

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

| ENVIRONMENT       | ΓAL MANA( | GEMENT |  |                     | 829 | 91/2 |
|-------------------|-----------|--------|--|---------------------|-----|------|
| CENTRE<br>NUMBER  |           |        |  | CANDIDATE<br>NUMBER |     |      |
| CANDIDATE<br>NAME |           |        |  |                     |     |      |

# 9 3 2 0 6 2 5 7 5

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.

|           | Examiner's<br>Use |
|-----------|-------------------|
| Section A |                   |
| 1         |                   |
| 2         |                   |
| Section B |                   |
|           |                   |
| Total     |                   |
|           |                   |

Eor

This document consists of 11 printed pages and 1 blank page.



## **Section A**

For Examiner's Use

Answer all questions in this section.

Write your answers in the spaces provided.

| 1 | (a) | Nev  | v organic matter is created through the process of photosynthesis. |
|---|-----|------|--|
|   |     | (i)  | What is the source of energy for photosynthesis?                   |
|   |     |      | [1]  |
|   |     | (ii) | Describe the process of photosynthesis.                            |
|   |     |      |  |
|   |     |      |  |
|   |     |      |  |
|   |     |      |  |
|   |     |      |  |
|   |     |      |  |
|   |     |      |  |
|   |     |      |  |

|     | iii) Use Fig. 1.1 to describe ho temperature affect the rate of  | ow light intensity, carbon dioxide photosynthesis.                                  | concentration and For Examiner's Use |  |  |  |
|-----|--|---|--------------------------------------|--|--|--|
|     | rate of photosynthesis   |   |                                      |  |  |  |
|     |  | 0.13 % CO <sub>2</sub> 20<br>0.03 % CO <sub>2</sub> 30<br>0.03 % CO <sub>2</sub> 20 | 0°C                                  |  |  |  |
|     |  |   |                                      |  |  |  |
|     | light in   | tensity   |                                      |  |  |  |
|     |  | Fig. 1.1  |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
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|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   | [4]                                  |  |  |  |
| (b) | Explain the difference in average net primary productivity (NPP) of the two biomes shown in Table 1.1. |   |                                      |  |  |  |
|     | Table 1.1  |   |                                      |  |  |  |
|     | biome  | average annual NPP/10 <sup>9</sup> kJ   |                                      |  |  |  |
|     | temperate forest   | 440   |                                      |  |  |  |
|     | savanna  | 180   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   |                                      |  |  |  |
|     |  |   | [3]                                  |  |  |  |

(c) Fig. 1.2 shows some characteristic features within the lower canopy of a tropical rain forest.

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Fig. 1.2

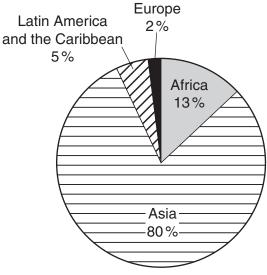
| Describe how biotic and abiotic factors interact to maintain <b>two</b> named ecosystems shown in Fig. 1.2. |
|---|
|   |
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|   |
| [8]   |

[Total: 20]

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2 (a) Study Fig. 2.1 which shows information on the number of people unserved by water supply and sanitation.

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total unserved: 2.4 billion

Fig. 2.1

| (i)  | State the difference in the percentage of people unserved by water supply and sanitation in: |  |  |  |
|------|--|--|--|--|
|      | Europe and Africa  |  |  |  |
|      | Asia and Africa[2]   |  |  |  |
| (ii) | Suggest one reason for the difference between:   |  |  |  |
|      | Europe and Africa  |  |  |  |
|      |  |  |  |  |
|      |  |  |  |  |
|      |  |  |  |  |
|      |  |  |  |  |
|      | Asia and Africa  |  |  |  |
|      |  |  |  |  |
|      |  |  |  |  |
|      |  |  |  |  |
|      | [4]  |  |  |  |

**(b)** Describe how point and non-point sources of pollution would lead to contamination of the river water shown in Fig. 2.2.

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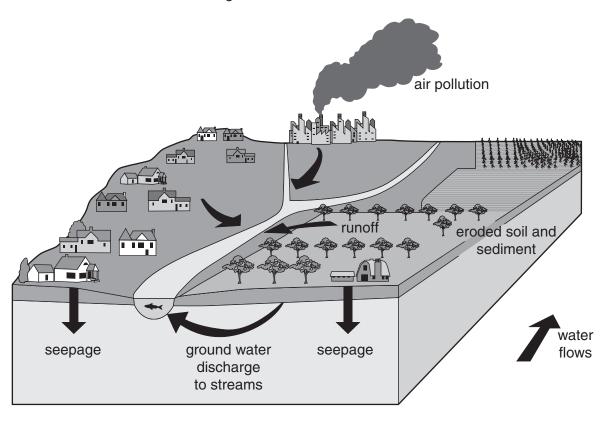
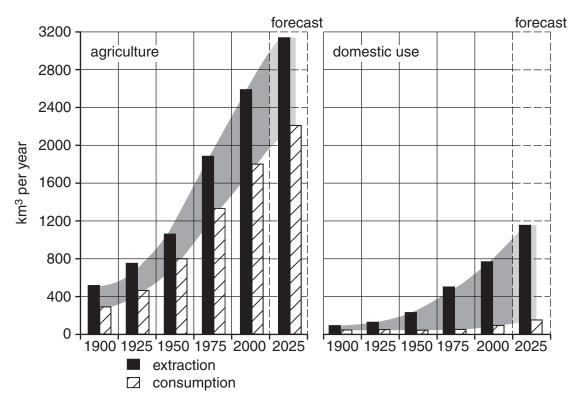


Fig. 2.2

| [6] |
|-----|

(c) Fig. 2.3 contains data on the global extraction and consumption of water for agriculture and domestic use (1900 to 2025).

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The grey band represents the difference between the amount of water extracted and that actually consumed.

Fig. 2.3

| and domestic use shown in Fig. 2.3. |
|-------------------------------------|
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
|                                     |
| [4]                                 |

| (ii) | It is generally assumed that by the year 2025 the world will be experiencing a water shortage. The data in Fig. 2.3 seem to contradict this assumption. Suggest <b>two</b> reasons for this. | For<br>Examiner's<br>Use |
|------|--|--------------------------|
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|      |  |                          |
|      |  |                          |
|      | [4]  |                          |
|      | [Total: 20]  |                          |

### **Section B**

Answer **one** question from this section on the separate answer paper provided.

3 (a) Hydrographs are visual representations of the variation in river discharge over time. Describe and explain how the river discharge shown in Fig. 3.1 responds, over time, to the rainfall event shown in the graph.
[10]

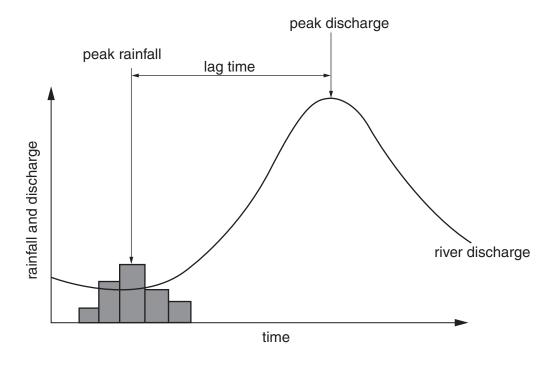


Fig. 3.1

(b) Some hydrologists argue that it is inevitable that some rivers will flood. With reference to examples you have studied, assess the extent to which human activity can contribute to river flooding. [30]

[Total: 40]

**4 (a)** Most of the region shown in Fig. 4.1 consists of tropical rain forest. Fig. 4.1 shows the degree of pressures on this region through illegal logging, mining and hunting.

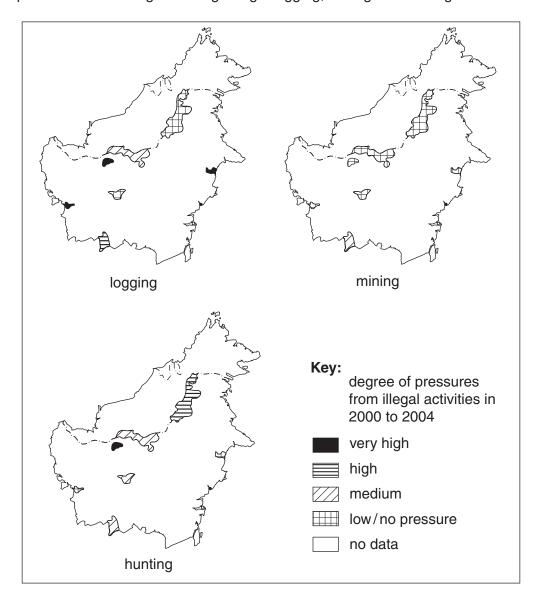


Fig. 4.1

Briefly describe the extent of pressures from these illegal activities upon the tropical rain forest of this region. [10]

(b) With reference to named examples, describe the policies that are being used to conserve ecologically important areas. Assess the extent to which these policies have been successful.

[30]

[Total: 40]

5 (a) Use the information shown in Fig. 5.1 to describe how an urban water cycle can become sustainable. [10]

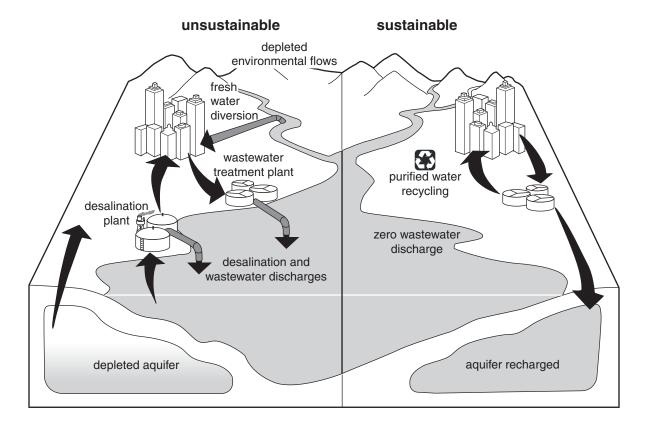


Fig. 5.1

(b) With reference to a large urban area you have studied, assess the measures that are being used to manage the pollution of rivers by industrial and domestic waste. [30]

[Total: 40]

#### Copyright Acknowledgements:

| Question 1a Figure. 1.1 | © K Byrne; Environmental Science; Nelson Thomas and Sons; 2001.  |
|-------------------------|--|
| Question 1c Figure. 1.2 | © Reimar 6/Alamy; Thick tropical rainforest jungle and stream with waterfall at Poas volcano Costa Rica; March 2008. |
| Question 2b Figure. 2.2 | © http://ga.water.usgs.gov/edu/waterquality.html.  |
| Question 2c Figure. 2.3 | © http://www.grida.no/publications/vg/water2/page/3229.aspx.   |
| Question 4a Figure. 4.1 | © http://maps.grida.no/region/geoasiap/.   |
| Question 5a Figure. 5.1 | © http://www.cleanocean.org/The%20sustainable%20urban%20water%20cycle.jpg.   |

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