Cambridge Assessment International Education

Cambridge O Level

CANDIDATE NAME	

CENTRE NUMBER						CANDIDATE NUMBER				

0300573178

ENVIRONMENTAL MANAGEMENT **5014/12**

Paper 1 Theory **October/November 2021**

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. Any blank pages are indicated.

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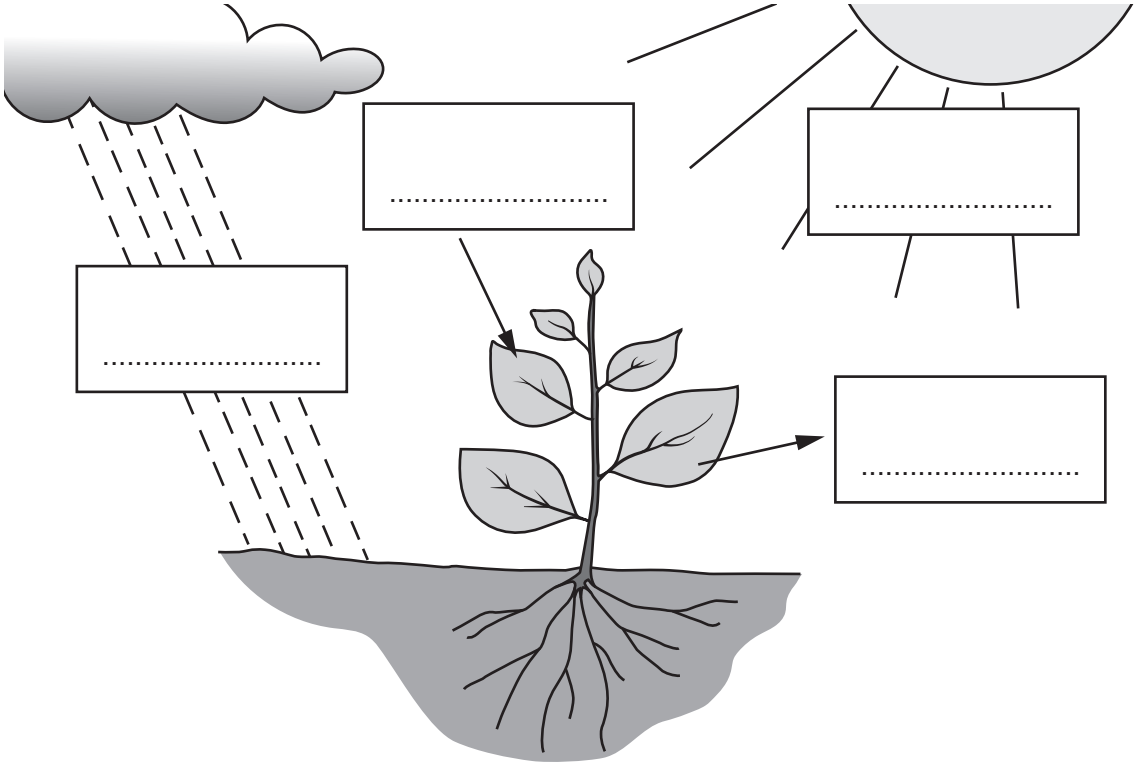
Section A

1 Green plants produce glucose by a process called photosynthesis.

The diagram shows the process of photosynthesis. The diagram is **not** complete.



(a) Complete the diagram by adding the words to the boxes.

carbon dioxide oxygen sunlight water [2]

(b) State the name of the green pigment in the leaves of green plants.

..... [1]

(c) State the name of the process in plants that **uses** glucose.

..... [1]

(d) Explain why crop yield increases when plants are grown in greenhouses.

.....

.....

.....

..... [2]

[Total: 6]

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2 The photograph shows a large area of farmland.

(a) Circle the type of agriculture shown in the photograph.

commercial arable	subsistence arable	commercial pastoral	subsistence pastoral

[1]

(b) Crop yield can be increased by improving irrigation methods.

State **two** other methods of increasing crop yield.

1 .....

2 .....

[2]

(c) State **two** ways of damaging soil by the mismanagement of irrigation.

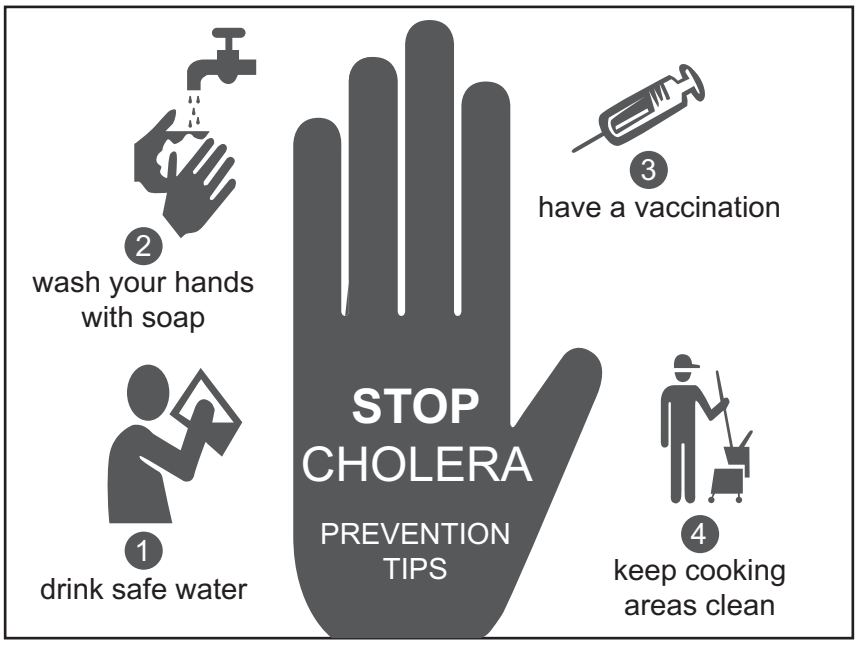
1 .....

2 .....

[2]

[Total: 5]

3 The poster shows a health campaign about preventing the spread of cholera.



(a) Explain how these prevention tips can reduce the spread of cholera.

.....

.....

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.....

.....

..... [3]

(b) Suggest why there are more outbreaks of cholera in less economically developed countries (LEDCs) than in more economically developed countries (MEDCs).

.....

.....

.....

..... [2]

[Total: 5]

4 The photograph shows an area of high population density in a city.

(a) Suggest **two** reasons for high population density in a city.

1 .....

.....

2 .....

.....

[2]

(b) State **two** strategies for managing the population size of a country.

1 .....

.....

2 .....

.....

[2]

[Total: 4]

Section B

5 The photograph shows a quarry where limestone is extracted.

(a) **(i)** State the name of the type of mining shown in the photograph.

..... [1]

(ii) Use the photograph to explain the impacts of this mine on the local environment.

.....

.....

.....

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..... [3]

(iii) Describe how limestone rock is formed.

.....

.....

.....

..... [2]

(iv) A mining company wants to open a new mine.

Suggest factors that affect the decision of the mining company to open the mine.

.....

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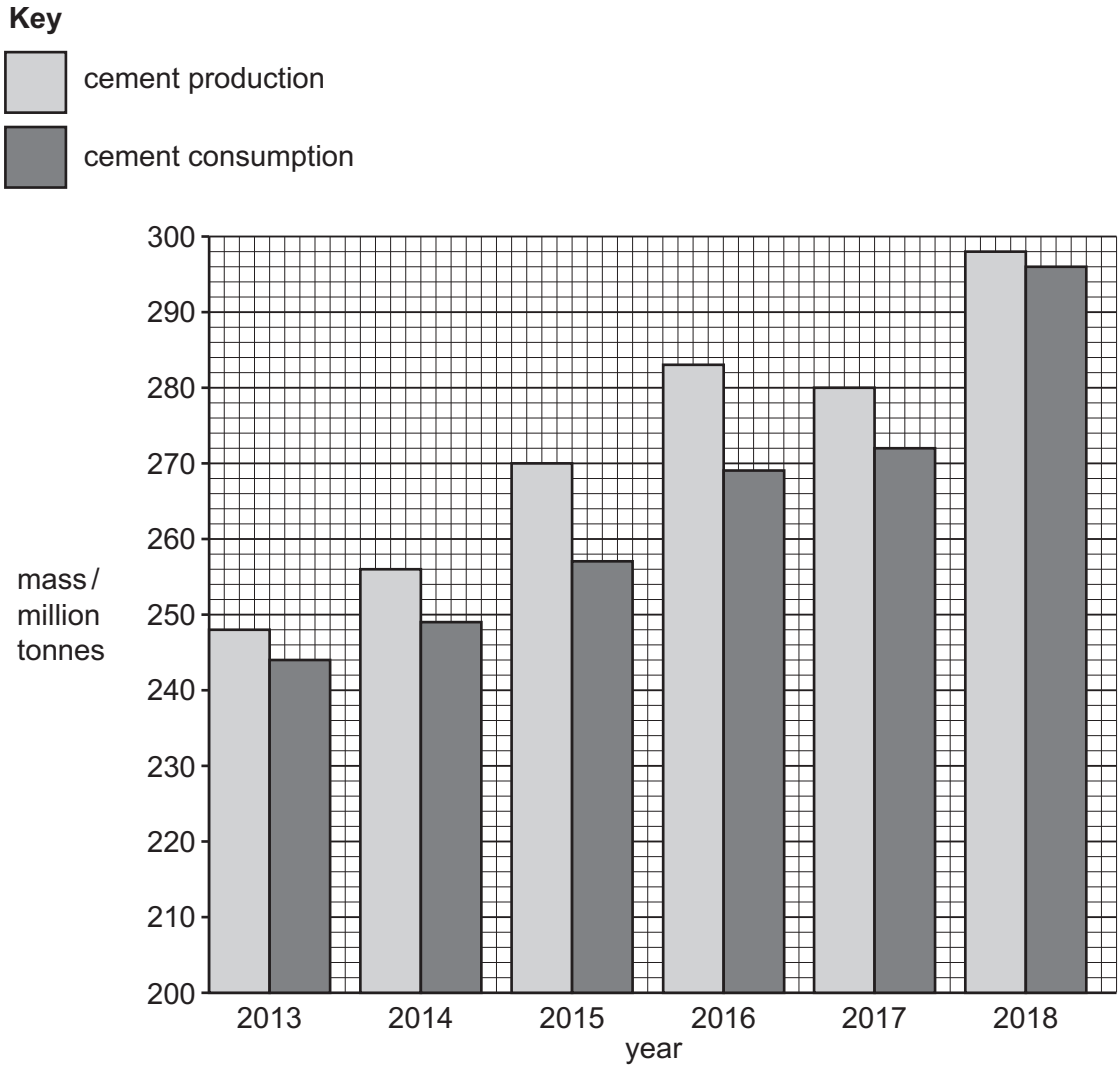
..... [3]

(b) Limestone is used to make cement.

The bar chart shows cement production and cement consumption in India between 2013 and 2018.



(i) Identify the year with the greatest difference between production and consumption.

..... [1]

(ii) Use data from the bar chart to describe the trend in consumption of cement in India between 2013 and 2018.

.....

.....

.....

..... [2]

(iii) In 2018, 298 million tonnes of cement was produced.

Cement production was predicted to increase by 4.5% in 2019.

Calculate the predicted cement production in million tonnes for 2019.

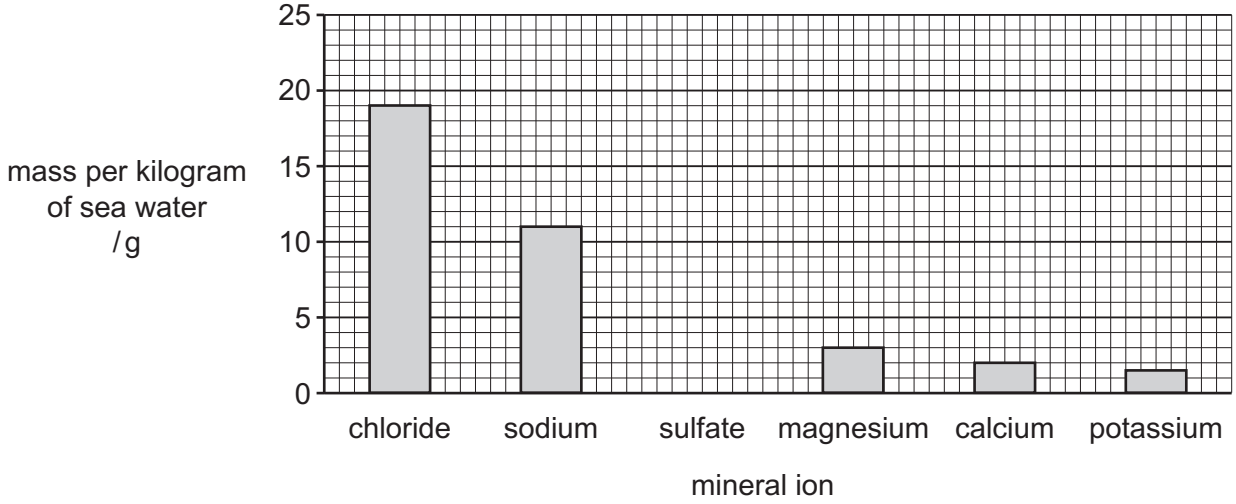
..... million tonnes [2]

[Total: 14]

6 **(a)** Sea water contains mineral ions.

The bar chart shows the mass of some mineral ions per kilogram of sea water.

The bar chart is **not** complete.



(i) Complete the bar chart to show 3.5 g of sulfate ions per kilogram of sea water. [1]

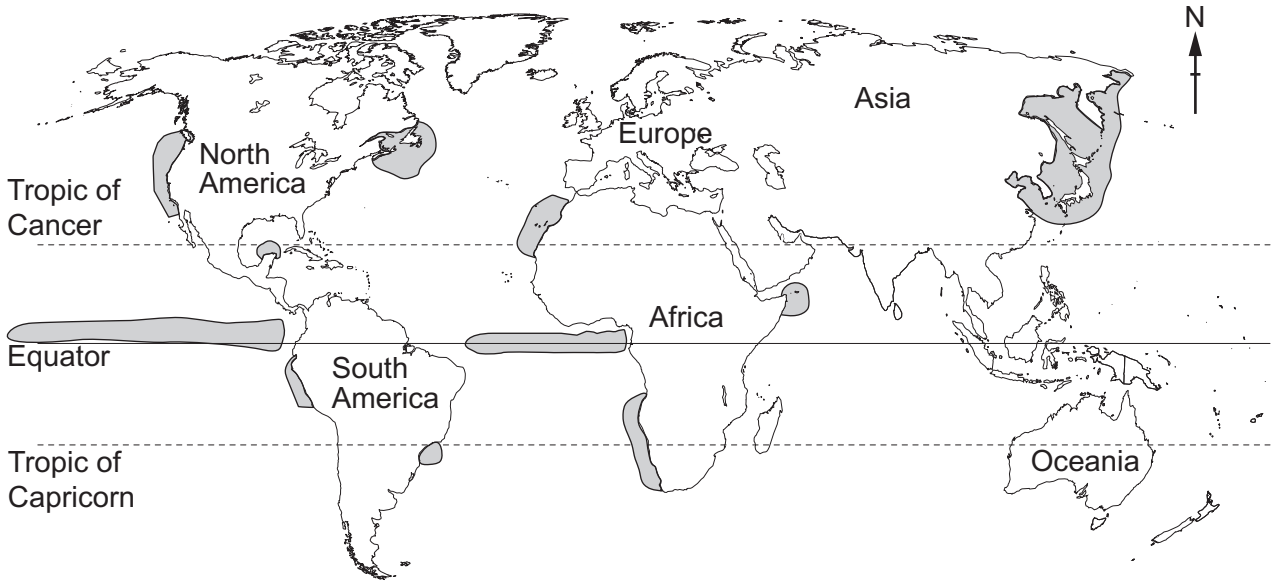
(ii) Calculate the total mass of chloride and sodium ions in one kilogram of sea water.

total mass = ... g [1]

(b) The map shows some major marine fish populations.

Key

major marine fish population



(i) Describe the distribution of major marine fish populations shown on the map.

.....

.....

.....

.....

.....

..... [3]

(ii) Many of the major marine fish populations are decreasing.

Describe strategies for managing the harvesting of marine fish populations.

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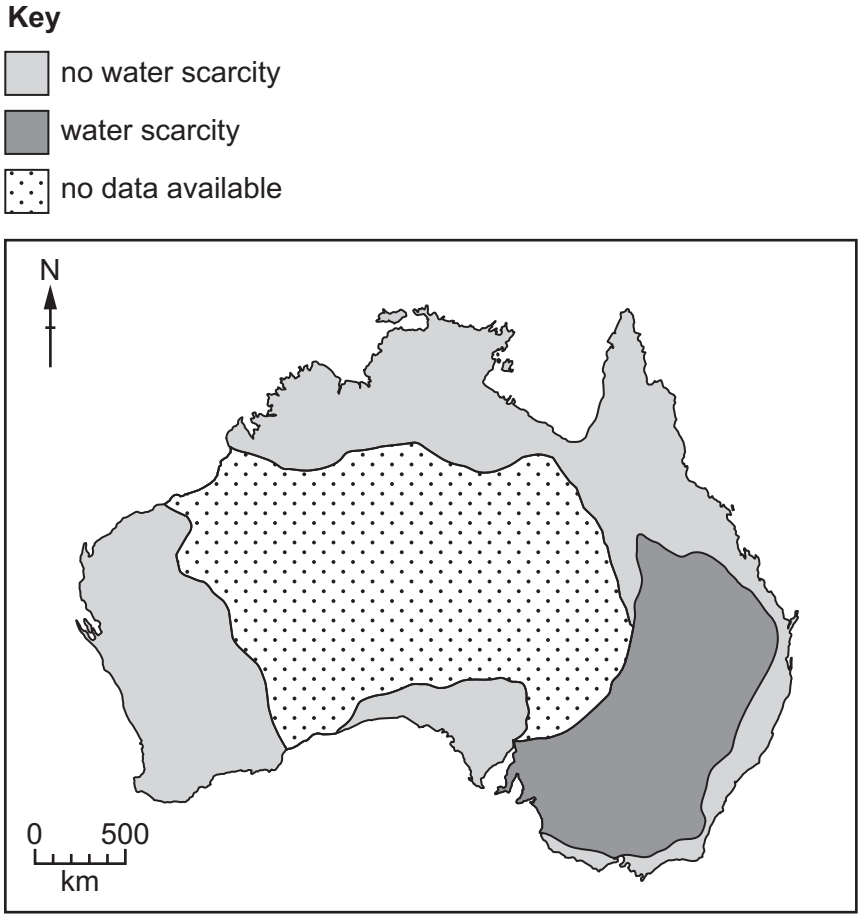
..... [4]

[Total: 9]

7 Water scarcity is when there is not enough fresh water to meet people's needs.

(a) The map shows water scarcity in Australia.



(i) Suggest reasons why there is water scarcity in the area shown on the map.

.....

.....

.....

..... [2]

(ii) Suggest reasons why some areas of Australia have no data available.

.....

.....

.....

..... [2]

(b) Water scarcity can cause drought.

State **one** impact of drought.

..... [1]

(c) Three strategies for managing the impacts of water scarcity are:

- desalination
- reservoirs
- emergency supplies of water in plastic bottles.

Suggest the benefits and limitations of these strategies.

.....

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..... [5]

[Total: 10]

8 The table shows vehicle emissions from cars with different types of engines.

engine type	carbon dioxide / arbitrary units	carbon monoxide / arbitrary units
electric	10	22
hybrid (electric and petrol)	50	176
diesel	160	408
petrol	120	221

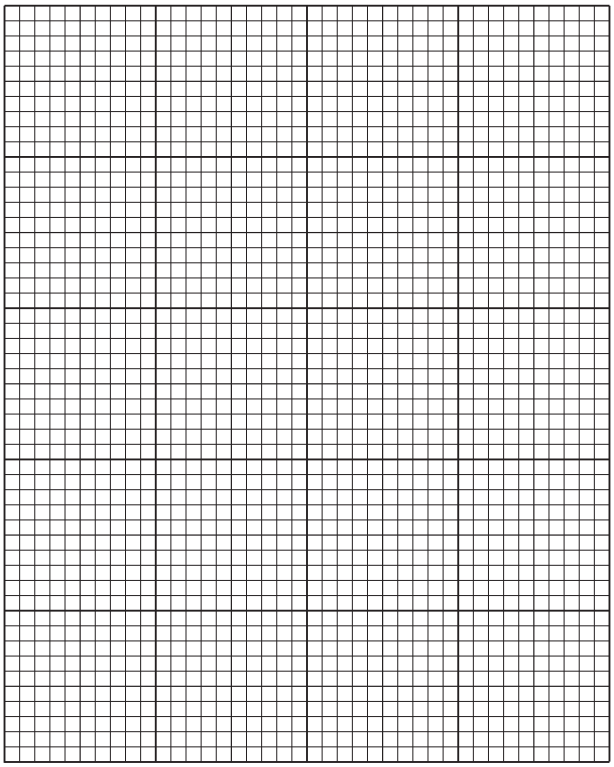
(a) **(i)** Calculate the difference in carbon monoxide emissions between a hybrid and a petrol engine.

..... [1]

(ii) Use the data to determine which engine type causes most harm to the environment.

..... [1]

(iii) On the grid, plot a bar chart of carbon **dioxide** emissions for each engine type.



[4]

(b) Suggest ways that governments can encourage the use of electric vehicles.

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..... [3]

(c) Explain why reducing carbon dioxide emissions is of **global** importance.

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..... [4]

[Total: 13]

9 A student reads a blog about nuclear power.

> In 2017, 10.5% of the world's electricity was generated from 454 nuclear power stations. Nuclear power produces a lot of energy from a small mass of fuel.
>
> Nuclear power stations use heat to produce steam to turn turbines, which drive generators. The heat comes from nuclear fission. Nuclear fission splits the nuclei of uranium atoms to release large amounts of energy.
>
> In 2017, 38% of the world's uranium production came from Kazakhstan. This was 23 300 tonnes of uranium. Canada produced 13 100 tonnes, which was 22%, and Australia's production was 5900 tonnes, which was 10%.

(a) Fossil fuel power stations also use heat to produce steam to turn turbines.

Explain how the source of heat energy in a nuclear power station is different from the source of heat energy in a fossil fuel power station.

.....

.....

.....

..... [2]

(b) Use the blog to present the data for the percentage and mass of uranium produced in Kazakhstan, Canada and Australia in a suitable table.

[4]

(c) Over two-thirds of the world's uranium production comes from only three countries.

Suggest why some people are concerned about this.

.....

.....

.....

..... [2]

(d) A student says:

> To meet world demand **and** combat climate change,
> **all** power stations built in the future should be nuclear power stations.

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

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..... [6]

[Total: 14]

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