Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

ENVIRONMENTAL MANAGEMENT **5014/01**

Paper 1

October/November 2006

Candidates answer on the Question Paper.
Additional Materials: Ruler (cm/mm)
Protractor

2 hours 15 minutes

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.

Answer **all** questions.

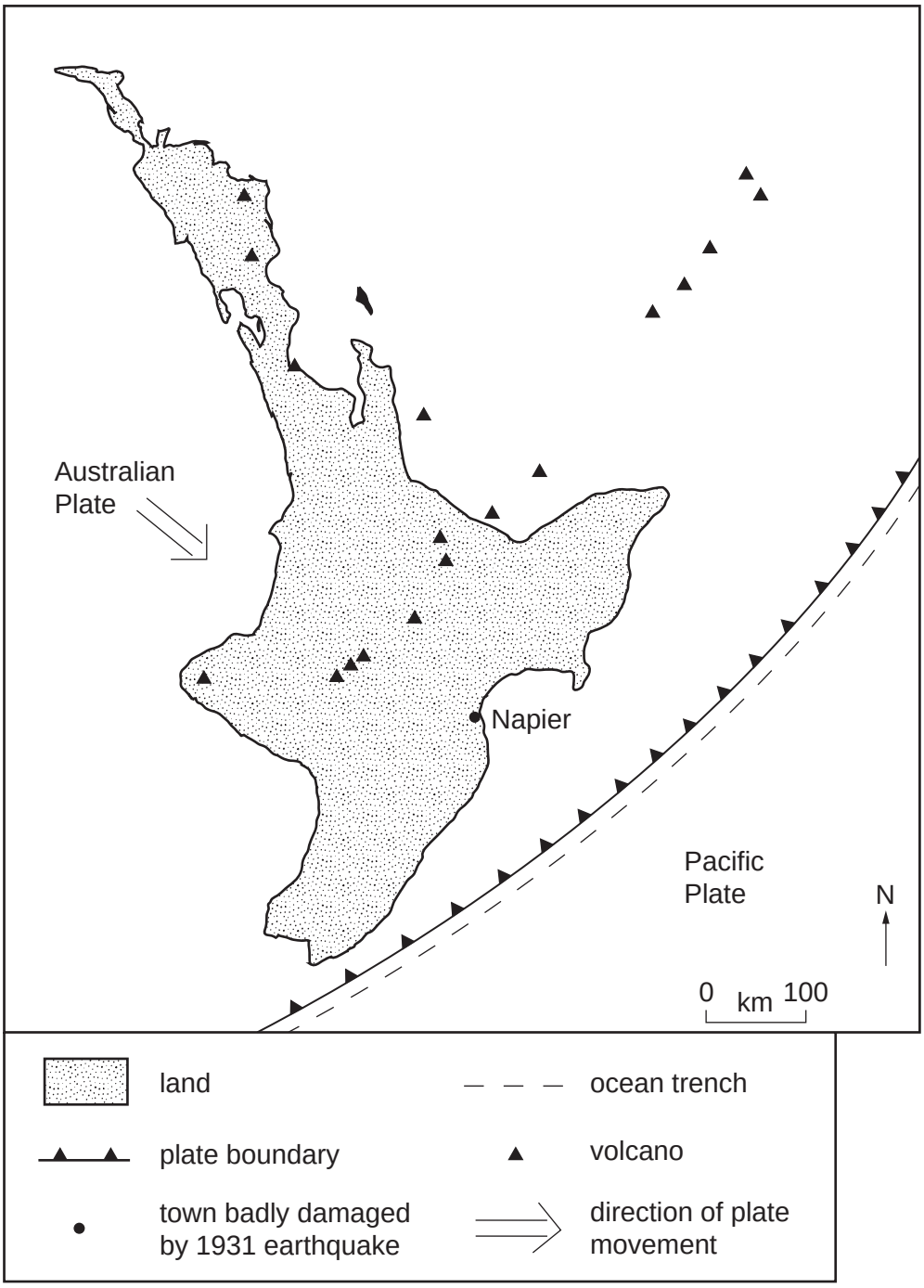
The number of marks is given in brackets [ ] at the end of each question or part question.
At the end of the examination, fasten all your work securely together.

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

This document consists of **25** printed pages and **3** blank pages.

Section A

1 **(a)** The map shows part of a plate boundary and some of the features caused by plate movement in North Island, New Zealand.



(i) What type of plate boundary is this?

.....[1]

(ii) Which oceanic plate is shown in the map?

.....[1]

(iii) Add an arrow to the map to show the likely direction of movement of the Pacific Plate. [1]

(b) In 1931 an earthquake destroyed much of the town of Napier. Explain why a powerful earthquake can affect the economy of a town or city.

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.....[4]

(c) Methods used to reduce the impact of future earthquakes include rebuilding the settlement on a different site and strengthening the structure of buildings. Suggest disadvantages of **one** of these methods.

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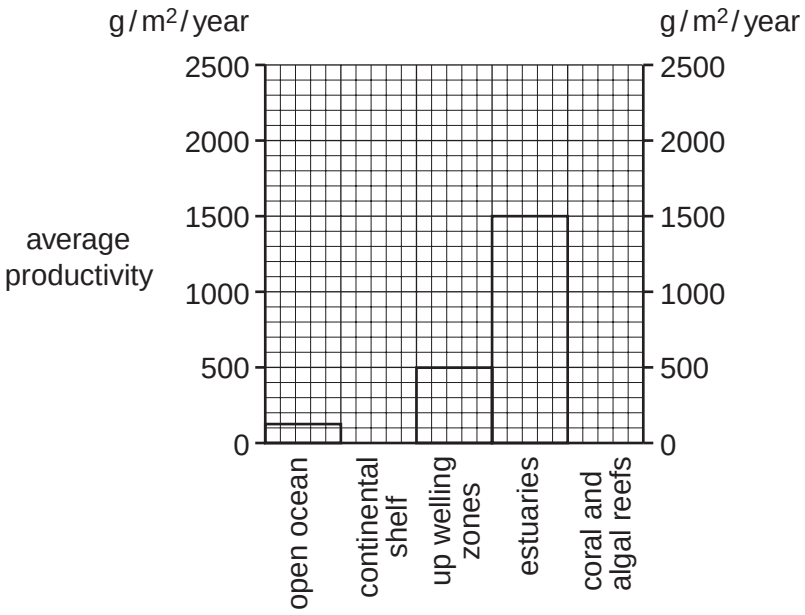
.....[3]

2 **(a)** The graph shows the average productivity of marine ecosystems.



(i) Complete the graph using the figures below:

ecosystem	average productivity (g/m^2/yr)
continental shelf	360
coral and algal reefs	2500

[1]

(ii) Why can changes in one marine ecosystem easily lead to changes in another marine ecosystem?

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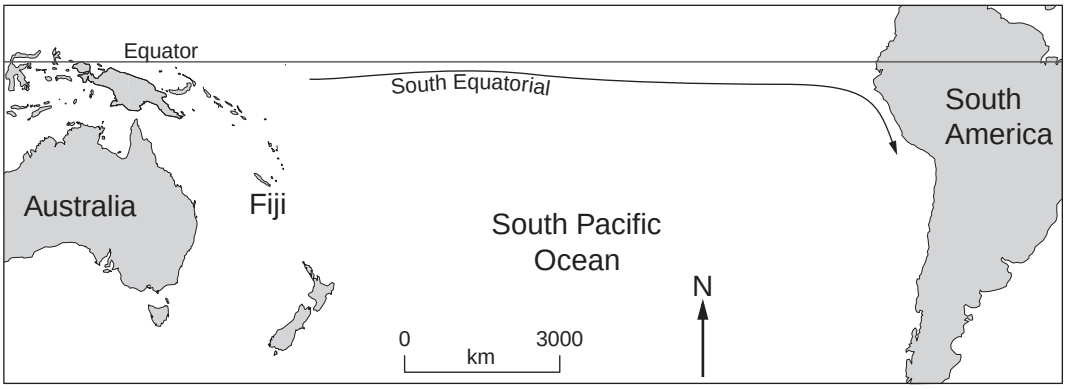
.....[1]

(b) The map shows an El Nino event in the Southern Pacific Ocean.



key

ocean current

land

Describe and explain El Nino.

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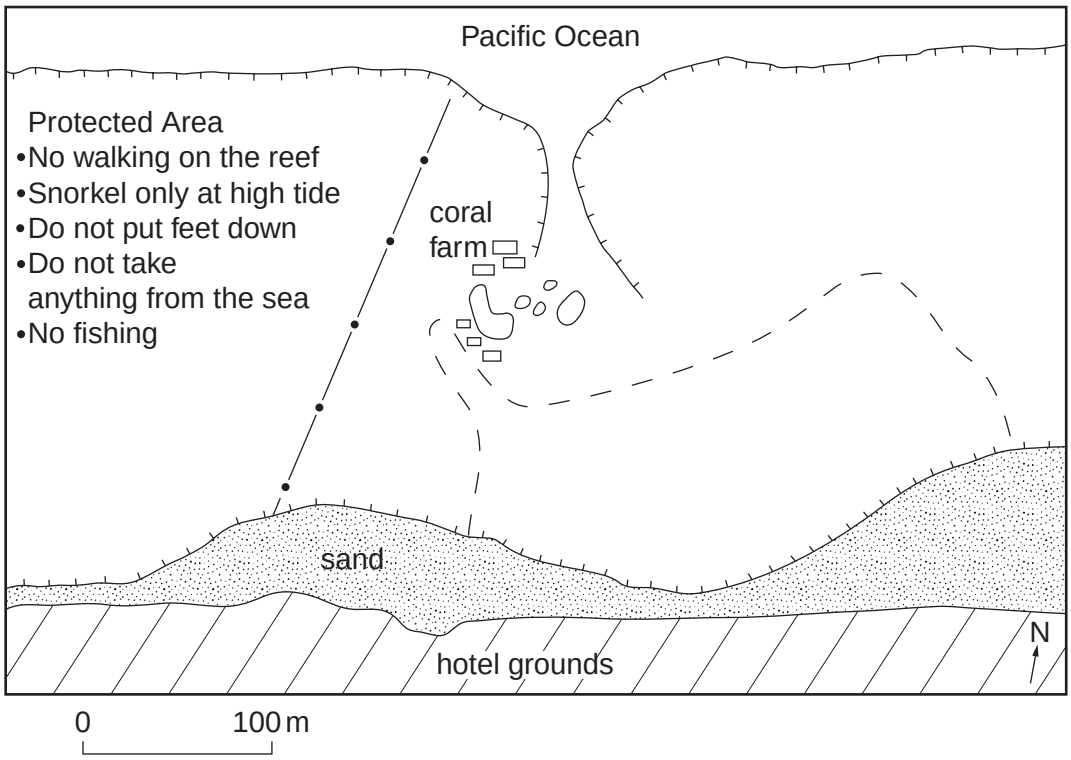
(c) In March 2000 an El Nino event damaged 65% of the coral reefs in Fiji. Coral reefs are made of the skeletons of tiny animals that grow very slowly. They can also be damaged by tourism which is increasing in Fiji. The map shows attempts started by local people, together with the hotel management and staff, to preserve the local coral.



racks in which coral are grown for replanting

guided reef walk at low tide

edge of coral reef at surface

boundary of protected area

What are the advantages of these measures both for the ecosystem and for the local people?

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.....[4]

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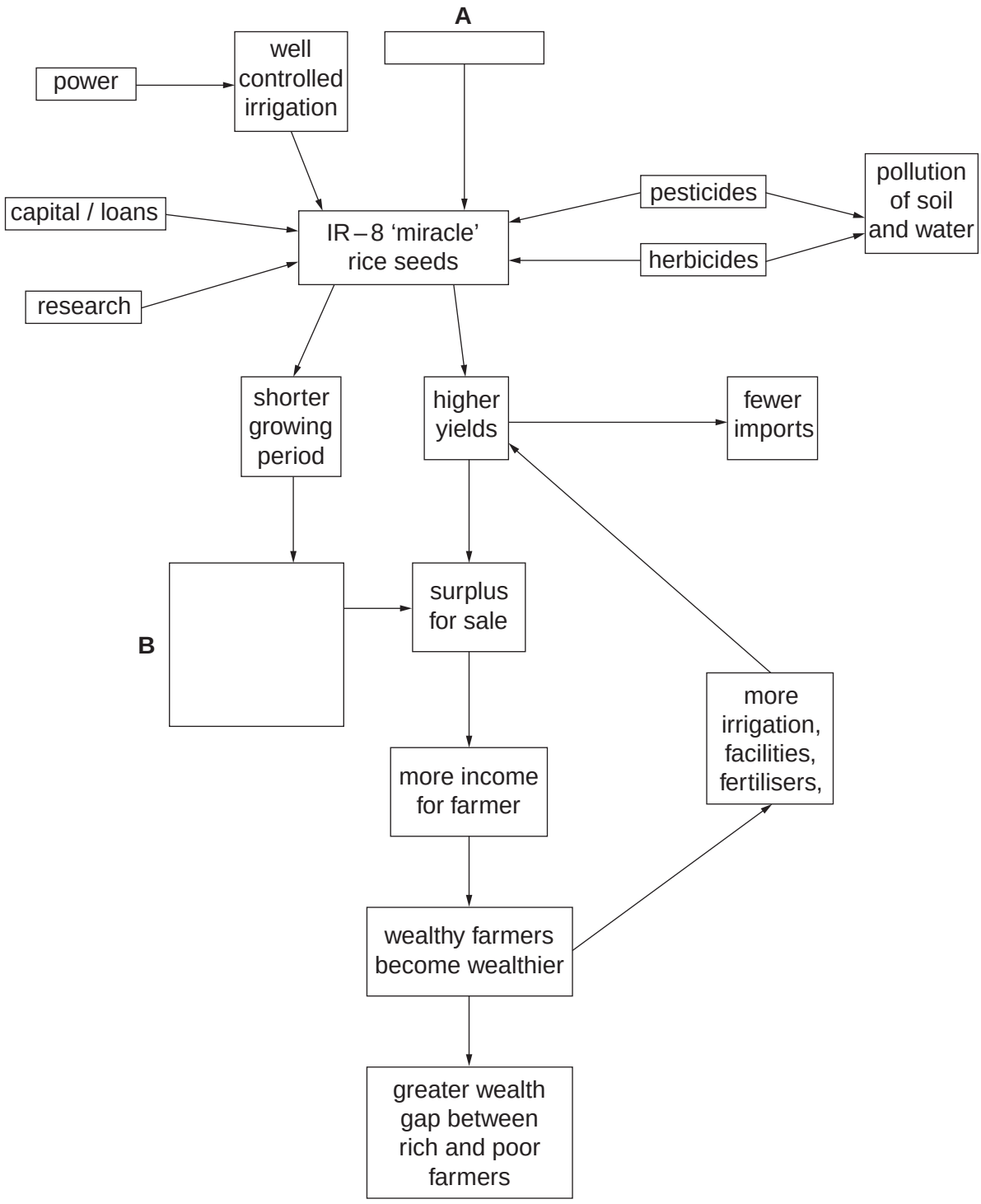
3 **(a)** The diagram shows some features of the 'green revolution' in rice farming in the Indian Punjab.



(i) State three **different** disadvantages of the 'green revolution' that are shown in the diagram.

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.....[3]

(ii) In the empty box **A** write another input that would help to increase yield. [1]

(iii) In the empty box **B** write how a shorter growing period can lead to a surplus for sale. [1]

(b) Explain the disadvantages of using only IR-8 seeds, instead of traditional seeds, over a very large area.

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.....[2]

(c) Suggest why all farmers in rice growing areas cannot benefit from the 'green revolution'.

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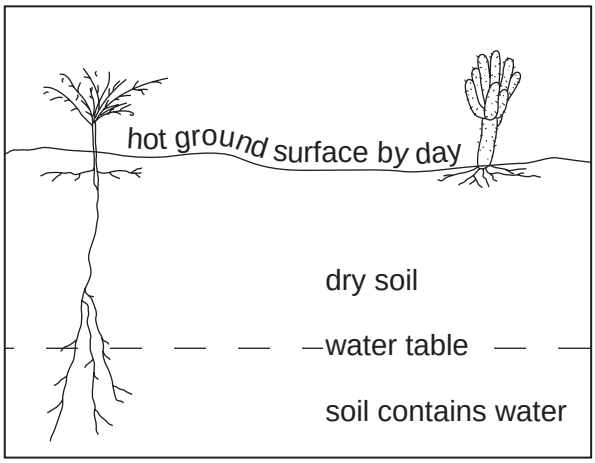
4 **(a)** The diagram shows vegetation in a hot desert where it rains, on average, only twenty-seven days in a year.



Explain why

(i) some plants have long roots,

.....[1]

(ii) other plants have shallow roots,

.....[1]

(iii) plants are widely spaced.

.....[1]

(b) Hunter-gatherers and nomadic pastoralists live in some desert areas and in other difficult environments. Choose **one** of these groups and explain how they are able to survive in their environment.

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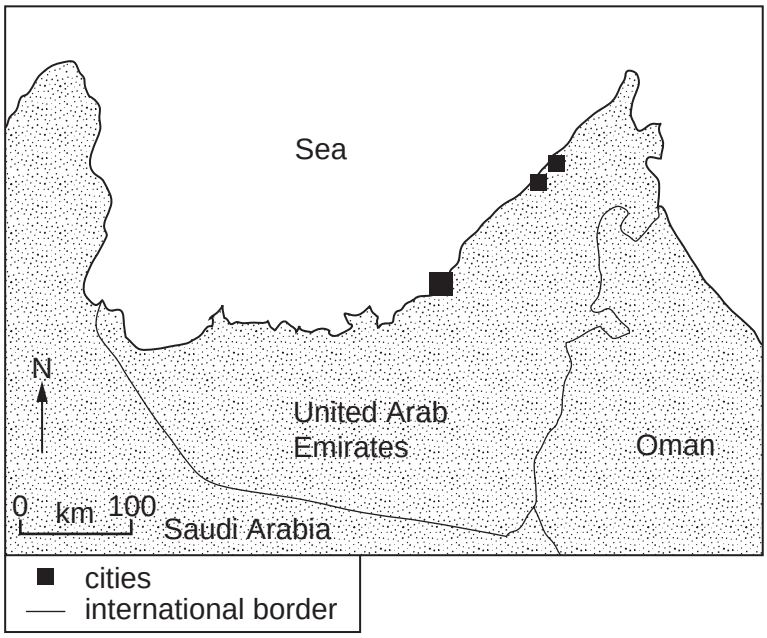
(c) The map shows the United Arab Emirates, an oil-rich state with a hot desert climate, only 75 mm of rain a year and no rivers.



(i) Suggest how the location of the country allows it to be able to supply large amounts of water for its growing tourist industry.

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.....[1]

(ii) Give one advantage and one disadvantage of this method of water supply.

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.....[2]

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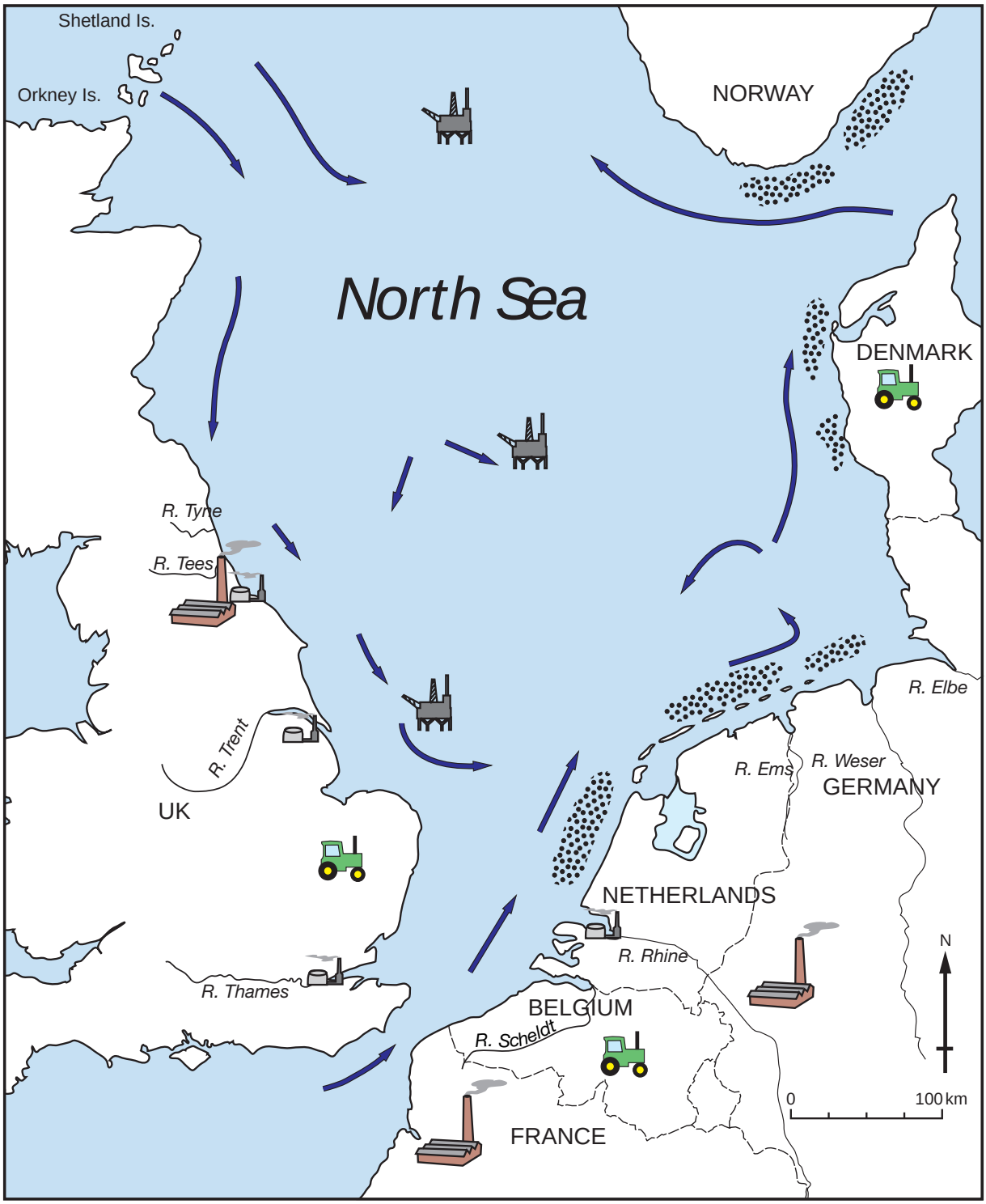
Section B

5 The map gives information about pollution in the North Sea.

Threats to the North Sea



Map Key					
	Fertilisers and Manure		Oil/gas Fields		Main sea Currents
	Oil Refineries		Chemical Industries		Algal Blooms

(a) (i) Name three sources of pollutants in the North Sea shown on the map.

1 .....

2 .....

3 .....[1]

(ii) Pollutants build up in the North Sea. Why are pollutants not dispersed quickly after reaching the North Sea?

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.....[2]

(iii) Where in the North Sea are algal blooms found?

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.....[1]

(iv) Suggest why algal blooms are located in these places.

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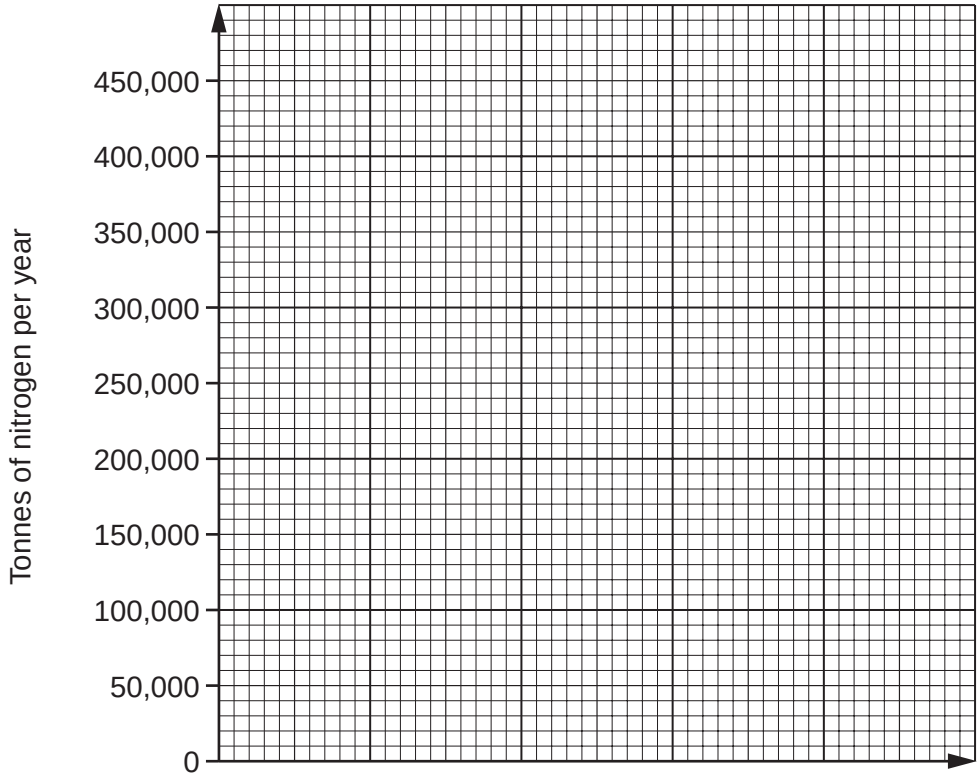
.....[1]

(b) **Amount of nitrogen from rivers flowing into the North Sea**
(tonnes per year)

River	Amount	Countries passed through
Thames	31 000	UK
Rhine	420 000	Switzerland, France, Germany, Netherlands
Scheldt	49 000	France, Belgium
Weser	87 000	Germany
Elbe	150 000	Czech Rep., Germany

(i) Draw a bar graph to show amounts of nitrogen from the five rivers.



[3]

(ii) Name two sources of nitrogen in the North Sea from human activities.

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.....[2]

(c) In Europe, as in other continents, some rivers carry more pollutants than others.

Give reasons why

(i) most of the world's rivers carry pollutants;

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(ii) some carry more than others.

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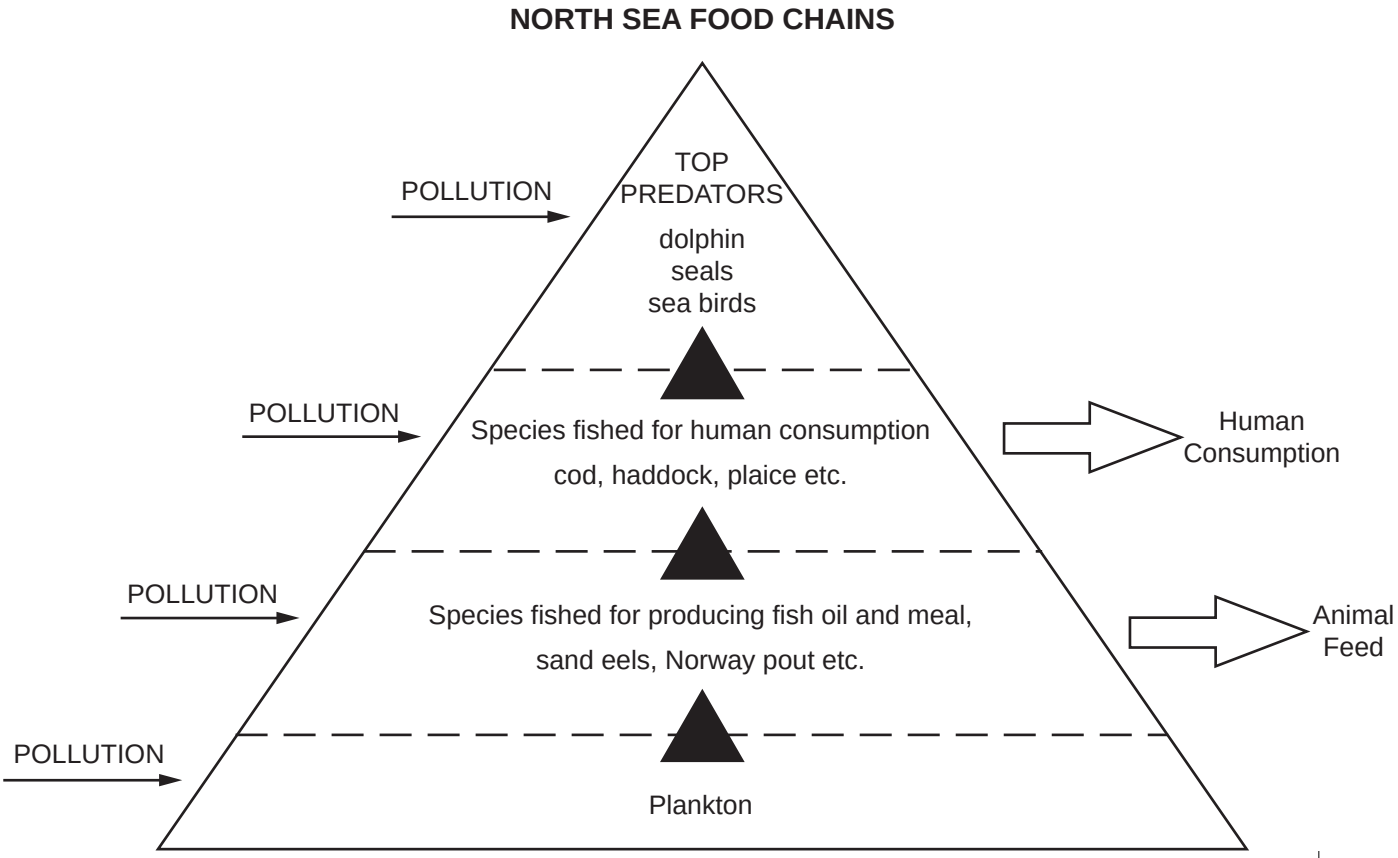
.....[6]

(d)



(i) Why is plankton important in the North Sea food chains?

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.....[1]

(ii) These are food chains under threat, with great competition for marine resources. Describe how the food chains diagram shows this.

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.....[3]

(iii) Explain how the growth of algal blooms affects marine life.

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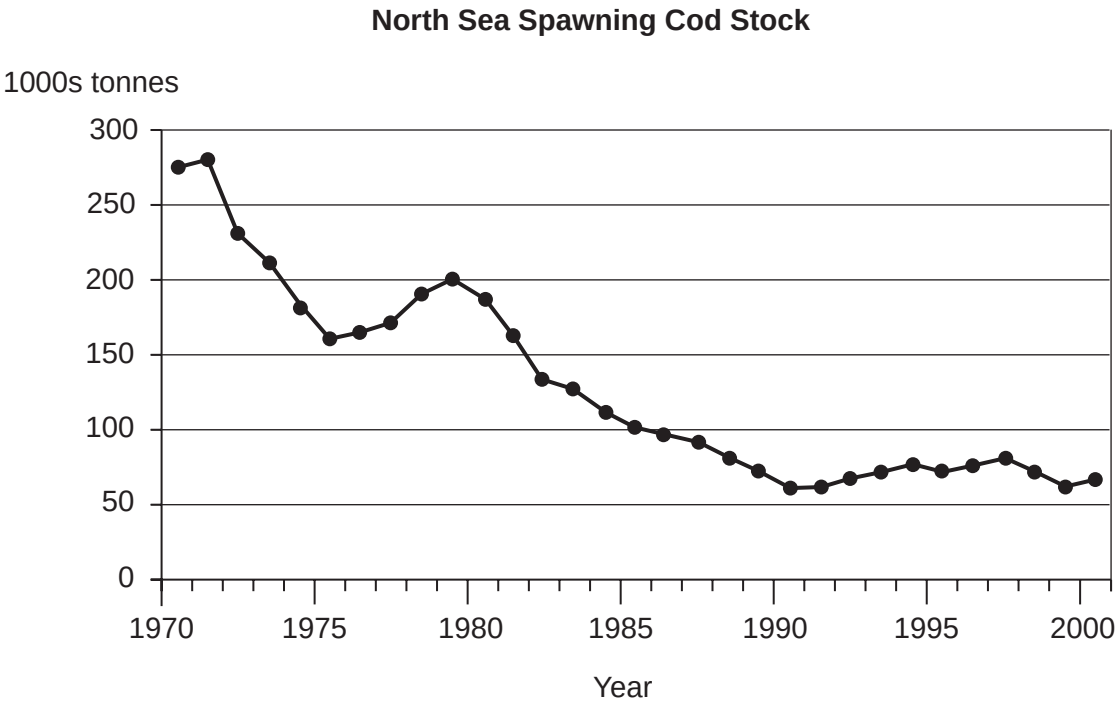
(e) The graph shows breeding stocks of cod in the North Sea.



Describe the trends shown in the graph.

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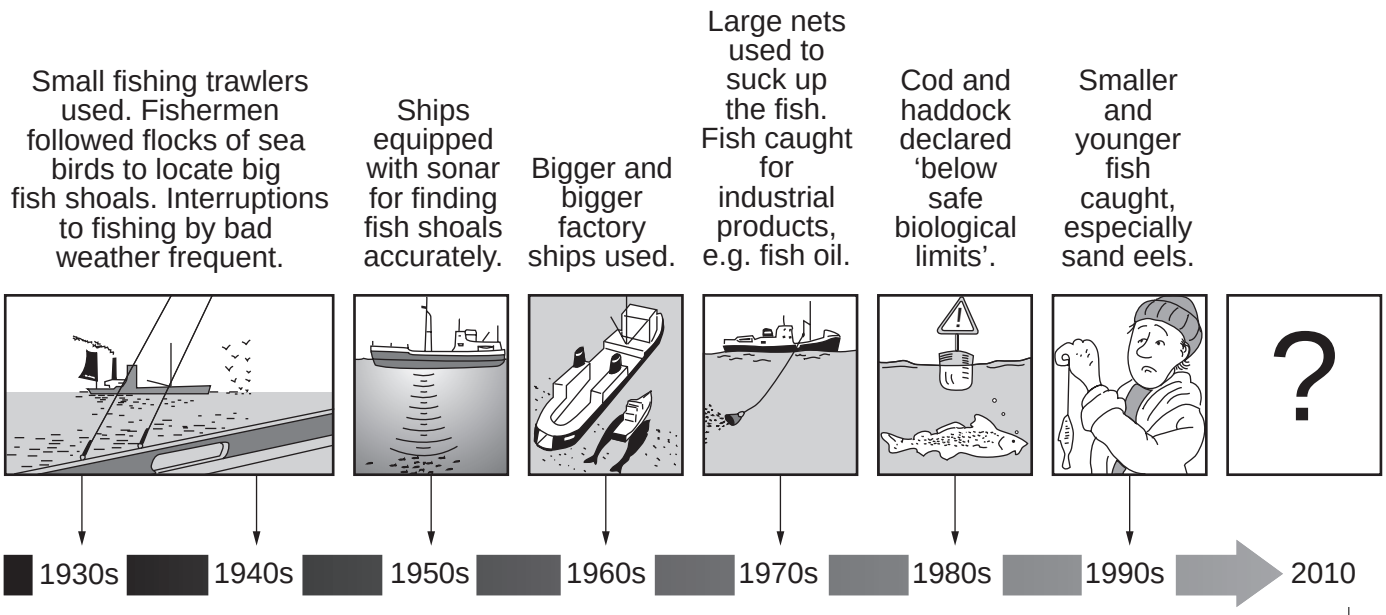
(f) Time Line for North Sea Fishing

North Sea Fishing Time Line



(i) What is meant by fish stocks falling 'below safe biological limits'?

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.....[2]

(ii) Describe what happened between the 1950s and 1990s to cause over-fishing in the North Sea and in many other parts of the world.

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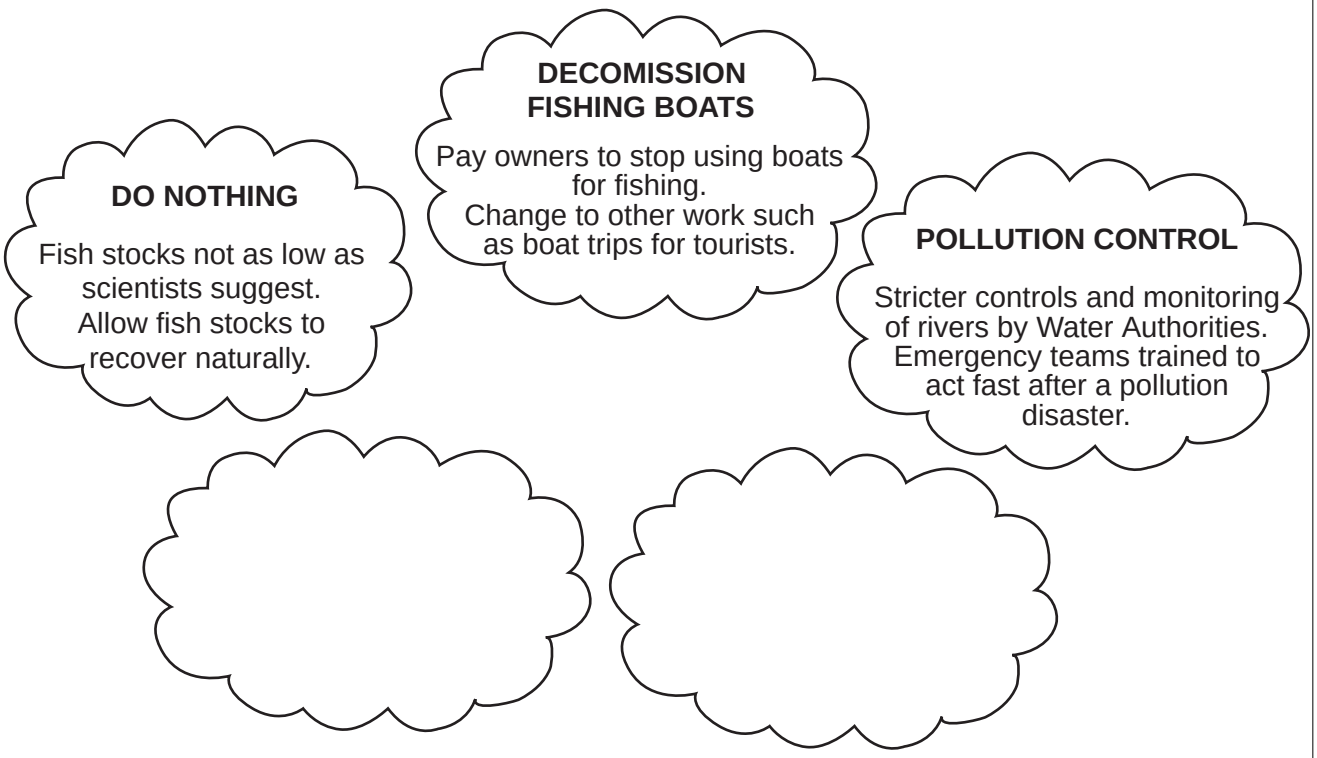
.....[3]

(g) **Options for Fishing Grounds under threat**



(i) Add two more options in the spaces provided for management of fishing grounds which have been over-fished. [4]

(ii) Are all the options sustainable?

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(iii) Is it better to use several different options instead of just using one? Explain your views as fully as you can.

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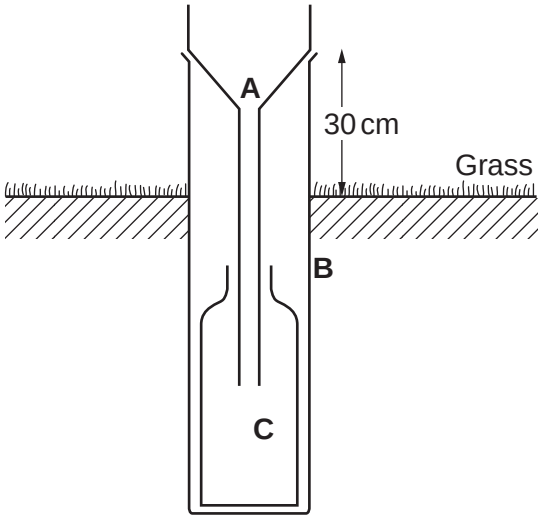
.....[5]

[Total: 40]

6 **(a)** The diagram below shows a rain gauge.



(i) Name the three parts labelled **A**, **B** and **C**.

A .....

B .....

C .....[3]

(ii) This rain gauge is partly buried in the ground and placed on grass with its top 30 cm above the ground surface. Explain the advantages of siting the rain gauge in this way.

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.....[3]

(iii) When or why is it sometimes difficult to obtain accurate readings of precipitation with a rain gauge?

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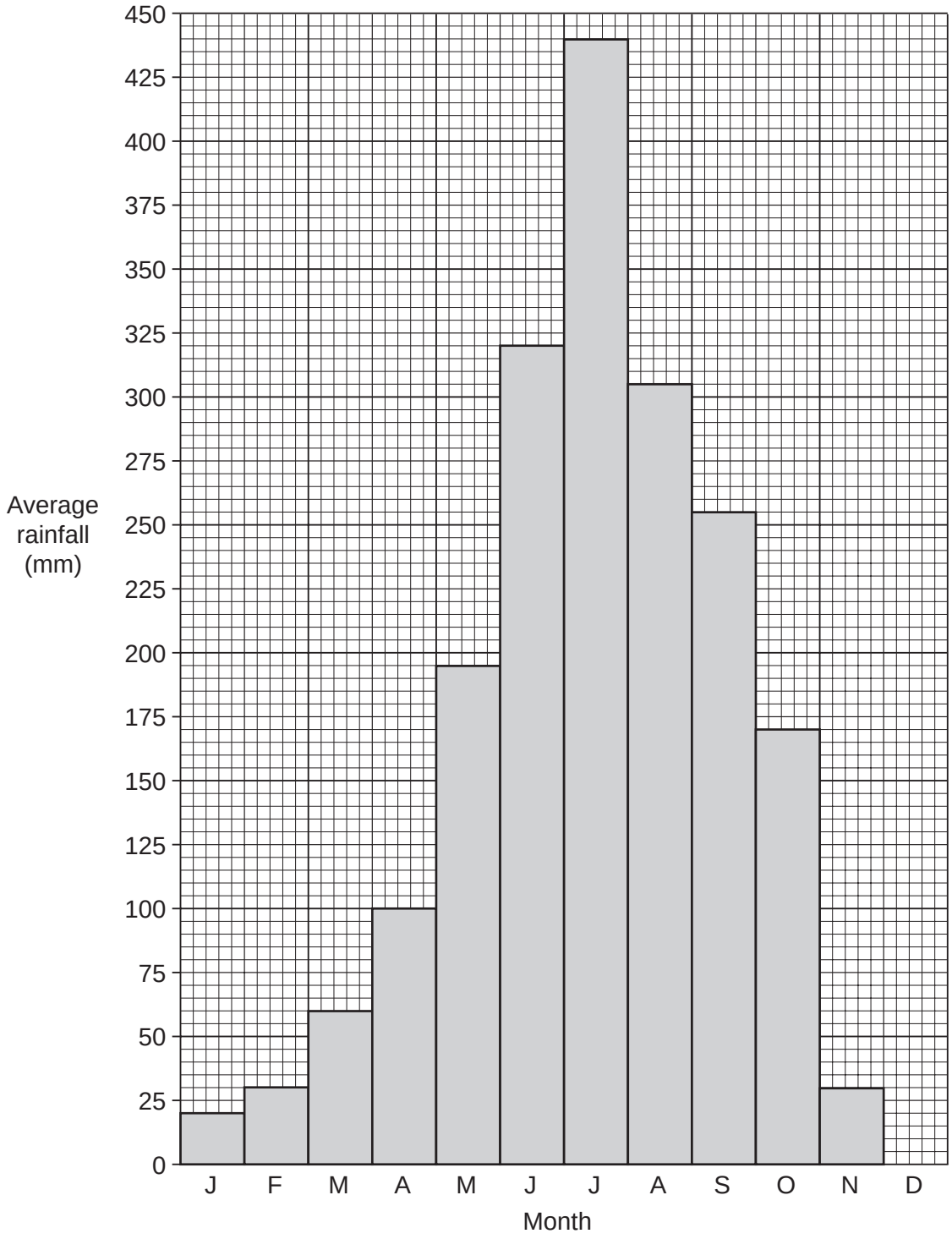
.....[2]

(b) Many places in South Asia have wet summers because of monsoon rains. Look at the rainfall graph for Dhaka, the capital city of Bangladesh.



(i) How much rain falls in Dhaka during the three wettest months? Show your working.

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.....[2]

(ii) Explain why the risk of flooding is greater in August and September than in May and June?

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.....[2]

(c) In summer 2004 large areas in South Asia were affected by some of the worst-ever floods. Bangladesh was the country most badly affected. Read this newspaper report.

Bangladesh stretches across the world's largest delta, where two of Asia's great rivers meet. The people of Bangladesh live with the risk of flooding. Summer is always wet, because it is the monsoon season; in 2004 it was very wet.

After almost non-stop rains in July and August, more than half of Bangladesh was already flooded. Then on 13 September 350 mm of rain fell in 24 hours in Dhaka, the worst rains for 50 years.

Not only were monsoon rains heavy in Bangladesh, but the rivers were full of floodwater. This came from the very heavy monsoon rains in northern India and Nepal. Every year Bangladeshis become more worried about trees being cut down in the hills and mountains of India and Nepal. Deforestation increases run off into rivers.

As a result of the floods in 2004, at least 760 were killed and more than 35 million Bangladeshis were affected. River floods washed away countless homes, roads and stores of vital subsistence crops, especially rice. It was estimated that 8.5 million homes were destroyed. The government put the cost of repairs to roads, agriculture and industry at US$6bn.

In the countryside where 75% of Bangladeshis live, the monsoon is normally welcomed. Houses are built on raised ground, sometimes on stilts. The river floods leave a new layer of rich silt which fertilises the padi (wet rice) fields. The many rivers and lakes are important sources of fish, which adds protein to the diet of rice farmers.

But in 2004 flood waters were more than four metres above normal flood levels, surrounding homes, wiping out the rice crop and threatening diarrhoea, dysentery and other diseases spread by dirty water.

(i) What is the evidence that flooding in 2004 in Bangladesh was much worse than normal?

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.....[2]

(ii) Where do people in Bangladesh live so as to avoid the normal monsoon floods?

.....[1]

(d) Floods have both advantages and disadvantages for farmers in Bangladesh.

(i) State two advantages of floods to farmers in Bangladesh. Explain their importance.

1 .....

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2 .....

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.....[4]

(ii) State one short-term and one long-term problem caused by floods in Bangladesh.

Short-term .....

.....

Long-term .....

.....[2]

(iii) Explain why different strategies are needed to reduce the effects of short-term and long-term problems.

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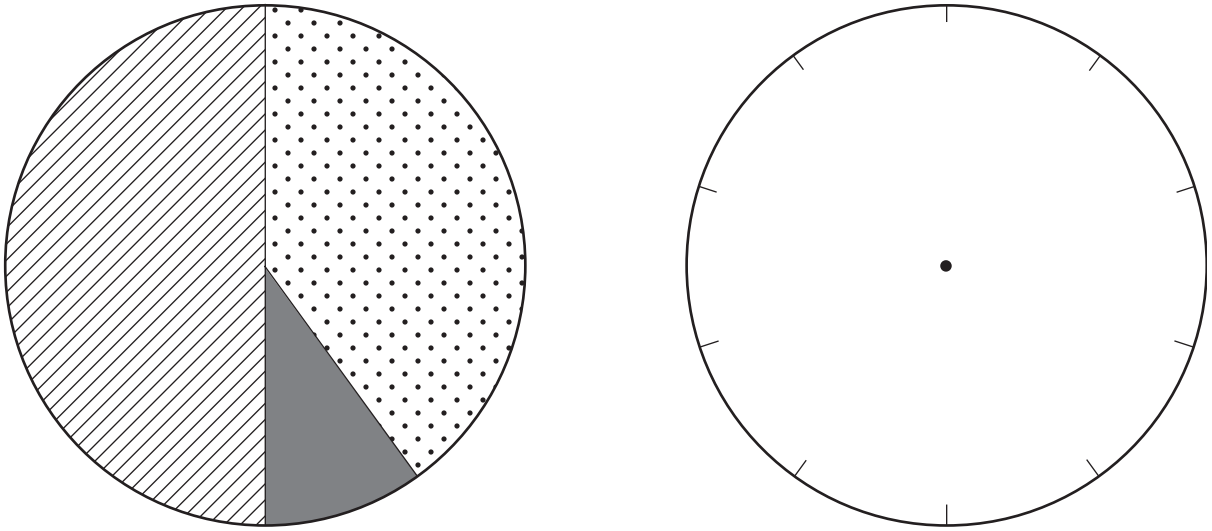
.....[3]

(e) The pie graphs are to show what happens to 100% of precipitation in forested and non-forested areas.

Forested **Non-forested**



KEY

Evapo-transpiration

Runoff

Groundwater

(i) % in non-forested areas

evapo-transpiration	25
runoff	45
groundwater	30

Show these percentages in the **non-forested** pie graph. [3]

(ii) For which process is there the largest difference between forested and non-forested areas?

.....[1]

(iii) The newspaper report suggested that deforestation in the mountains and hills of India and Nepal increased the floods in Bangladesh. Explain how this can happen.

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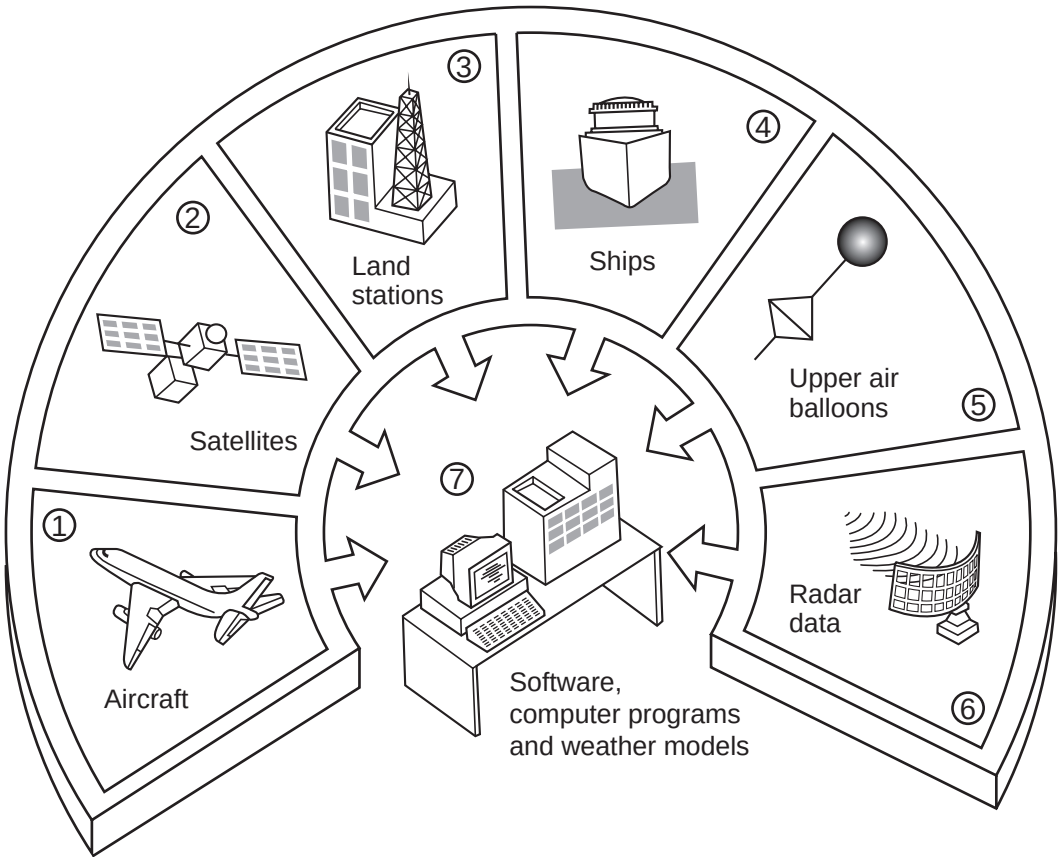
.....[3]

(f) One strategy to reduce the harmful effects of climatic hazards is improved weather forecasting.

Sources and use of data for weather forecasts



Explain why the accuracy of weather forecasts is increasing.

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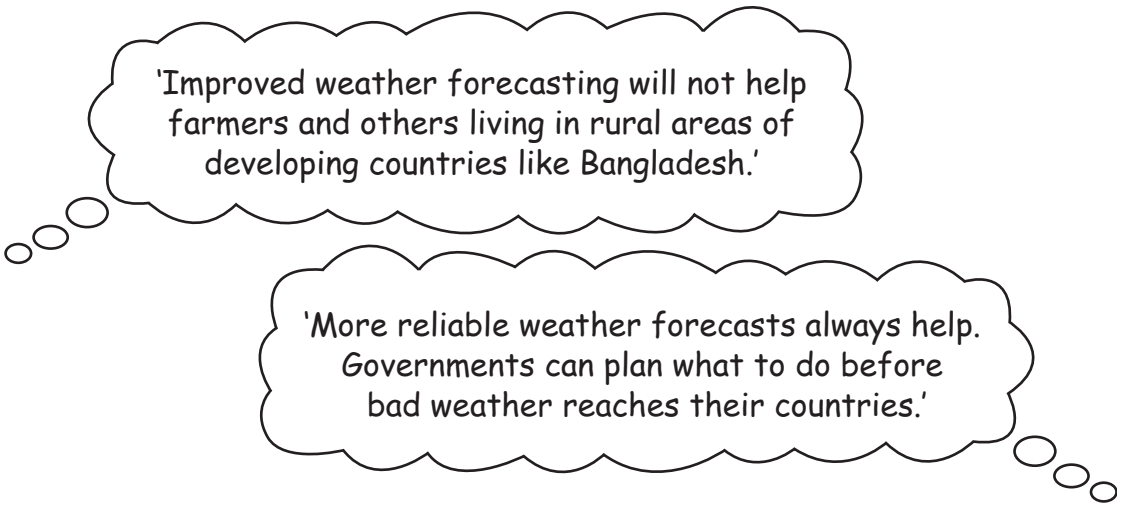
.....[4]

(g)



(i) Would improved weather forecasts have helped the people of Bangladesh in summer 2004?

(ii) Can governments in developing countries plan adequately for climatic hazards?

Give and explain your views on these.

(i) .....

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(ii) .....

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.....[5]

[Total: 40]

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