Cambridge International Examinations
Cambridge International Advanced Subsidiary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

ENVIRONMENTAL MANAGEMENT **8291/11**

Paper 1 Lithosphere and Atmosphere **October/November 2017**

1 hour 30 minutes

Additional Materials: Answer Booklet/Paper

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.

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

Section A
Answer **all** questions in this section.
Write your answers in the spaces provided on the question paper.

Section B
Answer **one** question from this section.
Write your answers on the separate answer paper provided.

At the end of the examination,
1. fasten all separate answer paper securely to the question paper;
2. enter the question number from Section B in the grid.

	For Examiner's Use
Section A	
1	
2	
Section B	
Total	

This document consists of **14** printed pages and **2** blank pages.

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International Examinations

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Section A

Answer **all** questions.

Write your answers in the spaces provided.

1 **(a)** Fig. 1.1 shows global greenhouse gas emissions from 1990 to 2005.
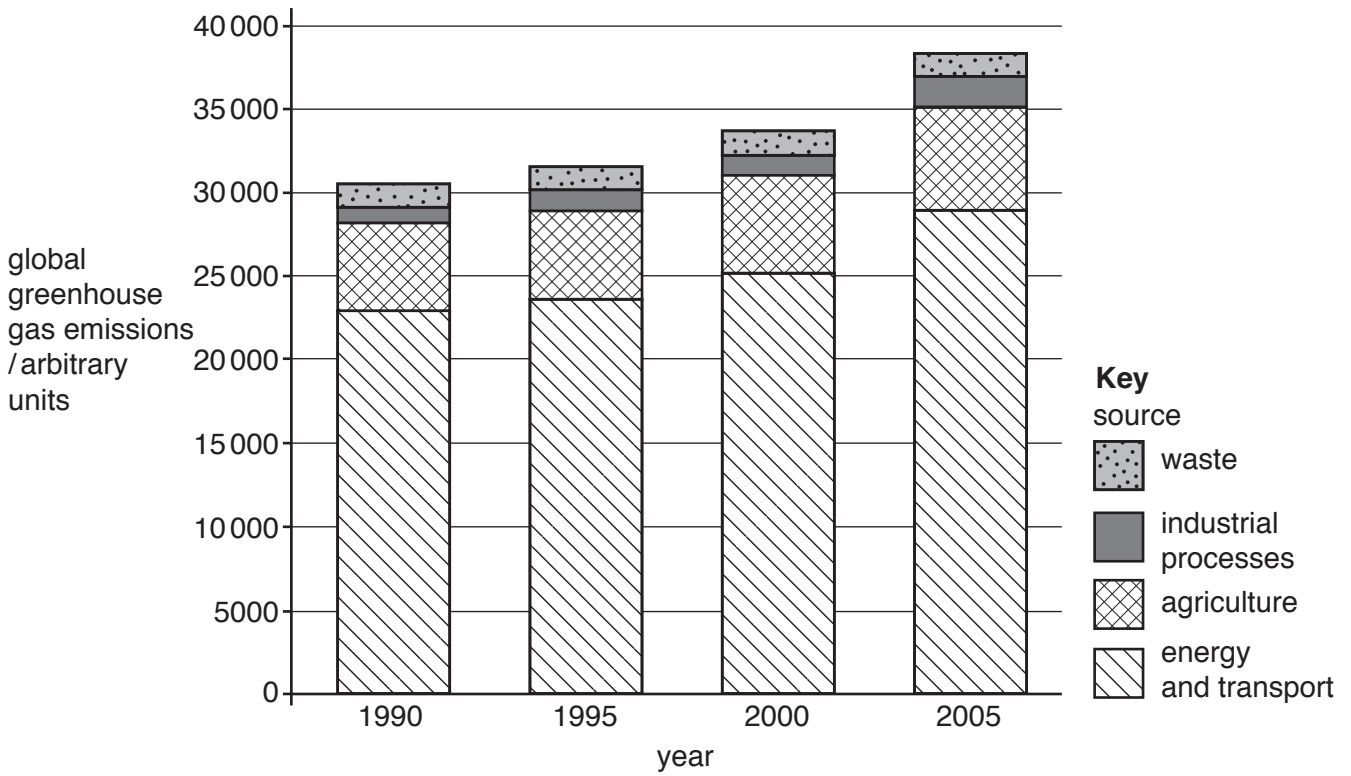
Fig. 1.1

(i) State the meaning of the term *greenhouse gas*.

....

.... [1]

(ii) State **two** trends in greenhouse gas emissions shown in Fig. 1.1.

....

....

....

.... [2]

(iii) The use of energy resources to generate electricity results in greenhouse gas emissions.

State **two** reasons why.

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.... [2]

(iv) A group of students obtained data from their local environmental agency on carbon dioxide, CO_2, emissions in their area. The results are shown in Table 1.1.

Plot the results as a labelled divided bar graph on the grid **and** complete the key.

Table 1.1

source	CO_2 emissions /arbitrary units
waste	1
industrial processes	2
agriculture	7
energy and transport	8
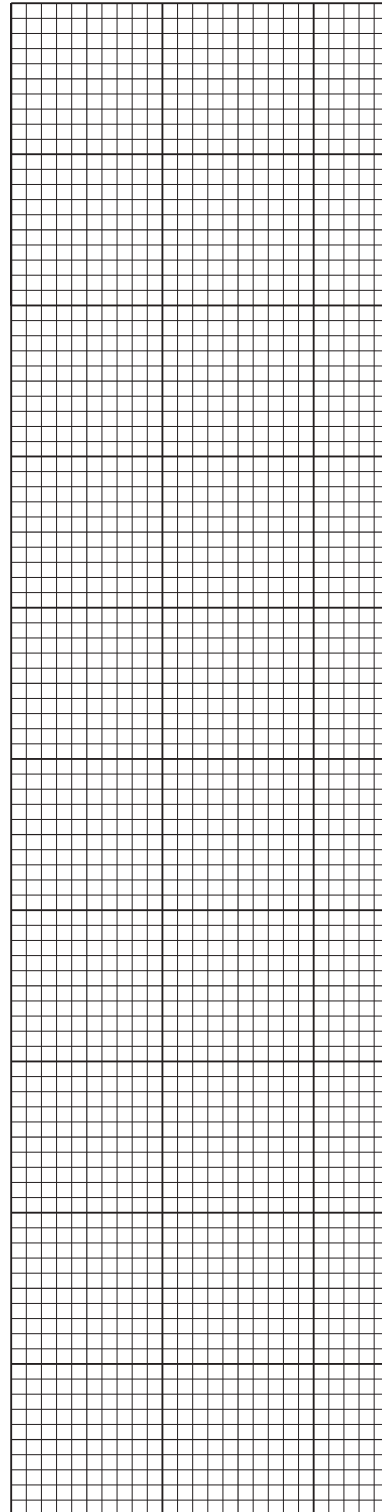
Key

[4]

(b) Table 1.2 shows the contribution made by two gases to the greenhouse effect.

Table 1.2

gas	contribution to total greenhouse gas emissions /%	greenhouse warming potential	increase in concentration since 1750 /%	length of time gas remains in atmosphere /years
carbon dioxide	77	1	30	100
methane	14	25*	150	8

*methane has 25 times the greenhouse warming potential of carbon dioxide

Using the information in Table 1.2, briefly assess the contribution of carbon dioxide and methane to global warming.

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.... [3]

(c) Fig. 1.2 shows global carbon dioxide emissions by country from industry.

Fig. 1.2

(i) With reference to Fig. 1.2, describe and explain the pattern of carbon dioxide emissions.

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(ii) Explain the possible impact of future greenhouse gas emissions from newly industrialised countries.

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.... [4]

[Total: 20]

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2 **(a)** Fig. 2.1 is a triangular graph which classifies soils according to texture.
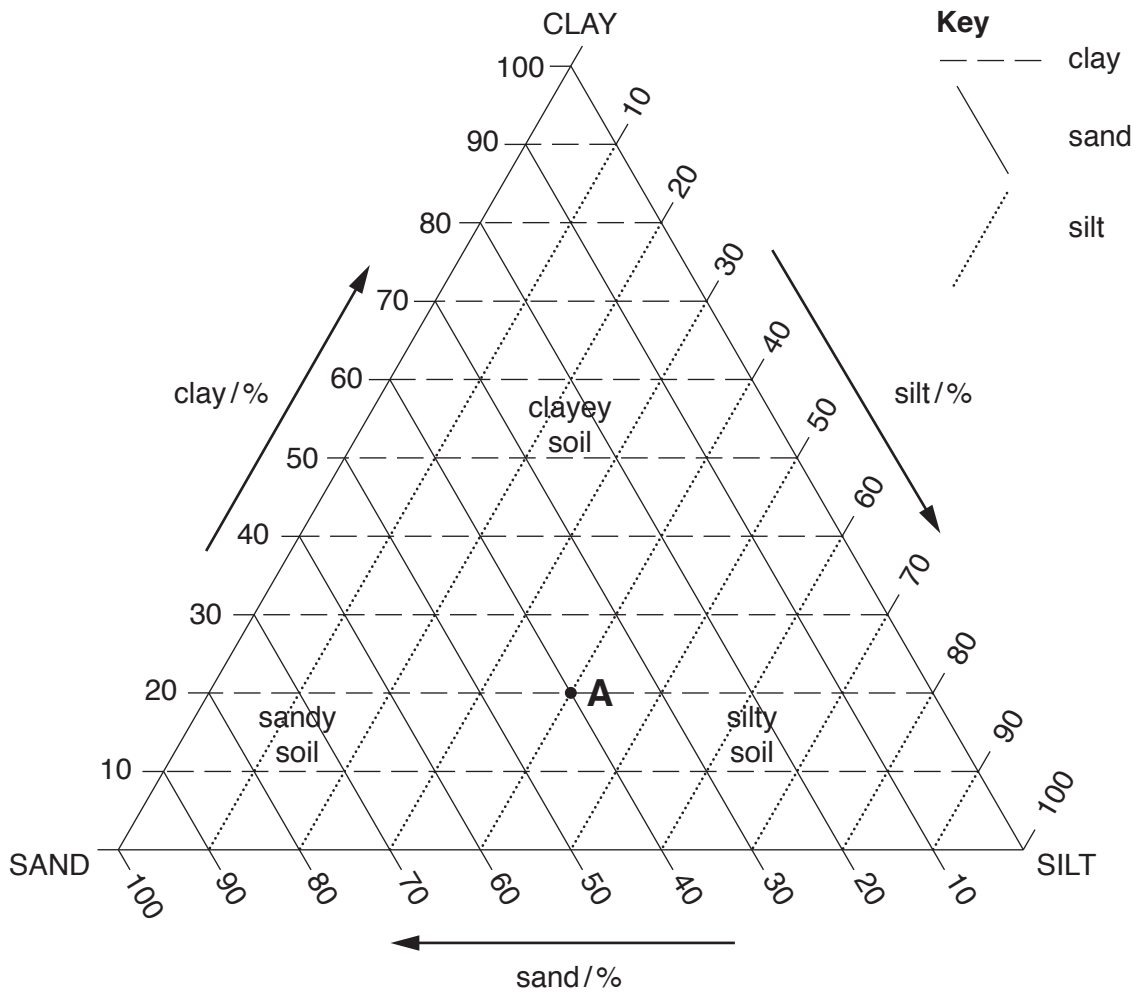
Fig. 2.1

(i) State why a triangular graph is used to classify soils according to texture.

....

.... [1]

(ii) With reference to Fig. 2.1, what percentage of sand, silt and clay are found at the point marked **A**?

sand ....

silt ....

clay ....

[2]

(iii) State **one** advantage and **one** disadvantage to cultivation of each of the following soil types.

a sandy soil ....

....

....

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a clayey soil ....

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....

[4]

(b) Fig. 2.2 contains information on biotic and abiotic components of a soil.
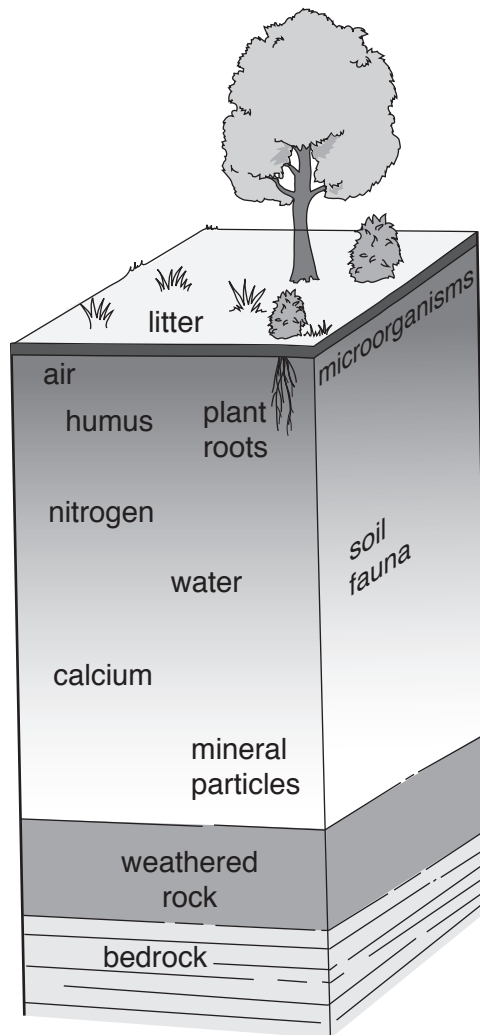
Fig. 2.2

(i) Identify **one** biotic and **one** abiotic soil component shown in Fig. 2.2.

biotic ....

abiotic ....

[1]

(ii) With reference to Fig. 2.2, describe the interaction between any **two** soil components.

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.... [3]

(iii) Describe **two** ways in which soil can be damaged by agricultural practices.

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.... [6]

(c) Fig. 2.3 contains techniques for soil conservation and for managing soils more sustainably.

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                    ┌──────────────────────┐
                    │  terracing hillsides │
                    └──────────────────────┘

┌────────────────┐
│ planting trees │                              ┌─────────────────────────────┐
└────────────────┘                              │ building earth dams on slopes│
                                                └─────────────────────────────┘
                        ┌─────────────────────┐
┌────────────────────────┐                      
│ applying green manure  │    soil conservation
└────────────────────────┘
                        └─────────────────────┘

          ┌───────────────────┐      ┌─────────────────────┐
          │ contour ploughing │      │  fencing in animals │
          └───────────────────┘      └─────────────────────┘
```
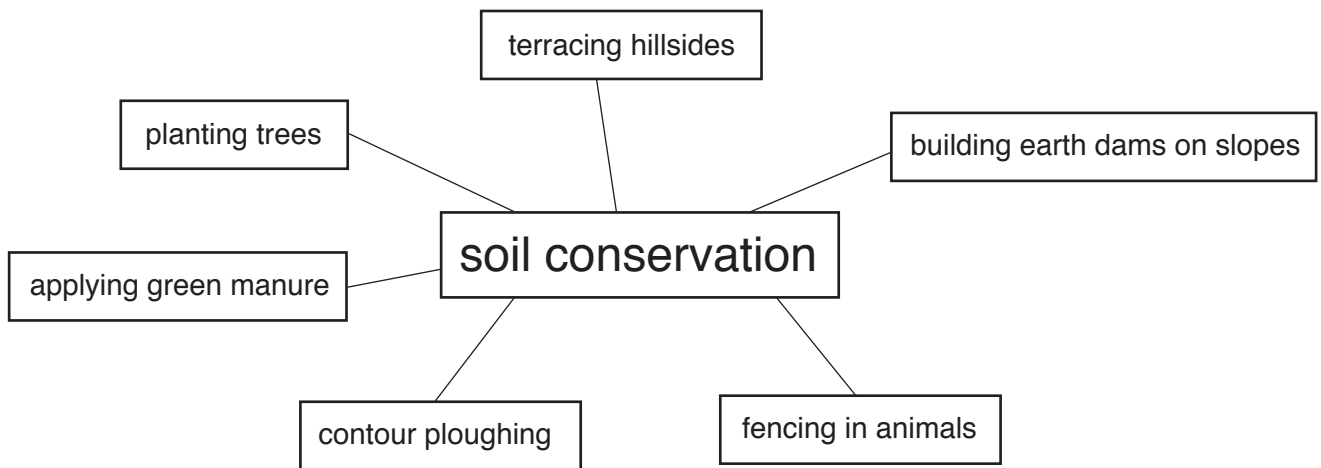
Fig. 2.3

Select **one** technique from Fig. 2.3 and explain how it results in a more sustainable use of the soil.

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.... [3]

[Total: 20]

Section B

Answer **one** question from this section.

Write your answers on the separate answer paper provided.

3   Study the information in Fig. 3.1 on the island of Benbecula in the Outer Hebrides, (NW Scotland).

Key
land
water
airport
causeway
N
Benbecula
road
North Atlantic Ocean
0   2 km
causeway
causeway

Benbecula is a low-lying island, exposed to strong winds and the full force of storms from the North Atlantic Ocean. It has a rural population of 1300, connected by narrow causeways to neighbouring islands and a small airport. It is likely to be affected by a projected rise in sea levels of up to two metres by the year 2100.

Fig. 3.1

(a) With reference to Fig. 3.1, suggest the likely consequences for the island of climatic change. [10]

(b) Using evidence from different parts of the world, assess to what extent global warming can be attributed to natural and human activities. [30]

[Total: 40]

4 Fig. 4.1 is an extract from an internet article containing information about Masdar City, in Abu Dhabi.

Masdar City

Masdar City is designed to be the most environmentally sustainable city in the world. The low-carbon, low-waste city relies entirely on renewable energy. Power is generated by a 10 MW photovoltaic power plant located on site and 1 MW of rooftop solar panels. Powered entirely by renewable energy, current Masdar City buildings are designed to cut energy use by 56% and potable water consumption by 54%.

Energy efficiency is achieved by:
- careful design
- efficient recycling of waste
- a low-energy transport system
- street layouts which reduce the effects of the hot summer sun
- walkways and plazas face away from the south and contain awnings and shade trees
- building exteriors use materials to minimise reflected sun.

Fig. 4.1

(a) With reference to the article in Fig. 4.1, evaluate Masdar City's claim to be 'the world's most environmentally sustainable city'. [10]

(b) The increasing concentration of human populations in large cities will result in both advantages and disadvantages for the sustainable management of resources. With reference to examples, assess to what extent you agree with this statement. [30]

[Total: 40]

5 Fig. 5.1 shows a variety of methods for monitoring the level of activity within a volcano.
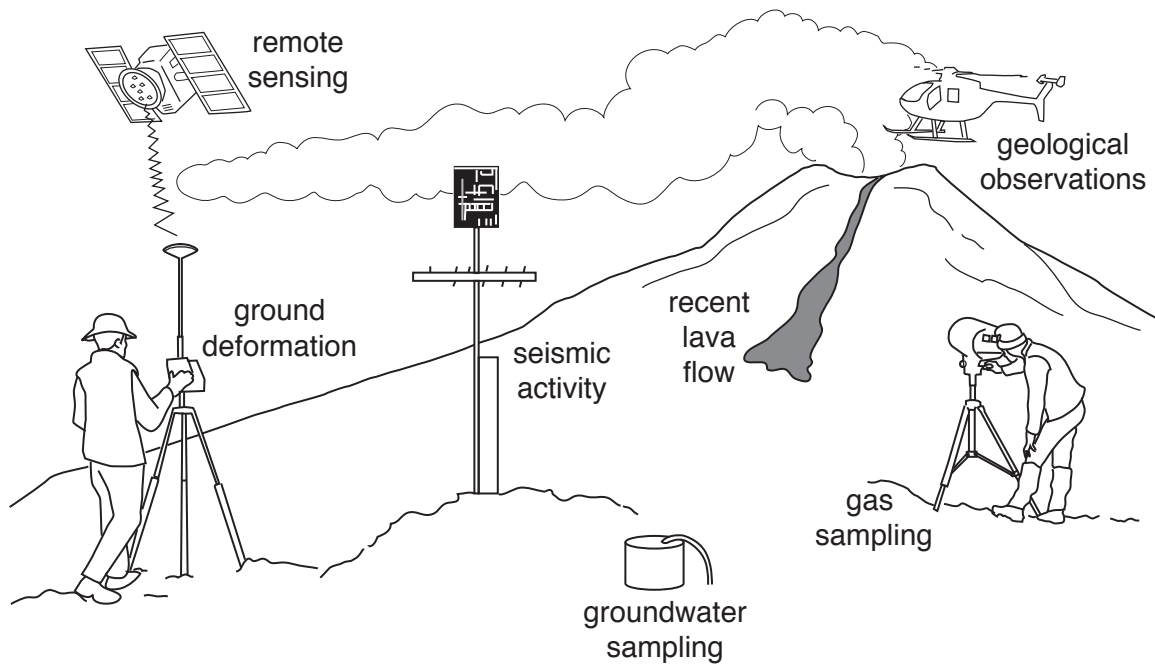
Fig. 5.1

(a) With reference to the methods shown in Fig. 5.1, outline how monitoring may help scientists predict volcanic eruptions. [10]

(b) With reference to examples, in what ways are MEDCs better able to withstand a major tectonic hazard event than LEDCs? [30]

[Total: 40]

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