



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

CANDIDATE
 NAME

CENTRE
 NUMBER

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ENVIRONMENTAL MANAGEMENT

8291/22

Paper 2 Hydrosphere and Biosphere

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



Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

For
Examiner's
Use

1 (a) What is meant by the terms *biome*, *net primary productivity (NPP)* and *biomass*?

biome

.....

NPP

.....

biomass

..... [3]

(b) Fig. 1.1 shows the locations of some of the world's major biomes.

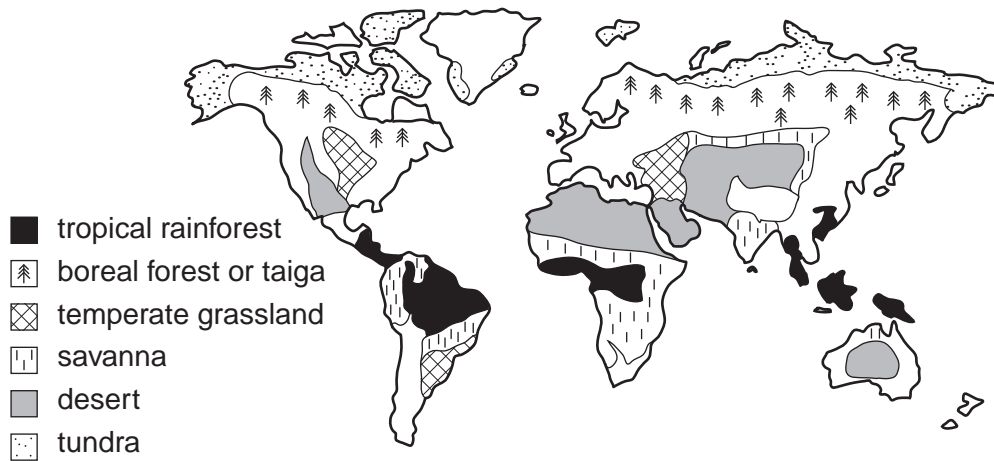


Fig. 1.1

(i) Name **one** biome associated with each of the following climatic conditions:

- hot summers, warm winters and a small amount of summer rainfall

.....

- cool short summers, very cold winters, small amounts of summer rainfall

.....

- hot and moist in every month.

..... [3]

(ii) Describe and suggest **one** reason for the distribution of deserts as shown in Fig. 1.1.

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.....[3]

(iii) Table 1.1 contains information on net primary productivity (NPP).

Table 1.1

biome	net primary productivity/kJ m ⁻²
tropical rainforest	9000
savanna	3000
deciduous temperate forest	6000
boreal forest	3500
temperate grassland	2000
polar tundra	600
desert	<200

With reference to Table 1.1 describe how NPP depends upon temperature and precipitation.

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.....[4]

- (c) Temperate grasslands such as the Prairies and the Pampas can be regarded as marginal areas that should not be over-farmed. Fig. 1.2 illustrates mechanised agriculture of the American Prairies and the climate of the area.



Average annual precipitation: 516 mm
Mean temperature: 2.5°C

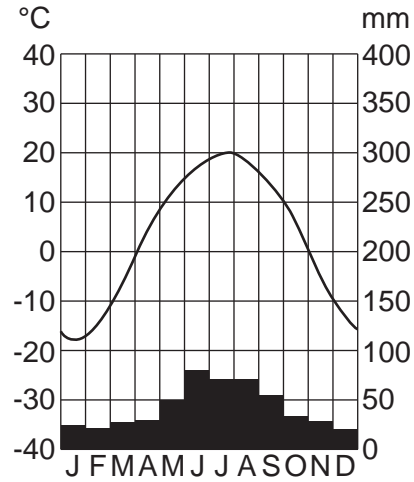


Fig. 1.2

- (i) Briefly explain why the climate of this area is regarded as semi-arid.

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..... [2]

- (ii) Suggest why the farming activities shown in Fig. 1.2 might become unsustainable.

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..... [3]

(iii) Outline **one** method that could be used to maintain future crop production in the area shown in Fig. 1.2.

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..... [2]

[Total: 20]

2 (a) Fig. 2.1 shows four sources of water pollution.

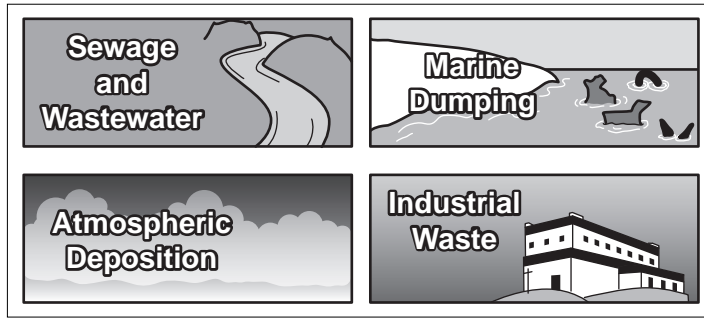


Fig. 2.1

(i) For each of the sources of water pollution shown in Fig. 2.1 identify a different type of pollutant.

- sewage and wastewater
- marine dumping
- atmospheric deposition
- industrial waste [4]

(ii) Outline the effects pollution from sewage and wastewater may have upon human health and freshwater ecosystems.

- human health
-
-
-
-
- freshwater ecosystems
-
-
-
-
- [4]

(iii) Describe **two** effects marine dumping by ships at sea might have upon marine ecosystems.

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..... [4]

Section B

Answer **one** question from this section.

- 3 (a) Fig. 3.1 shows some of the possible sources of conflicts of interest that can exert pressures upon an area of outstanding natural beauty.

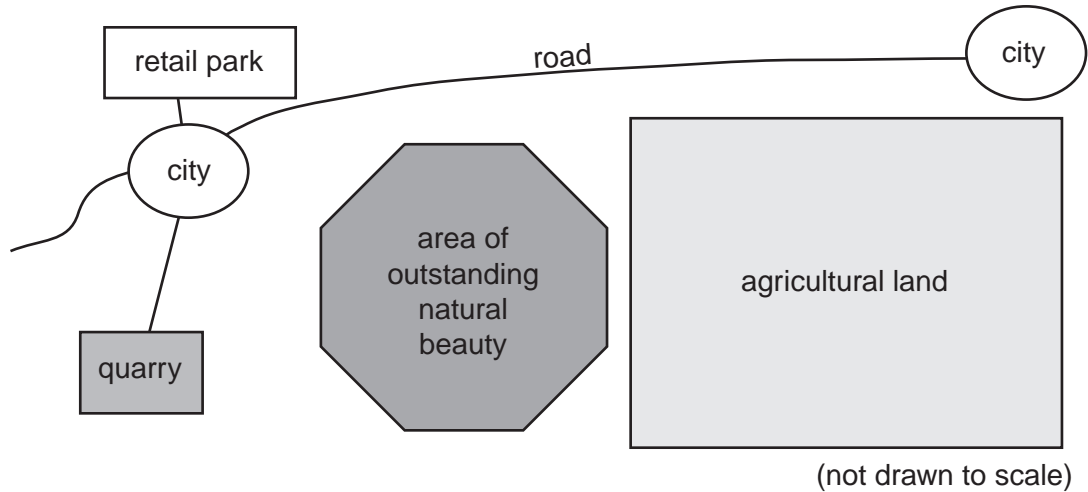


Fig. 3.1

Briefly explain how the needs of local communities, public enjoyment of the countryside and the need for conservation would give rise to these conflicts of interest. [10]

- (b) Using examples you have studied, assess the responsibilities of National Parks in protecting areas that are of ecological importance and outstanding natural beauty. [30]

[Total: 40]

- 4 (a) Fig. 4.1 illustrates the region around an expanding city. The demands of the city give rise to adverse effects on the supply and quality of water in this region.

Describe **three** of these effects.

[10]

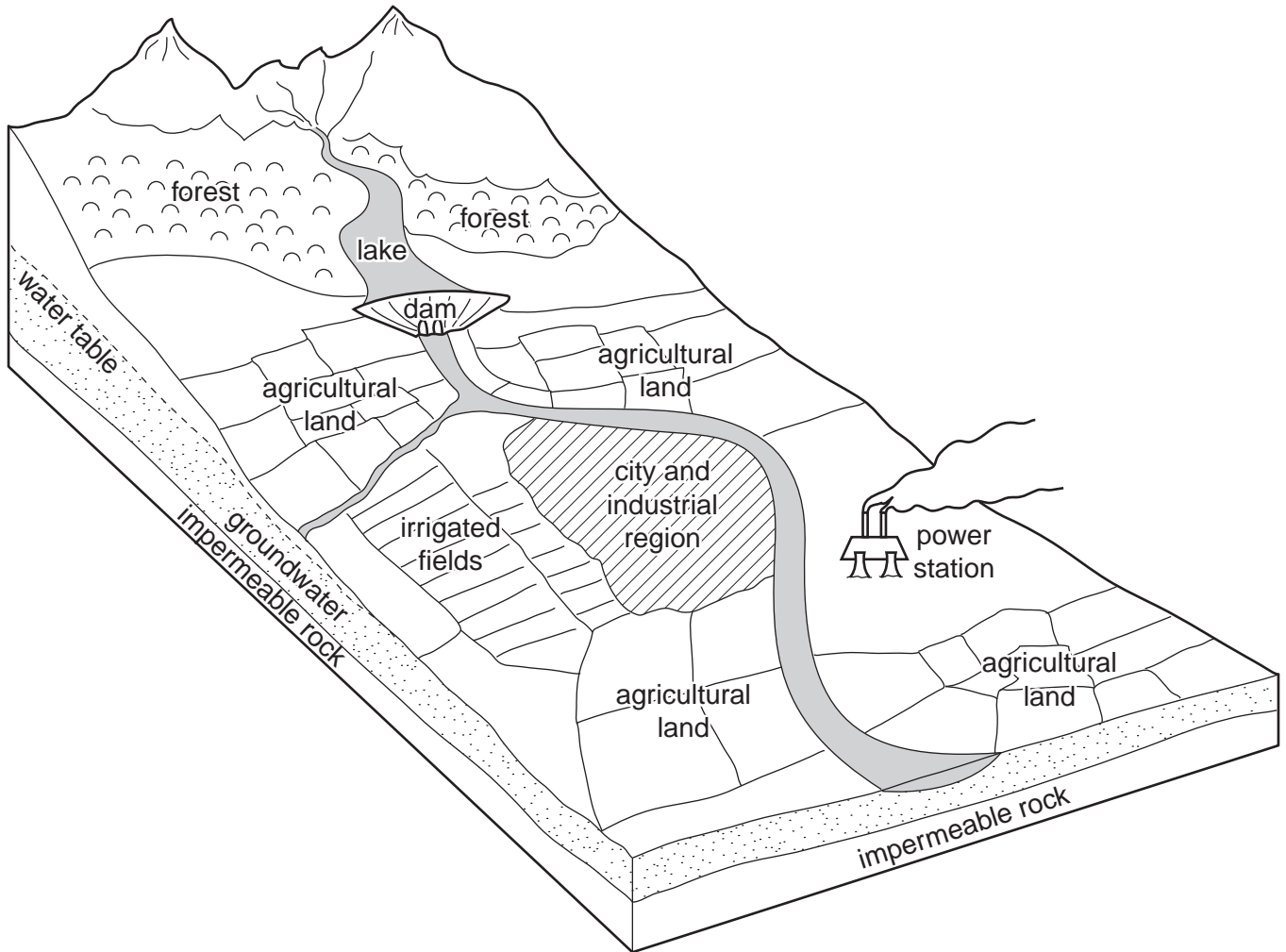


Fig. 4.1

- (b) With reference to named examples with which you are familiar, evaluate the strategies that have been adopted to achieve a sustainable supply of water. [30]

[Total: 40]

- 5 (a) Give **three** reasons for the differences in population growth for the regions shown in Fig. 5.1. [10]

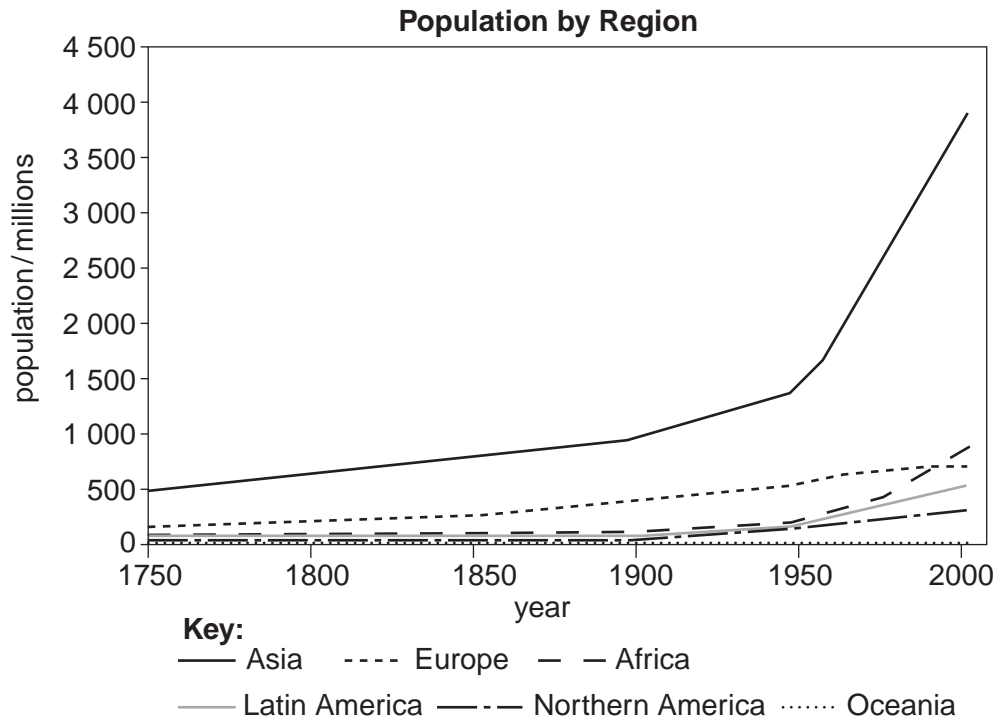


Fig. 5.1

- (b) Why is it necessary for nations to develop policies for managing future changes to their population size? For **either** a less economically developed country (LEDC) **or** more economically developed country (MEDC), assess its policies for managing future population change. [30]

[Total: 40]

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Question 2b © www.coolschool.ca/lor/GEO12/unit10/u10I04.htm.

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