Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

7251180637

ENVIRONMENTAL MANAGEMENT **5014/12**

Paper 1 **May/June 2018**

2 hours 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

Write your answers in the spaces provided on the Question Paper.

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.

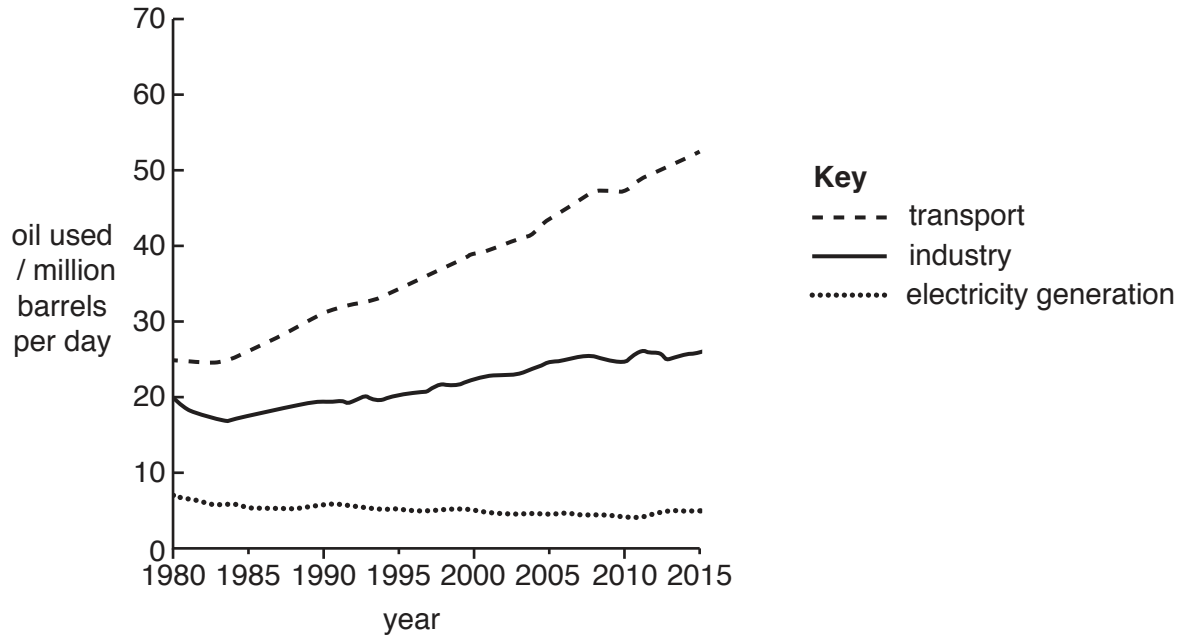
This document consists of **22** printed pages and **2** blank pages.

CAMBRIDGE
International Examinations

Section A

Answer **all** the questions.

1 The graph shows some changes in the use of oil in the world from 1980 to 2015.



(a) (i) Calculate the quantity of oil used per day in 1980.

..... million barrels per day [1]

(ii) Compare the trends in the use of oil for industry and for generating electricity between 1980 and 2015.

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.....

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.....[2]

(iii) Suggest reasons for the trend in the use of oil for generating electricity since 1980.

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.....[2]

(iv) Suggest **one** reason why the use of oil for transport has increased so greatly.

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.....[1]

(b) (i) Describe how oil is formed.

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.....[2]

(ii) Describe methods used to search for oil deposits.

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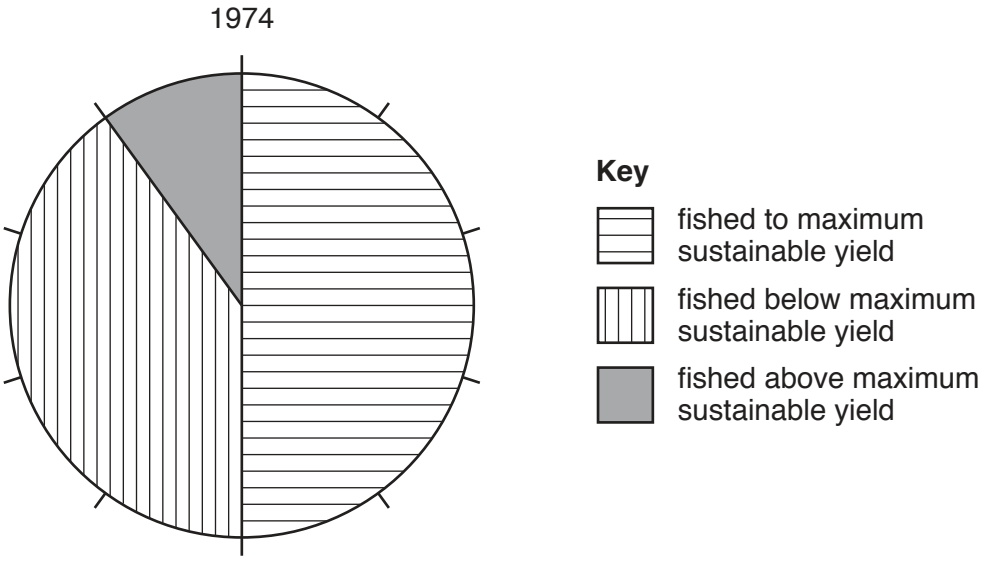
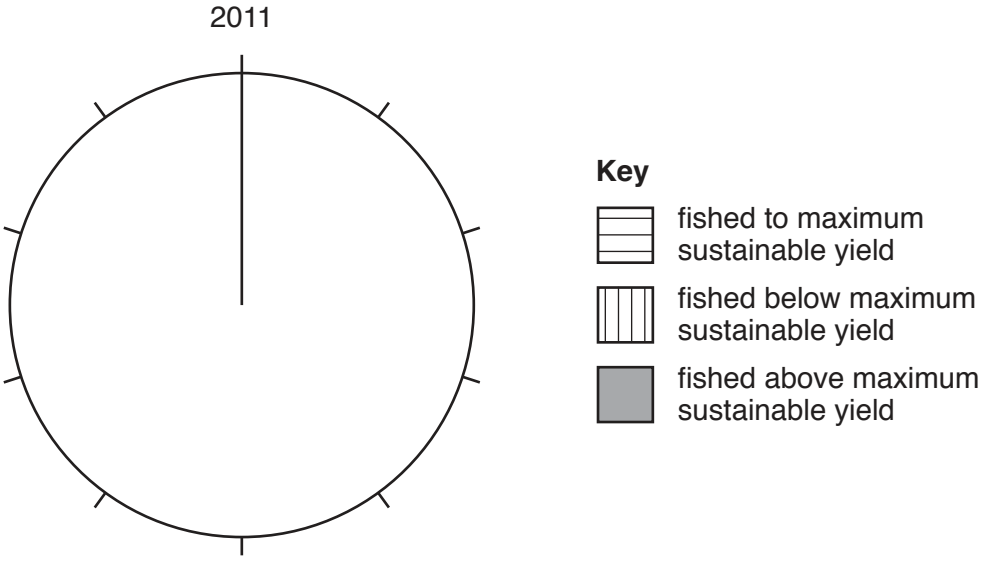
.....[2]

2 **(a)** The pie graph shows the state of world fisheries in 1974. Maximum sustainable yield means the largest catch of fish that can be caught without reducing future fish stocks.



(i) Use the figures in the table to complete the pie graph for 2011. Use the key provided.

state of world fisheries in 2011	percentage
fished to maximum sustainable yield	61
fished below maximum sustainable yield	10
fished above maximum sustainable yield	29



[2]

(ii) State the percentage of fish stocks that were **not** fished above the maximum sustainable yield in 1974.

.....[1]

(iii) Suggest reasons why the percentage of fish stocks that were fished **above** the maximum sustainable yield increased between 1974 and 2011.

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.....[4]

(b) Quotas are one method used to try to keep fishing sustainable.

(i) Explain how quotas keep fishing sustainable.

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.....[2]

(ii) Give **one** reason why quotas can be harmful to fish stocks.

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.....[1]

[Turn over

3 **(a)** The photograph shows a wheat farming area. Some information about the wheat farming is given in the box.

- low capital expenditure per hectare
- low numbers of farm workers per hectare
- low yield per hectare
- high yield per farm worker

(i) Explain why the area in the photograph is suitable for the use of farming machinery.

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.....[3]

(ii) Wheat is grown in some of these fields year after year.

Suggest why wheat yields per hectare are decreasing year by year.

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.....[1]

(iii) Suggest a purpose for the trees shown in the photograph.

.....

.....[1]

(iv) Circle **three** terms in the list that describe the system of farming shown in the photograph.

commercial subsistence cropland pastoral intensive extensive [1]

(v) Give **one** economic factor that influences the type of farming in the photograph.

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.....[1]

(b) Mixed cropping is a different type of farming.

Explain how mixed cropping can be managed to be a sustainable method of farming.

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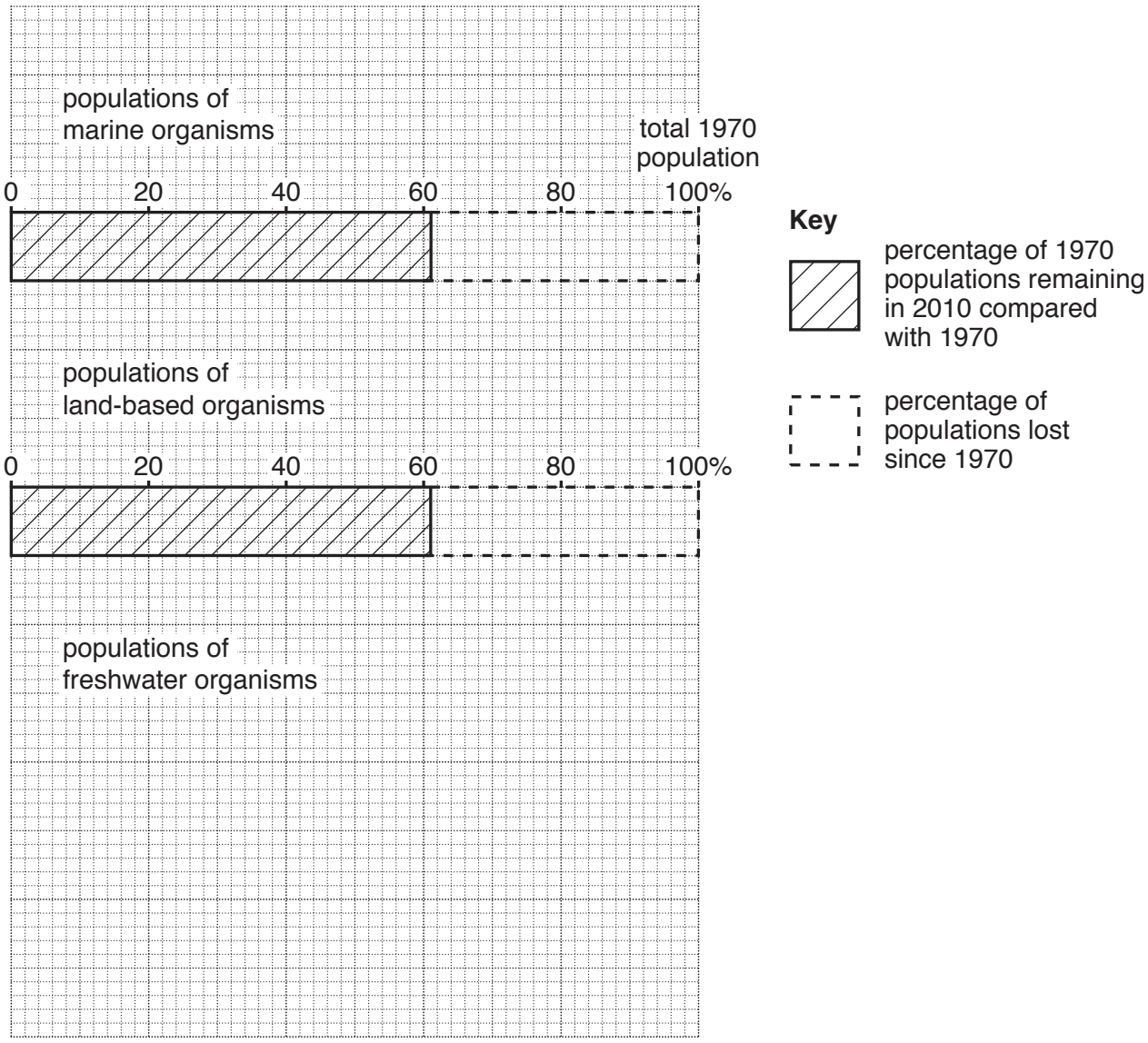
.....[3]

[Turn over

4 **(a)** According to the WWF, between 1970 and 2010 the populations of many marine and land-based organisms have decreased. The horizontal bar graph shows these changes.



(i) Draw a horizontal bar for freshwater organisms in the space provided to show that 24% of the 1970 populations remained in 2010. Use the key shown and the same scale. [2]

(ii) State the percentage of the 1970 populations of land-based organisms that had been lost by 2010.

..... % [1]

(b) Wildlife populations have decreased dramatically since 1970.

Suggest reasons why some people **disagree** with the protection of wildlife.

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.....[3]

(c) State **four** different strategies for conserving wildlife biodiversity.

1.....

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2.....

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4.....

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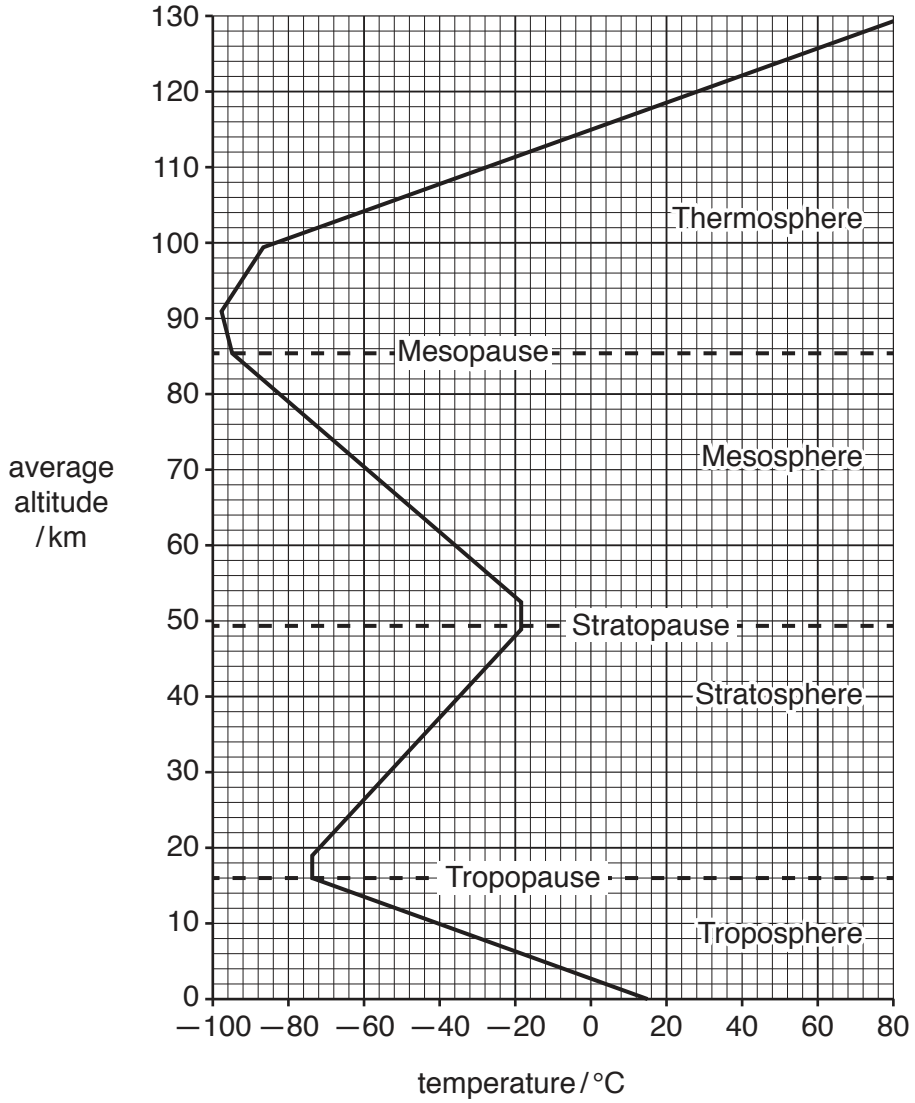
[4]

Section B

Answer **both** questions.

5 **(a)** The diagram shows the structure of the atmosphere.



(i) State the average altitude and air temperature at the tropopause.

altitude ..... km temperature ..... °C [2]

(ii) Describe the changes in temperature above the troposphere.

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..... [3]

(iii) The ozone layer occurs at an altitude of approximately 20 to 30 km. Draw the ozone layer on the diagram of the structure of the atmosphere. [1]

(iv) Explain why the ozone layer is vital to life on Earth.

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.....

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..... [2]

(v) Above Antarctica there is an area of reduced ozone concentration, commonly known as the ozone hole.

Explain how the damage to the ozone layer over Antarctica has occurred.

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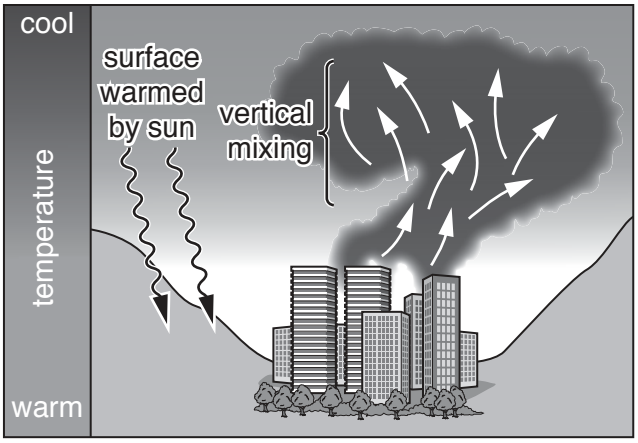
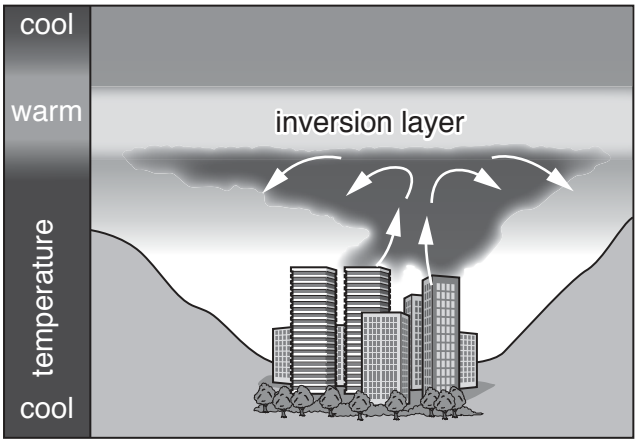
..... [4]

[Turn over

(b) The diagrams show normal atmospheric conditions and a temperature inversion.



normal atmospheric conditions



temperature inversion

(i) Using the diagrams, describe why atmospheric temperatures are usually warmest near the ground surface.

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..... [1]

(ii) Using the diagrams, describe what is meant by a *temperature inversion*.

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..... [2]

(iii) Explain how a temperature inversion increases atmospheric pollution in a city.

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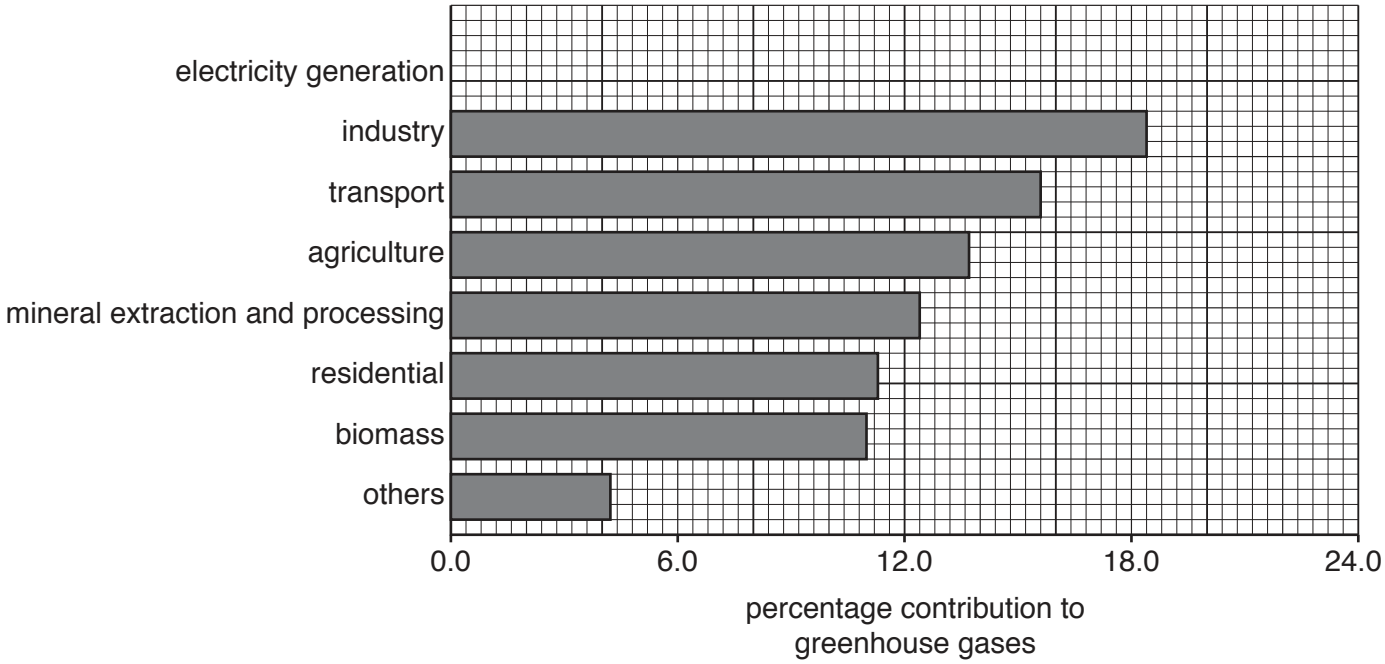
..... [3]

(c) The graph shows sources of greenhouse gases in the atmosphere.



(i) Complete the graph by showing an electricity generation contribution to greenhouse gases of 21.0%. [1]

(ii) State the percentage contribution to greenhouse gases from transport.

.....% [1]

(iii) Explain how electricity generation and agriculture produce greenhouse gases.

electricity generation .....

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agriculture .....

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[5]

(iv) Suggest ways in which greenhouse gas emissions can be reduced.

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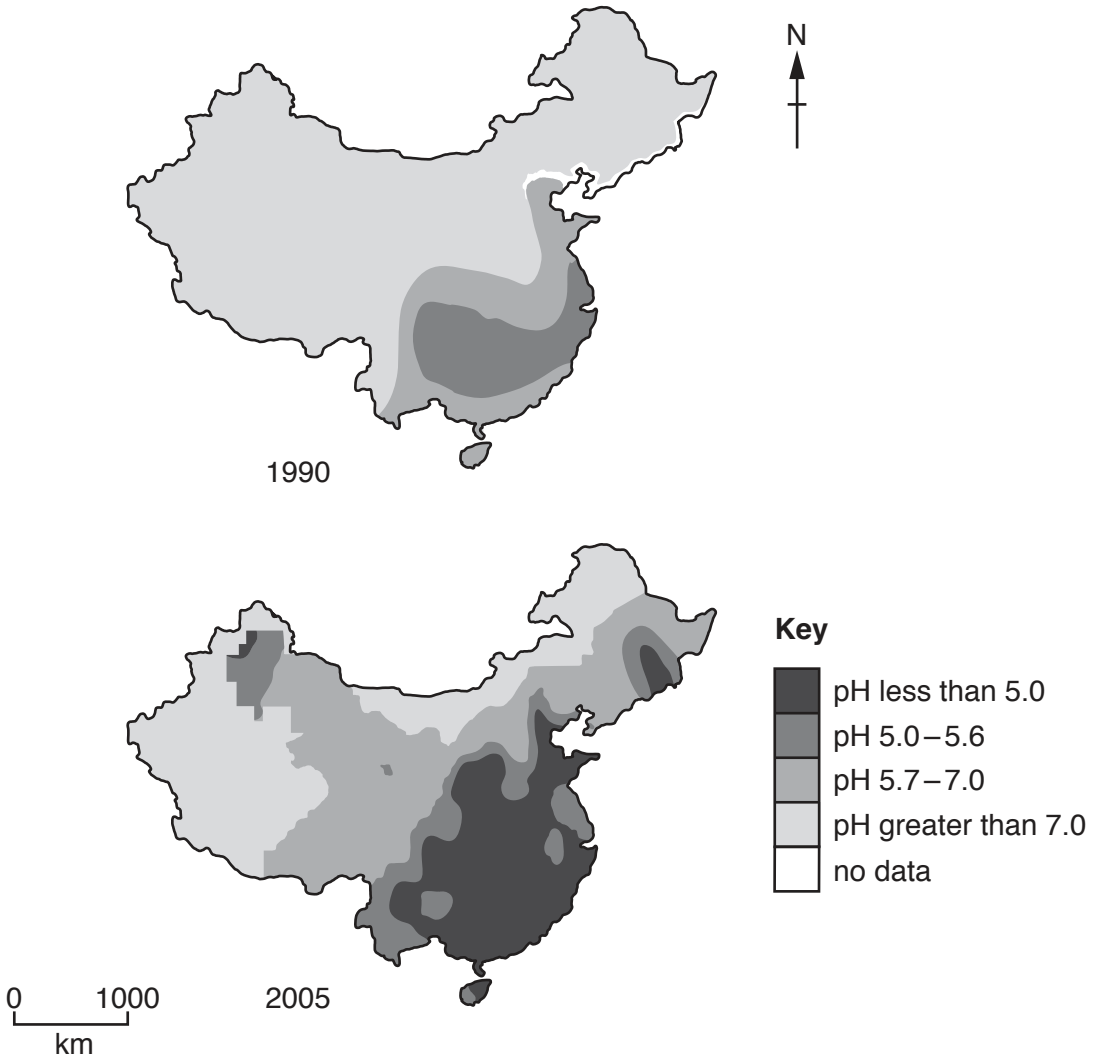
..... [3]

(d) The maps show the pH of rainfall in China in 1990 and 2005. The lower the pH, the more acidic the rainfall.



(i) State the lowest pH of rainfall in China in 1990.

..... [1]

(ii) Describe the changes in the pH of rainfall in China from 1990 to 2005.

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..... [3]

(iii) Suggest **two** reasons for the changes in the pH of rainfall in China from 1990 to 2005.

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..... [2]

(e) Is international cooperation necessary to overcome the problems of atmospheric pollution? Give reasons for your answer.

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..... [6]

6 **(a)** The newspaper article is about the link between toxins (pollutants) in the oceans and the death of whales.

Increase in whale deaths around the UK

Scientists think that flame retardants and polychlorinated biphenyls (PCBs) released in the oceans damage the immune system of whales. Whales then become infected with diseases and parasites which cause them to become confused and swim onto beaches where they die. Whales accumulate toxins from the food they eat. Almost 600 whales died on UK beaches in 2014. It has been found that these whales had the highest concentration of PCBs in their bodies of whales anywhere in the world.

(i) State the **two** toxins from the article thought to cause the death of whales.

..... and ..... [1]

(ii) Explain why toxin levels are higher in top predators than in animals lower in the food chain.

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..... [2]

(iii) Suggest how toxins enter the oceans.

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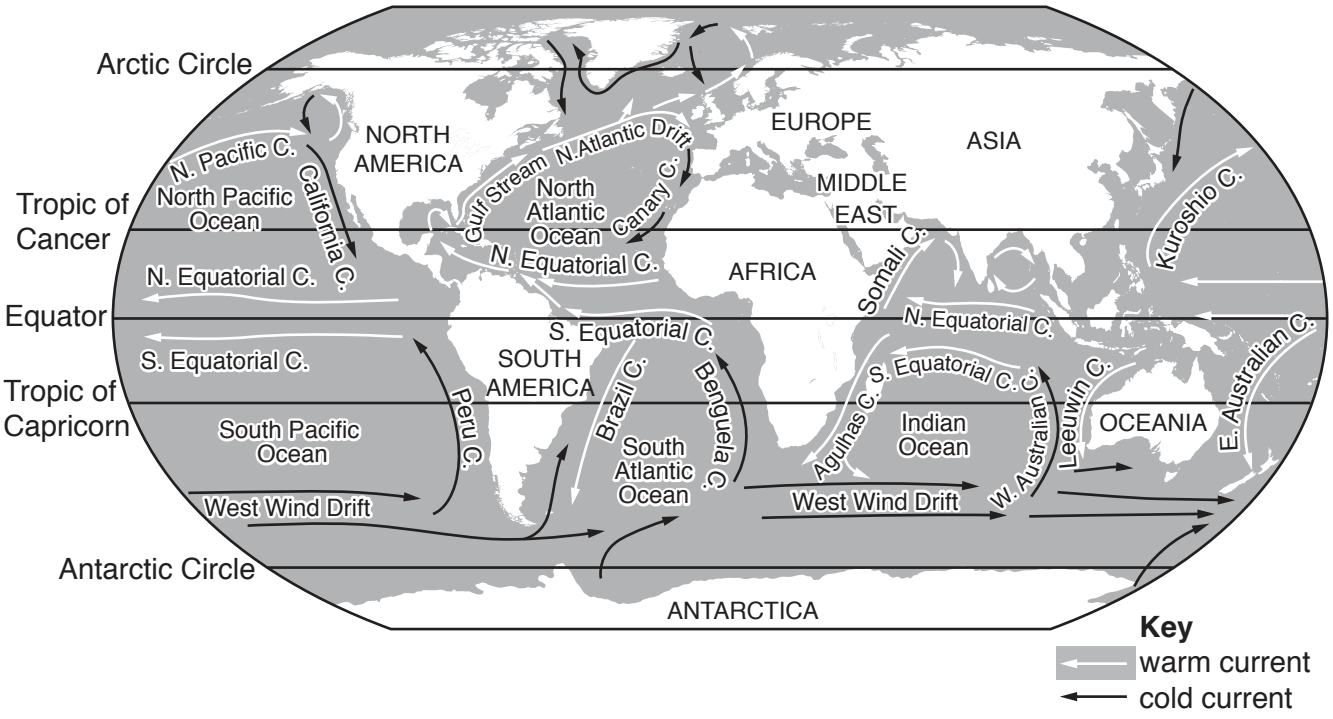
..... [2]

(b) The map shows warm and cold ocean currents.



(i) Name the cold current along the west coast of South America.

..... [1]

(ii) Describe the movement of ocean currents in the Atlantic Ocean.

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..... [3]

(iii) Suggest how oil pollution from the Middle East can reach Antarctica.

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..... [2]

(iv) Describe the effect of the Benguela current on the climate of the west coast of southern Africa.

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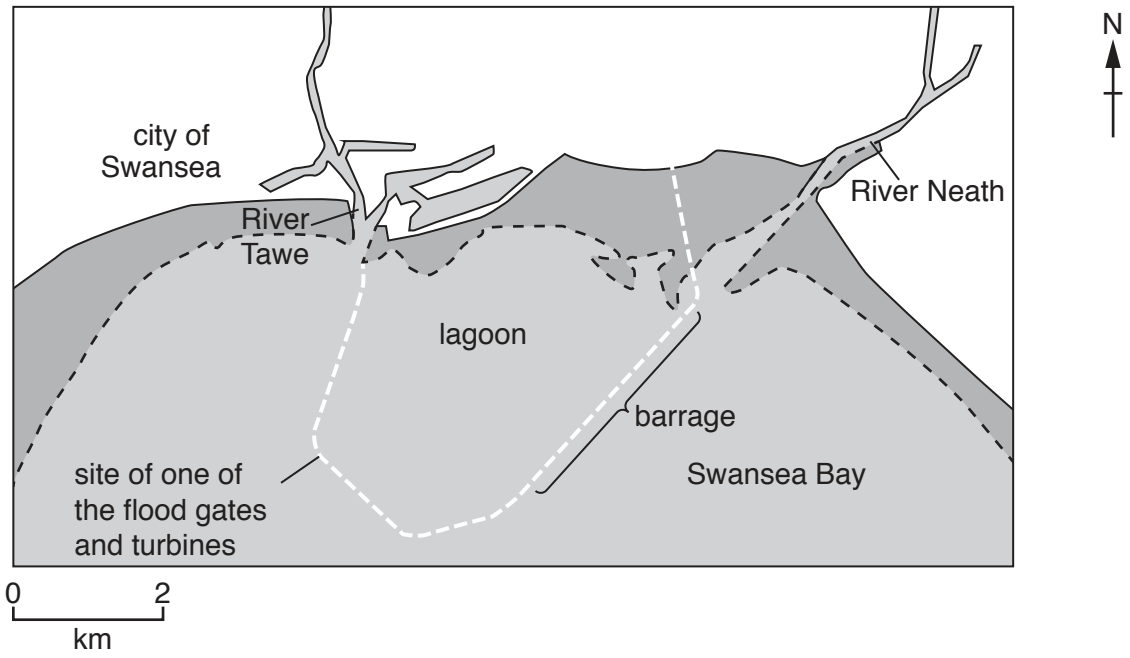
..... [2]

[Turn over

(c) The information is about a proposed tidal barrage for generating electricity in Swansea Bay in the UK.

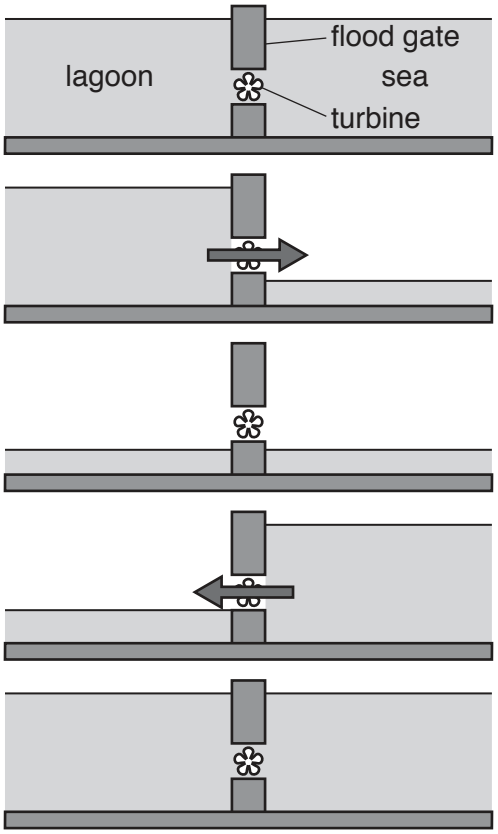


Swansea Bay has one of the world's largest tidal ranges, often reaching 10 m. A 10 km long barrage would be built 3 km out to sea. The barrage would have 16 underwater turbines generating electricity on both the rising (incoming) and falling (outgoing) tide. Enough renewable power would be generated for 155 000 homes for 120 years.

An environmental impact assessment (EIA) is needed before the barrage can be built. The EIA will identify environmental impacts on coastal ecosystems and suggest ways to reduce them.

How it works

As the tide goes out, the flood gates in the barrage stay closed and the lagoon stays full. The flood gates are then opened to let the water out until water levels on each side of the barrage are the same. When the tide comes in the process is reversed.



starting point; high tide; lagoon full

↓

tide goes out forming
a head of water in the lagoon

↓

low tide; no head of water in the lagoon

↓

tide comes in forming
a head of water outside the lagoon

↓

return to starting point

(i) State the tidal range in Swansea Bay.

..... m [1]

(ii) Briefly describe how electricity will be generated at the barrage.

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..... [3]

(iii) Explain why the barrage is a renewable method of generating electricity.

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..... [2]

(iv) State how many homes will be provided with electricity by the barrage.

..... [1]

(v) Suggest why it is important that the rivers Tawe and Neath still flow into the sea rather than into the lagoon.

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..... [3]

(vi) Suggest why people are concerned about the environmental impact of the barrage.

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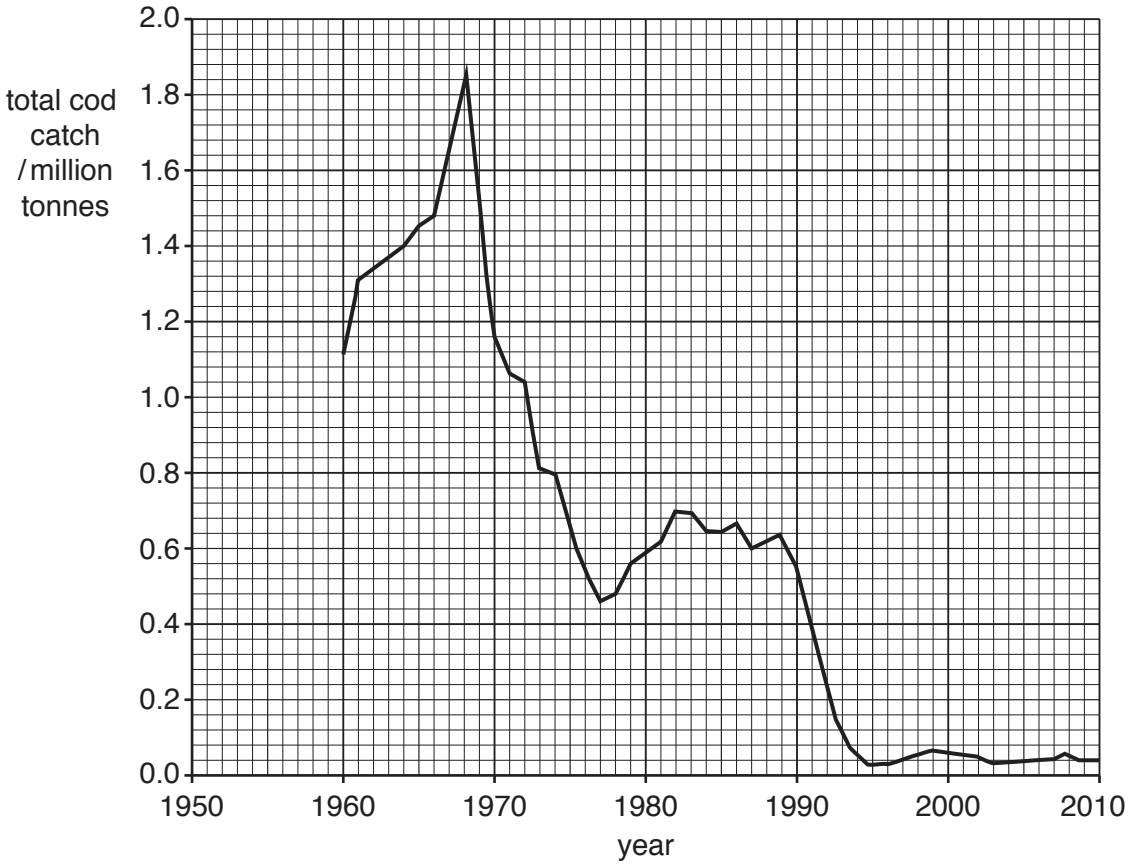
(d) The graph shows the cod catch in the Northwest Atlantic Ocean from 1950 to 2010. Cod are a species of fish.



(i) Complete the graph using the data in the table.

year	total cod catch / million tonnes
1950	0.6
1955	0.9

[1]

(ii) Describe the change in the cod catch in the Northwest Atlantic Ocean from 1960 to 1995.

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..... [3]

(iii) Suggest **one** reason why the cod catch has remained low since 1995.

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..... [1]

(iv) Cod are part of the Atlantic Ocean ecosystem.

Explain the meaning of the term *ecosystem*.

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..... [2]

(e) 'Plastics cause greater damage to marine environments than raw sewage and heavy metals.'

How far do you agree with this statement? Give reasons for your answer.

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..... [6]

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