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

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

ENVIRONMENTAL MANAGEMENT **8291/02**

Paper 2 Hydrosphere and Biosphere **October/November 2008**

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, table 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.

All questions in this paper carry equal marks.

For Examiner's Use	
Section A	
1	
2	
Section B	
Total	

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

Section A

For Examiner's Use

Answer **all** questions in this section.

Write your answers in the spaces provided.

1 **(a)** Table 1.1 gives the average values for annual net primary productivity (NPP) and biomass for two ecosystems.

Table 1.1

ecosystem	NPP / g m^{-2}	mean biomass / g m^{-2}
savanna grassland	900	4000
temperate deciduous forest	1200	30000

(i) Explain what is meant by the following terms:

ecosystem .....

.....

.....

.....

.....

net primary productivity .....

.....

.....

.....

.....

biomass .....

.....

.....

.....

.....[6]

(ii) Suggest **one** reason for the difference in NPP between savanna grassland and temperate deciduous woodland.

.....

.....

.....

.....[2]

(iii) Explain why the values for mean biomass are greater than those for NPP in both ecosystems.

.....

.....[1]

(iv) For the woodland, the biomass value is over 20 times greater than the NPP value. For the savanna, the biomass value is about 4 times greater than the NPP value.

Briefly explain why.

.....

.....[1]

[Turn over

(b) Read the following Greenpeace news report on biodiversity; then answer the questions that follow.

For Examiner's Use

As the two-week long world summit on biodiversity drew to a close, Greenpeace described the outcome as major failure – a missed opportunity to stop the global loss of life in the world's forests and oceans.

At the beginning of the conference, Greenpeace presented a roadmap to recovery, a global map of the last intact forests, and a network of marine reserves on the high seas, calling governments to take action.

The need for a moratorium on high seas bottom trawling, the most destructive form of fishing, is now being blocked by a few key countries.

Despite the exploitation of the Amazon by illegal and destructive logging providing timber products to internal and external markets, the Brazilian government has blocked any meaningful collaboration at a regional and international level.

(a moratorium is a legal authorisation, often by an emergency law)

(i) In this report a 'roadmap' is a plan or a route.
Give **two** reasons why Greenpeace suggested 'a roadmap to recovery'. (lines 4–5)

.....

.....

.....

.....[2]

(ii) Suggest why a moratorium on high seas trawling is proposed in the roadmap. (line 7)

.....

.....

.....

.....[2]

(iii) Outline the effects that illegal and destructive logging would have upon the food webs found within tropical rain forests. (line 9)

.....

.....

.....

.....[2]

(iv) Some nations rejected the recommendations made by Greenpeace. Discuss the possible reasons for this.

For Examiner's Use

.....

.....

.....

.....

.....

.....

.....

.....[4]

[20 marks]

2 **(a)** Fig. 2.1 is a simplified model showing the passage of water in part of a drainage basin.

For Examiner's Use

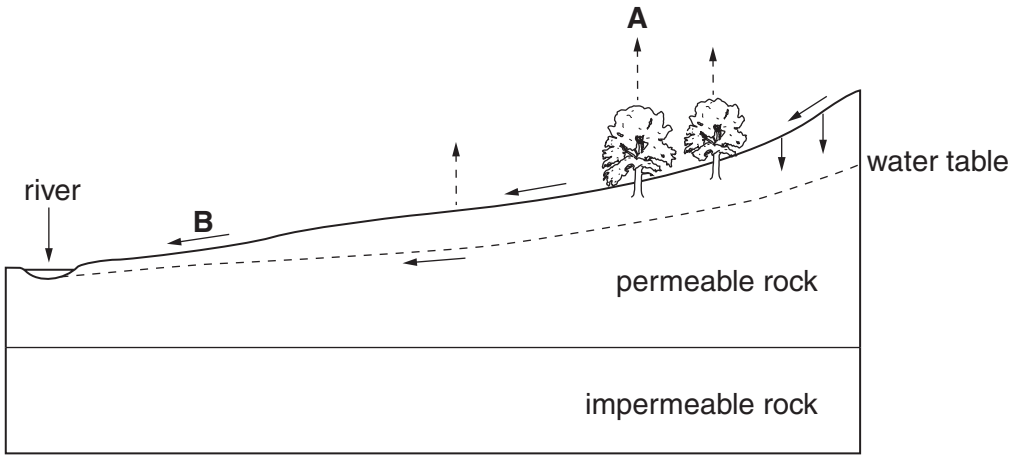


Fig. 2.1

(i) What is meant by the terms

drainage basin, ...

.....

.....

infiltration? .....

.....

.....[2]

(ii) State the names of the process occurring at points **A** and **B** in Fig. 2.1.

A .....

B .....[2]

(iii) Describe how a balance between water gain and water loss would be maintained in a drainage basin.

For Examiner's Use

.....

.....

.....

.....

.....

.....

.....

.....[4]

(iv) Describe how the flows in Fig. 2.1 would respond to conditions of heavy rainfall following a wet winter.

.....

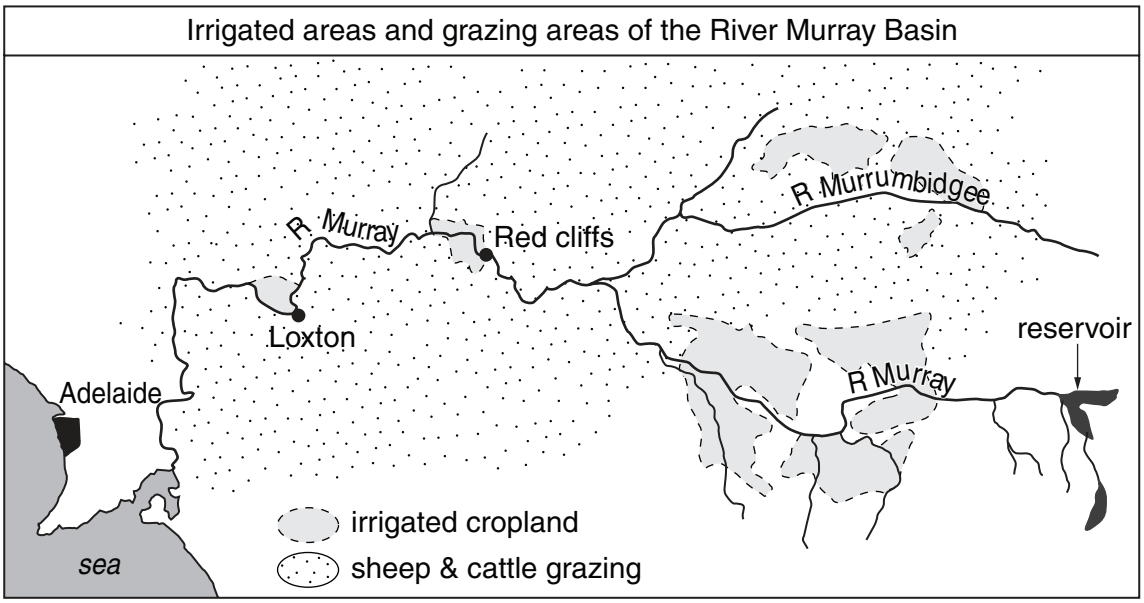
.....

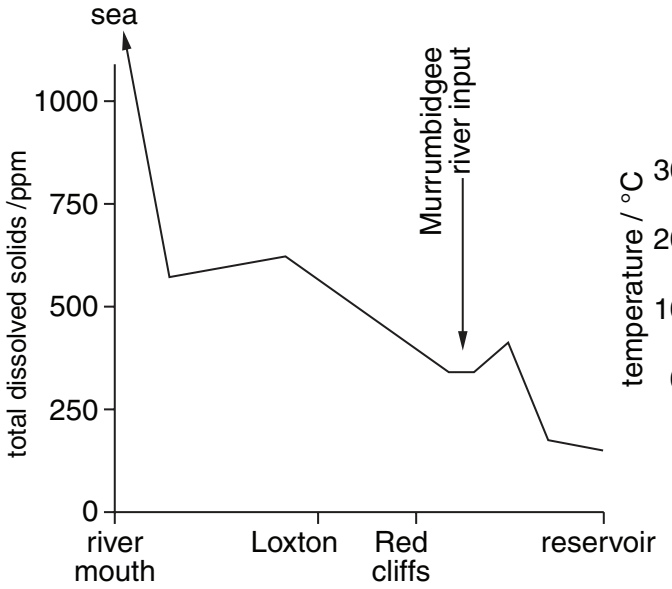
.....

.....[2]

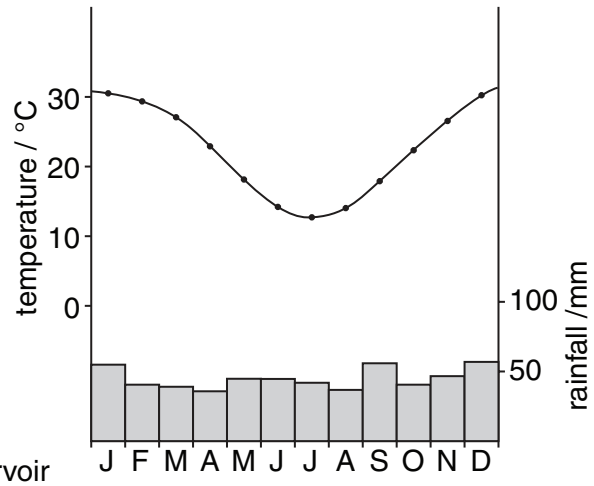
(b) Fig. 2.2 shows some of the characteristics of the River Murray drainage basin in south east Australia.

For Examiner's Use





salinity in the Murray River



climatic chart for Loxton

Fig. 2.2

(i) Less than 50% of the water received by the River Murray actually reaches the sea. Outline **four** reasons for this significant loss of river water.

For Examiner's Use

.....

.....

.....

.....

.....

.....

.....

.....

.....[4]

(ii) Describe and explain the pattern of salinity between the reservoir and the sea within the River Murray system shown in Fig. 2.2.

.....

.....

.....

.....

.....

.....

.....

.....[4]

(iii) Suggest **one** strategy that could be used to relieve the problems of **either** water supply **or** water quality in the River Murray Basin.

.....

.....

.....

.....[2]

[20 marks]

[Turn over

Section B

Choose **one** question from this section.

Answers must be in continuous prose.

Write your answers on the separate paper provided.

3 **(a)** The Chagga people of Tanzania effectively maintain biodiversity by practising agroforestry. This is shown in Fig. 3.1.

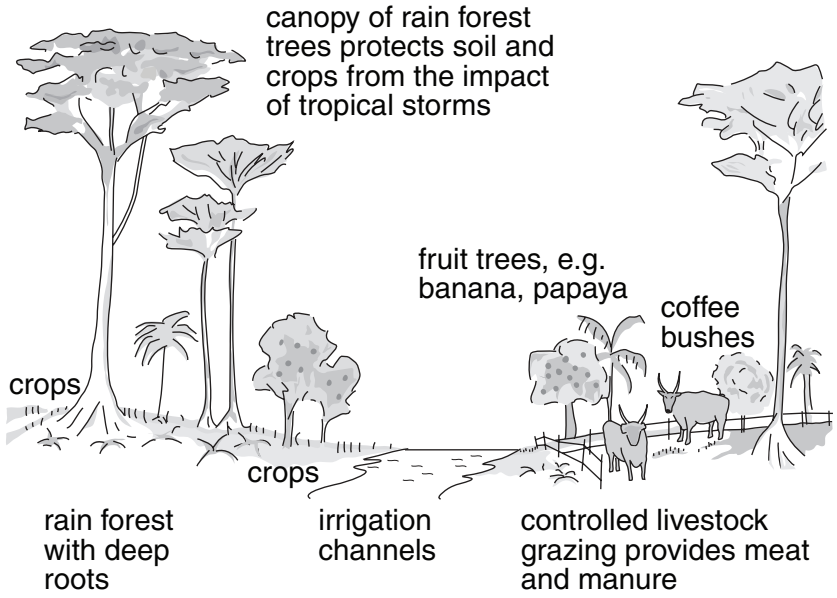


Fig. 3.1

Describe **three** ways in which this system of agricultural land-use helps to maintain biodiversity. [10]

(b) Using examples you have studied, explain how National Parks help to conserve ecosystems. For the examples you have chosen, assess the extent to which they have been successful in achieving their objectives. [30]

[40 marks]

4 **(a)** Briefly describe the possible effects of global warming upon the flows and stores in the global hydrological cycle illustrated in Fig. 4.1. [10]

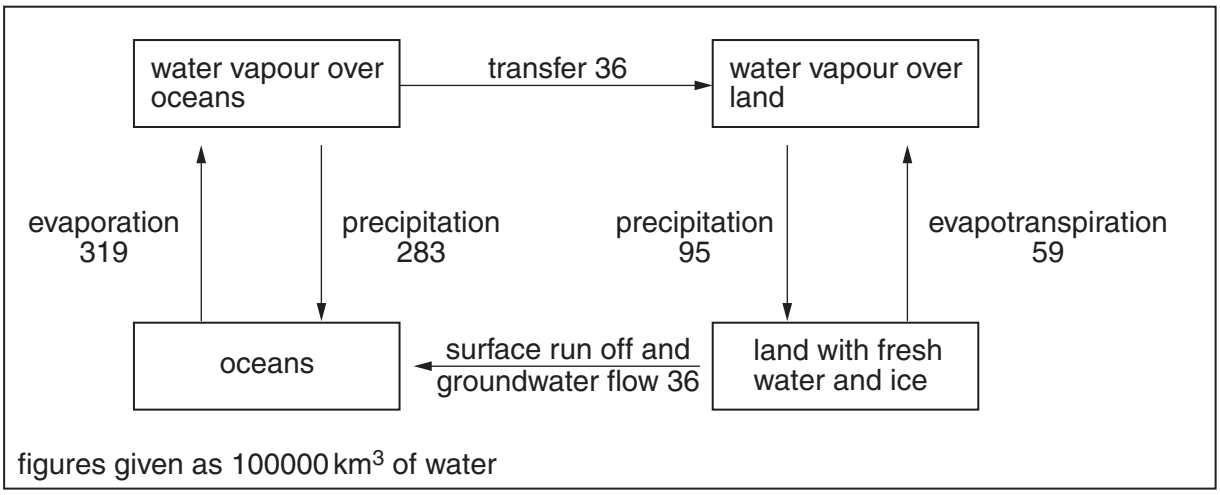


Fig. 4.1

(b) Using examples with which you are familiar, discuss the advantages and disadvantages of conserving water supplies through the construction of dams and reservoirs. [30]

[40 marks]

5 **(a)** Fig. 5.1 shows a pattern of forest regeneration following clearance of the original climax vegetation cover.

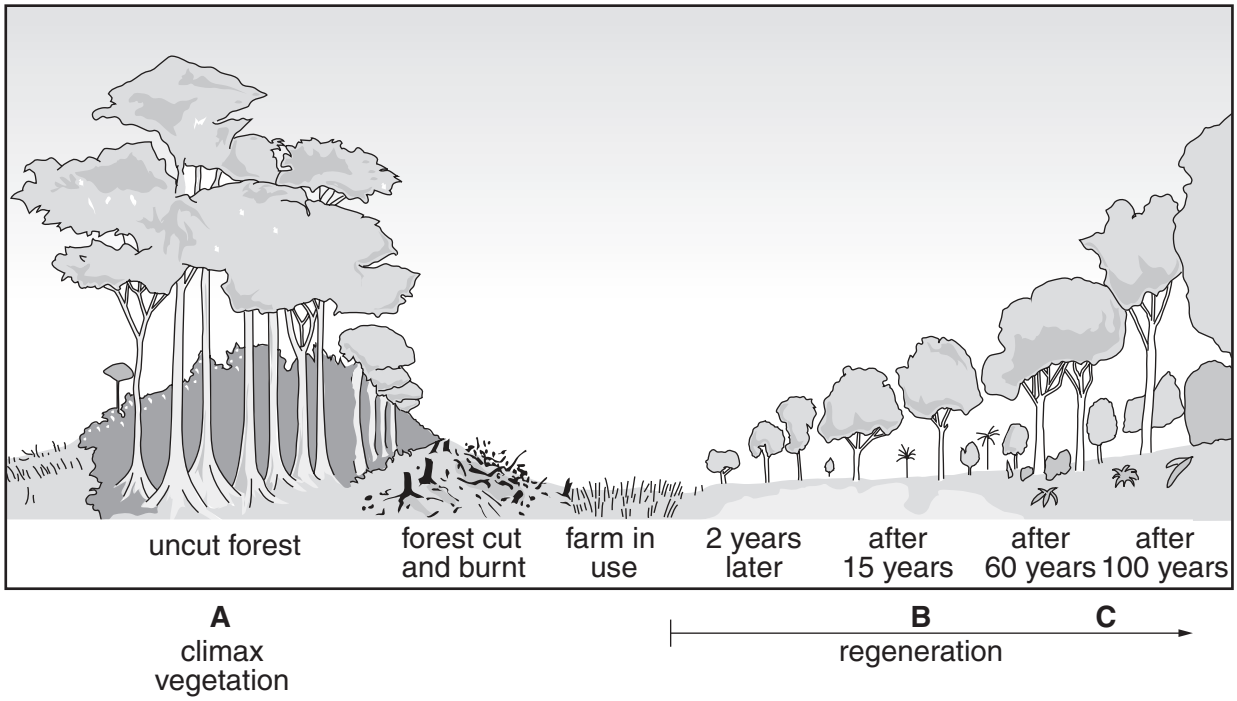


Fig. 5.1

Describe how biotic and abiotic processes work together in stages **A**, **B**, and **C** of this model. [10]

(b) Describe the damaging effects of forest clearance upon soils and hydrological systems within a deforested region, and beyond that region. Assess the extent to which it has been possible to restore areas affected by such deforestation. [30]

[40 marks]