Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

ENVIRONMENTAL MANAGEMENT **8291/01**

Paper 1 Lithosphere and Atmosphere

May/June 2006

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 a soft pencil for any diagrams, graphs, tables or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

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

Section B
Answer **one** question from this section.
Answer the question 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 opposite.

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

This document consists of **11** printed pages and **1** blank page.

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International Examinations

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For Examiner's Use

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

1 Three major effects of polluting the Earth's atmosphere are

- stratospheric ozone depletion,
- global warming,
- acid deposition.

(a) **(i)** Use the equations below to describe how CFCs contribute to the depletion of stratospheric ozone.

$$CFCl_3 \xrightarrow{UV} CFCl_2 + Cl$$

$$Cl + O_3 \longrightarrow O_2 + ClO$$

$$ClO + O \longrightarrow O_2 + Cl$$

.....

.....

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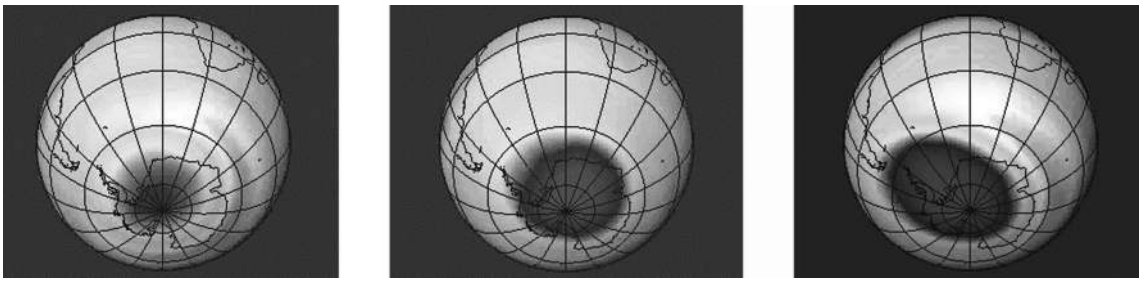
.....[3]

(ii) Describe **two** ways in which the hole in the ozone layer over the Antarctic, as shown in Fig. 1.1, changed between 1980 and 1991.

October 1980 October 1985 October 1991



Key = Ozone Hole

Fig. 1.1

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.....

.....[2]

(iii) Describe **one** way in which the depletion of stratospheric ozone can affect

1 people .....

.....

2 agricultural production .....

.....[2]

(b) Fig. 1.2 is a model showing the atmospheric processes that contribute to global warming.

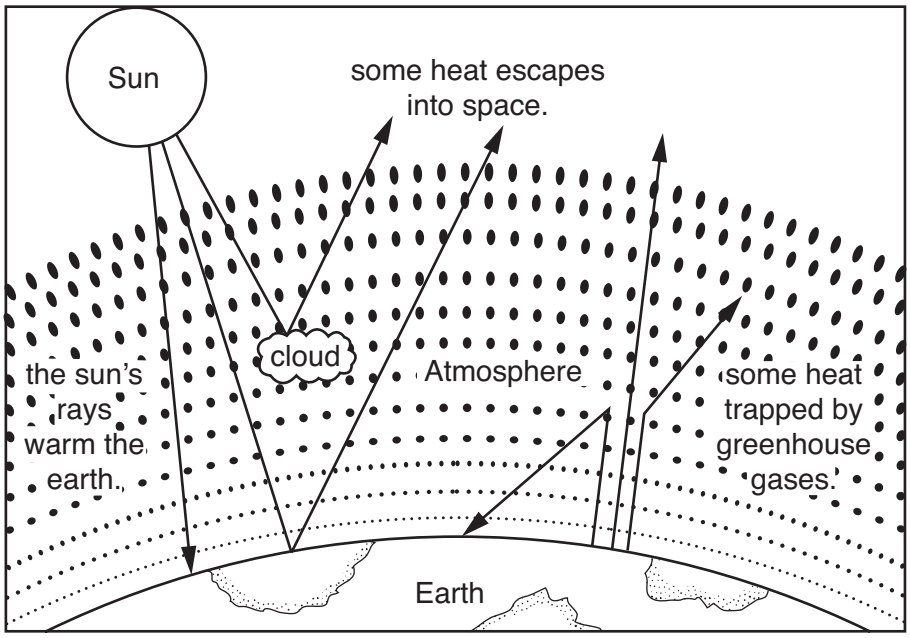

Fig. 1.2

(i) Name **two** greenhouse gases.

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.....[2]

(ii) Explain how greenhouse gases contribute to global warming.

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.....[3]

(iii) Describe **one** piece of evidence that could suggest that global climates have warmed and cooled in the past.

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.....[2]

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(c) **(i)** Describe and explain the difference between acid deposition at points **A** and **B** on Fig. 1.3.

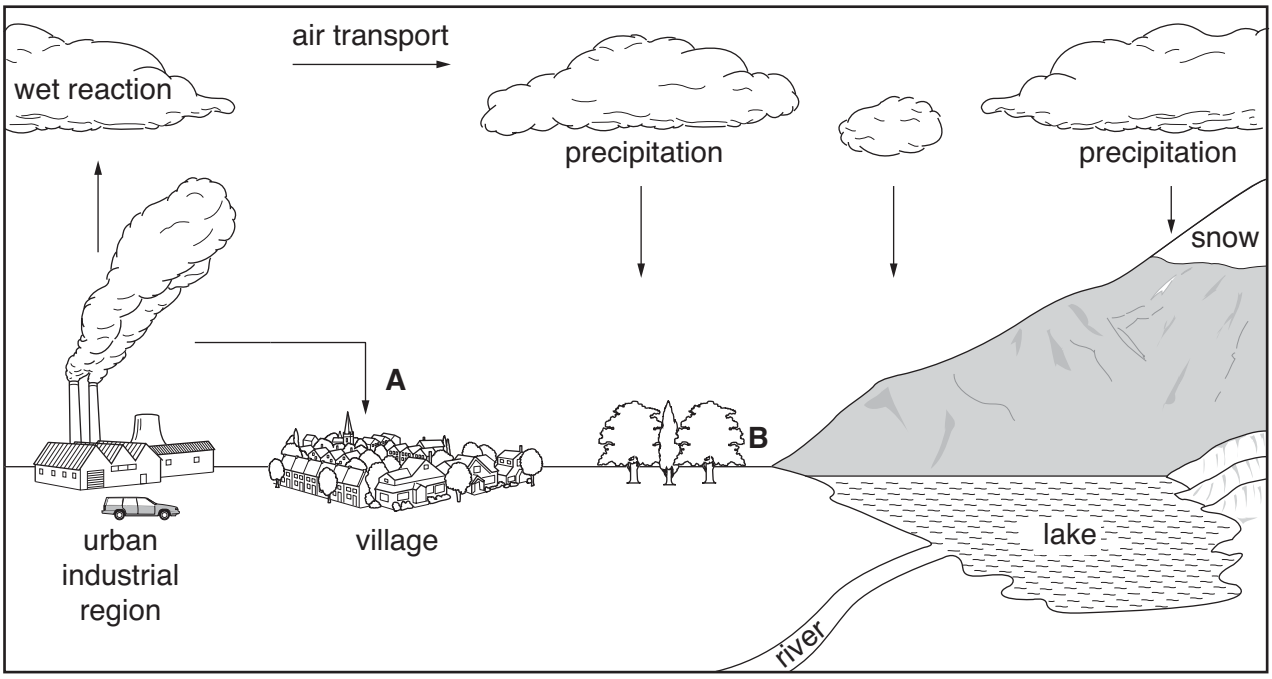

Fig. 1.3

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.....[4]

(ii) Describe the effect that acid deposition has upon **one** of the following: buildings **or** woodland **or** lakes.

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.....[2]

[20 marks]

2 **(a)** Fig. 2.1 shows the processes operating at a destructive plate boundary (A) and constructive plate boundary (B).

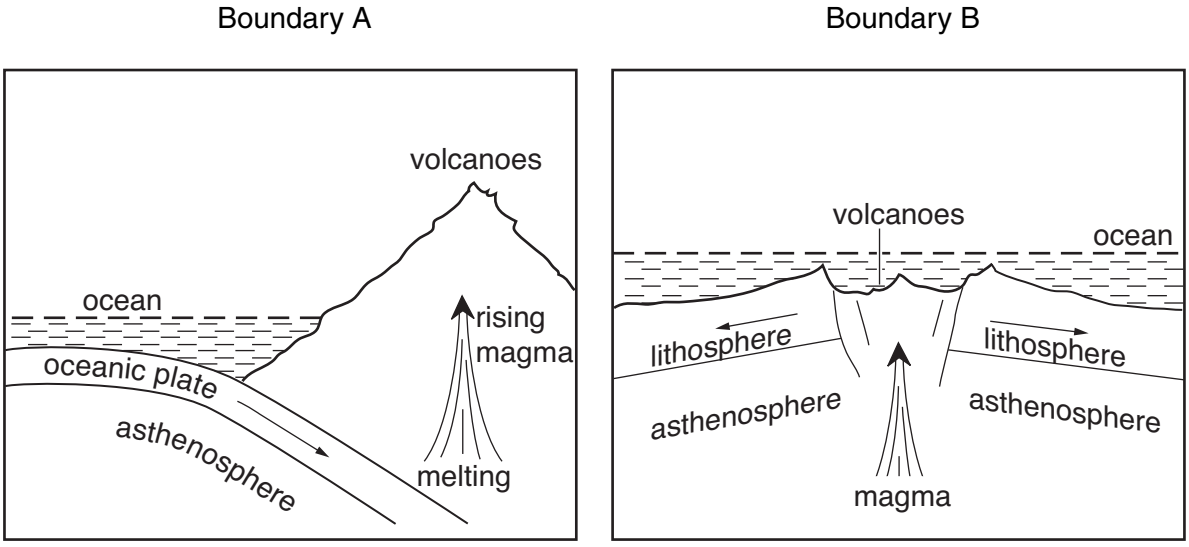

Fig. 2.1

(i) Why are the processes operating at plate boundary A regarded as being destructive, whilst those at plate boundary B are constructive?

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.....[2]

(ii) What is the difference between magma and lava?

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.....[2]

(iii) Describe **one** difference between the lavas produced from each of these plate boundaries.

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.....[2]

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(iv) Identify and describe **one** feature, other than a volcano, which could be produced at **either** of these plate boundaries.

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.....[2]

(b) Fig. 2.2 provides information about the impact of eruptions by Mount Etna between 1983 and 2001.

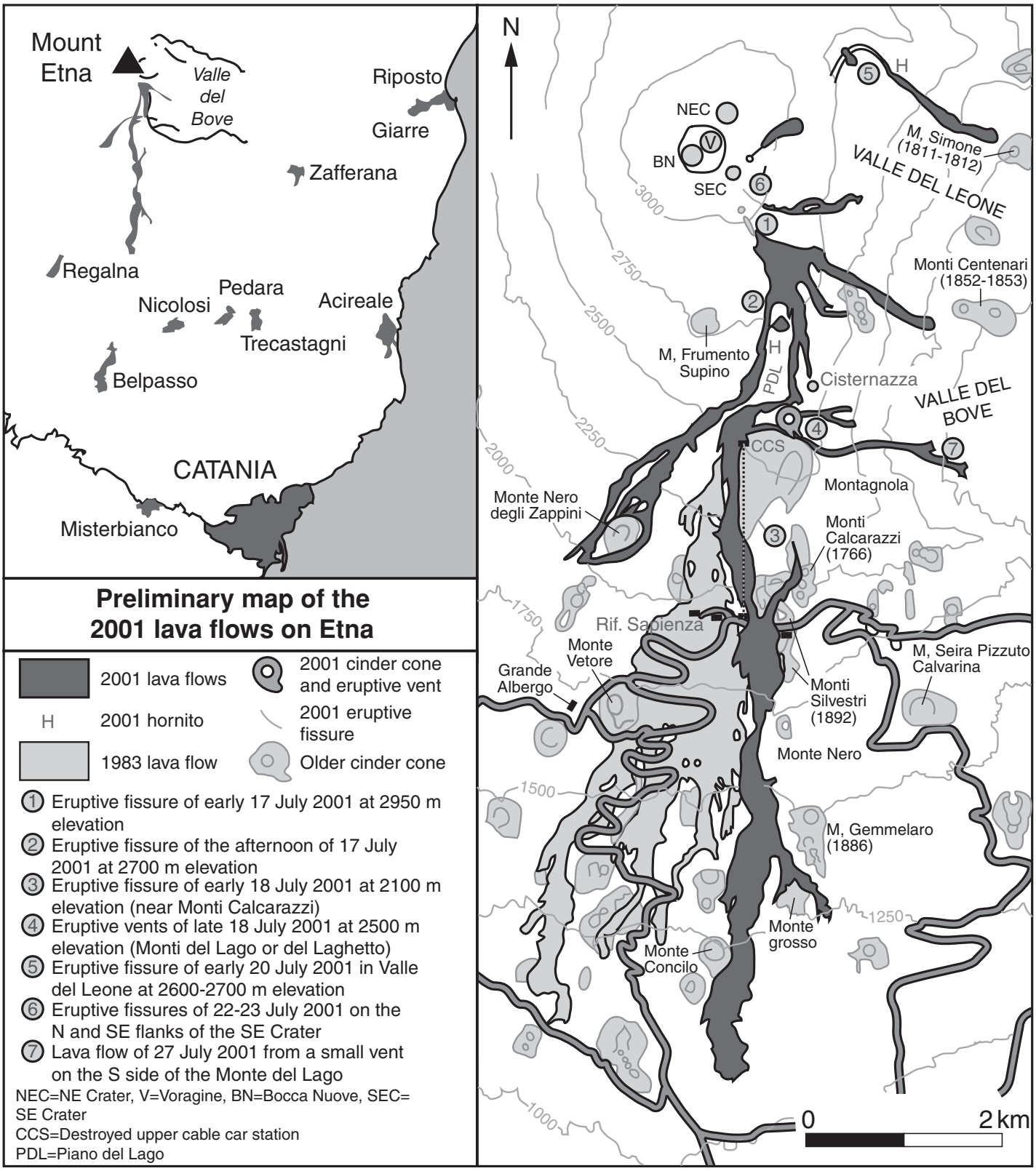

Fig. 2.2

For Examiner's Use

(i) Using Fig. 2.2, state **four** different types of volcanic activity that occurred during the 2001 eruption sequence.

.....

.....

.....

.....[4]

(ii) State **two** pieces of evidence that could have been used to predict the route taken by volcanic lava during the 2001 eruption.

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.....[2]

(iii) Suggest **three** ways in which economic activity was disrupted by the 2001 eruption.

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.....[3]

(iv) Describe how seismic activity, ground deformation and gas emissions can be used to predict a volcanic eruption such as that depicted in Fig. 2.2.

1 seismic activity .....

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.....

2 ground deformation .....

.....

.....

3 gas emissions .....

.....

.....[3]

[20 marks]

Section B

Answer **one** question from this section.

Answers must be in continuous prose.

Write your answers on the separate answer paper provided.

3 **(a)** The results of an environmental impact assessment of a quarry construction in Swaziland are given in Table 3.1. Outline **three** reasons why its impact upon the environment is likely to be mainly negative. [10]

Table 3.1

Impact	Negative impacts		Positive impact
	Yes	No	
Access route			
Impact on fauna and flora due to widening of access road in National Reserve	•		
Impact on amphibians & reptiles crossing the access road	•		
Erosion of access road surface	•		
Impact on Mr Siwela's homestead due to noise and dust	•		
Quarry site - Construction phase			
Potential hydrocarbon pollution of the soil	•		
Potential loss of soil fertility due to compaction	•		
Potential increase in silt load in runoff water from stockpile area	•		
Potential loss of vegetation due to clearing of stockpile area		•	
Potential loss of breeding habitat of fauna of conservation priority on bulk sampling area		•	
Potential loss of fauna habitat due to fires	•		
Potential for feeding or trapping fauna on lease area	•		
Potential for high SiO_2 dust levels from drilling	•		
Potential for high noise levels from drilling	•		
Quarry site - Operational phase			
Potential reduction in green chert value during quarrying	•		
Potential impact on topography due to the height of the product stockpile	•		
Potential increase in size of gully erosion on lease area	•		
Potential loss of flora species diversity due to veldt fires	•		
Potential for feeding or trapping fauna on lease area	•		
Potential loss of fauna habitat due to fires	•		
Potential for increased silt load in runoff water from quarrying area	•		
Potential impact on fauna during the breeding season	•		
Provision of employment			•
Impact on Mr Siwela's homestead due to noise and dust	•		
Quarry site - Decommissioning phase			
Impact due to removal of infrastructure and product stockpile			•
Potential loss of fauna habitat due to veldt fires	•		
Potential for feeding or trapping fauna on lease area	•		
A potential exists of the formation of sheet erosion over the rehabilitated stockpiling and loading area	•		
Impact due to decrease in work force	•		

(b) Describe and explain the impact of mining upon an area with which you are familiar. For the area you have chosen, assess the extent to which landscape restoration methods have been successful. [30]

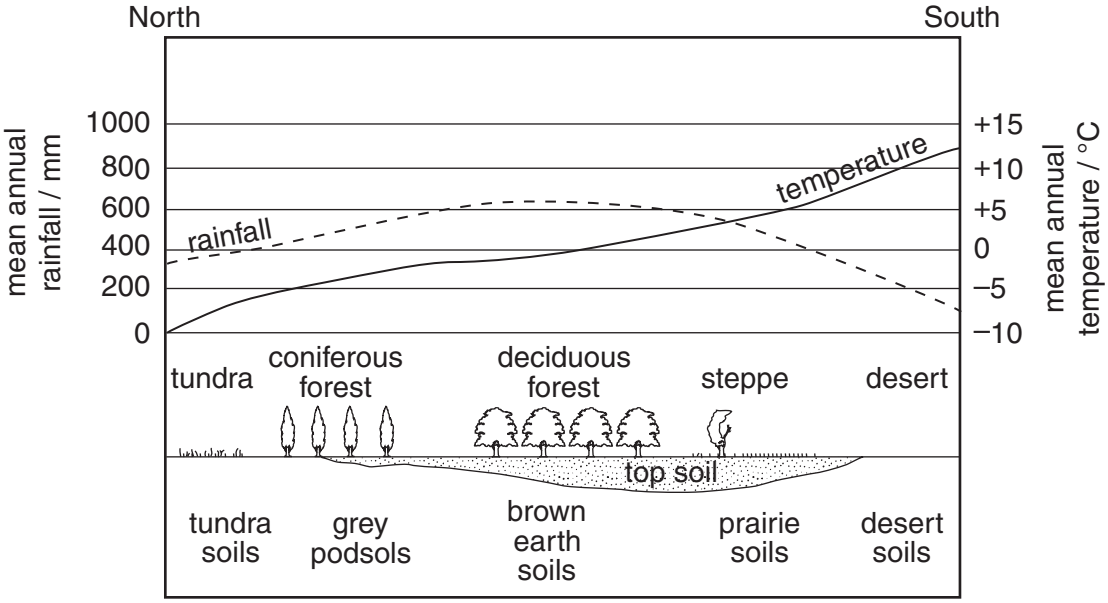
[40 marks]

4 **(a)** Describe **three** ways in which satellites have made a contribution to our understanding of weather and climate. [10]

(b) With reference to examples you have studied, describe and explain the methods used to reduce atmospheric pollution. Discuss the extent to which these methods have proven to be successful. [30]

[40 marks]

5 **(a)** Describe the relationship between climate and soils shown in Fig.5.1. [10]



profile of climate, vegetation and soils, north to south across Eastern Europe.

Fig. 5.1

(b) Using examples you have studied, describe how human activity can affect rates of soil erosion. Assess the extent to which this problem can be successfully managed. [30]

[40 marks]

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Copyright Acknowledgements:

Question 2	Fig. 2.2 © http://boris.vulcanoetna.com/ETNA_2001.html 15 September 2001.
Question 3	Table 3.1 © http://www.sntc.org.sz/discuss/impacts.html 15 January 1999.

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