



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

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER



**ENVIRONMENTAL MANAGEMENT**

**8291/21**

Paper 2 Hydrosphere and Biosphere

**May/June 2011**

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

This document consists of **12** printed pages.



Section A

Answer **all** questions in this section.

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Write your answers in the spaces provided.

- 1 (a) An ecosystem can change, over time, as a result of the action of biotic and abiotic processes: a change known as succession. Fig.1.1 shows stages in a succession from open water towards a woodland climax.

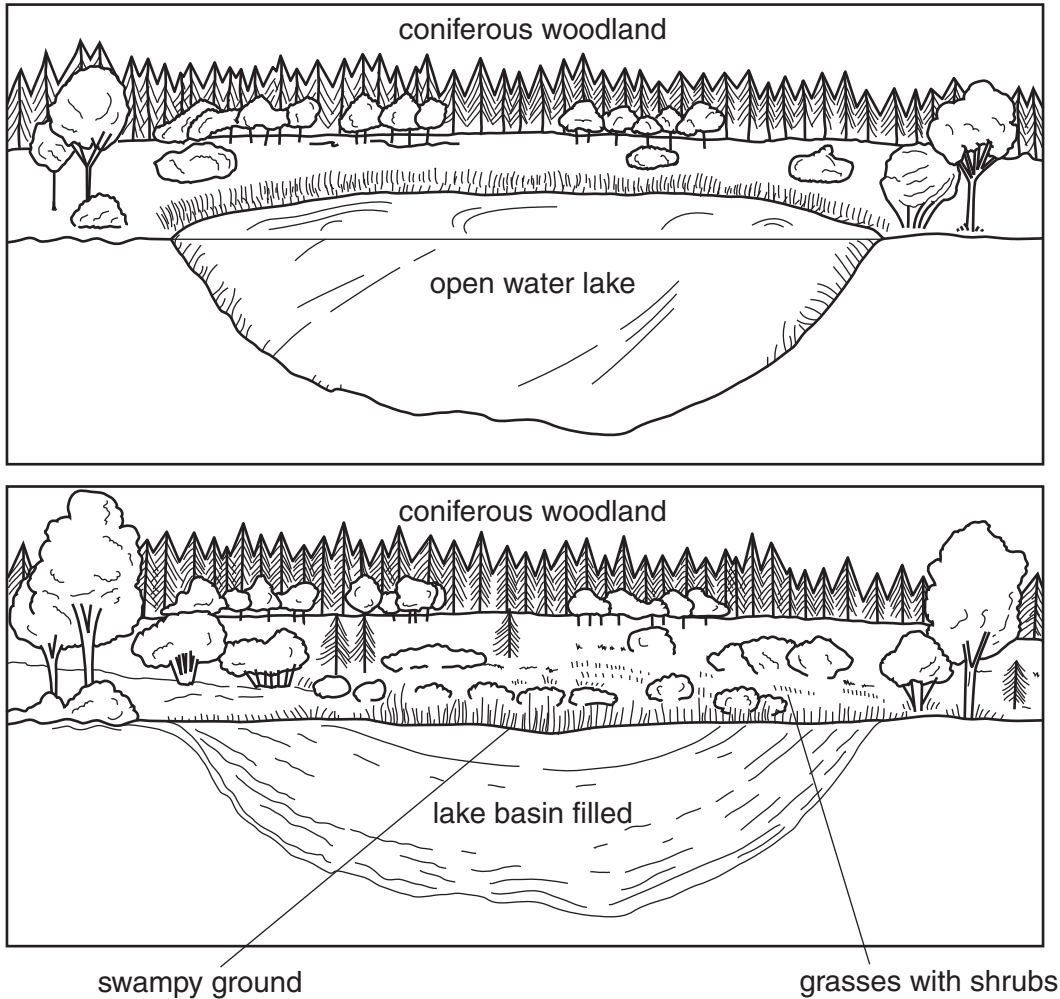


Fig. 1.1

- (i) Giving an example of each term, explain what is meant by *biotic* and *abiotic*.

biotic .....

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abiotic .....

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[4]

- (ii) Suggest how the action of biotic and abiotic processes could have brought about the changes shown in Fig. 1.1.

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.....[4]

- (iii) Provided there is no human intervention, suggest how the area of grass and swampy ground develops into a woodland climax.

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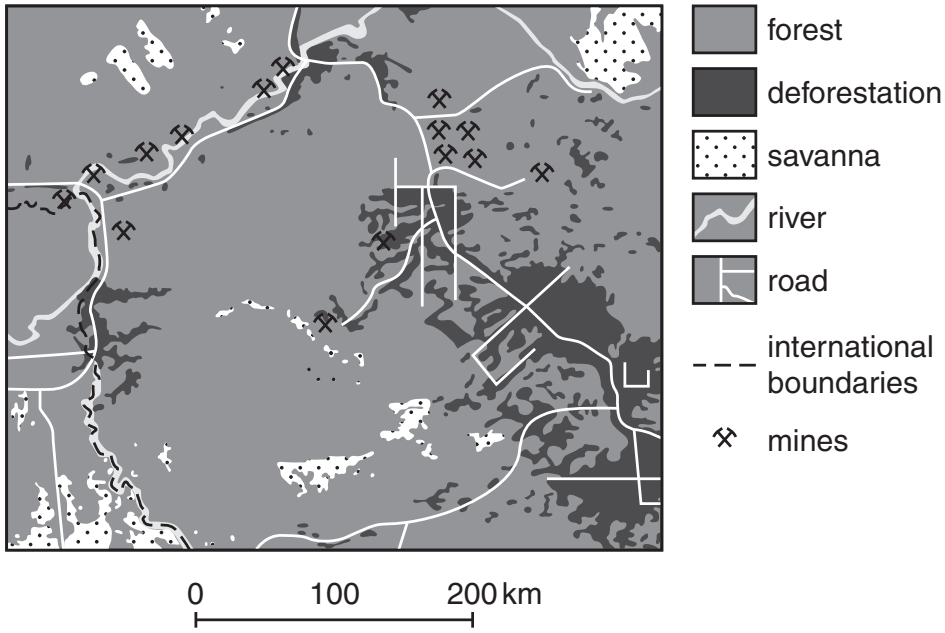
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.....[2]

(b) Fig. 1.2 contains information on deforestation associated with mining, timber production and agriculture in the tropical rainforest in the state of Rondonia in Brazil.

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**Deforestation in Rondonia (Brazil)**



**Fig. 1.2**

(i) With reference to Fig. 1.2 describe **three** effects that large scale deforestation might have on the ecology of this region of the Amazon Rainforest.

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[6]

(ii) Explain why it might take longer for an area of tropical rainforest to recover from mining than from felling and fires.

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[4]

[Total: 20]

2 (a) Fig. 2.1 is an illustration of the hydrological cycle.

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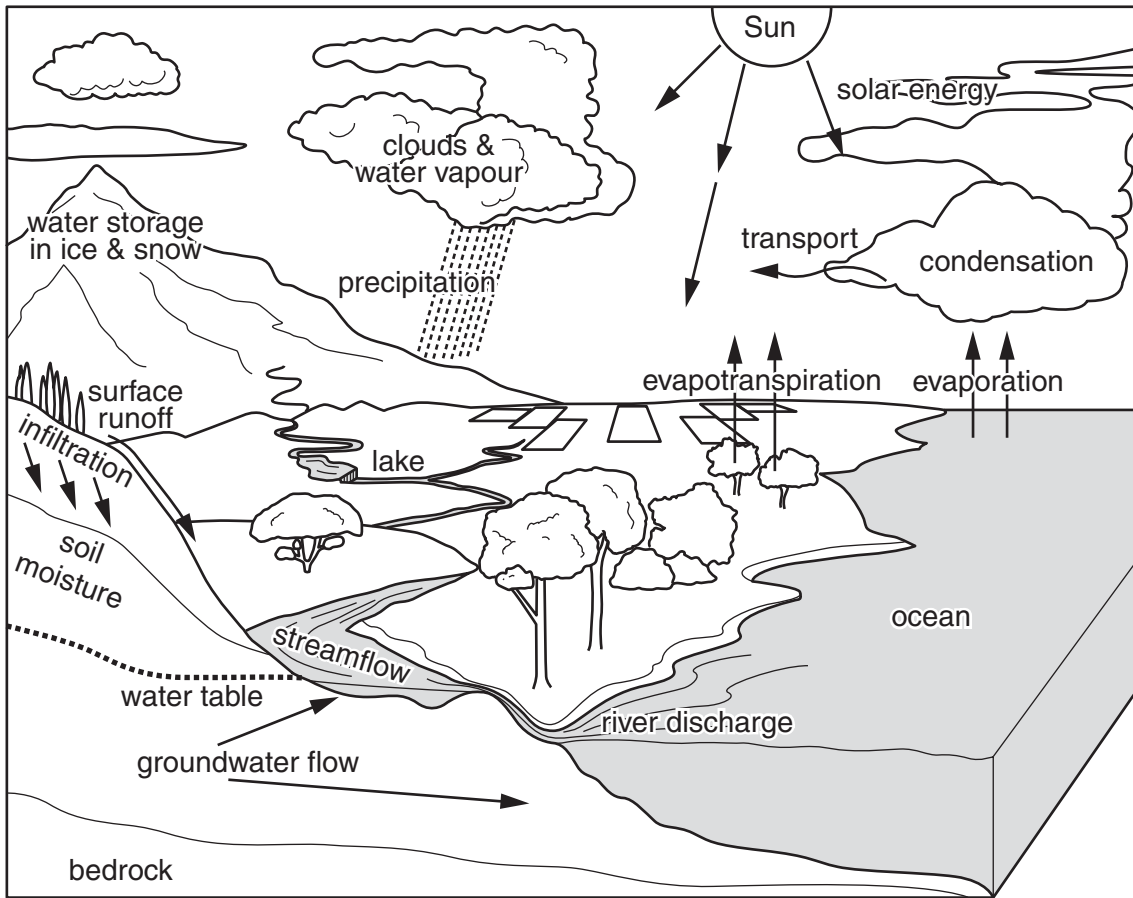


Fig. 2.1

(i) Describe the role of precipitation, infiltration, groundwater and clouds in the hydrological cycle.

precipitation .....

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infiltration .....

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groundwater .....

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clouds .....

..... [4]

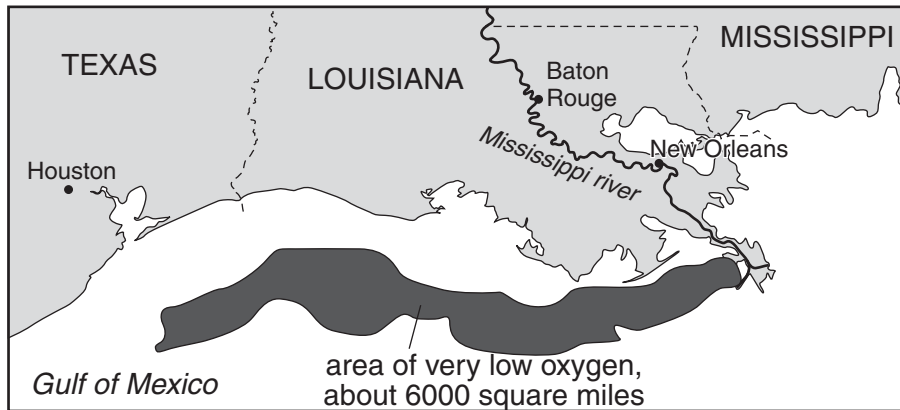






- (c) The Gulf of Mexico dead zone, shown in Fig. 2.3, is an area of water with a very low dissolved oxygen content (less than 2ppm dissolved oxygen) at the mouth of the River Mississippi.

For Examiner's Use



**Fig. 2.3**

Suggest reasons for the development of this area of very low dissolved oxygen.

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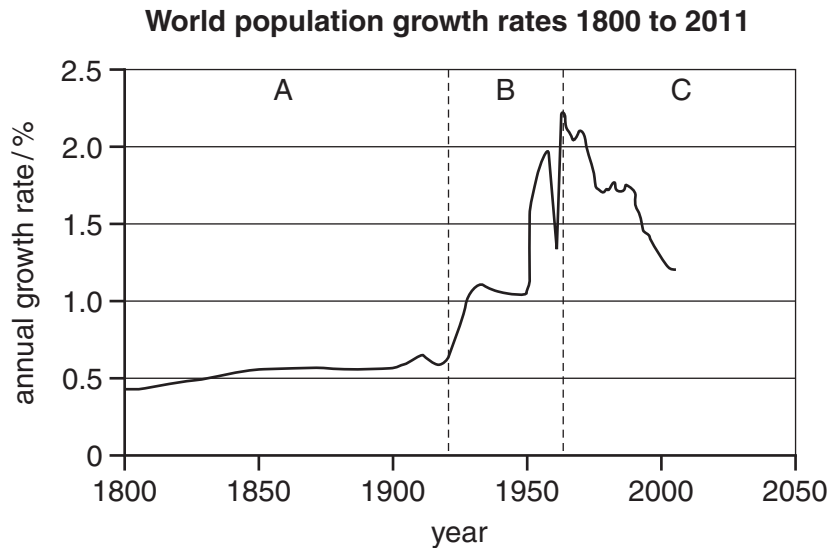
[4]

[Total: 20]

## Section B

Answer **one** question from this section.

- 3 (a) Briefly explain the differences in the rate of growth in world population within the periods labelled A, B and C in Fig. 3.1. [10]



**Fig. 3.1**

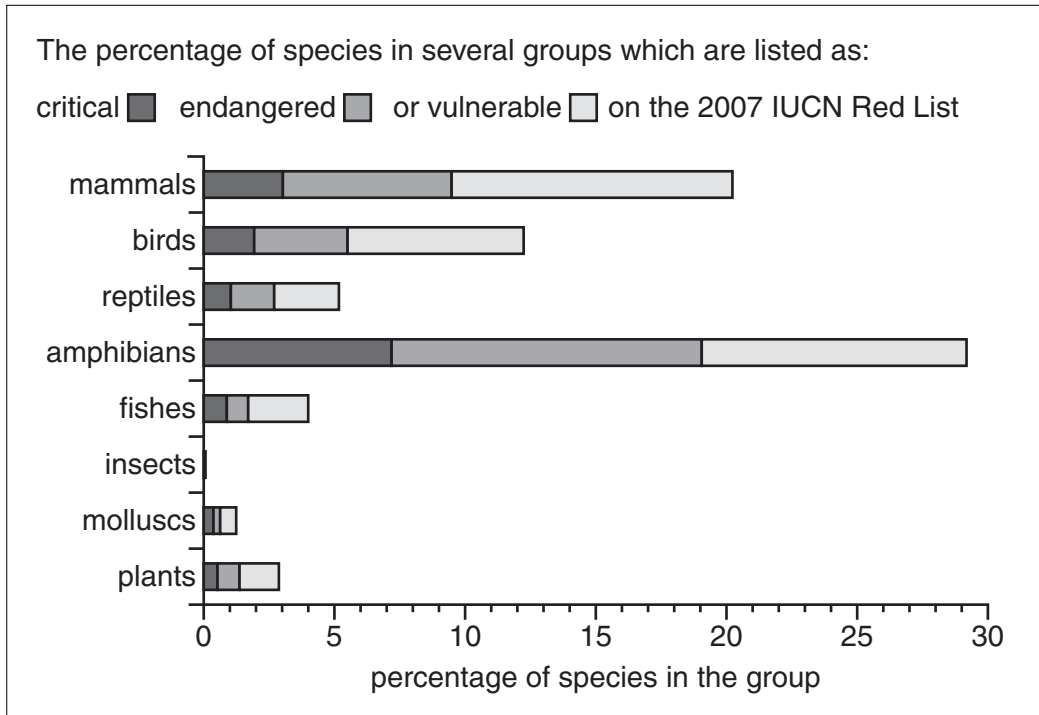
- (b) With reference to examples of More Economically Developed Countries (MEDCs) and Less Economically Developed Countries (LEDCs), assess the extent to which a future sustainable global environment is dependent on reducing human population growth. [30]

[Total: 40]

- 4 (a) The IUCN Red List of Threatened Species is widely recognised as the most comprehensive global approach for evaluating the conservation status of plant and animal species. The list classifies the threat to a species into one of three levels: critical (most threatened), endangered and vulnerable (least threatened).

Fig. 4.1 is a summary of the threatened species list for 2007.

IUCN stands for the International Union for Conservation of Nature.



**Fig. 4.1**

Briefly outline how the summary of the Red List shown in Fig. 4.1 might indicate priorities and preferred methods of conservation and preservation of species. [10]

- (b) With reference to examples you have studied, assess the role of **two** different types of designated areas, such as National Parks or Wildlife Parks, in the conservation of species. [30]

[Total: 40]

- 5 (a) Fig. 5.1 shows the percentage of water consumed for different purposes in four countries. Briefly describe and give reasons for the different patterns of use. [10]

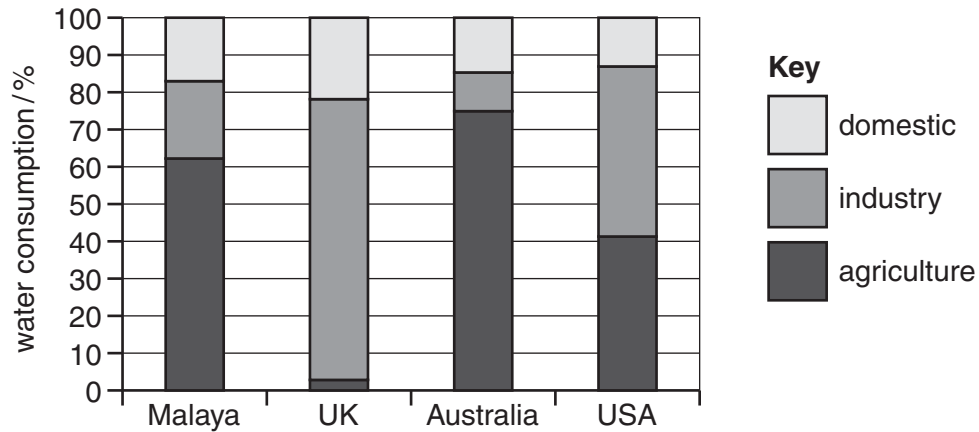


Fig. 5.1

- (b) With reference to an area with which you are familiar, assess the effects of **either** industrial **or** agricultural activity upon the natural supplies of water. For the area you have chosen, evaluate **one** method that is being used to achieve a sustainable supply of water. [30]

[Total: 40]

Copyright Acknowledgements:

Question 1(b) Fig. 1.2 Photograph © Destruction; Photograph number 2745899; iStockphoto.

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