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

CANDIDATE NAME

CENTRE NUMBER | | | | | |

CANDIDATE NUMBER | | | | |

ENVIRONMENTAL MANAGEMENT **8291/23**

Paper 2 Hydrosphere and Biosphere **May/June 2012**

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 **11** printed pages and **1** blank page.

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

1 **(a)** Fig. 1.1 contains information on the estimated residence times of the world's water resources.
A residence time is the estimated average period of time water will remain in a water store.

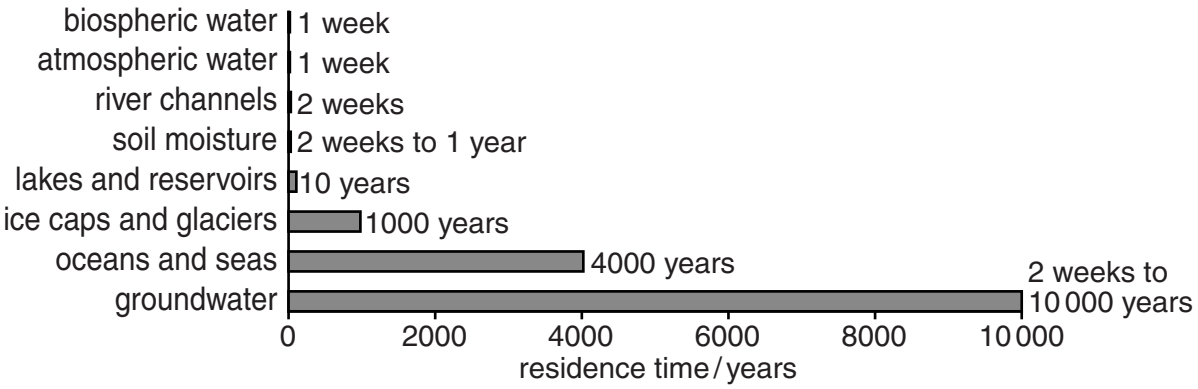

Fig. 1.1

(i) Using information in Fig. 1.1, explain why water in some stores has a residence time of only a few weeks.

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(ii) Using information from Fig. 1.1 explain the estimated residence times for stores of 1000 years or more.

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(iii) Outline why a recognition of water residence times is important to human activity.

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(b) Fig. 1.2 shows the features of aquifers.

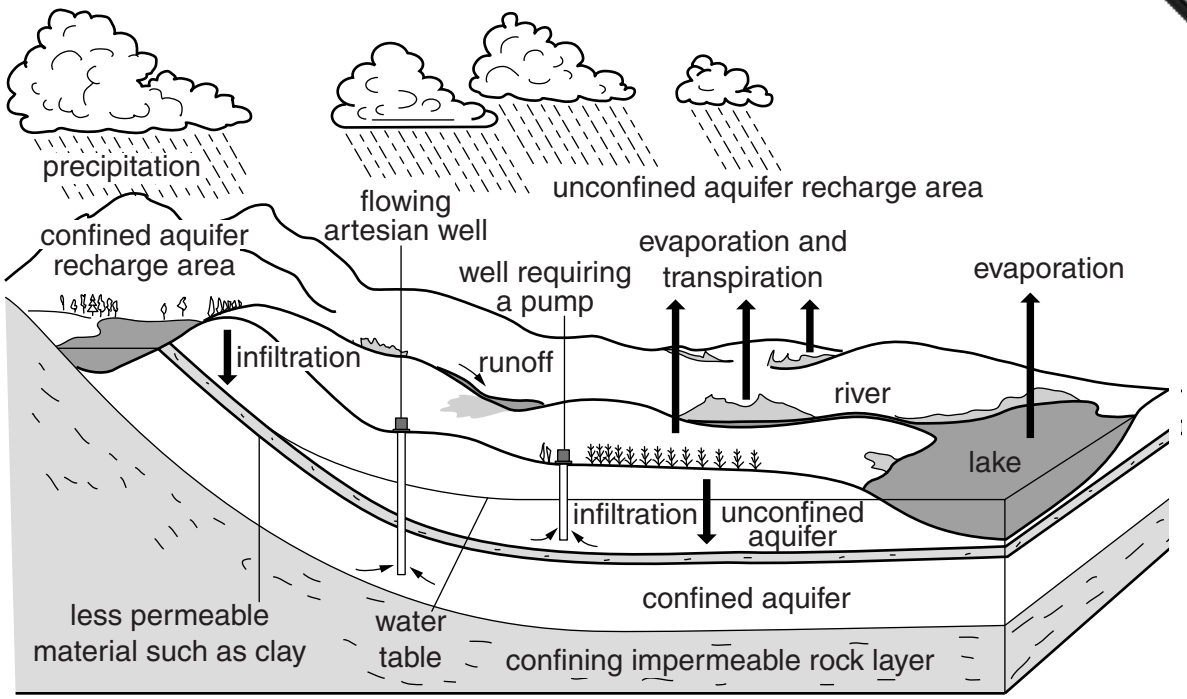

Fig. 1.2

(i) Describe the geological conditions that produce the confined and unconfined aquifers shown in Fig. 1.2.

confined .....

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unconfined .....

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(ii) Explain how a balance between losses and gains of water to the aquifers is achieved.

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(iii) With reference to **two** different sources of pollution, describe how groundwater may become contaminated.

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[Total: 20]

2 **(a)** Fig. 2.1 shows energy transfer through the trophic levels in a food chain.

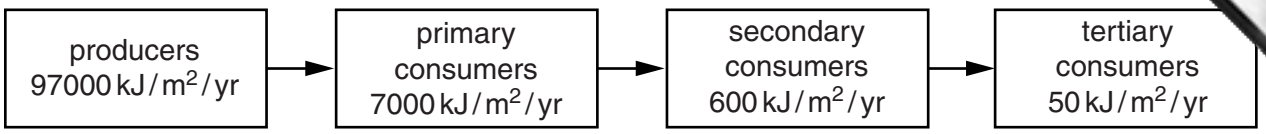

Fig. 2.1

(i) What is meant by the terms *food chain* and *trophic level*?

food chain .....

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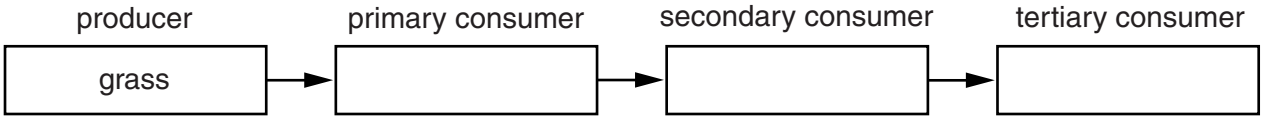
trophic level .....

.....[2]

(ii) Each of the following are members of a grassland food chain:

small snake **hawk** **grass** **mouse**

Complete the boxes below to show the correct trophic level for each organism in the food chain.



[2]

(iii) Explain why the energy transferred between trophic levels decreases along the food chain shown in Fig. 2.1.

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.....[2]

(iv) A pyramid of numbers shows the number of organisms at each trophic level in a food chain.

Using information from Fig. 2.1 explain the reduction in the number of organisms shown in Fig. 2.2.

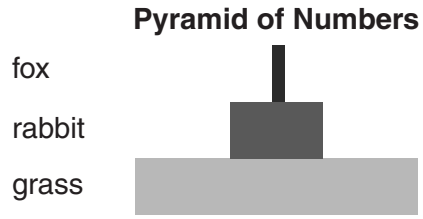

Fig. 2.2

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(b) Fig. 2.3 and Fig. 2.4 contain information, by continent, on the number of threatened species and the number of protected sites.

number of threatened species

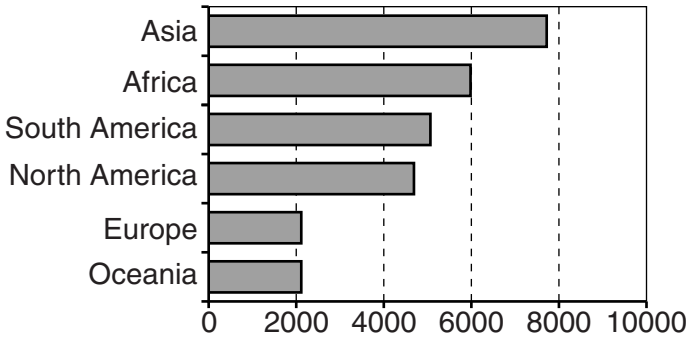

Fig. 2.3

number of sites in which biodiversity is protected

Europe	479
Africa	198
Asia	160
South America	70
North America	36
Oceania	21

Fig. 2.4

(i) To what extent is there a relationship between the data contained in Figs. 2.3 and 2.4?
Suggest an explanation for your answer.

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(ii) Outline **three** factors which have an influence on the numbers of thre species shown in Fig. 2.3.

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[Total: 20]

Section B

Answer **one** question from this section.

3 **(a)** With reference to Table 3.1, give **three** reasons why the percentage contribution of oil exploration and production to marine pollution is less than that of other sources. [10]

Table 3.1

source of marine pollution	percentage contribution
land based discharge	44
atmospheric inputs	33
marine transport	12
dumping	10
oil exploration and production	1

(b) With reference to examples you have studied, describe **three** effects of marine pollution upon marine environments. Why is the issue of marine pollution difficult to manage on both a local and international scale? [30]

[Total: 40]

4 **(a)** Describe and suggest explanations for the relationship between the changing populations of rabbits and lynx shown in Fig. 4.1. [10]

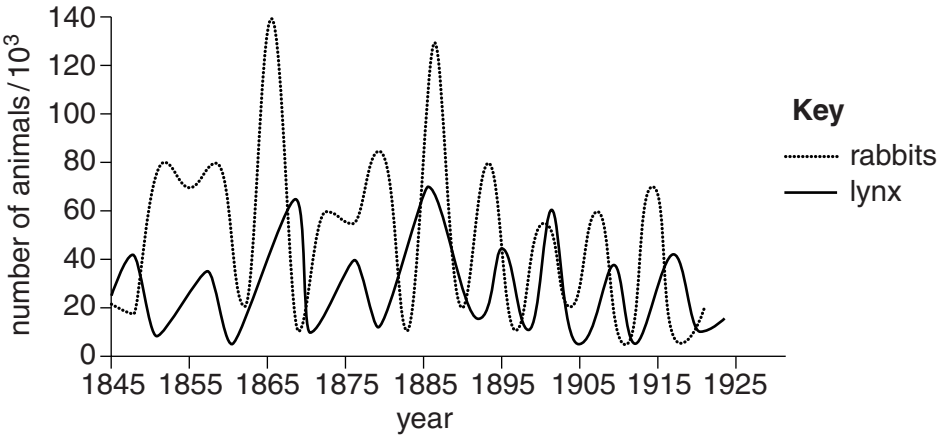

Fig. 4.1

(b) Assess the relative merits of safari parks and zoos in the conservation of endangered species. Refer to examples you have studied. [30]

[Total: 40]

5 **(a)** Describe how global warming might affect the amounts of water contained in [illegible] stores shown in Table 5.1.

Table 5.1

natural store	percentage of water stored
oceans	97.2
snow and ice	2.15
deep groundwater	0.635
shallow groundwater	0.31
freshwater lakes	0.009
salt water lakes and inland seas	0.008
soil and percolating water	0.005
atmospheric water	0.001
rivers	0.0001

(b) Describe the extent to which climatic change is likely to affect the supply of water for domestic, agricultural and industrial purposes. With reference to a country with which you are familiar assess **two** ways in which it is attempting to cope with these issues. [30]

[Total: 40]

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