



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

CANDIDATE  
NAME

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NUMBER

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**ENVIRONMENTAL MANAGEMENT**

**8291/23**

Paper 2 Hydrosphere and Biosphere

**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.**  
Electronic calculators may be used.

**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, **1** blank page and an Insert.

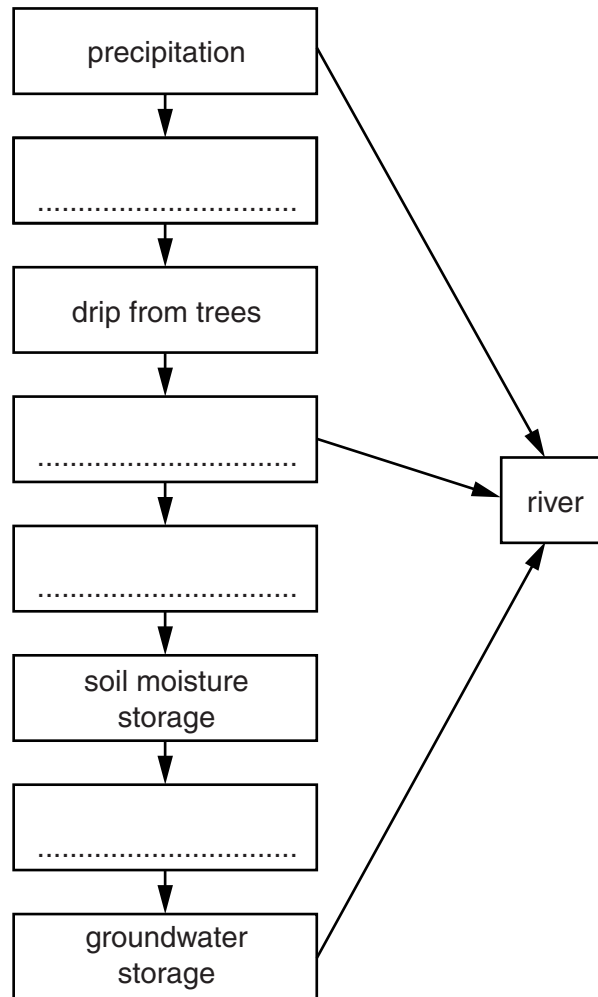


## Section A

Answer **all** questions in this section.

For  
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Use

- 1 (a) Fig. 1.1 is a model of part of the water cycle in a forest in a river valley.



**Fig. 1.1**

- (i) Write the following labels into the appropriate empty boxes in Fig. 1.1.

**surface storage**

**percolation**

**infiltration**

**interception**

[4]

(ii) Describe the conditions that would cause the level of water in the river in Fig. 1.1 to rise rapidly and cause flooding.

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(iii) Outline **two** man-made changes to the flows and stores in Fig. 1.1 that would enable the flooding referred to in (ii) to subside.

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..... [2]

(b) Fig. 1.2 (on the Insert) contains information on the Kariba Dam on the Zambezi River.

(i) With reference to Fig. 1.2 suggest why this was a suitable site to construct the Kariba Dam.

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**Question 2 starts on page 6.**

2 (a) Within most coastal dune systems a vegetation succession occurs.

Marram grass is a characteristic plant of sand dunes as shown in Fig. 2.1 (on the Insert).

Fig. 2.2 contains a cross section through a sand dune system with a table showing the results of a survey recorded along a 175 metre transect from the shore line, away from the sea, through the sand dune system.

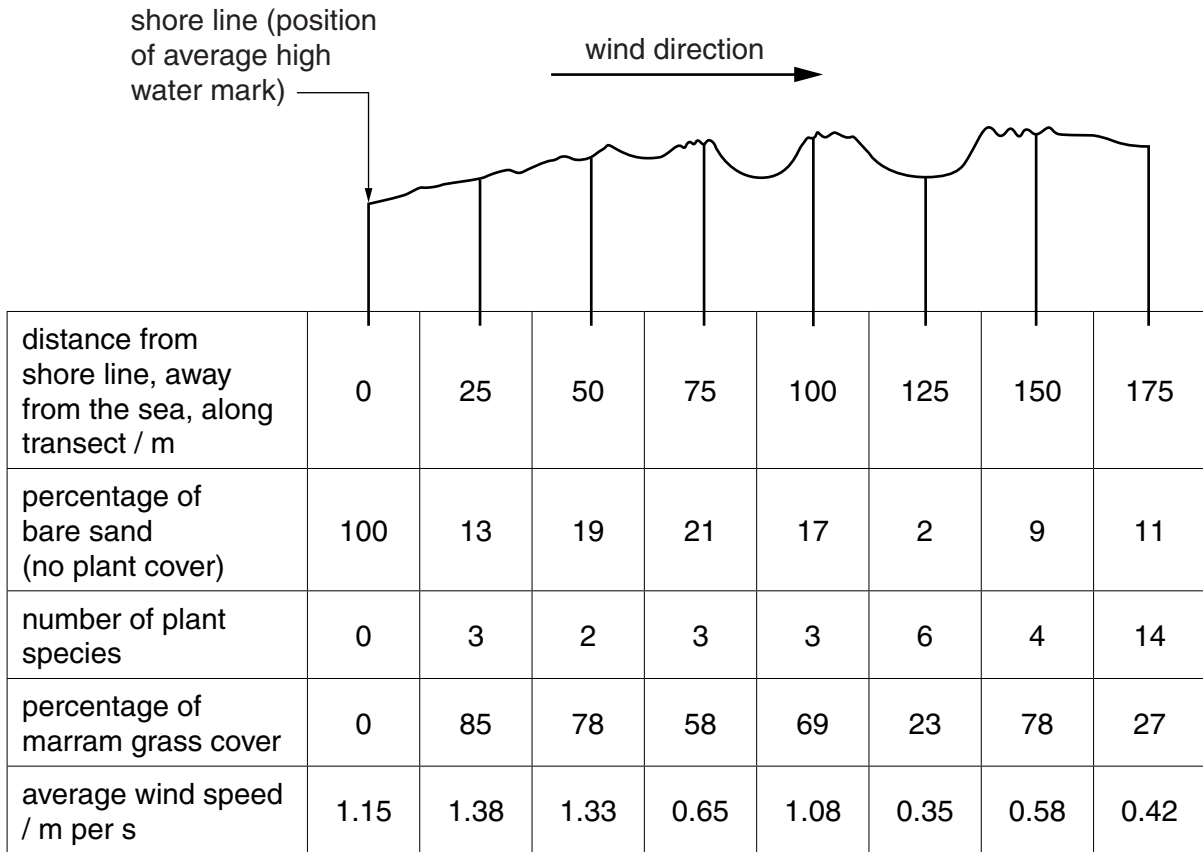


Fig. 2.2

(i) What is meant by the term *succession*?

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..... [2]

(ii) Suggest why the percentage of marram grass cover is highest at 25 metres.

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..... [2]

(iii) Describe and explain the trend in plant diversity with increasing distance from 0 m to 175 m.

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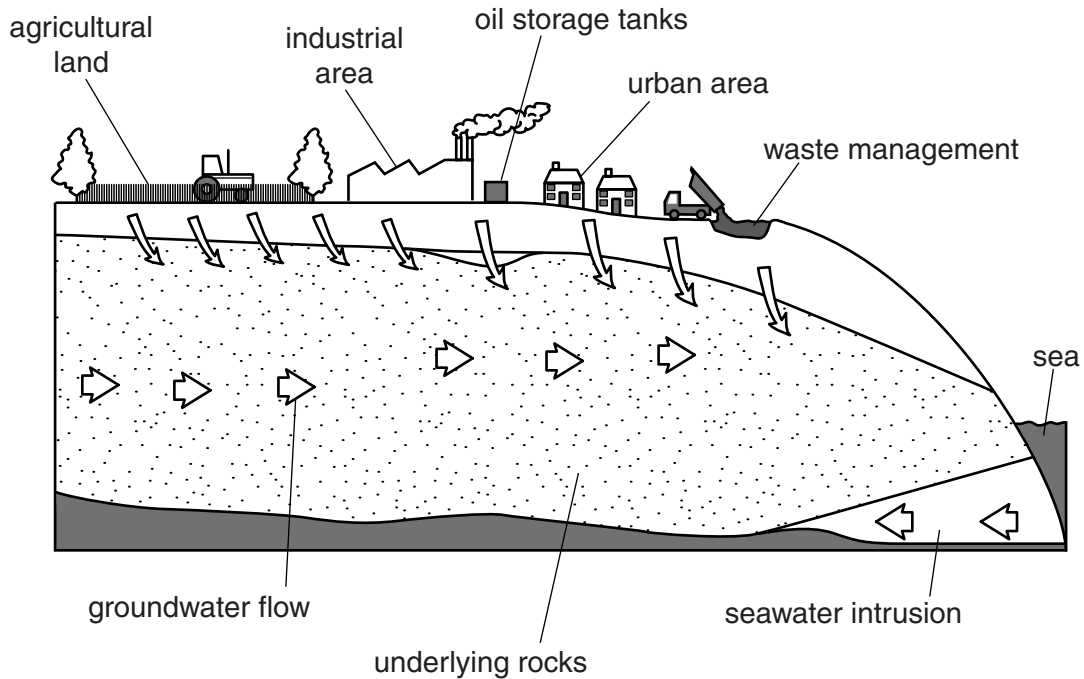


**Section B starts on page 10.**

## Section B

Select **one** question from this section.

- 3 (a) Fig. 3.1 shows some sources that can be the cause of groundwater pollution.



**Fig. 3.1**

With reference to **three** of the sources in Fig. 3.1 describe the processes that can lead to groundwater pollution. [10]

- (b) With reference to **either** an agricultural **or** an urban area with which you are familiar, assess the measures that have been used to achieve a clean water supply. [30]

[Total: 40]

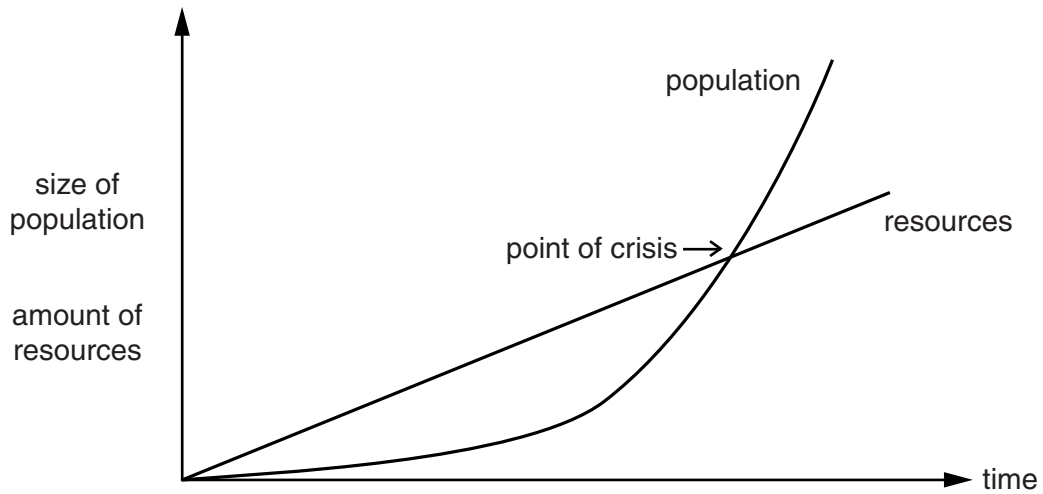
- 4 (a) Fig. 4.1 (on the Insert) shows the size of the River Mississippi Delta in 2011 and its predicted area in 2100.

Suggest reasons for the predicted reduction in area of the River Mississippi Delta in 2100. [10]

- (b) Using examples with which you are familiar, assess the extent to which human activity has an adverse effect on both the quantity and quality of river water. [30]

[Total: 40]

- 5 (a) Fig. 5.1 shows a relationship between population and resources; a model proposed by Thomas Malthus in 1798.



**Fig. 5.1**

Briefly describe the trends for population and resources shown in Fig. 5.1.  
Outline **two** criticisms of this model.

[10]

- (b) Using examples of countries from LEDCs **and** MEDCs, evaluate the policies that aim to reduce issues caused by overpopulation and underpopulation.

[30]

[Total: 40]

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*Copyright Acknowledgements:*

Question 1b Figure 1.2 Photograph  
Question 2a Figure 2.1 Photograph  
Question 2b Figure 2.3 Photograph  
Question 4 Figure 4.1 Photograph

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