Cambridge Assessment International Education

Cambridge International AS Level

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

4962846894

ENVIRONMENTAL MANAGEMENT **8291/11**

Paper 1 Principles of Environmental Management **May/June 2024**

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

INSTRUCTIONS

- Section A: answer **all** questions.
- Section B: answer **one** question.
- 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

Answer **all** questions in this section.

1 **(a)** Fig. 1.1 shows the structure of the Earth's atmosphere.

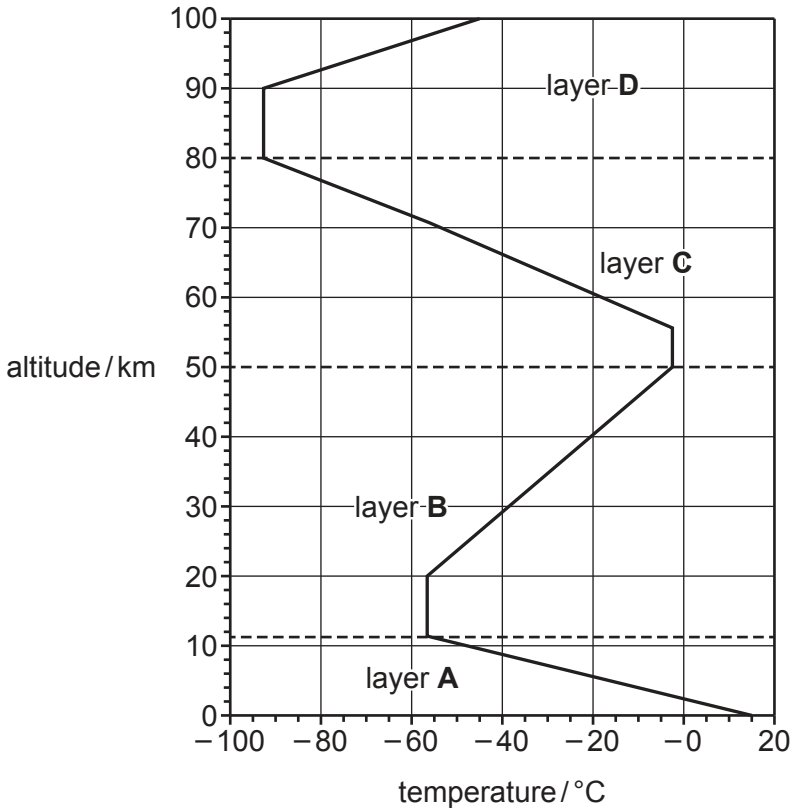

Fig. 1.1

(i) Identify the letter on Fig. 1.1 that represents the:

thermosphere ……..……

troposphere. …….

[2]

(ii) Describe the change in temperature shown in layers **A** and **B**.

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..... [2]

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(iii) Explain how the structure of layer **B** causes the temperature change between an altitude of 20 km and 50 km.

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..... [3]

(b) (i) Outline how the natural greenhouse effect maintains the temperature of the Earth's atmosphere.

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..... [4]

(ii) Suggest how eating a plant-based diet can reduce the enhanced greenhouse effect.

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..... [4]

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(iii) State **two other** ways that human activities contribute to the enhanced greenhouse effect.

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2 .....

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[2]

[Total: 17]

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2 In 1910, a volcano erupted on Savai'i island, Samoa. The area was covered with a layer of lava which cooled to form solid rock known as a lava field.

Fig. 2.1 shows plants growing on the lava field.

Fig. 2.1

(a) Fig. 2.1 shows a stage in the primary succession of an ecosystem.

(i) Identify **one** piece of evidence in Fig. 2.1 that shows this is primary succession.

..... [1]

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(ii) Explain how this ecosystem will change over time.

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..... [6]

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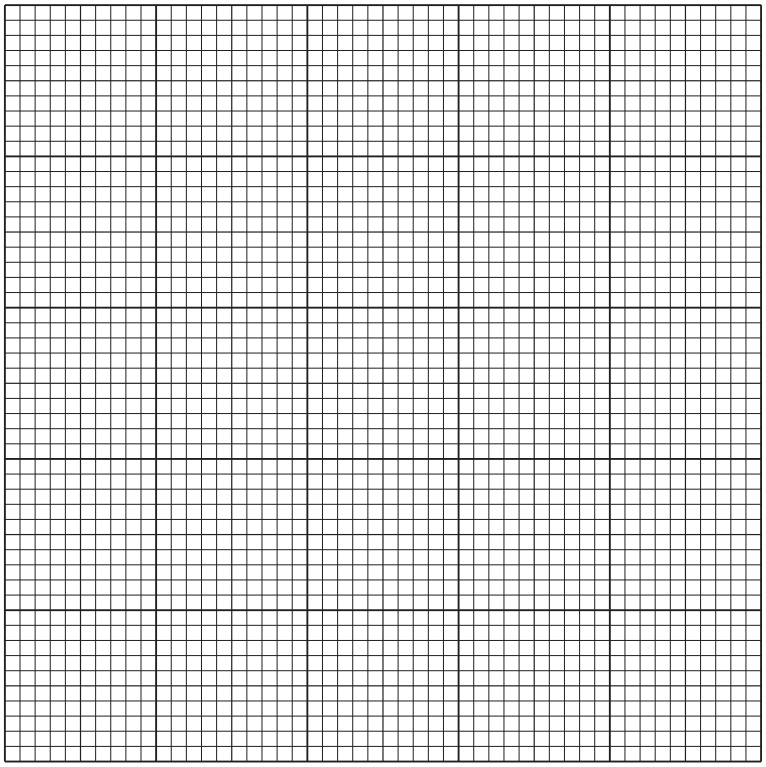
(b) Table 2.1 shows the net primary productivity for five ecosystems.

Table 2.1

ecosystem	net primary productivity / g carbon m^{-2} $year^{-1}$
sand dune (large area of sand with very few plants)	15
forest	360
tundra	65
grassland	230
desert scrubland (large area of sand with small plants)	32

(i) Plot a bar chart to show the net primary productivity for the ecosystems shown in Table 2.1.



[4]

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(ii) Predict the net primary productivity for the ecosystem shown in Fig. 2.1.

Explain your answer.

net primary productivity = ... g carbon m^{-2} $year^{-1}$

explanation .....

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[3]

(iii) The productivity of an ecosystem can be expressed as net primary productivity or gross primary productivity.

Compare how gross primary productivity is different to net primary productivity.

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..... [4]

[Total: 18]

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3 Fig. 3.1 shows small-scale mineral extraction in Africa.

Fig. 3.1

(a) Suggest the impacts that this mineral extraction can have on the ecosystem.

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..... [5]

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(b) (i) Rocks containing cobalt are mined in Africa. Cobalt metal is used in rechargeable batteries. Cobalt can be recycled from these rechargeable batteries.

Suggest **two** reasons why most cobalt is mined and **not** recycled.

1 .....

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2 .....

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[2]

(ii) After recycling the cobalt, the waste from the rechargeable batteries can be incinerated.

Name **one other** strategy for waste disposal and explain the impacts of this method.

strategy .....

impacts .....

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[3]

(iii) Some governments promote the strategy of reduce, reuse and recycle to manage the impacts of waste disposal.

Evaluate the strategy of reducing the use of rechargeable batteries.

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[Total: 13]

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4 Fig. 4.1 shows a model for describing a country's energy sustainability.

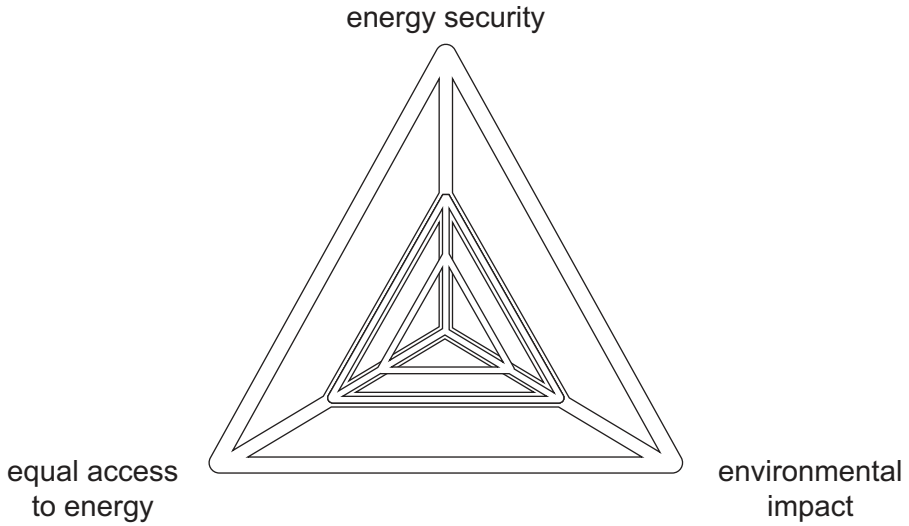

Fig. 4.1

(a) (i) Define the term sustainability.

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..... [2]

(ii) Energy security can be short-term and long-term.

Describe long-term energy security.

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(iii) Explain the causes of energy insecurity.

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(b) Table 4.1 shows two countries ranked by energy sustainability. The overall rank position is calculated using the rank position for the three aspects of energy sustainability.

Table 4.1

		energy sustainability rank		
overall rank position	**country**	**energy security**	**equal access to energy**	**environmental impact**
1st	Sweden	5th	19th	2nd
4th	Finland	2nd	21st	19th

Suggest **two** strategies that Finland can introduce to improve their overall rank position shown in Table 4.1.

1 .....

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2 .....

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[2]

[Total: 12]

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Section B

Answer **one** question from this section.

EITHER

5 'Reducing the water used for agriculture is the most effective strategy for managing water security.'

To what extent do you agree with this statement?

Give reasons and include information from relevant examples to support your answer.

[20]

OR

6 Evaluate the success of local, national and global policies as strategies for managing human population.

Give reasons and include information from relevant examples to support your answer.

[20]

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