Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

4228965101

ENVIRONMENTAL MANAGEMENT **5014/12**

Paper 1 Theory **October/November 2020**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

INFORMATION

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Blank pages are indicated.

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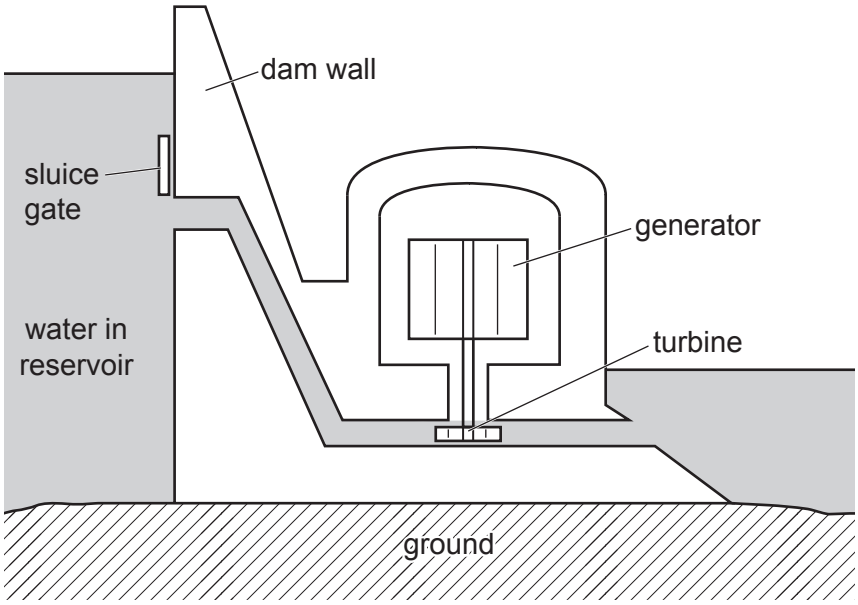
Section A

1 The diagram shows how electricity can be generated using hydroelectric power.



(a) Use the diagram to explain how electricity is generated using a hydroelectric power station.

.....

.....

.....

.....

.....

..... [3]

(b) State **one** impact of a hydroelectric power station on the environment.

.....

..... [1]

(c) Other than impact on the environment, suggest reasons why some countries do **not** have any hydroelectric power stations.

.....

.....

.....

..... [2]

[Total: 6]

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2 The photograph shows mesh tanks in the sea where fish are farmed.

(a) Suggest the purpose of the mesh tanks shown in the photograph.

.....

..... [1]

(b) Fish farming can help to reduce the number of wild fish caught.

State **two** other strategies to reduce overfishing of wild fish.

1 .....

.....

2 .....

.....
[2]

(c) Suggest **two** negative effects of fish farming on the environment.

1 .....

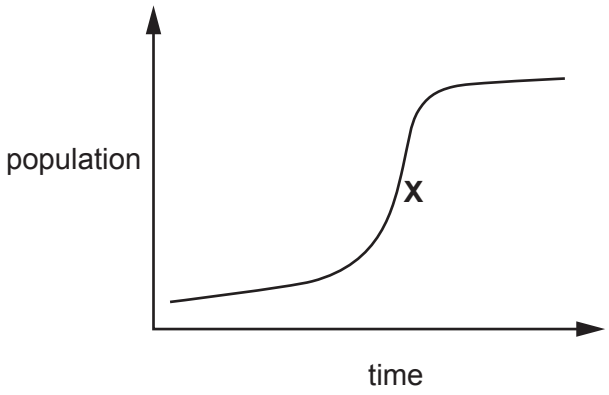
.....

2 .....

.....
[2]

[Total: 5]

3 The graph shows a typical population growth curve.



(a) Name the part of the population growth curve labelled **X**.

..... [1]

(b) Describe strategies for managing human population size.

.....

.....

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.....

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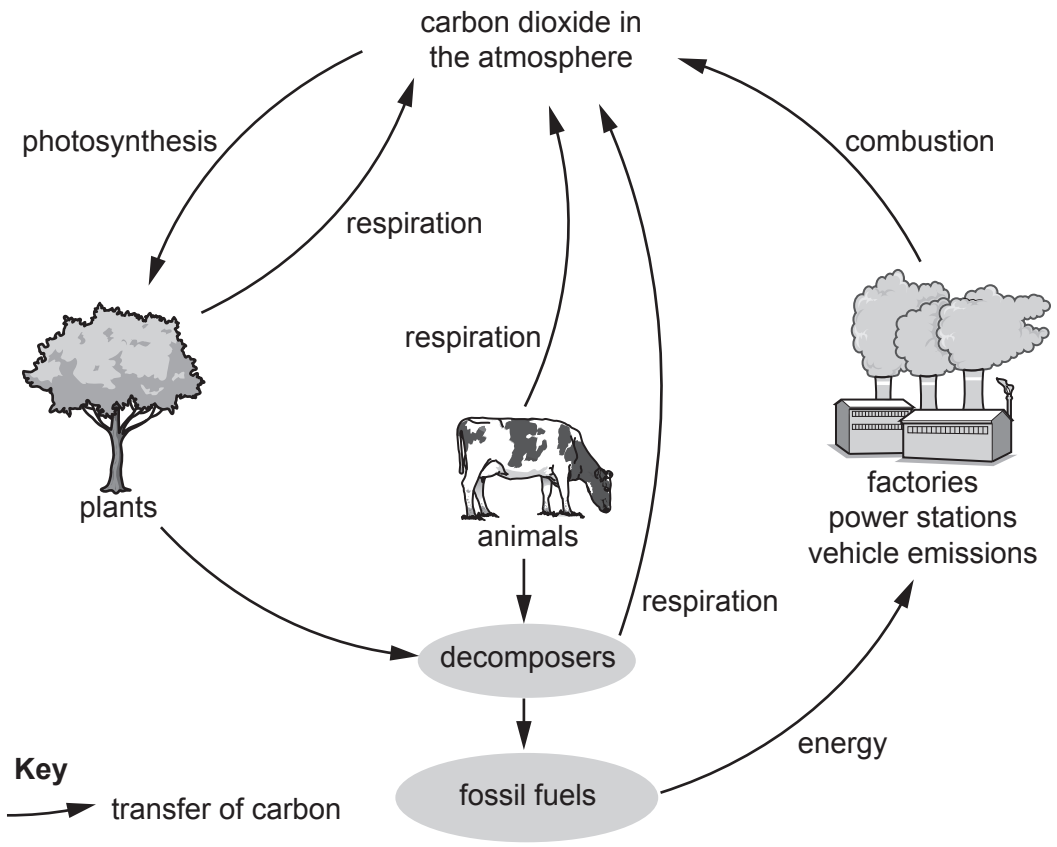
..... [3]

[Total: 4]

4 The diagram shows part of the carbon cycle.



(a) Use the diagram to state **two** different processes that release carbon dioxide into the atmosphere.

1 .....

2 .....
[2]

(b) Plants use carbon dioxide in photosynthesis.

State where the energy for this process comes from.

..... [1]

(c) Carbon dioxide is a greenhouse gas.

Name **two** other greenhouse gases.

1 .....

2 .....

[2]

[Total: 5]

Section B

5 **(a)** Access to safe drinking water is different around the world.

(i) Suggest reasons why fewer people have access to safe drinking water in Africa than in North America.

.....

.....

.....

..... [2]

(ii) A well is one way for people to access fresh water.

State **three** other sources of fresh water.

1 .....

.....

2 .....

.....

3 .....

.....
[3]

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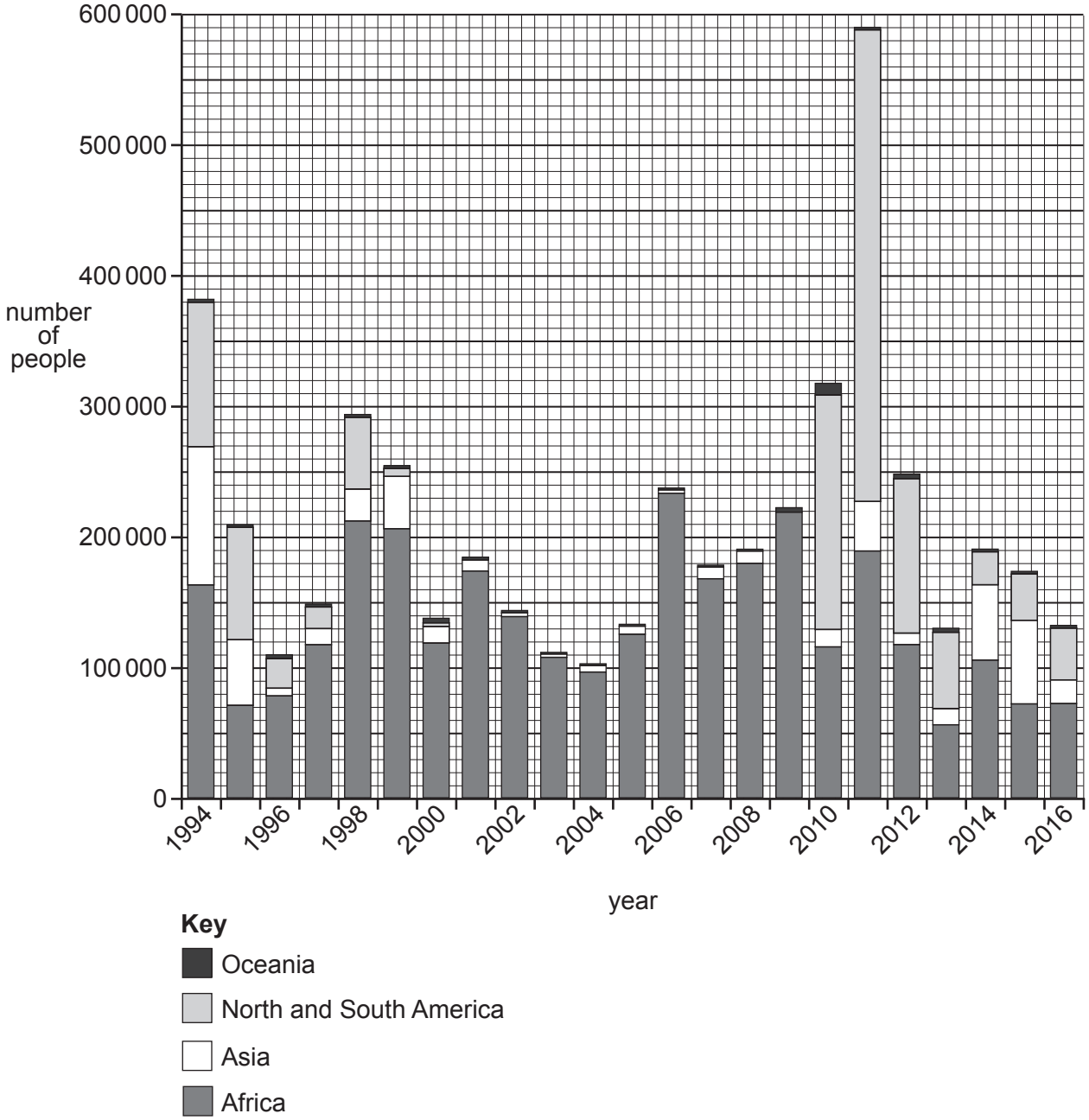
(b) The bar chart shows the number of people infected with cholera in different continents from 1994 to 2016.



(i) Identify the **year** with the total highest number of people infected with cholera.

..... [1]

(ii) Identify the **continent** with the highest number of people infected with cholera between 1999 and 2009.

..... [1]

(iii) Suggest what the bar chart shows about the total number of people infected with cholera between 1994 and 2016.

.....

..... [1]

(c) Suggest reasons why there can be an outbreak of cholera after a natural disaster.

.....

.....

.....

..... [2]

[Total: 10]

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6 **(a)** A food chain in a forest ecosystem is shown.

tree → caterpillar → small bird → hawk

(i) Explain what the arrow represents in this food chain.

.....

..... [1]

(ii) Name the tertiary consumer in this food chain.

..... [1]

(iii) Suggest what could happen to the number of caterpillars in this food chain if all the small birds died.
Give a reason for your answer.

number of caterpillars .....

reason .....

.....
[1]

(b) The fact sheet shows information about wetlands.

Wetlands

Wetlands are important in many ways:

- Wetlands provide a habitat for a variety of different plants and animals.
- Wetlands control flooding by taking up water from tides and rivers.
- Wetlands act as filters, cleaning water and trapping toxins.
- Wetlands provide leisure facilities such as canoeing, fishing and birdwatching.

(i) Use the fact sheet to explain why wetlands are important for maintaining biodiversity.

.....

.....

.....

..... [2]

(ii) Suggest how providing leisure facilities can help to conserve wetlands.

.....

..... [1]

(iii) A development company wants to drain a wetland in South America to make a local town bigger.

Four people discuss the proposed draining of the wetland.

A Town official

Draining the wetland will provide people with homes, shops and roads.

B Scientist

The wetland is an important habitat for several rare species of birds and frogs. If the wetland is drained, the species may become extinct.

C Town resident

The wetland should be drained because it is a breeding ground for mosquitoes that spread malaria.

D Environmental officer

If we drain the wetland, there will be a greater chance of flooding in the town.

Do you think the wetland should be drained?

Support your view with reference to the comments made by the different people.

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..... [7]

[Total: 13]

7 **(a)** Marble and slate are metamorphic rocks.

Describe the formation of metamorphic rocks.

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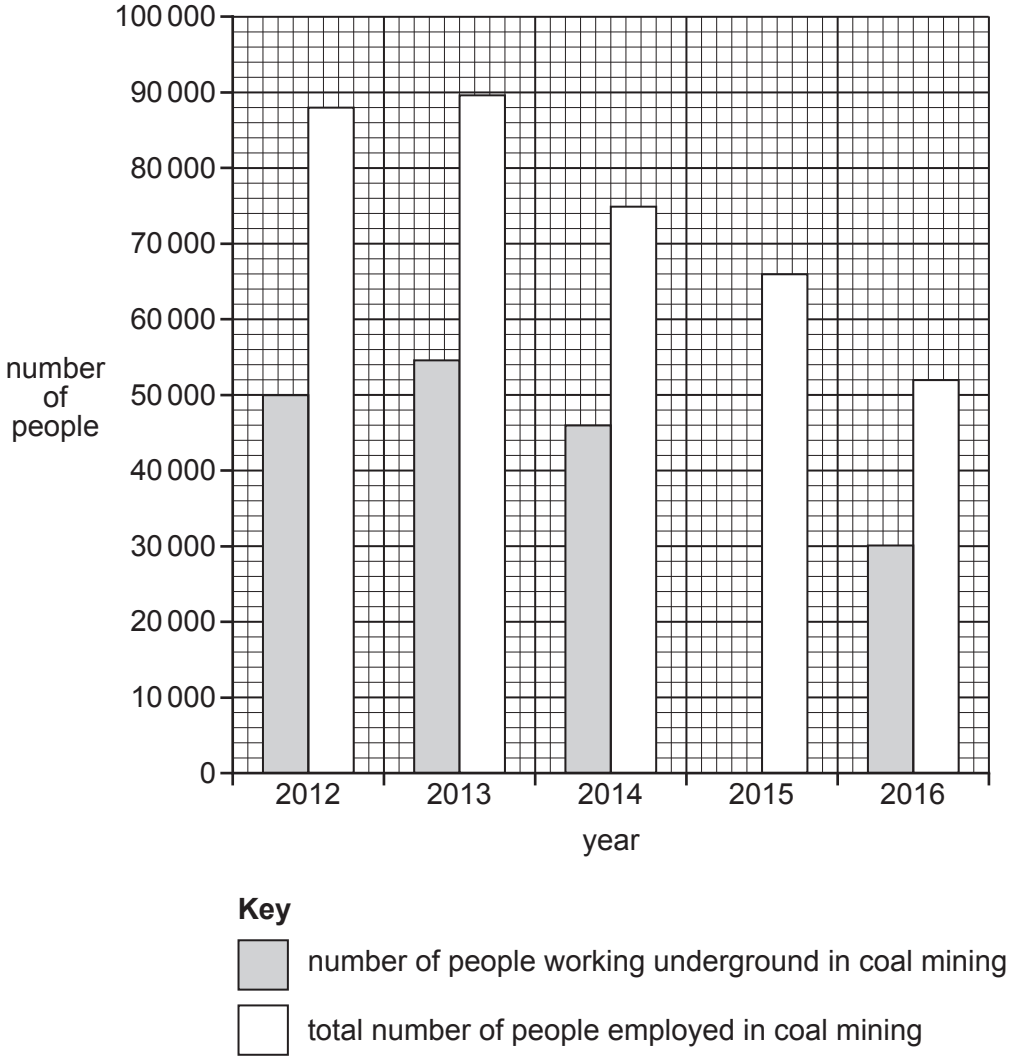
..... [2]

(b) The bar chart shows the number of people employed in the coal mining industry in the USA from 2012 to 2016.



(i) Complete the bar chart to show that the number of people working underground in coal mining in 2015 was 40100. [1]

(ii) In 2013, a total of 89900 people were employed in the coal mining industry in the USA. The number of people working underground in coal mining was 54500.

Calculate the percentage of people working underground in coal mining in 2013.

..... % [1]

(iii) Suggest reasons why the total number of people employed in the coal mining industry in the USA decreased after 2013.

.....

.....

.....

..... [2]

(c) The photograph shows part of an opencast coal mine.

(i) The coal mine provides employment for local people.

Describe **other** benefits a coal mine can have for local people.

.....

.....

.....

.....

.....

..... [3]

(ii) State **two** ways the land can be used after the coal mine closes.

1 .....

2 .....

[2]

(d) Some countries are burning less coal to reduce carbon dioxide emissions. These countries are using other energy resources such as nuclear, wind and solar power.

Suggest reasons why some countries continue to use coal as an energy resource.

.....

.....

.....

.....

.....

..... [3]

[Total: 14]

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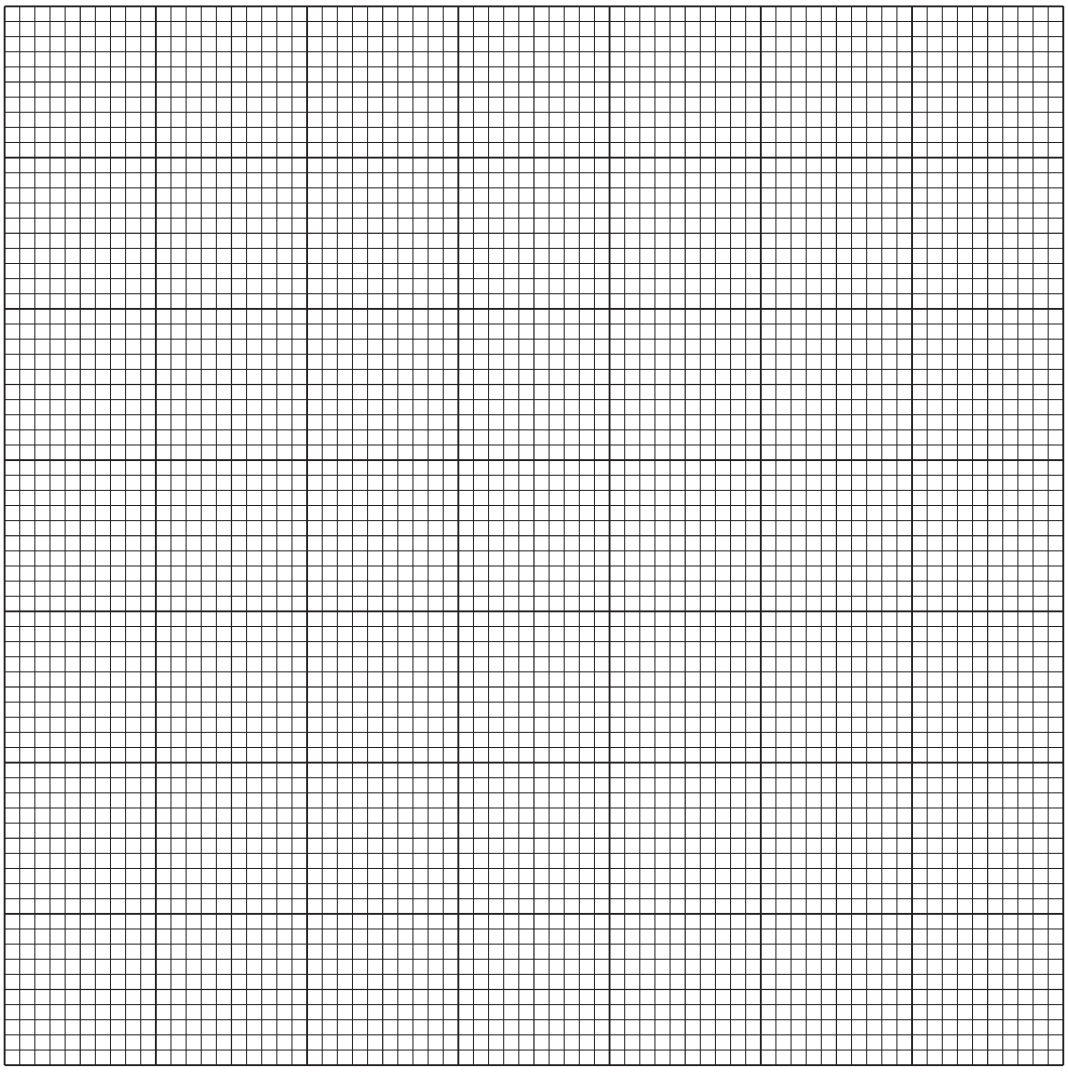
8 A scientist investigates the effect of nitrogen fertiliser on the yield of corn plants.

The table shows the results.

mass of nitrogen fertiliser applied / kg per hectare	yield of corn / kg per hectare	increase in yield of corn / kg
0	814	0
10	1142	328
20	1305	.....
30	1393	579
40	1417	603
50	1441	627
60	1441	627

(a) **(i)** **Complete the table** to calculate the increase in yield of corn when 20 kg per hectare of nitrogen fertiliser is applied compared to 0 kg per hectare. [1]

(ii) Plot, on the grid, a line graph of the **increase** in yield of corn against mass of nitrogen fertiliser applied.



[4]

(iii) Use the data to predict what will happen to the yield of corn if 70 kg per hectare of nitrogen fertiliser is applied.

.....

..... [1]

(iv) Suggest **two** environmental factors that can cause a change in the yield of corn.

1 .....

.....

2 .....

.....
[2]

(b) Overuse of fertilisers can cause river pollution.

Explain how fertilisers get into rivers.

.....

.....

.....

..... [2]

(c) Crop yield can be increased by using genetically modified plants.

Explain **two** ways genetically modified plants can increase yield.

1 .....

.....

2 .....

.....
[2]

[Total: 12]

9 A student reads some information about flooding in Bangladesh.

Flooding in Bangladesh

Bangladesh is a very low-lying country in Asia. Bangladesh has large rivers that split into many smaller rivers near the sea. These smaller rivers are surrounded by flood plains. Flood plains are areas of land that are covered by water when rivers overflow.

Every year, during the wet season, there is flooding. After flooding, a layer of nutrient-rich sediment is left on the land. This makes the soil very fertile.

In some years, the flooding in Bangladesh is very large-scale. In 1987, 57 300 km^2 of land was flooded. In 1988, another big flood covered 82 000 km^2 of land. The flood of 1998 covered 77 700 km^2 of land. In 2004, about 70 800 km^2 of land was flooded.

(a) **(i)** State the meaning of *flood plain*.

.....

..... [1]

(ii) Use the information about flooding in Bangladesh to give **one** reason why flood plains are important.

.....

..... [1]

(b) Present the data from the information in a suitable table to show the area of land flooded in each year given.

[3]

(c) The student says,

> **Small-scale** flooding is a good thing, even though it can cause damage.

To what extent do you agree with this statement? Give reasons for your answer.

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..... [6]

[Total: 11]

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