



**ECOSYSTEMS AND SOCIETIES**  
**STANDARD LEVEL**  
**PAPER 2**

Thursday 7 May 2009 (morning)

Candidate session number

2 hours

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**INSTRUCTIONS TO CANDIDATES**

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all of Section A in the spaces provided. Refer to the resource booklet which accompanies this question paper.
- Section B: answer two questions from Section B. Write your answers on answer sheets. Write your session number on each answer sheet, and attach them to this examination paper and your cover sheet using the tag provided.
- At the end of the examination, indicate the numbers of the questions answered in the candidate box on your cover sheet and indicate the number of sheets used in the appropriate box on your cover sheet.



## SECTION A

Answer **all** of Section A in the spaces provided.

The resource booklet provides information on Svalbard. Use the resource booklet and your own studies to answer the following.

1. (a) (i) State which major biome is found on Svalbard. [1]  
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- (ii) Explain why productivity in the biome named in part (a)(i) is low. [2]  
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- (b) (i) Using the data given in **Figure 4**, compare the climate on Svalbard from 1961–1990 with the climate from 1991–2004. [3]  
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- (ii) Suggest **one** possible reason for the differences in mean air temperature between the two periods. [1]  
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- (c) (i) Describe **two** factors that have caused the speciation of Svalbard reindeer. [2]  
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(Question 1(c) continued)

- (ii) Using the information in **Figure 6** draw a food chain or food web for wild reindeer **and** another for Svalbard reindeer. [2]

- (iii) Identify, giving a reason, which of the food chains or webs drawn in part (c)(ii) is least stable. [2]

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- (d) (i) Distinguish between *positive feedback* and *negative feedback*. [1]

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*(Question 1(d) continued)*

- (ii) Coal dust and gases from mining may affect local or global climate.  
Using **Figure 7** and **Figure 8**, describe and explain **one** example of positive feedback and **one** example of negative feedback caused by coal mining emissions that may affect the climate. [4]

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- (e) (i) Describe **two** advantages of Svalbard as a location for a seed vault. [2]

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- (ii) Explain the importance of preserving seeds for future generations. [2]

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**QUESTION REMOVED FOR COPYRIGHT REASONS**

- (ii) Suggest **two** reasons why interest in exploiting oil and natural gas reserves under the Arctic Ocean is increasing. [2]

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## SECTION B

Answer **two** questions. Write your answers on the answer sheets provided. Write your session number on each answer sheet, and attach them to this examination paper and your cover sheet using the tag provided.

Each essay is marked out of **[20]** of which **[2]** are for clarity of expression, structure and development of ideas:

**[0]** Quality of expression, structure and development is poor.

**[1]** Quality of expression, structure and development is limited.

**[2]** Quality of expression is clear, structure is good and ideas are well developed.

2. (a) Distinguish between the terms *biodiversity* and *species diversity*. [2]

(b) Describe and explain how biodiversity changes during succession, and discuss how human activities can interrupt succession. [8]

(c) Outline the arguments for preserving biodiversity. Identify which of these arguments are most prominent in the World Conservation Strategy and suggest why. [8]

Expression of ideas [2]

3. (a) Define what is meant by the term *sustainability*. [2]

(b) Explain, with reference to a case study, how the concept of sustainability applies in the exploitation of water resources. [6]

(c) Compare the environmental value systems of **two** named societies and describe how these societies might differ in the way that they exploit their resources. [10]

Expression of ideas [2]



4. (a) Distinguish between *pyramids of numbers* and *pyramids of biomass*, and outline **two** consequences of pyramid structure in ecosystems. [4]
- (b) Evaluate the advantages and disadvantages to ecosystems and societies of banning the pesticide DDT. [6]
- (c) With reference to examples other than pesticide use, describe the ways in which farmers can improve the productivity of their soil, and discuss how the strategies adopted may differ between technocentric and ecocentric farmers. [8]

*Expression of ideas* [2]

5. (a) Outline the link between greenhouse gases and global temperatures. [2]
- (b) Explain why the effects of global environmental problems, such as global warming and ozone depletion, will not have an impact on every society to the same extent. [6]
- (c) Human responses to global warming can be divided into strategies to prevent global warming from happening (preventive) and strategies to reduce the impacts that global warming might have (reactive). Outline preventive and reactive management strategies to address global warming. Evaluate the strengths and weaknesses of preventive versus reactive approaches. [10]

*Expression of ideas* [2]

