



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

CANDIDATE  
NAME

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CENTRE  
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**ENVIRONMENTAL MANAGEMENT**

**8291/11**

Paper 1 Lithosphere and Atmosphere

**May/June 2013**

**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.

DO **NOT** WRITE IN ANY BARCODES.

**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	
<b>Section A</b>	
1	
2	
<b>Section B</b>	
<b>Total</b>	

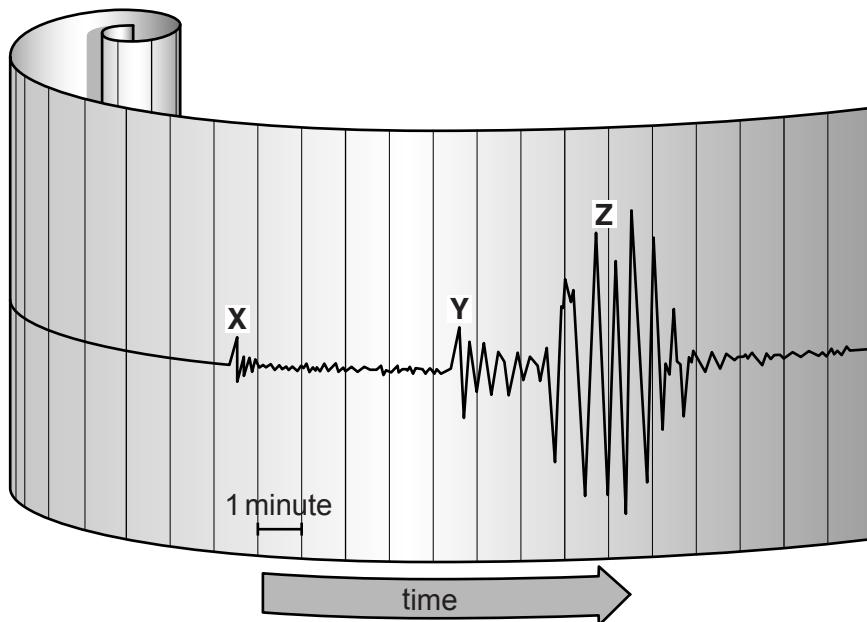
This document consists of **11** printed pages and **1** blank page.



## Section A

Answer **all** questions from this section.

- 1 (a)** Seismic waves are produced by earthquakes and recorded as seismograms. Fig. 1.1 shows a seismogram recording from an earthquake.



**Fig. 1.1**

- (i) What is meant by the term *seismic wave*?

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

- (ii) Name each of the seismic waves shown at points **X** and **Y** in Fig. 1.1.

**X** .....

**Y** .....

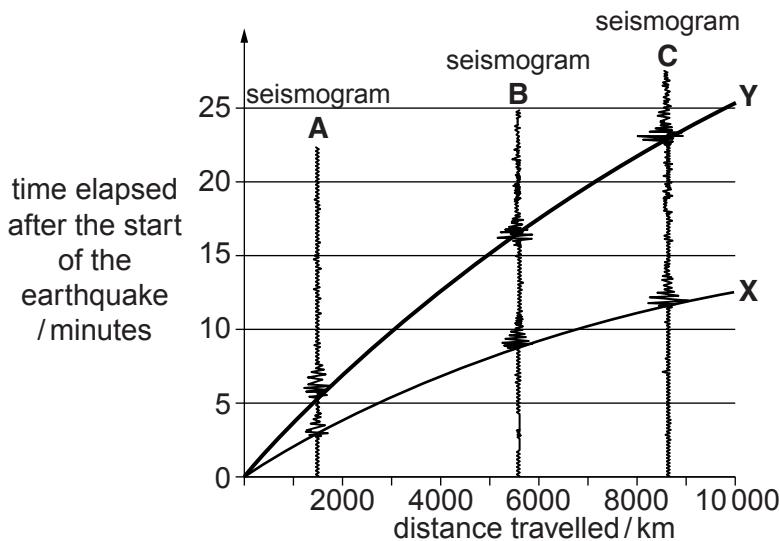
- (iii) Name which of the three kinds of seismic waves shown in Fig. 1.1 that is likely to cause most damage to a land surface?

..... [1]

- (iv) Explain your answer to (iii).

.....  
.....  
.....  
.....  
.....  
..... [3]

- (b) Fig. 1.2 shows the distance travelled by seismic waves **X** and **Y** shown in Fig. 1.1. Seismograms **A**, **B** and **C** are recorded at different distances from the epicentre of the earthquake.

**Fig. 1.2**

- (i) How far has seismic wave **X** travelled after 10 minutes?

..... [1]

- (ii) What is the time interval between waves **X** and **Y** on seismogram **B**?

..... [1]

- (iii) To what extent will the data shown in Fig. 1.2 be of use to people within 2000 km of the epicentre of the earthquake?

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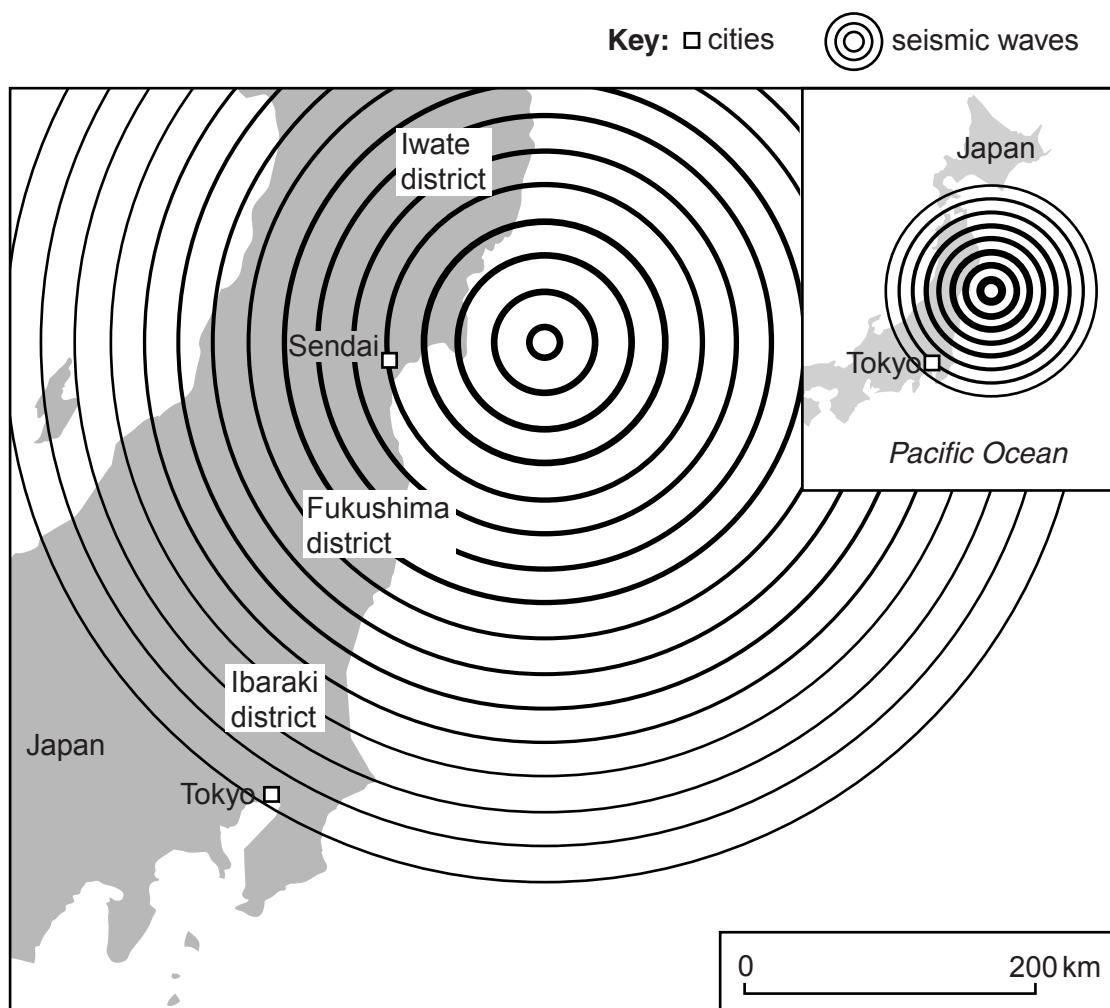
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.....

[4]

- (c) Fig. 1.3 shows the region affected by the Japan earthquake of 2011.



**Fig. 1.3**

- (i) Using data from Fig. 1.3 explain why the districts of Ibaraki and Iwate might have received different amounts of structural damage from this earthquake.

.....  
 .....  
 .....  
 ..... [2]

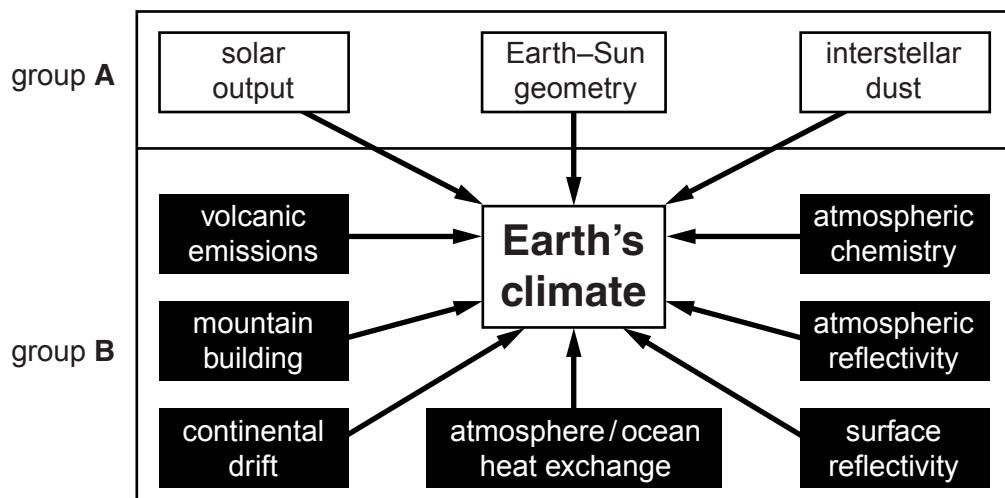
- (ii) The city of Sendai was devastated by the tsunami that accompanied the earthquake as well as by seismic waves. Explain how tsunamis form and why they cause so much damage.

[5]

. [5]

[Total: 20]

- 2 (a) Fig. 2.1 shows some factors that contribute to the Earth's climate.



**Fig. 2.1**

- (i) Suggest why the factors shown in Fig. 2.1 are classified into two groups **A** and **B**.

.....  
 .....  
 .....  
 .....  
 ..... [2]

- (ii) Select **one** factor from group **A** and outline how it makes a contribution to climate.

.....  
 .....  
 .....  
 .....  
 .....  
 .....  
 ..... [2]

- (iii) Select **two** factors from group **B** other than atmospheric chemistry, and briefly describe how each makes a contribution to climate.

1 .....

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.....  
.....

[6]

- (b)** Changes to the Earth's climate have been attributed to emissions of greenhouse gases of which  $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{N}_2\text{O}$  and CFCs make an important contribution.

- (i) Complete Table 2.1 below by writing an appropriate source alongside the greenhouse gas. As guidance the first has been completed. [3]

**Table 2.1**

<b>greenhouse gas</b>	<b>source</b>
CO <sub>2</sub> (carbon dioxide)	burning of carbon based fuels
CH <sub>4</sub> (methane)	
N <sub>2</sub> O (dinitrogen oxide)	
CFCs	

- (ii) Table 2.2 shows some information concerning three greenhouse gases.

**Table 2.2**

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Comment on the relative risk to the Earth's climate posed by the three greenhouse gases in Table 2.2.

[4]

(c) Suggest and explain reasons why **some** scientists regard the current trends in global climate change as natural rather than anthropogenic (derived from human activity).

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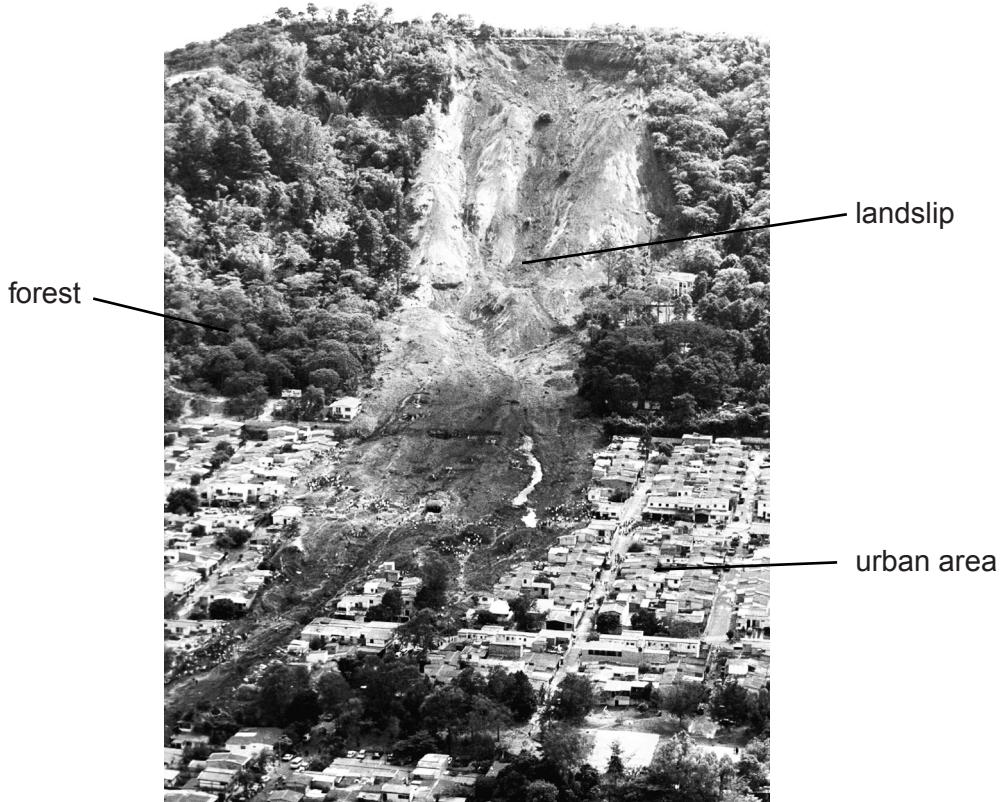
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[Total: 20]

**Section B**

Select **one** question from this section.

- 3 (a) Briefly describe how a combination of human activity and natural processes could have led to the landslide shown in Fig. 3.1. [10]



**Fig. 3.1**

- (b) With reference to examples you have studied, assess the strategies that might be adopted to manage sudden mass movements such as that shown in Fig. 3.1. [30]

[Total: 40]

- 4 (a) Fig. 4.1 is a map of a frontal depression or cyclone and Fig. 4.2 is a cross section drawn between points A and B on the map.

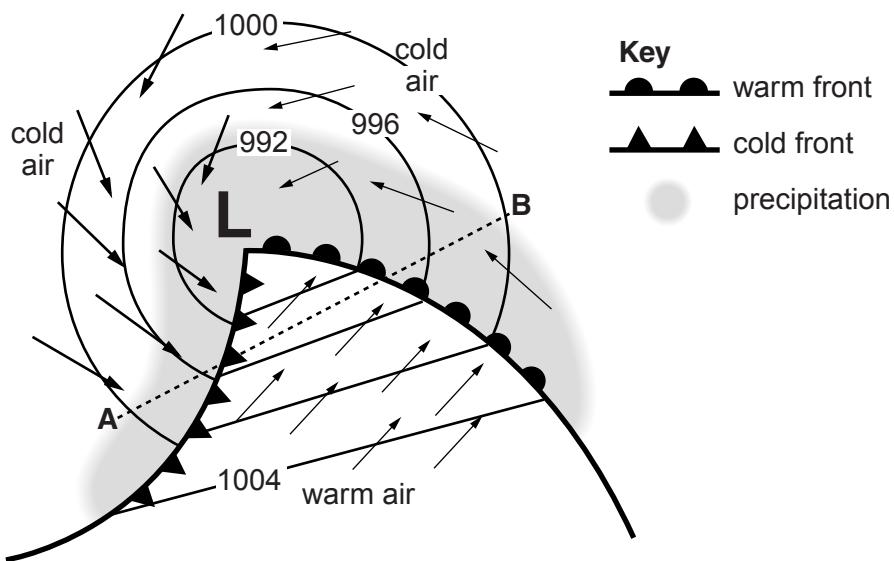


Fig. 4.1

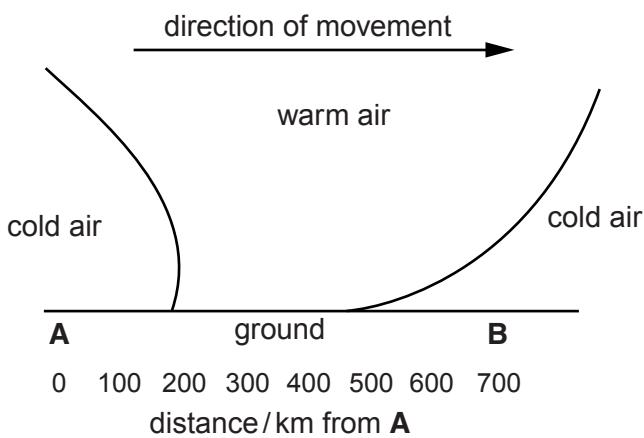


Fig. 4.2

The whole weather system will pass over point B in 48 hours.

Describe and explain the changing weather conditions at B during this period.

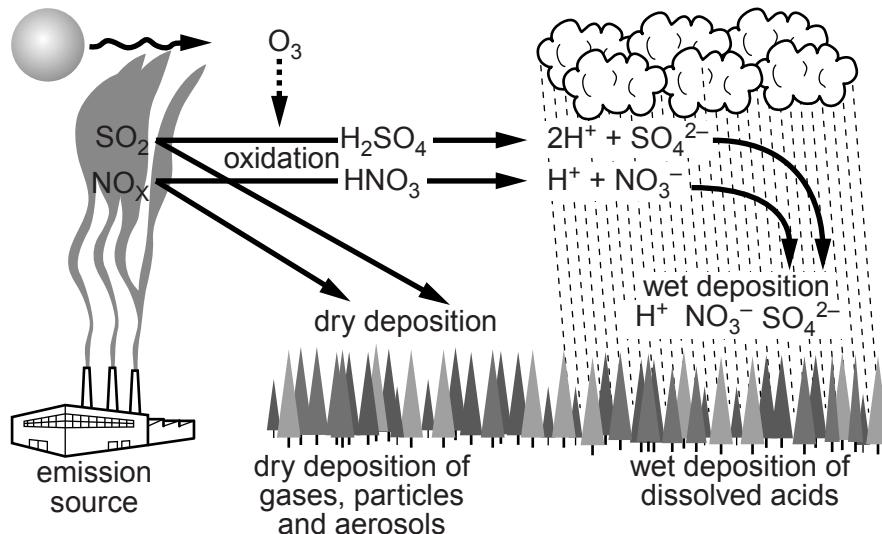
[10]

- (b) Describe how satellite photographs assist the use of weather charts in forecasting weather hazards. With reference to examples with which you are familiar, assess the value of making short and long term forecasts of weather hazards.

[30]

[Total: 40]

- 5 (a) Fig. 5.1 contains information on dry and wet acid deposition.



**Fig. 5.1**

With reference to Fig. 5.1 briefly explain the processes of dry and wet acid deposition. Describe how the processes may affect the areas beyond the emission source. [10]

- (b) With reference to either an urban or a rural area with which you are familiar, identify the main causes of atmospheric pollution and assess the measures that have been used to reduce it. [30]

[Total: 40]

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***Copyright Acknowledgements:***

Question 1b Figure 1.2 © ADAPTED: <http://www.colorado.edu/physics/phys2900/homepages/Marianne.Hogan/graphs.html>.  
Question 2a Figure 2.1 © ADAPTED: [www.physicalgeography.net/fundamentals/7y.html](http://www.physicalgeography.net/fundamentals/7y.html).  
Question 3 Photograph © ASSOCIATED PRESS #01011402206.

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