

Centre Number	Candidate Number	Name
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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

October/November 2005

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.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

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

Section A

Answer all questions in this section.

Write your answers in the spaces provided.

- 1 (a) Fig. 1.1 is a framework used for depicting different types of mass movement on slopes.

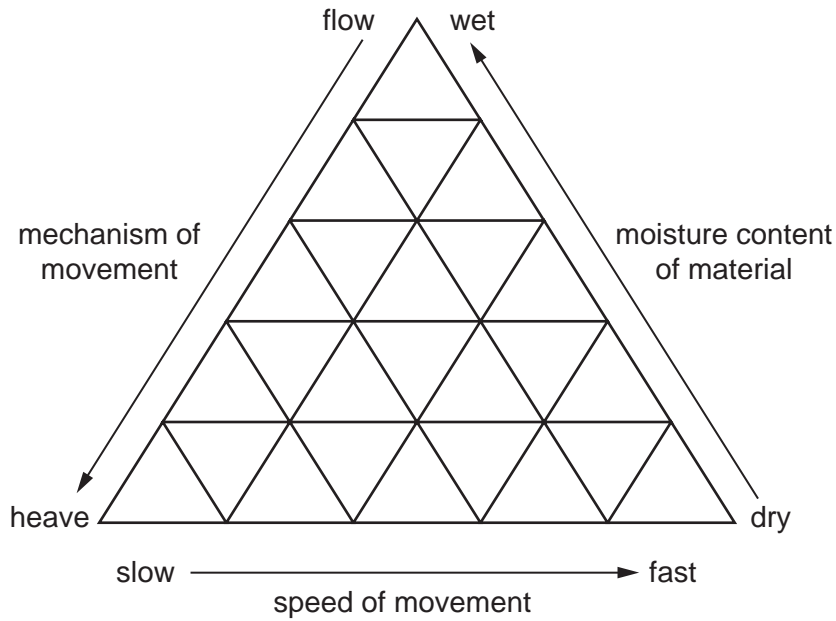


Fig. 1.1

- (i) Write the labels **L**, **M** and **S** on Fig. 1.1 to show the appropriate positions for the processes: mudflow, landslide and soil creep.

L for landslide,

M for mudflow,

S for soil creep.

[3]

- (ii) Explain the role of water in the movement of material on slopes.

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.....[2]

(iii) Distinguish between flows and slides of material on slopes.

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.....[2]

(iv) Give **two** reasons why landslides occur.

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.....[2]

(b) The following photograph and news extract contain information on the Sarno mudslides of 1998.



- The mudslides struck late on Tuesday and followed several days of torrential rain.
- Witnesses described seeing a 34 year old woman and her sons being swept away.
- Piles of mud and boulders covered railway tracks and roads bringing circulation to a standstill. The cause of so much death and damage lay in recent forest fires that stripped hills of vegetation and the refusal of residents to leave their homes.

(i) What is a *mudslide*?

.....
.....[1]

(ii) Describe the sequence of events which caused the Sarno mudslides.

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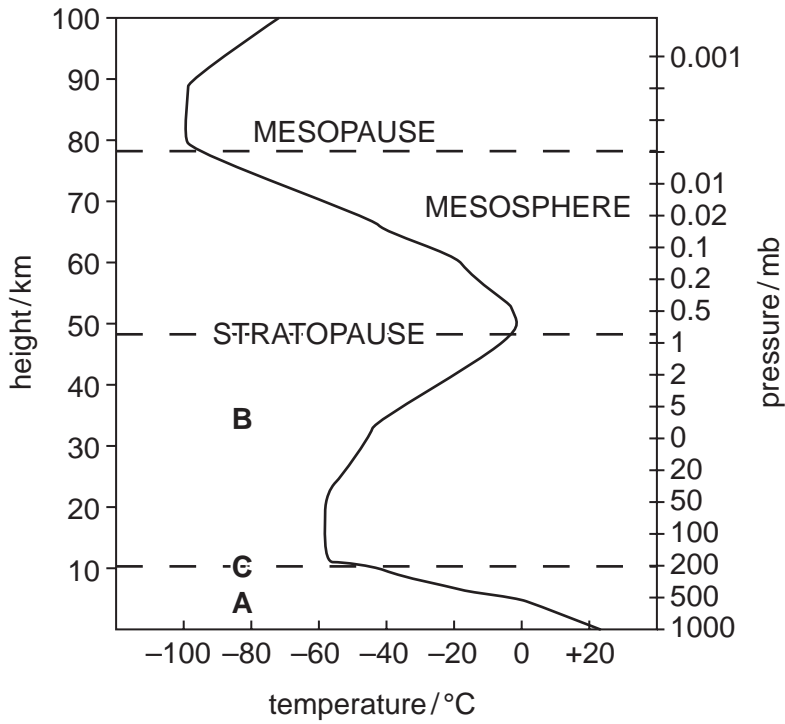
(iii) Outline the management strategies that could be adopted to reduce

- the likelihood of future mudslides,
- the damage and loss of life caused by such mudslides.

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.....[6]

[20 marks]

2 (a) Fig. 2.1 shows the vertical structure of the Earth's atmosphere.



key:

} = temperature change with altitude

Fig. 2.1

(i) Name zones **A** and **B** and boundary line **C**.

A =

B =

C =

[3]

(ii) Why do most weather processes take place within zone **A**?

.....

[3]

(iii) Why do temperatures decrease with altitude within zone A?

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.....[2]

(iv) Explain why stratospheric ozone is important.

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.....[2]

(b) Fig. 2.2 shows the Earth's energy budget.

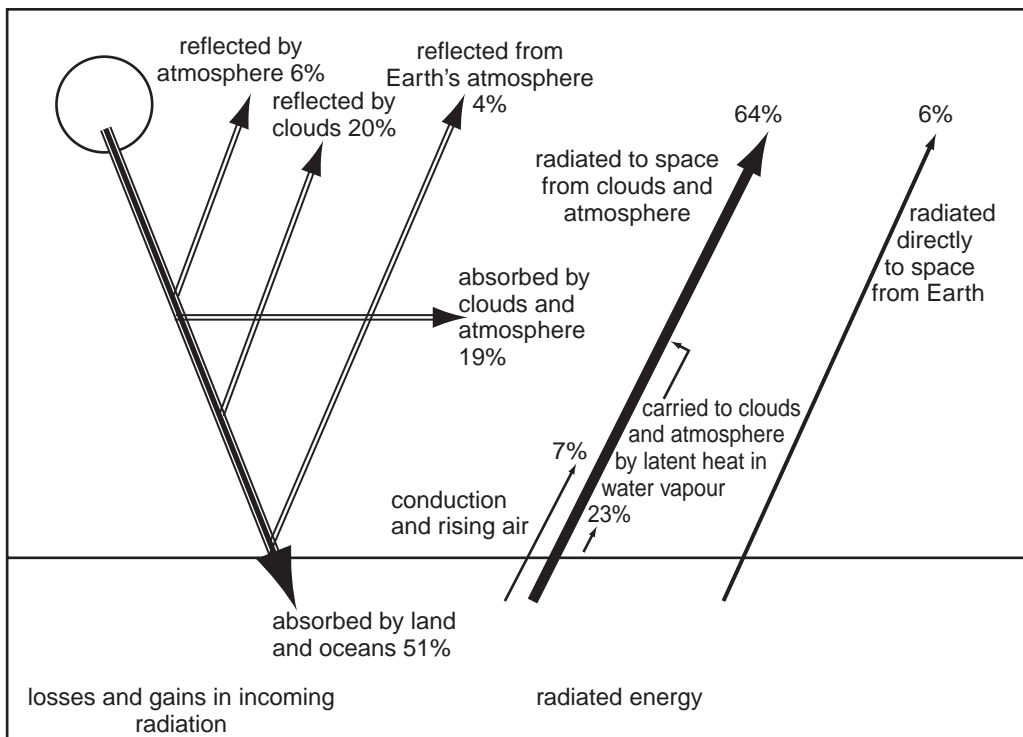
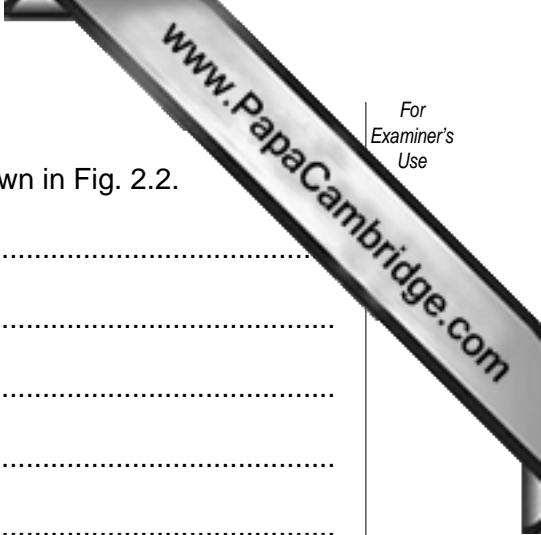


Fig. 2.2



(i) Describe the pattern of inputs and outputs of energy shown in Fig. 2.2.

.....[5]

(ii) Describe and explain how an increase in the accumulation of atmospheric carbon dioxide and methane in the troposphere may alter the energy budget shown in Fig. 2.2.

.....[5]

[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) Describe the trends shown in the list in Table 3.1 which gives the number of deaths from some natural disasters. [10]

Table 3.1

year	location	nature of disaster	deaths
1883	Krakatoa	island volcano, tsunami	36,000
1900	Galveston, USA	hurricane, storm surge	6,000
1908	Messina, Italy	earthquake	85,000
1920	Gansu, China	landslides caused by earthquake	200,000
1927	Tien Shan, China	earthquake	200,000
1951	London	smog (smoke, fumes and fog)	2850
1970	Bangladesh	tropical cyclone, storm surge	300,000
1972	Hong Kong	landslips	138
1974	USA (Tornado Alley)	148 tornadoes in April	300
1980	Mt St Helens USA	volcano	57
1985	Nevado del Ruiz (Colombia)	volcano	25,000
1986	Bangladesh	cyclone	2000
1989	California	earthquake	62
1995	Kobe, Japan	earthquake	5000
1995	Montserrat	volcano	20
1998	Nicaragua	hurricane	3800
2003	Algeria	earthquake	2250

- (b) Describe and explain the causes, effects and human responses to **one** major tectonic or climatic event you have studied. Evaluate the strategies that are aimed at reducing the impact of similar events in the future. [30]

[40 marks]

- 4 (a) Describe and explain the distinct weather conditions that might occur at places A, B and C in Fig. 4.1.

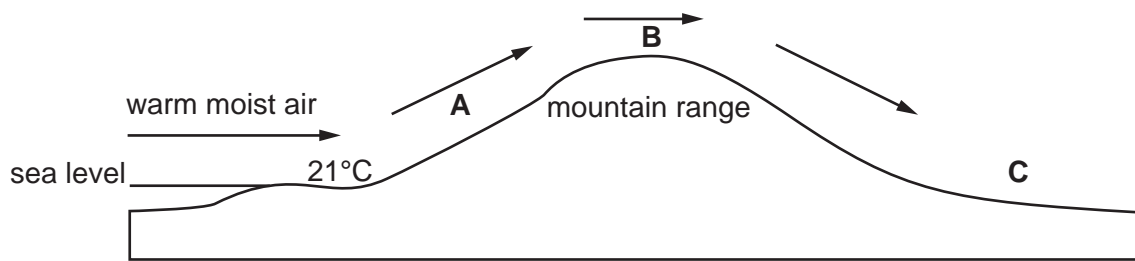


Fig. 4.1

- (b) What methods are employed to make long term and short term weather forecasts? Why is weather forecasting important and not always as accurate as we would like? [30]

[40 marks]

- 5 (a) What is meant by the term *acid precipitation*?
Describe and explain the distribution of acid precipitation across Europe, as shown

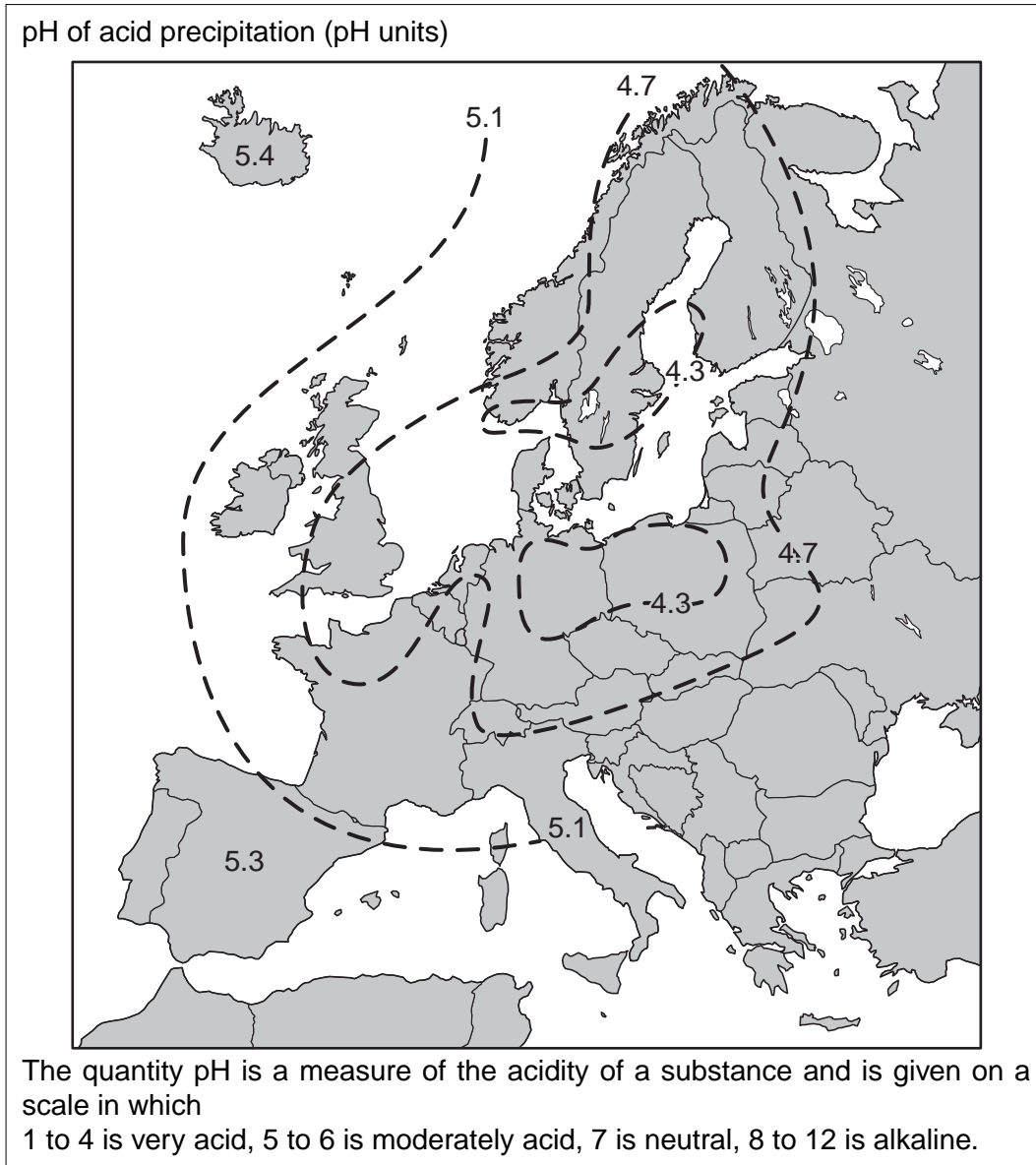


Fig. 5.1

- (b) Describe the effects of acid precipitation upon both urban and non-urban areas. Outline and evaluate the measures which have been taken to control pollution from acid precipitation.

[30]

[40 marks]

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