



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

CANDIDATE
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ENVIRONMENTAL MANAGEMENT

8291/11

Paper 1 Lithosphere and Atmosphere

May/June 2010

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	
Section A	
1	
2	
Section B	
Total	

This document consists of **9** printed pages and **3** blank pages.



Section A

Answer **all** questions in this section.

For
Examiner's
Use

- 1 (a) Table 1.1 contains information on six major types of environmental hazard and five characteristics of such hazards. The characteristics are graded on a scale from 1 to 5 with:

- 1 the most significant in its effects
- 5 the least significant in its effects.

Use the data in Table 1.1 to answer the questions that follow.

Table 1.1

hazard	duration of the hazard event	unpredictability of the onset of the event	area affected by the event	loss of life	long term impact of the hazard event
drought	1	4	1	1	1
tropical cyclone	2	5	2	2	1
earthquake	5	3	1	2	2
volcano	4	1	4	2	3
landslide	2	1	4	4	4
tornado	5	2	3	4	5

- (i) Droughts and tropical cyclones are climatic hazards; earthquakes and volcanoes are tectonic hazards.

What are the meanings of the terms *climatic* and *tectonic*?

- climatic

.....

- tectonic

.....
 [2]

- (ii) Droughts and tropical cyclones are the most severe of the hazards listed in Table 1.1.

What characteristics warrant them being the most severe?

droughts

.....

.....

.....

tropical cyclones

.....

.....

.....[4]

- (iii) Although unpredictable, landslides and tornadoes are less severe in their effects than the other types of hazard. Using the information from Table 1.1, explain why.

.....

.....

.....

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.....

.....

.....

.....

.....[4]

- (b) "A natural hazard is a perceived natural event which threatens both life and property – a disaster is the realisation of this hazard."

Explain how this quotation would have a different meaning for more economically developed countries (MEDCs) than it would for less economically developed countries (LEDCs).

.....

.....

.....

.....[3]

```
graph TD; A[identify risk] --> B[analyse risk]; B --> C[assess risk]; C --> D[treat risk]; C --> E[risk acceptance]; F[monitor and review] <--> A; F <--> B; F <--> C; G[risk communication] <--> A; G <--> B; G <--> C
```

The diagram illustrates the Risk Management Process. It begins with a central vertical flow of three boxes: 'identify risk', 'analyse risk', and 'assess risk', connected by downward arrows. From 'assess risk', the process branches into two final boxes: 'treat risk' and 'risk acceptance', also connected by downward arrows. To the left of the central flow is a large box labeled 'monitor and review', and to the right is a large box labeled 'risk communication'. Both of these side boxes are connected to each of the three central boxes ('identify risk', 'analyse risk', and 'assess risk') by horizontal double-headed arrows, indicating a continuous, two-way relationship between the central process and these monitoring/communication activities.

With reference to an example of a natural hazard you have studied, explain how following the stages shown in Fig. 1.1 would help minimise the risk posed by this natural hazard.

..... [7]

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- 2 (a) Use Fig. 2.1 to explain why the amount of energy received per m^2 from the Sun is different at latitudes **A**, **B** and **C**.

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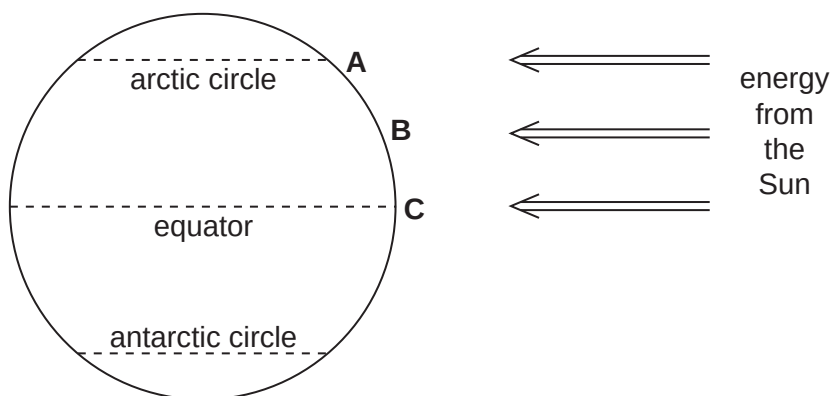


Fig. 2.1

.....

 [2]

- (b) Table 2.1 contains information about average annual radiation budgets for the northern hemisphere.

Table 2.1

	latitude	radiation absorbed/ Wm^{-2}	radiation re-radiated/ Wm^{-2}	overall radiation balance/ Wm^{-2}
positive heat balance	0° (equator)	327	189	+138
	30°	207	X	+9
negative heat balance	60°	135	190	Y
	90° (north pole)	98	176	-78

- (i) What is meant by the term *Earth Energy Budget*?

.....

 [2]

- (ii) Calculate the amount of radiation that is re-radiated at 30° (**X**) and the overall radiation balance at 60° (**Y**).

X =

Y = [2]

- (iii) Which of the two factors, radiation absorbed or radiation re-radiated, is principally responsible for the differences in the overall radiation balance?

.....[1]

- (iv) Suggest **one** reason that would explain the overall radiation balance of $+9 \text{ Wm}^{-2}$ at 30° N .

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

- (v) Suggest **two** processes, other than the energy received per m^2 , that would contribute to the radiation balance of $+138 \text{ Wm}^{-2}$ at the Equator and the balance of -78 Wm^{-2} at the North Pole.

.....
.....
.....
.....
.....
.....
.....
.....[4]

- [8]

[Turn over
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Section B

Select **one** question from this section.

- 3 (a) Briefly describe the natural processes that would have contributed to the mass movement illustrated in Fig. 3.1. [10]

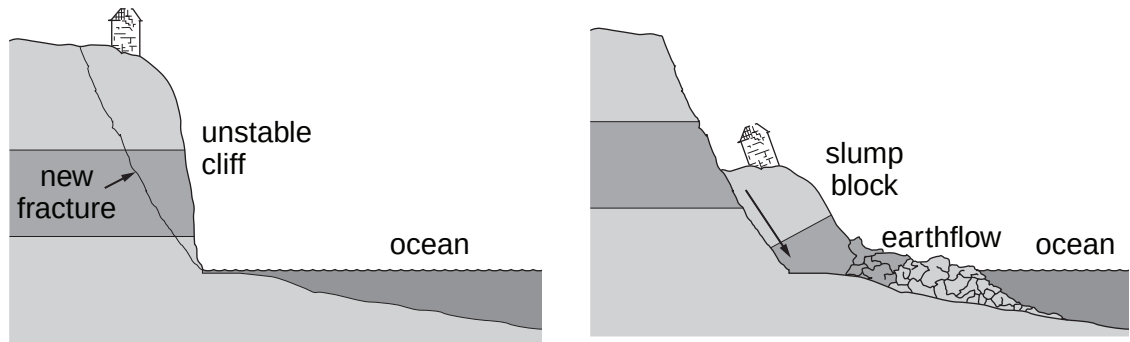


Fig. 3.1

- (b) With reference to examples with which you are familiar, describe how **either** agricultural activity **or** building construction has contributed to slope instability. For the examples you have selected, assess **two** measures that could be adopted to help stabilise slopes. [30]

[Total: 40]

- 4 (a) Identify each of the alternative sources of energy shown in Fig. 4.1. Briefly describe how electricity is generated in each case. [10]

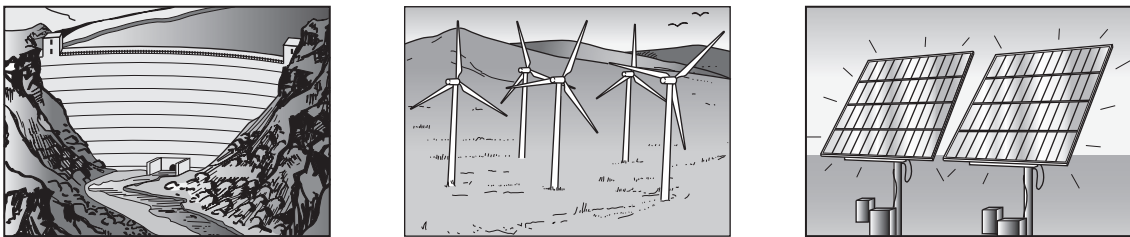


Fig. 4.1

- (b) Discuss the extent to which the advantages of the alternative sources of energy shown in Fig. 4.1 outweigh their disadvantages. [30]

[Total: 40]

- 5 (a) Describe the distribution of acid deposition across Europe shown in Fig. 5.1. Suggest **two** reasons for this.

[10]

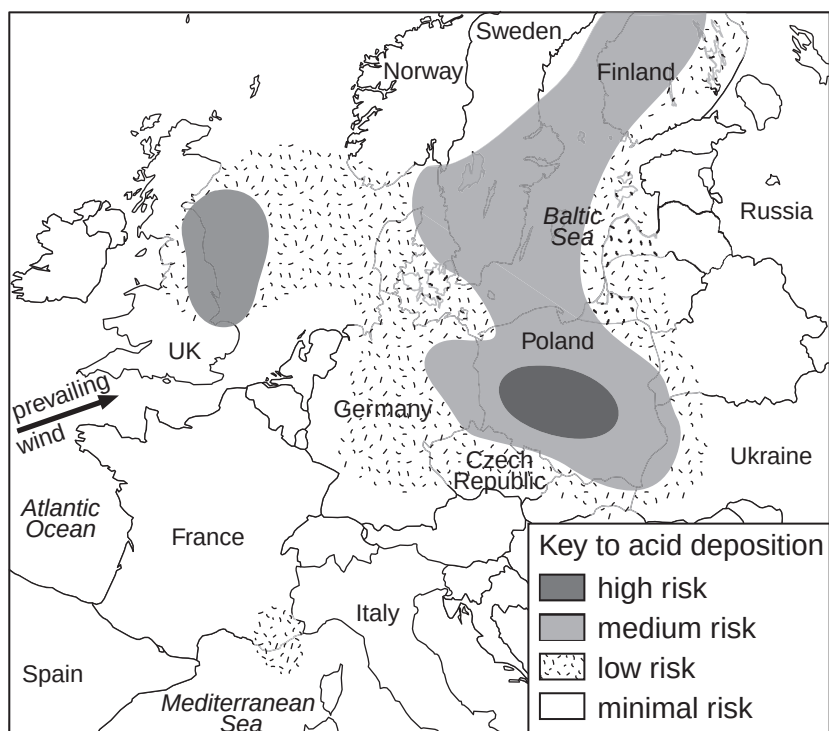


Fig. 5.1

- (b) Describe the effects acid deposition can have upon urban and non-urban environments. Using examples with which you are familiar, assess the extent to which such effects can be reduced.

[30]

[Total: 40]

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