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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,

- fasten all separate answer paper securely to the question paper; 1.
- enter the question number from Section B in the grid opposite. 2.

iner'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.

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

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

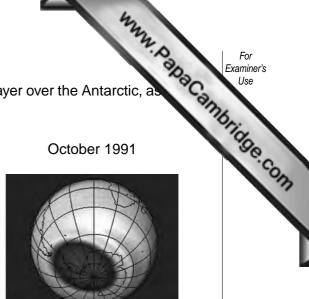
$$ClO + O \longrightarrow O_2 + Cl$$

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

October 1985

October 1980





October 1991

= Ozone Hole Key

Fig. 1.1

		[2]
ı	people	
2		
_	agricultural production	
		[2]
	 Des 1	3

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

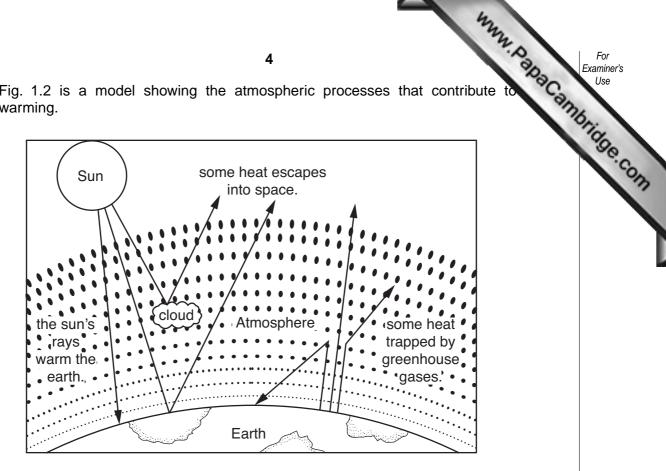


Fig. 1.2

(1)	Name two greennouse gases.
	[2]
(ii)	Explain how greenhouse gases contribute to global warming.
	[3]
(iii)	Describe one piece of evidence that could suggest that global climates have warmed and cooled in the past.
	[2]

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

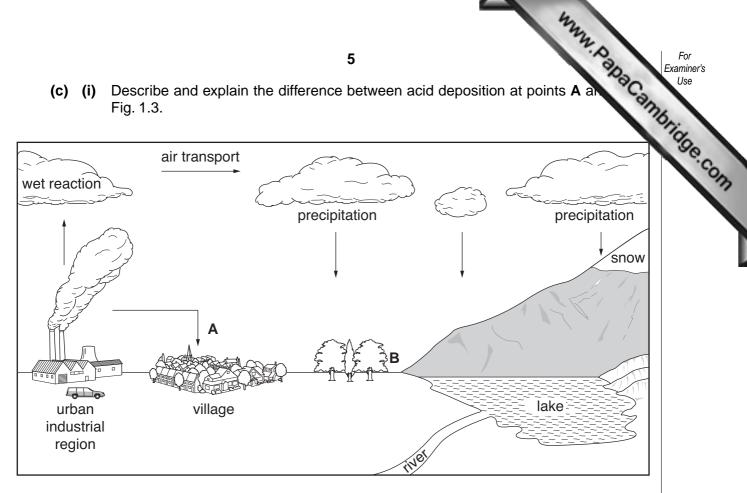


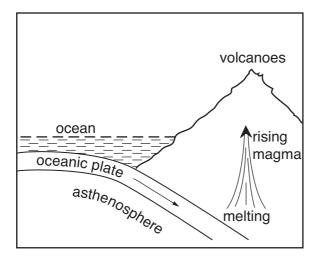
Fig. 1.3

		[4]
(ii)	Describe the effect that acid deposition has upon one of the following: buildings or woodland or lakes.	
		[2]
		[20 marks]

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

Boundary A

Boundary B



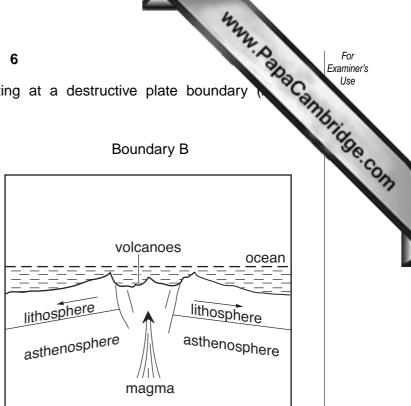


Fig. 2.1

(i) Why are the processes operating at plate boundary A regarded as being destructive,

	whilst those at plate boundary B are constructive?
	[2]
/ii\	
(11)	What is the difference between magma and lava?
	[2]
(iii)	Describe one difference between the lavas produced from each of these plate boundaries.
	[2]

www.PapaCambridge.com Identify and describe one feature, other than a volcano, which could be pl at either of these plate boundaries.

www.PapaCambridge.com (b) Fig. 2.2 provides information about the impact of eruptions by Mount Etna between Mount Etna Valle Riposto del NEC (Bove M, Simone (1811-1812) Giarre VALLE DEL LEONE Zafferana Monti Centenari Regalna (1852-1853) Pedara Acireale Nicolosi Trecastagni M, Frumento Supino VALLE DEL Belpasso Cisternazza BOVE **CATANIA** Montagnola Monte Nero degli Zappini Monti^{*} Misterbianco Calcarazzi (1766)Preliminary map of the Rif. S 2001 lava flows on Etna Monte M, Seira Pizzuto 2001 cinder cone Calvarina Grande 2001 lava flows and eruptive vent Monti Albergo Silvestri 2001 eruptive (1892)Н 2001 hornito fissure Monte Nero 1983 lava flow Older cinder cone 00 1 Eruptive fissure of early 17 July 2001 at 2950 m elevation M, Gemmelaro Eruptive fissure of the afternoon of 17 July (1886) 2001 at 2700 m elevation 3 Eruptive fissure of early 18 July 2001 at 2100 m elevation (near Monti Calcarazzi) 4 Eruptive vents of late 18 July 2001 at 2500 m Monte grosso elevation (Monti del Lago or del Laghetto) Monte. 5 Eruptive fissure of early 20 July 2001 in Valle Concilo del Leone at 2600-2700 m elevation 6 Eruptive fissures of 22-23 July 2001 on the N and SE flanks of the SE Crater Lava flow of 27 July 2001 from a small vent on the S side of the Monte del Lago NEC=NE Crater, V=Voragine, BN=Bocca Nuove, SEC=

Fig. 2.2

2km

SE Crater

PDL=Piano del Lago

CCS=Destroyed upper cable car station

[20 marks]

		ng Fig. 2.2, state four different types of volcanic activity that occurred due of eruption sequence.
(i)		ng Fig. 2.2, state four different types of volcanic activity that occurred duly 1 eruption sequence.
		[4]
(ii)		te two pieces of evidence that could have been used to predict the route taken volcanic lava during the 2001 eruption.
		[2]
(iii)	_	ggest three ways in which economic activity was disrupted by the 2001 ption.
		[3]
(iv)		scribe how seismic activity, ground deformation and gas emissions can be used predict a volcanic eruption such as that depicted in Fig. 2.2.
	1	seismic activity
	2	ground deformation
	3	gas emissions
		[3]

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	Positive	
Impact		No	impact
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]

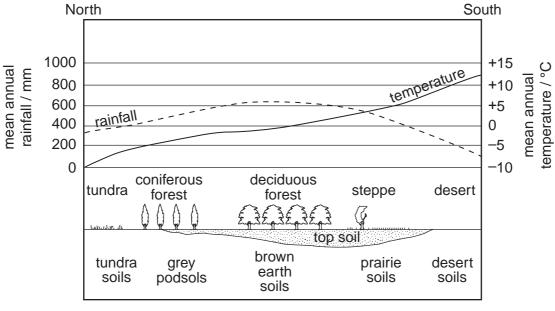
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- (a) Describe three ways in which satellites have made a contribution to our und weather and climate.
- www.papaCambridge.com (b) With reference to examples you have studied, describe and explain the methods us reduce atmospheric pollution. Discuss the extent to which these methods have proven to successful.

[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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