



**ENVIRONMENTAL SYSTEMS AND SOCIETIES
STANDARD LEVEL
PAPER 2**

Wednesday 3 November 2010 (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 the change in population of Plains bison in North America. Use the resource booklet and your own studies to answer the following.

1. (a) (i) With reference to the resource booklet **only**, state **two** biomes which represent the Plains bison’s natural habitat. [1]

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(ii) With reference to the resource booklet **only**, identify **one** natural factor and **one** human factor which interrupt the process of ecological succession. [2]

Natural factor:

Human factor:

(iii) With reference to organisms in the resource booklet **only**, describe an example of each of the following types of population interaction. [2]

Mutualism:
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Predation:
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(This question continues on the following page)



(Question 1 continued)

- (b) With reference to the resource booklet and your own studies, draw a simple systems diagram to show the role that Plains bison play in a grassland **soil** system. [4]

- (c) (i) Explain why early exploitation of Plains bison by American Indians could be considered sustainable. [2]

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- (ii) Explain **three** ways in which the status of Plains bison as a natural resource has changed over time. [3]

1.

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2.

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3.

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(This question continues on the following page)



(Question 1 continued)

- (d) (i) With reference to the map in Figure 6, describe how the range of Plains bison has changed over time. [2]

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- (ii) With reference to Figure 4, predict, giving reasons, **two** impacts that the decline of Plains bison by 1889 might have had on local populations of rabbits. [2]

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(Question 1 continued)

- (e) With reference to Figure 8, explain why researchers examined economic and cultural factors as well as ecological factors when they measured the “restoration potential” for Plains bison herds in different locations. [3]

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- (f) (i) Suggest why the Plains bison is sometimes described as an “iconic” (representative, very significant) species. [2]

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- (ii) Outline the arguments that might be given for preserving Plains bison as a species by a deep ecologist and an environmental manager. [2]

Deep ecologist:

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Environmental manager:

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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) Outline the environmental impact of **two named** food production systems. [4]
- (b) Discuss the importance of international development policies in affecting human population growth in LEDCs. [5]
- (c) Explain the relationships between population growth, social systems and food production technologies. Refer to **named** contrasting countries in your answer. [9]

Expression of ideas [2]

3. (a) Describe the distribution, structure and relative productivity of a **named** biome, and suggest how these may be affected by global warming. [6]
- (b) Discuss why there is uncertainty about predictions concerning global warming. [6]
- (c) Justify the argument that changes need to be made in individual lifestyles to effectively address the issues of global warming. [6]

Expression of ideas [2]



4.

<p>“Earth provides enough to satisfy every man’s need, but not every man’s greed.” Mahatma Gandhi</p> <p>“We do not inherit the Earth from our ancestors: we borrow it from our children.” A traditional Kenyan proverb and American Indian saying</p>
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- (a) Describe the role of any **two named** historical influences in the environmental movement. [3]
- (b) With reference to the concepts of carrying capacity and environmental value systems, discuss the two quotations above. [7]
- (c) Describe and evaluate ecocentric and technocentric responses to eutrophication. [8]

Expression of ideas [2]

5.
 - (a) Draw and label a survivorship curve for both a **named** *K*-strategist and *r*-strategist. [4]
 - (b) Explain how *K*-strategies and *r*-strategies are linked to succession. [6]
 - (c) Population dynamics can be defined as, “the study of changes and the reasons for changes in population size”. Discuss why an understanding of the population dynamics of an endangered species is essential to the efforts for its conservation. [8]

Expression of ideas [2]

