Cambridge International AS Level

Cambridge Assessment International Education
Cambridge International Advanced Subsidiary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

ENVIRONMENTAL MANAGEMENT **8291/21**

Paper 2 Hydrosphere and Biosphere **October/November 2019**

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 an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

Section A
Answer **all** questions in this section.
Write your answers in the spaces provided on the question paper.

Section B
Answer **one** question from this section.
Write your answers 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.

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

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

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[Turn over

Section A

Answer **all** questions in this section.

Write your answers in the spaces provided.

1 **(a)** Fig. 1.1 is a photograph of a desert biome.

Fig. 1.1

(i) State the two main abiotic factors which control the distribution of the biome shown in Fig. 1.1.

1 .....

2 ..... [2]

(ii) Describe the effect that **one** abiotic factor has on a desert soil.

.....

.....

.....

..... [2]

(iii) Table 1.1 contains six soil characteristics.

Identify **two** characteristics of a soil in a desert biome.

Place a tick (✓) in the boxes next to your choices.

Table 1.1

characteristic	present in desert soil
very little leaf litter	
high soil moisture content	
silt and clay layers	
thick, dry horizon over parent rock	
thick humus layer	
rapid rate of decomposition	

[2]

(b) Fig. 1.2 shows part of a desert food web.

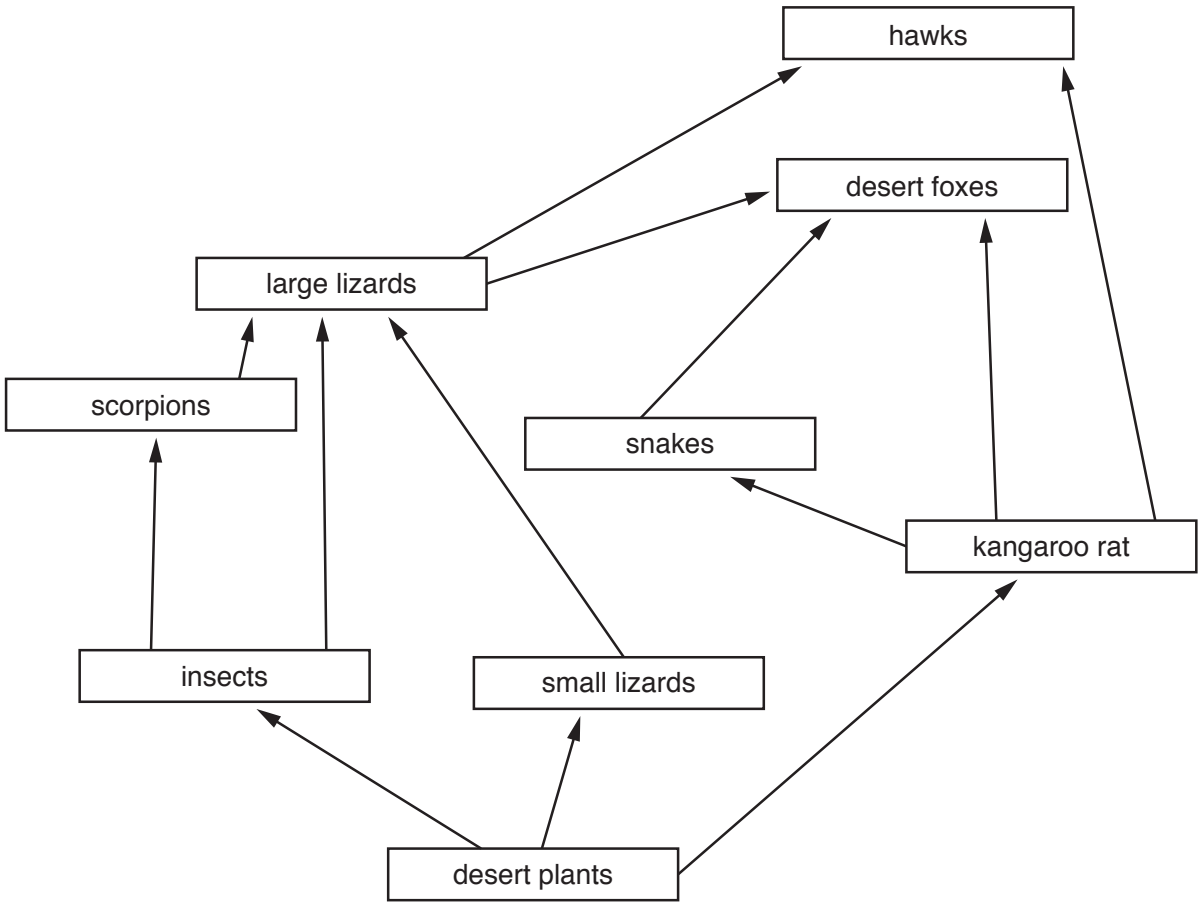

Fig. 1.2

(i) State the trophic level of each of the following organisms in Fig. 1.2.

scorpion .....

desert plant .....

kangaroo rat ..... [3]

(ii) Explain **one** possible effect of the loss of insects on the food web shown in Fig. 1.2.

.....

.....

.....

..... [2]

(iii) State which trophic level has the least energy in a pyramid of energy.

..... [1]

(iv) State which type of organism is essential for the breakdown of organic matter in an ecosystem.

..... [1]

(v) Desertification is the process of desert biomes spreading into previously fertile areas.

Describe **two** human activities responsible for desertification.

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..... [4]

(vi) Suggest reasons why desertification is increasing.

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..... [3]

[Total: 20]

[Turn over

2 **(a)** Fig. 2.1 shows water use by sector for countries with contrasting levels of economic development.

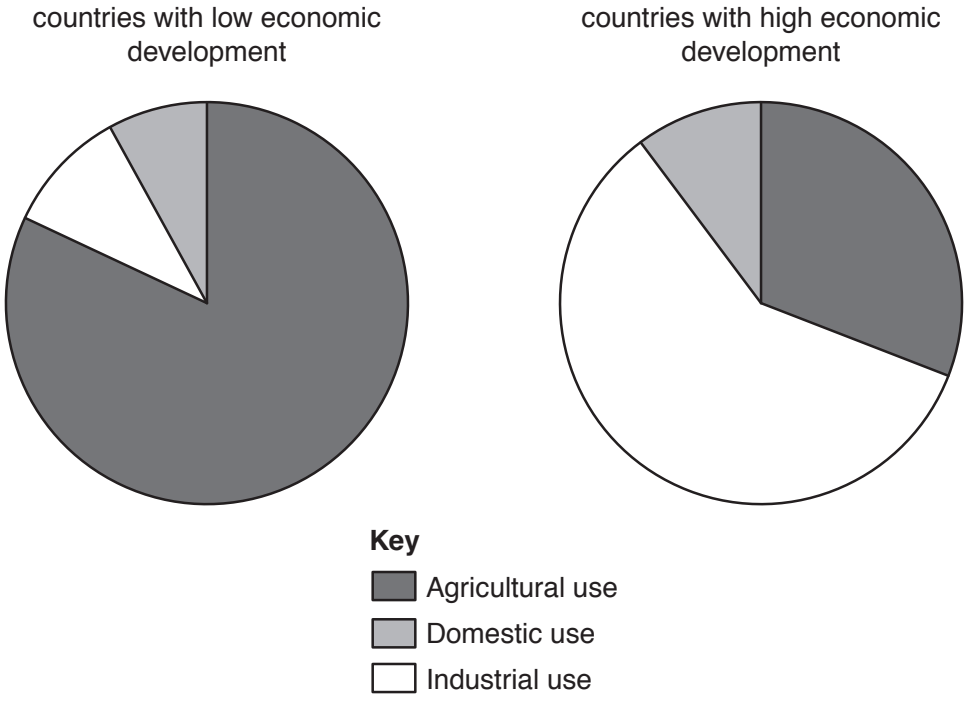

Fig. 2.1

(i) Describe **two** differences in water use between countries with low levels of economic development and countries with high levels of economic development shown in Fig. 2.1.

.....

.....

.....

..... [2]

(ii) As a country becomes more economically developed, its water use changes.

Explain **two** reasons for changes in water use.

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..... [4]

[Turn over

(b) Fig. 2.2 shows an area of the Colorado River drainage basin in the United States of America.

The Colorado River drainage basin has an area of approximately 640,000 km^2.

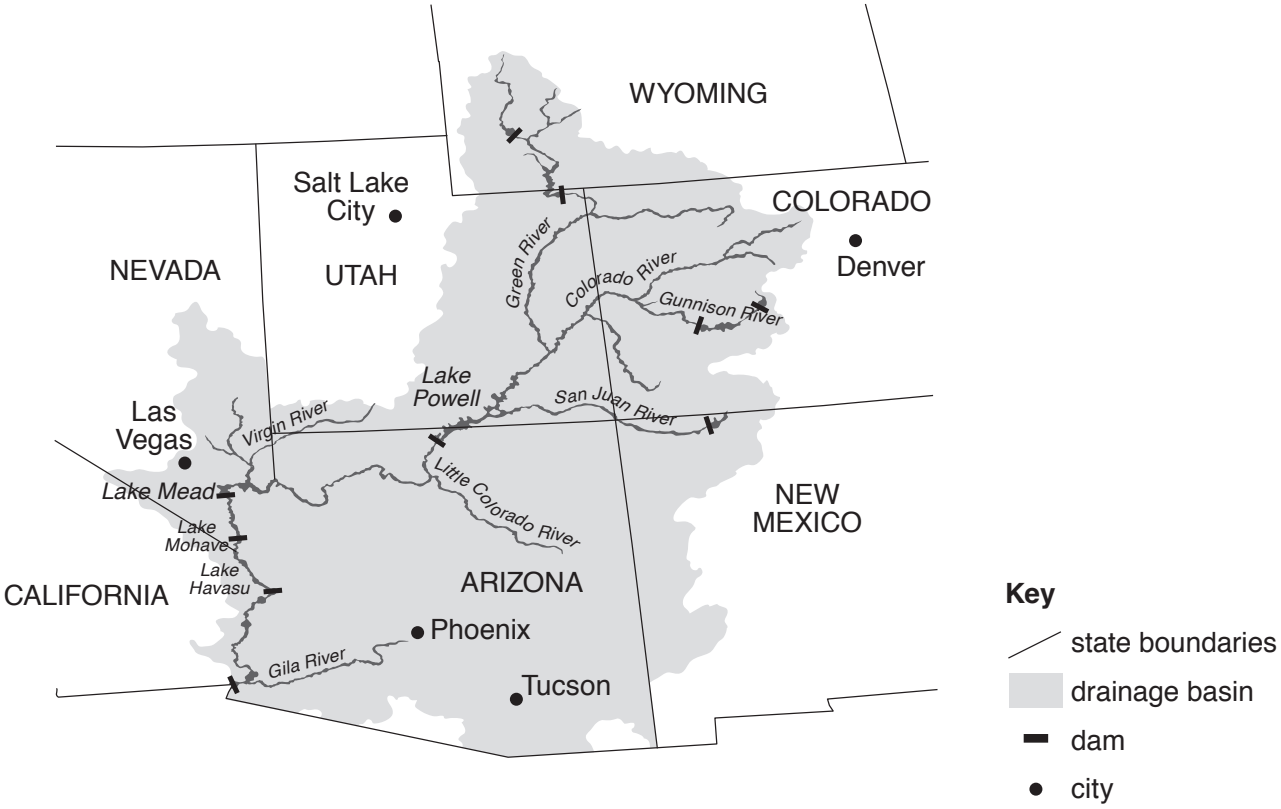

Fig. 2.2

(i) It was predicted that Lake Mead shown in Fig. 2.2 will be dry by the year 2021.

Suggest reasons for this prediction.

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..... [4]

(ii) Suggest **two** strategies to manage a sustainable water supply to the cities in the Colorado Basin shown in Fig. 2.2.

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..... [4]

(iii) Describe **three** advantages and **three** disadvantages of storing water in reservoirs.

advantages .....

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disadvantages .....

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..... [6]

[Total: 20]

Section B

Answer **one** question from this section.

Write your answers on the separate answer paper provided.

3 Fig. 3.1 is an extract from an article.

Arctic sea ice at minimum extent

06/12/2016

Scientists at the National Snow and Ice Data Centre (NSIDC) said that there was a reduction in the extent of Arctic sea ice for a short time in November, calling this an 'almost unprecedented' event.

Sea ice decreased by around 50,000 km^2 in this period, mainly in the Barents Sea.

This removed an area of ice larger than Denmark from the Arctic at a time of year when sea ice is usually increasing.

Fig. 3.1

(a) Describe the possible causes and effects of the change in the extent of the sea ice outlined in Fig. 3.1. [10]

(b) Assess the success of international protocols, such as Kyoto, in managing the biosphere. [30]

[Total: 40]

4 Fig. 4.1 shows a map of the South-to-North Water Transfer Project in China.

The South-to-North Water Transfer Project aims to take water from southern rivers, such as the Yangtze river, and supply the water to areas with limited water resources in the north.

Fig. 4.1

(a) Describe the advantages and disadvantages of water supply management projects such as the South-to-North Water Transfer Project shown in Fig. 4.1. [10]

(b) Using examples, assess the success of the strategies used to supply safe drinking water in different parts of the world. [30]

[Total: 40]

5 Fig. 5.1 is a diagram that represents the stages in a succession.

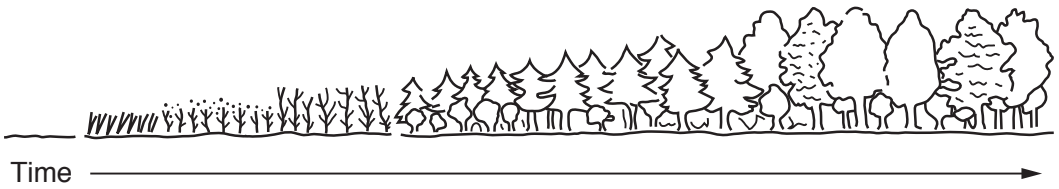

Fig. 5.1

(a) Describe and explain the stages of succession in a named habitat. [10]

(b) Using examples, assess how political and economic factors affect the success of conservation strategies. [30]

[Total: 40]