanic soils will grow! Deposits from erosion on the mountains and from new eruptions are carried to Java's lowlands, forming thick layers of fertile sediment on the island's plains.

(i) Explain why fertile volcanic soils are present almost everywhere in Java.

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.....[2]

(ii) Look at the information about the island of Java.

Java in Indonesia

Area	Population	Population density	Birth rate	Death rate
7% of Indonesia	140 million	1025 per km²	18 per 1000	7 per 1000

The total population of Indonesia is 235 million. Approximately what percentage of these live on the island of Java? Circle **one** answer.

40% 50% 60% 70% [1]

(iii) What information shows that Java is a very overcrowded island compared with the rest of Indonesia?

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.....[1]

(iv) What is the rate of natural increase of population in Java?

.....[1]

For Examiner's Use

(v) The government of Indonesia is increasingly worried about environmental damage in Java as overcrowding forces subsistence farmers to extend cultivation to steep mountain slopes and forest reserves.

J, **K** and **L** are three ways that have been suggested to tackle the problem.

J	**K**	**L**
Manage the land Educate farmers about strategies of soil conservation	Manage population increase Put more money into family planning programmes	Promote economic development Support growth of industries in the large cities

In your view, which one of these ways would be the best for solving the problem of environmental damage in Java? Explain your view.

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.....[4]

[Total: 40]