UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER					

ENVIRONMENTAL MANAGEMENT **5014/11**

Paper 1 **October/November 2011**

2 hours 15 minutes

Candidates answer on the Question Paper.

Additional Materials: Ruler
Protractor

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 **25** printed pages and **3** blank pages.

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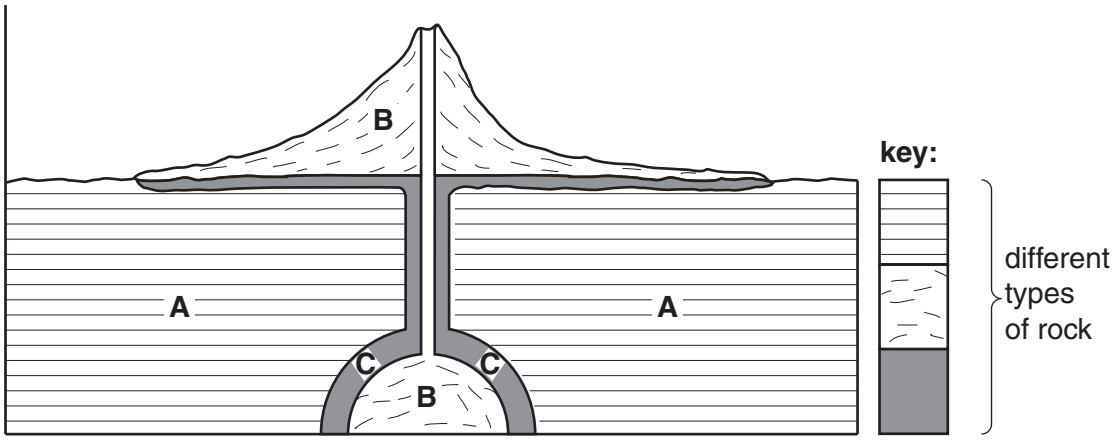
Section A

For Examiner's Use

1 **(a)** The diagram shows an area of volcanic activity.



(i) The diagram shows igneous, sedimentary and metamorphic rocks. Identify each of these.

A .....

B .....

C ..... [2]

(ii) In which of these types of rock is coal found? Give reasons for your answer.

.....

.....

..... [2]

(b) Choose **two** types of rock which are used in industry. Name each and describe how it is used.

rock type 1 .....

use .....

.....

rock type 2 .....

use .....

..... [3]

(c) Why do some people object to the quarrying of rocks?

For Examiner's Use

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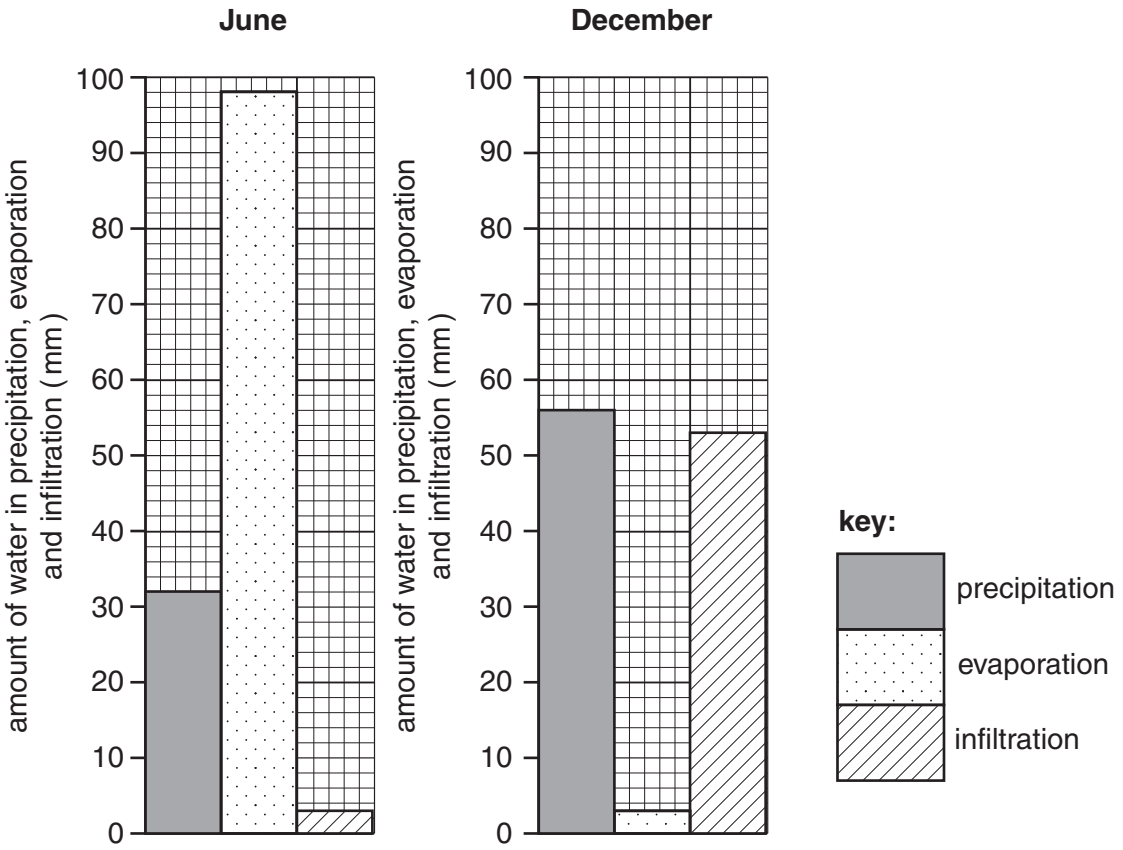
..... [3]

For Examiner's Use

2 **(a)** Look at the bar graphs, which show measurements of precipitation, evaporation and infiltration for two months recorded in the same UK location in June (summer) and December (winter).



(i) How many millimetres of water were evaporated into the atmosphere in June?

..... mm [1]

(ii) How many more millimetres of water infiltrated into the soil in December than in June?

..... mm [1]

(iii) Using the bar graphs only, explain why infiltration was high in December.

.....

..... [1]

(iv) Explain how and why farmers would have a problem if the conditions shown on the bar graph for June continued for several months.

problem .....

reasons for the problem .....

.....

..... [3]

(b) Explain how vegetation reduces soil moisture and adds to the water vapour content in the atmosphere.

For Examiner's Use

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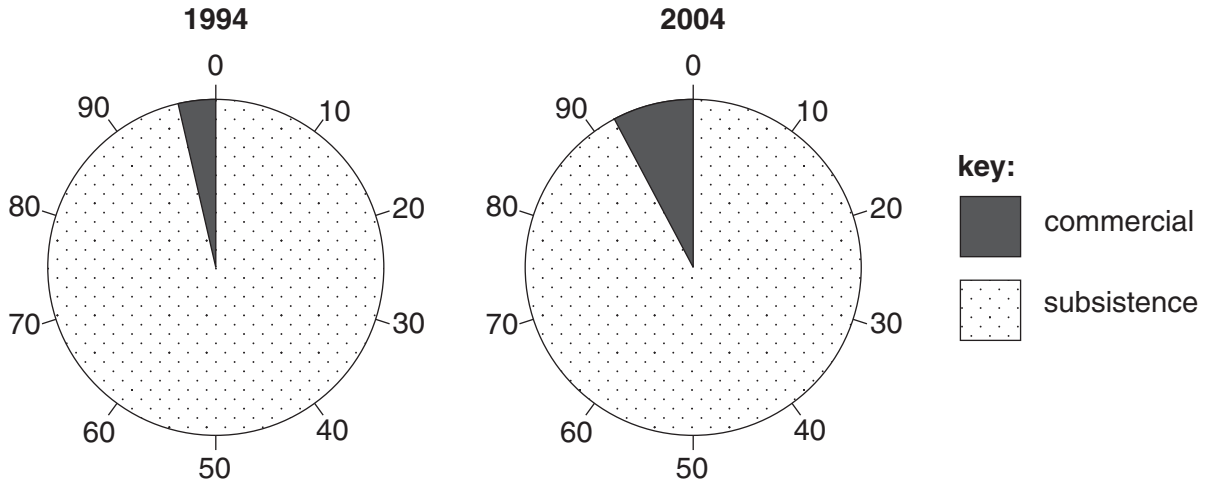
For Examiner's Use

3 **(a)** The pie graphs show information about types of crop farming in Botswana for two years.



(i) What percentage of cropland was used by commercial farms in 2004?

..... % [1]

(ii) Describe the changes in the percentages of cropland used by subsistence and commercial farmers from 1994 to 2004.

.....

..... [1]

(b) The table shows the number of farms and the average maize yield per hectare for subsistence and commercial farms in Botswana in 2004.

type of farm	number of farms in 2004	average yield per hectare (metric tonnes)
subsistence	51 833	170
commercial	21	531

source: Ministry of Agriculture Botswana

(i) How much greater was the average maize yield per hectare on the commercial than the subsistence farms?

..... metric tonnes per hectare [1]

For Examiner's Use

(ii) Explain why crop yields per hectare are greater on commercial than subsistence farms.

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.....[4]

(c) Which of these types of crop farming is likely to be more harmful to the environment? Explain your answer.

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.....[3]

For Examiner's Use

4 **(a)** **(i)** Explain the meaning of *dry land farming.*

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.....[1]

(ii) Some of the methods used in dry land farming are listed below.

- mulching (covering the surface with dead plants or bark)
- planting crops only in alternate years (with a mulch on the soil in the year between)
- strip farming (strips of crops between uncultivated land)

Explain how these methods help crops to grow better in dry areas.

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.....[3]

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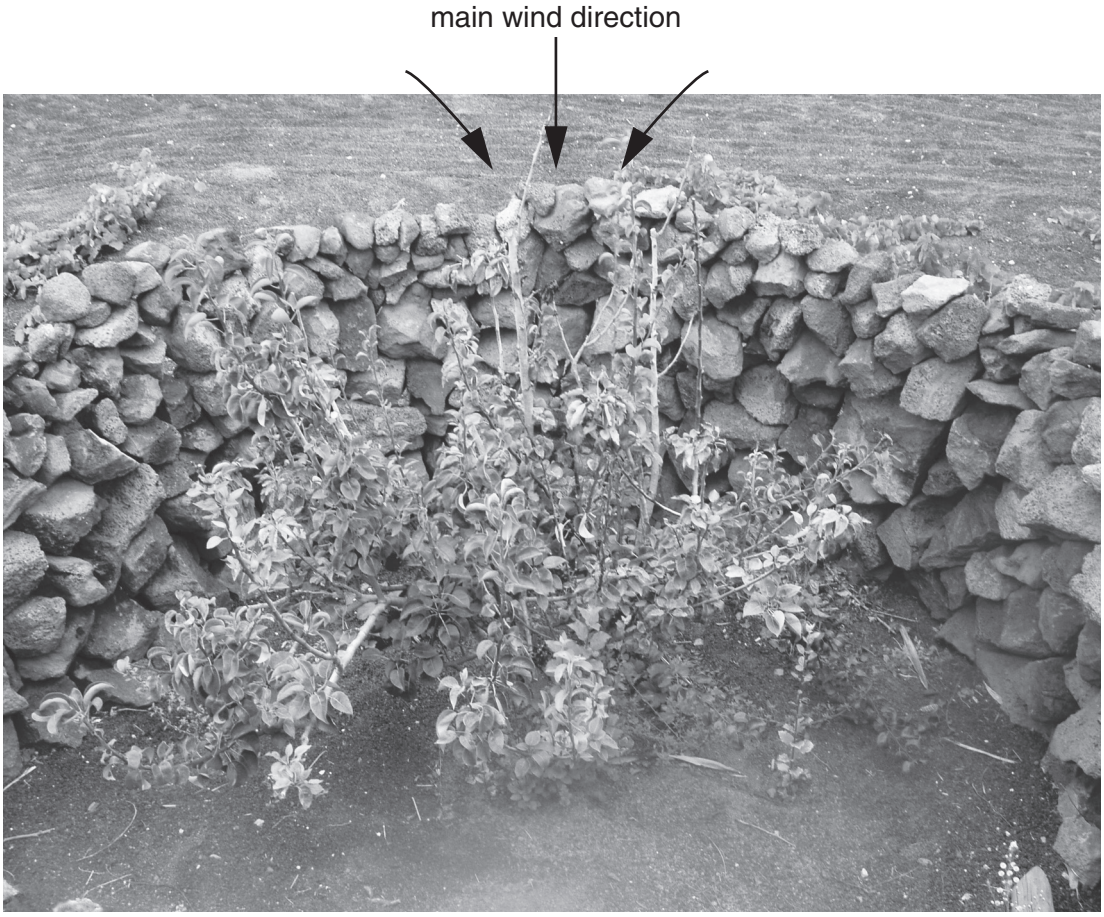
For Examiner's Use

(b) Look at the photograph, which shows a method of dry land farming used on the hot, dry island of Lanzarote.



Describe what the farmer has done and why it will improve the environment for the plant.

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..... [3]

(c) Explain the likely effects of overcultivation in dry areas.

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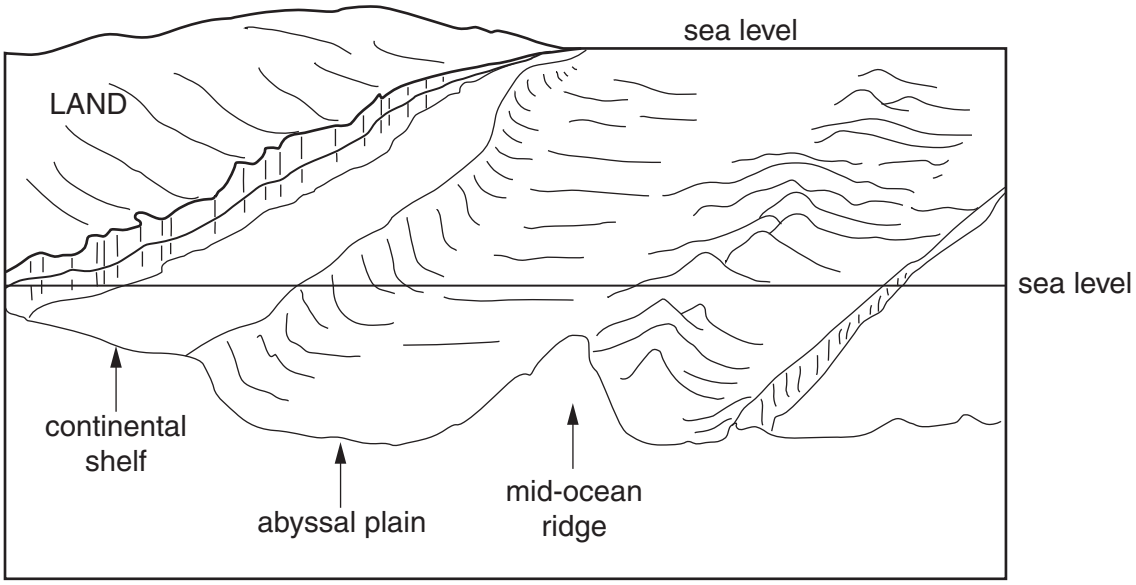
..... [3]

Section B

For Examiner's Use

5 **(a)** Look at the cross-section part of the ocean floor.

Cross sectional diagram of part of the ocean floor



(i) On the diagram, shade in the area of ocean floor which forms the continental shelf. [1]

(ii) State one major physical difference between the continental shelf and the rest of the ocean floor.

.....

..... [1]

(iii) Explain how mountain ranges on the ocean floor, like the mid-ocean ridge shown on the cross-section, are formed.

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..... [2]

For Examiner's Use

(iv) Information about the continental shelf;

- 10 per cent of the total area of the oceans
- over 50 per cent of the oceans' biological productivity
- over 95 per cent of the world's marine fish catch

Explain why the world's most productive ocean fishing grounds are found on continental shelves.

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..... [4]

(v) Describe **two** factors which limit human exploitation of potential resources in the rest of the ocean beyond the continental shelf.

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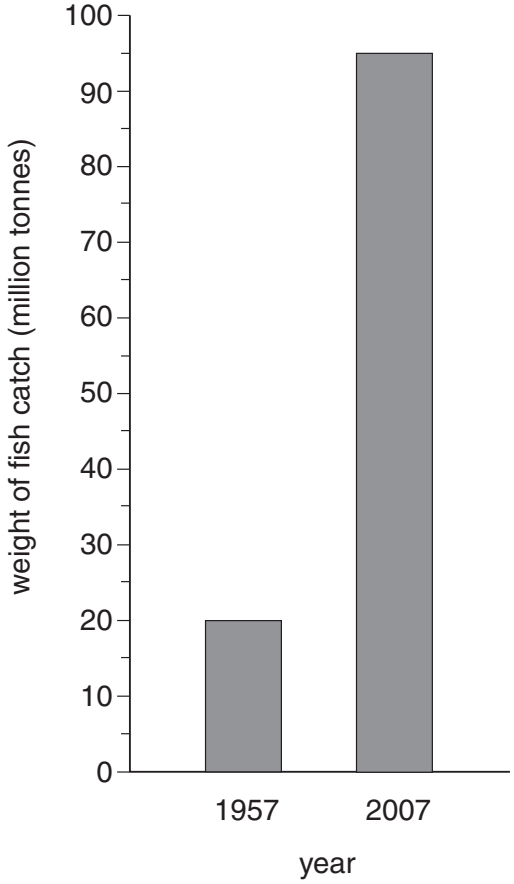
..... [2]

For Examiner's Use

(b) **(i)** Look at the information about the world fish catches.

Total world marine fish catch



What was the increase in total catch between 1957 and 2007?

.....

..... [1]

(ii) State **two** different human factors for this big increase in total world fish catch.

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..... [2]

For Examiner's Use

(iii) In the Pacific Ocean off the coast of Peru, the effect of El Nino results in large variations in the size of fish stocks and fish catches from year to year.
Explain the natural factors which cause stocks of fish, such as anchovy, to be more plentiful in some years than in others off the coast of Peru.

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..... [3]

(iv) Overall, which is more important for explaining the big increase in world fish catch – human or natural factors? Explain your answer.

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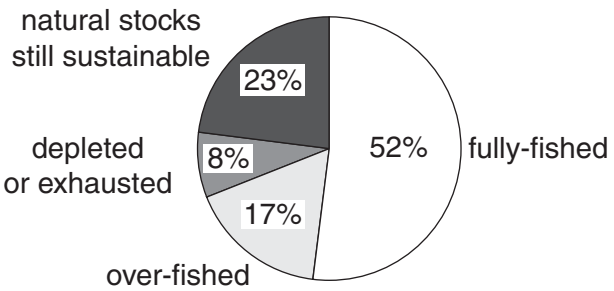
..... [3]

For Examiner's Use

(c) Look at the information about the world's main commercial fish species.

World commercial fish species



A Successfully farmed	B Natural stocks still sustainable	C Natural stocks in decline from overfishing
e.g. trout oysters	e.g. herring sardines whitebait mussels	e.g. tuna cod plaice monkfish

(i) Explain what is meant by 'natural stocks still sustainable'.

.....

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..... [2]

(ii) From the pie graph, calculate the total percentage of present catch levels that cannot be sustained. Show your working.

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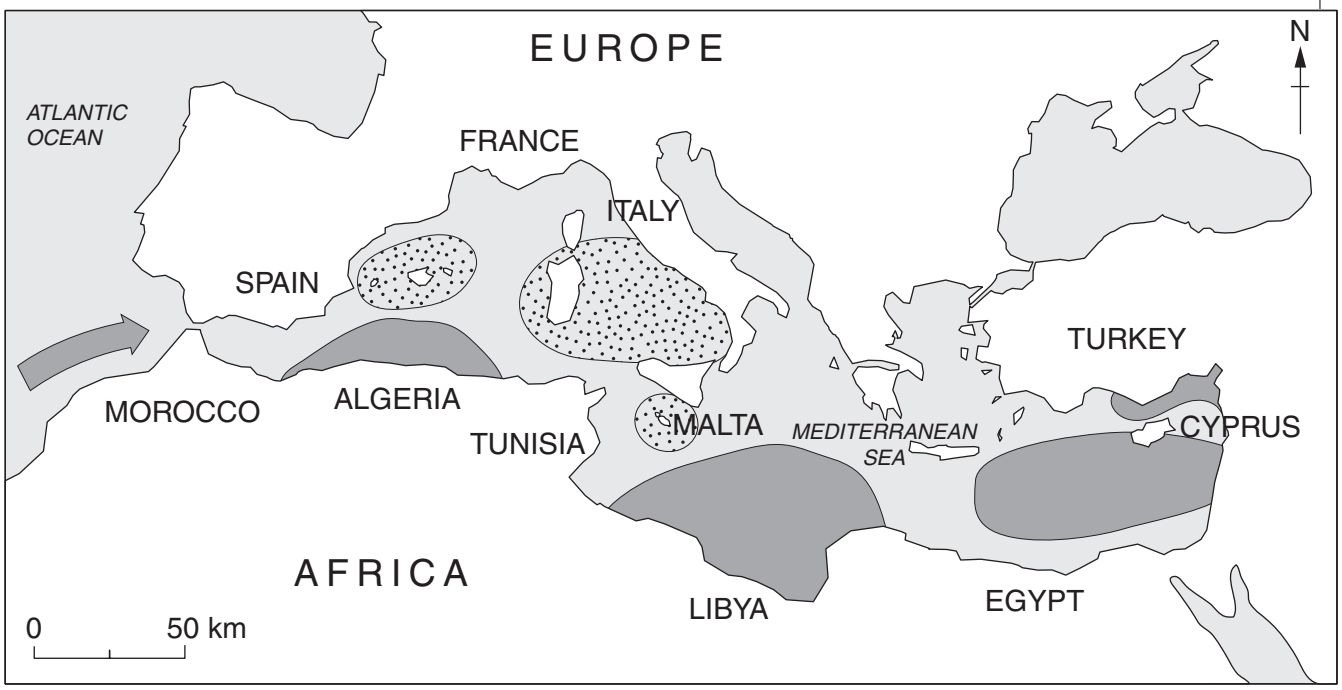
..... [2]

For Examiner's Use

(iii) Each year over 1 million blue fin tuna migrate into the Mediterranean Sea for one month to breed. The map shows locations of the main breeding grounds.

Mediterranean Sea



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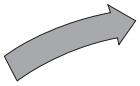
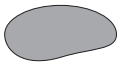
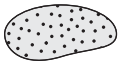

tuna migration route for breeding


present breeding grounds of tuna


exhausted breeding grounds of tuna

Where do the blue fin tuna migrate from?

.....[1]

(iv) Describe the location of their present breeding grounds.

.....

.....

.....[2]

(v) What is the evidence from the map for tuna being listed in box **C**?

.....

.....[1]

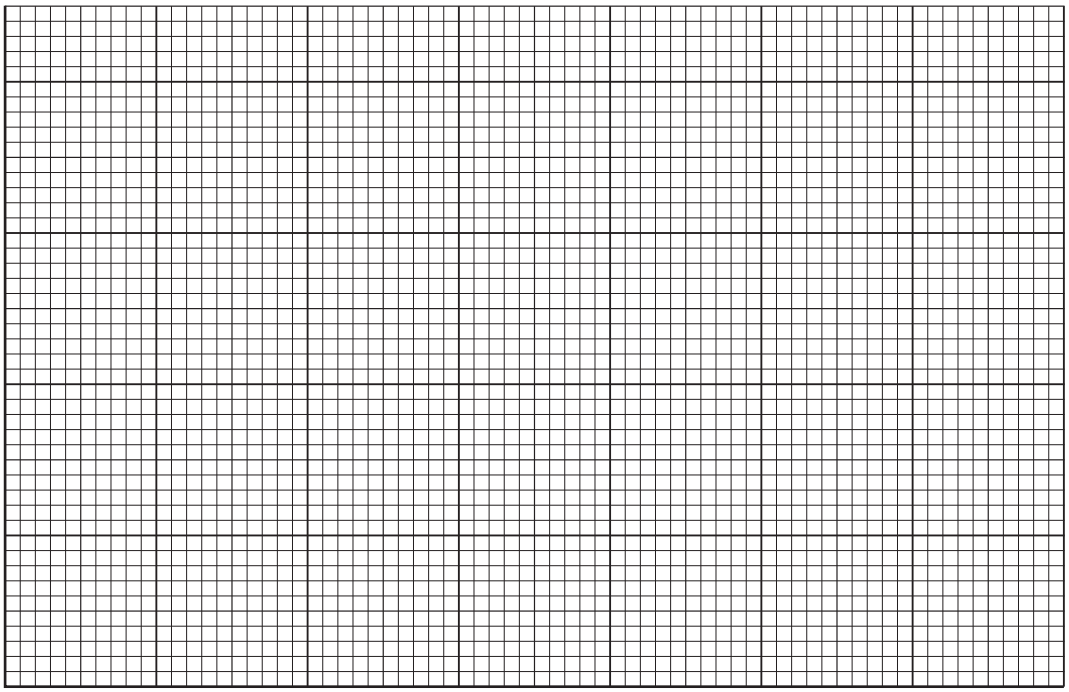
For Examiner's Use

(vi) Weight of breeding age tuna remaining in the Mediterranean Sea 1970–2005
(thousand tonnes)

1970	180	1990	150
1975	220	1995	160
1980	150	2000	70
1985	130	2005	50

In the grid below draw a line graph to show these values.

weight of tuna
(thousand tonnes)



years

[3]

(vii) Describe the evidence from the values and the graph for tuna being listed in box **C**.

.....

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.....[3]

For Examiner's Use

(d) Information about the methods used to catch blue fin tuna in the Mediterranean Sea is given below.

Old fishing methods – 10 per cent of today's total catch	**New fishing methods** – 90 per cent of today's total catch
• Rows of nets guide the tuna into a net hung between four old wooden fishing boats • The boats close in and trap the tuna • The tuna are killed and sold off to Asian buyers, most of it for sushi • Traditional activity, undertaken by fishermen from small coastal ports in Spain and Morocco	• Large boats with hi-tech equipment catch the tuna in giant nets • Tuna dragged back live to cages off the coast where they are fattened up for several months • These are known as 'tuna ranches', operated by large multi-national companies • Tuna from the ranches are loaded straight on to ships bound for Japan, without calling at any port

(i) Explain why more tuna can be caught using the new fishing methods instead of the old.

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..... [3]

(ii) The EU (European Union) has quotas for the amount of tuna that can be caught each year. EU officials complain that these are being ignored because they are unable to monitor tuna fish catches properly.

Why is it more difficult for EU officials to control the amount of tuna being caught by boats using the new fishing methods than for those still using the old methods?

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..... [2]

(iii) The new fishing methods are described as 'industrial fish farming'. Explain why.

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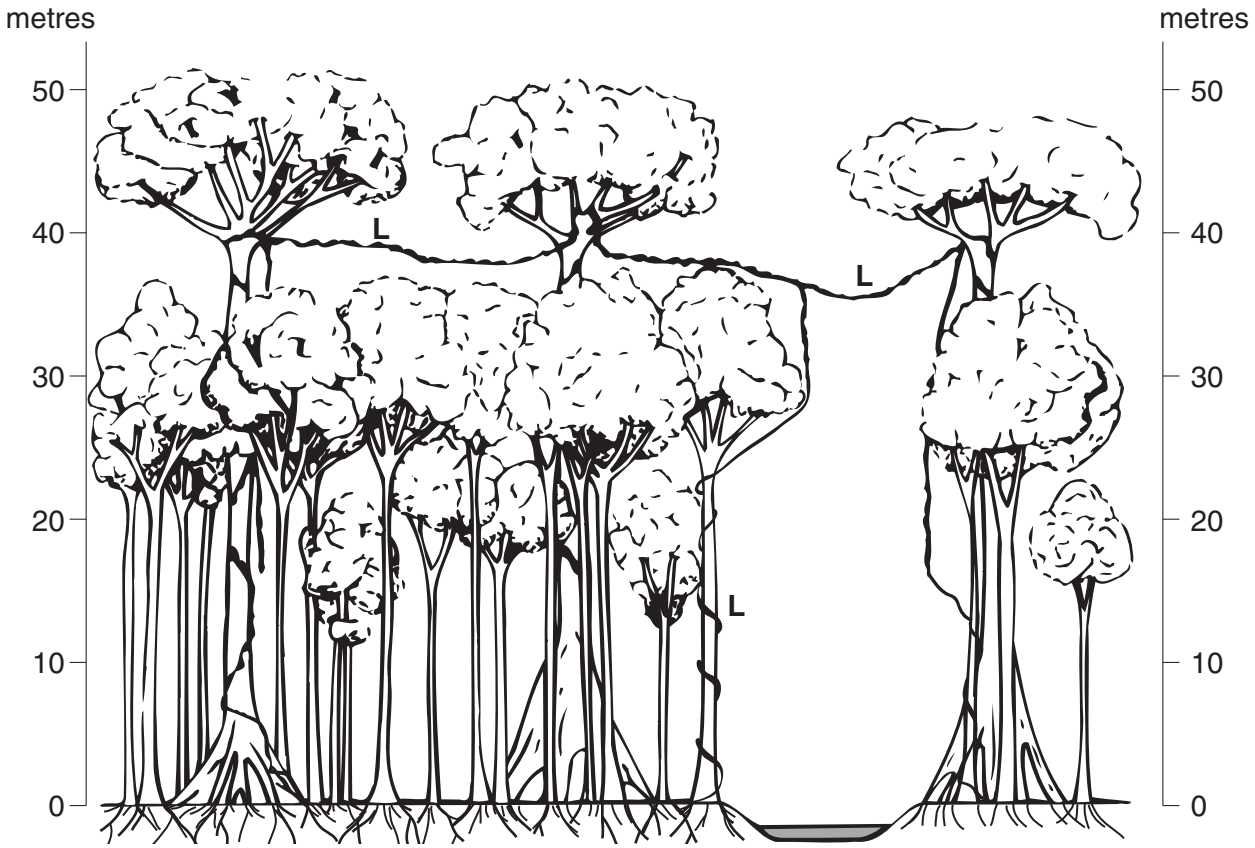
..... [2]

[Total: 40 marks]

For Examiner's Use

6 **(a)** Look at the sketch showing vegetation cover in a tropical rainforest ecosystem.

Tropical rainforest



(i) How tall are the emergents (tallest trees) shown in the sketch?

.....[1]

(ii) State the height of this forest's canopy layer.

.....[1]

(iii) Describe two characteristics of the roots of the tall trees in tropical rainforests.

.....

.....

.....[2]

For Examiner's Use

(iv) Tropical rainforests are very competitive plant communities. Describe the evidence shown in the sketch and explain why tropical rainforests are competitive communities.

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..... [4]

(v) Woody creepers (lianas) are labelled **L** on the sketch. Describe the niche occupied by them in the forest and explain how their adaptation allows them to survive in this competitive community.

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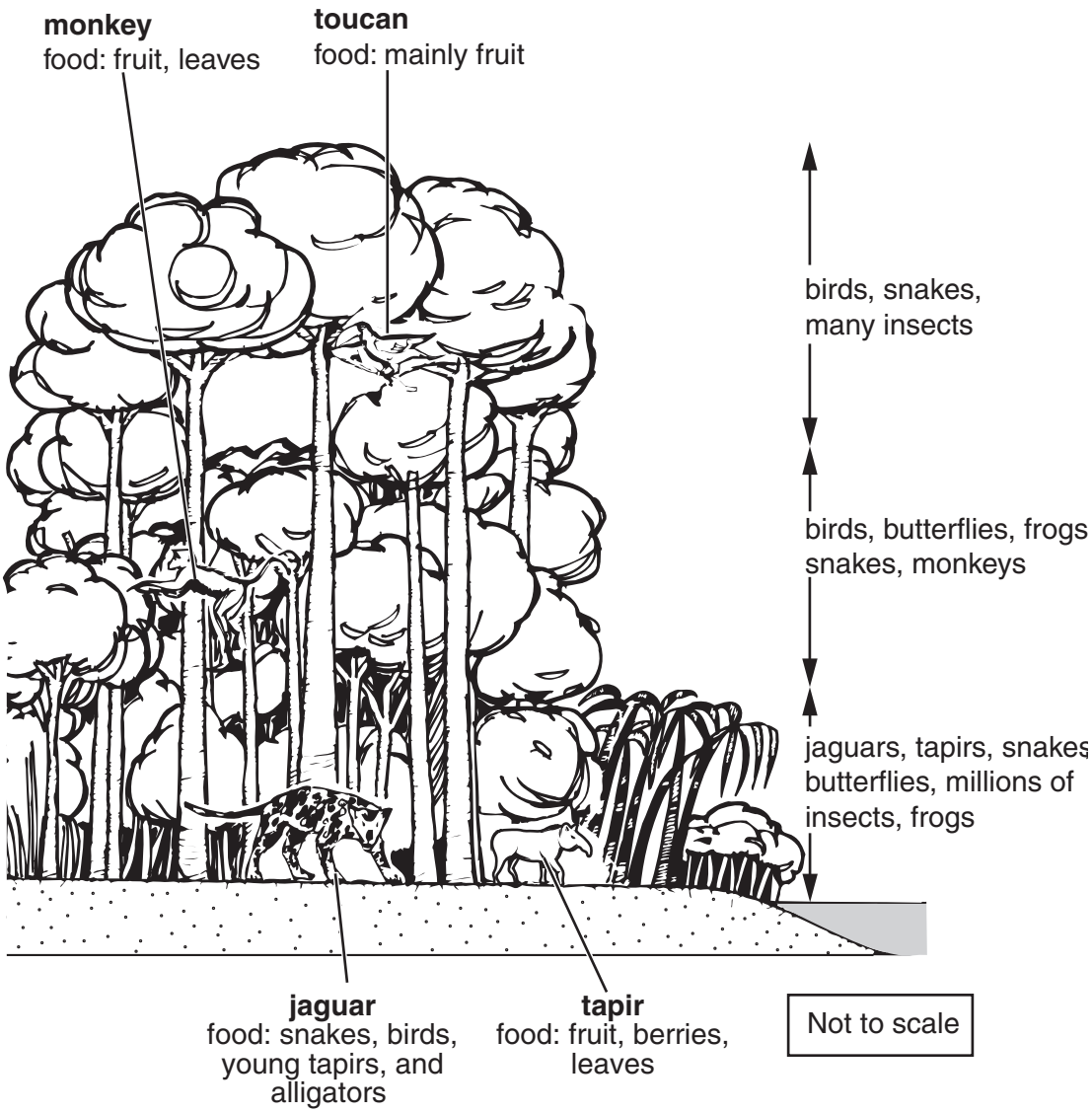
..... [2]

For Examiner's Use

(b) Information about some of the species which live in tropical rainforests is given on and next to the sketch below.

Tropical rainforest species



(i) Rainforests provide a great variety of habitats for the many different species which live there. Choose two different rainforest habitats. State and explain the differences between them as habitats for forest creatures.

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..... [4]

For Examiner's Use

(ii) Using the information given, complete the rainforest food web by filling the spaces provided for examples and drawing in arrows.

Rainforest food web

groups	species
tertiary consumers	humans
secondary consumers	.....
primary consumers	..... , ... , ...
producers (plants)	..... , ... , ...
	bacteria, fungi

[4]

(iii) Explain why humans are successful tertiary consumers. Consider local tribes and users from outside the forest.

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.....[2]

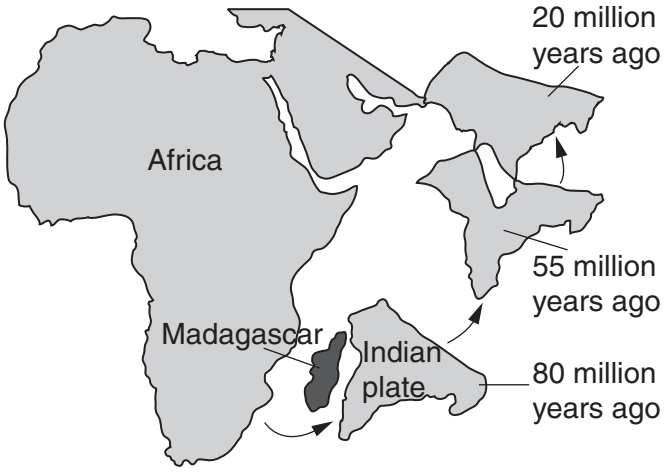
(iv) Living in the soil are bacteria and fungi. What is the name for this group of species in an ecosystem food web?

.....[1]

For Examiner's Use

(c) The island of Madagascar split apart from India about 100 million years ago.

The Indian plate and its movement north



(i) Name the theory used by geologists to explain the northward movement of India.

.....[1]

(ii) Where and why has the movement of India led to mountain building?

.....

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.....[2]

(d) Today's animals and plants in Madagascar evolved in isolation from other land masses. As a result,

- 90 per cent of its plants and 70 per cent of its animals are *endemic*
  – this means they are unique to Madagascar, found nowhere else.

- it is called a *conservation hotspot*
  – this means a place with very diverse species, threatened by destruction

Many species have already become extinct by uncontrolled hunting. Also 80 per cent of the island's dense forest cover has already been lost. What remains is under threat from mining and logging.

For Examiner's Use

(i) Should people be concerned about the loss of plant and animal species in Madagascar? Explain your view on this.

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..... [4]

(ii) Organisations with an interest in species conservation include

IUCN WWF CITES

Choose one of them and briefly describe the type of conservation work it does.

name of organisation .....

.....

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..... [3]

For Examiner's Use

(e) In 2003 the Government of Madagascar began to take conservation seriously for the first time. The plan was to increase the area under conservation and to support better the already existing National Parks. Half the tourist revenue from the National Parks was to go to surrounding communities. The Parks and Reserves will give employment to local people in tourist jobs such as guides. Madagascar is a country of poor people. More than half of them live on less than US$1 per day.

(i) The plan for the National Parks is an example of ecotourism. What is meant by ecotourism?

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..... [2]

(ii) How might this plan increase the chances of the forests and wildlife of Madagascar being preserved?

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..... [2]

For Examiner's Use

(f) One plan put forward in global climate negotiations is that developing countries, such as Madagascar, should be paid by richer developed countries for **not** clearing their rainforests.

(i) Describe how they think this plan will help to slow down local and global climate changes.

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(ii) How good or bad an idea is this plan? Explain its possible advantages and disadvantages.

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..... [5]

[Total: 40 marks]

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