Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
TOTAL	

General Certificate of Education
Advanced Subsidiary Examination
January 2012

Environmental Studies ENVS1

Unit 1 The Living Environment

Thursday 12 January 2012 9.00 am to 10.00 am

You will need no other materials.
You may use a calculator.

Time allowed
- 1 hour

Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
  Two of these marks are for the Quality of Written Communication.
- You will be marked on your ability to:
  – use good English
  – organise information clearly
  – use specialist vocabulary where appropriate.
- Question 4(a) should be answered in continuous prose.
  Quality of Written Communication will be assessed in this answer.

There are no questions printed on this page

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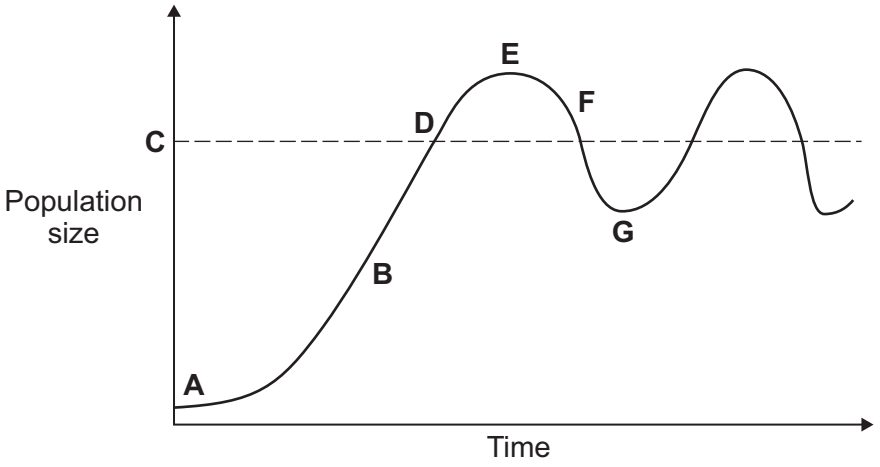
ANSWER IN THE SPACES PROVIDED

Answer **all** questions in the spaces provided.

1 The graph shows the theoretical growth curve of a population.



1 (a) Complete the table by selecting the appropriate letter from the graph.

Feature of the graph	Letter
Carrying capacity	
The first point at which the population is likely to overexploit its environment	
The point at which most deaths are caused by density independent factors/The point at which growth is exponential	
A point at which the population is in the lag phase	

(4 marks)

1 (b) Give **one** example of a density independent factor.

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(1 mark)

5

Turn over for the next question

2 The development of the second runway at Manchester Airport was controversial.

2 (a) Outline **two** problems that airport expansion may cause in the surrounding area.

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2 .....

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(2 marks)

2 (b) Manchester Airport is in a Green Belt.

Why are areas designated as Green Belts?

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(2 marks)

2 (c) Environmental Impact Assessments typically include suggestions to reduce the damage that may be caused by a development.

2 (c) (i) Explain why zoning may be suggested.

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(2 marks)

2 (c) (ii) Explain how the enhancement of the landscape around a new development may result in wildlife conservation.

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(4 marks)

10

Turn over for the next question

3 The picture shows a White-clawed Crayfish, *Austropotamobius pallipes*, the only species of freshwater crayfish native to Britain. Like all crustaceans, crayfish have calcareous (calcium-based) exoskeletons.

3 (a) (i) Some of the sites where White-clawed Crayfish are found are Sites of Special Scientific Interest (SSSIs).

Explain how SSSIs help to conserve species.

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(2 marks)

3 (a) (ii) Name the UK law that protects many native British species such as the White-clawed Crayfish.

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(1 mark)

3 (b) Suggest why the White-clawed Crayfish cannot survive in water that is too acidic.

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(2 marks)

3 (c) Several introduced crayfish species are now breeding in the wild in Britain.

Suggest **two** reasons why these non-native species pose a threat to the White-clawed Crayfish.

1 .....

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2 .....

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(2 marks)

3 (d) Describe how the process of succession may threaten aquatic species.

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(3 marks)

10

Turn over for the next question

4 (a) Explain how the presence of life on Earth brought about environmental change before human impacts occurred.

Quality of Written Communication will be assessed in this answer.

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(6 marks)

4 (b) Human activities have altered the population dynamics of many species.

4 (b) (i) Explain what is meant by 'homeostatic population regulation'.

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(2 marks)

4 (b) (ii) Explain the concept of Maximum Sustainable Yield.

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(2 marks)

10

Turn over for the next question

5 The picture shows a lacewing, *Chrysoperla carnea*, which is a predatory insect.

Source: Thinkstock

Organic farming uses methods that aim to increase the populations of such invertebrates that prey on crop pests.

5 (a) State **two** ways, other than the predation of pests, in which invertebrates are beneficial to humans.

1 .....

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2 .....

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(2 marks)

5 (b) Outline how farmland may be managed in order to increase the populations of predatory invertebrates.

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(4 marks)

5 (c) Describe how a sweep net may be used to survey grassland for the presence of predatory invertebrates.

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(4 marks)

10

Turn over for the next question

6 The picture shows a Wolverine, *Gulo gulo*, the largest member of the weasel family. Wolverines live in the Northern hemisphere and are found at low population densities.

Source: Thinkstock

6 (a) Describe how the density of a population of Wolverines may be estimated.

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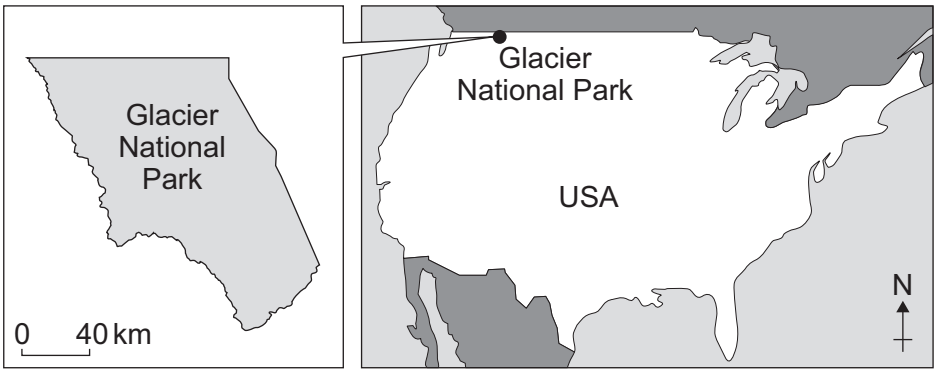
(5 marks)

6 (b) (i) The map shows Glacier National Park in the United States. It supports a population of about 40 Wolverines, of which only about 10 are breeding adults.



Suggest why such a small breeding population may threaten the long-term survival of Wolverines in Glacier National Park.

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(2 marks)

6 (b) (ii) Female Wolverines give birth in dens dug in deep snow. Recent climate warming has led wildlife conservationists to call for the establishment of long south-north biological corridors.

Explain why protected south-north biological corridors may help to conserve Wolverine populations.

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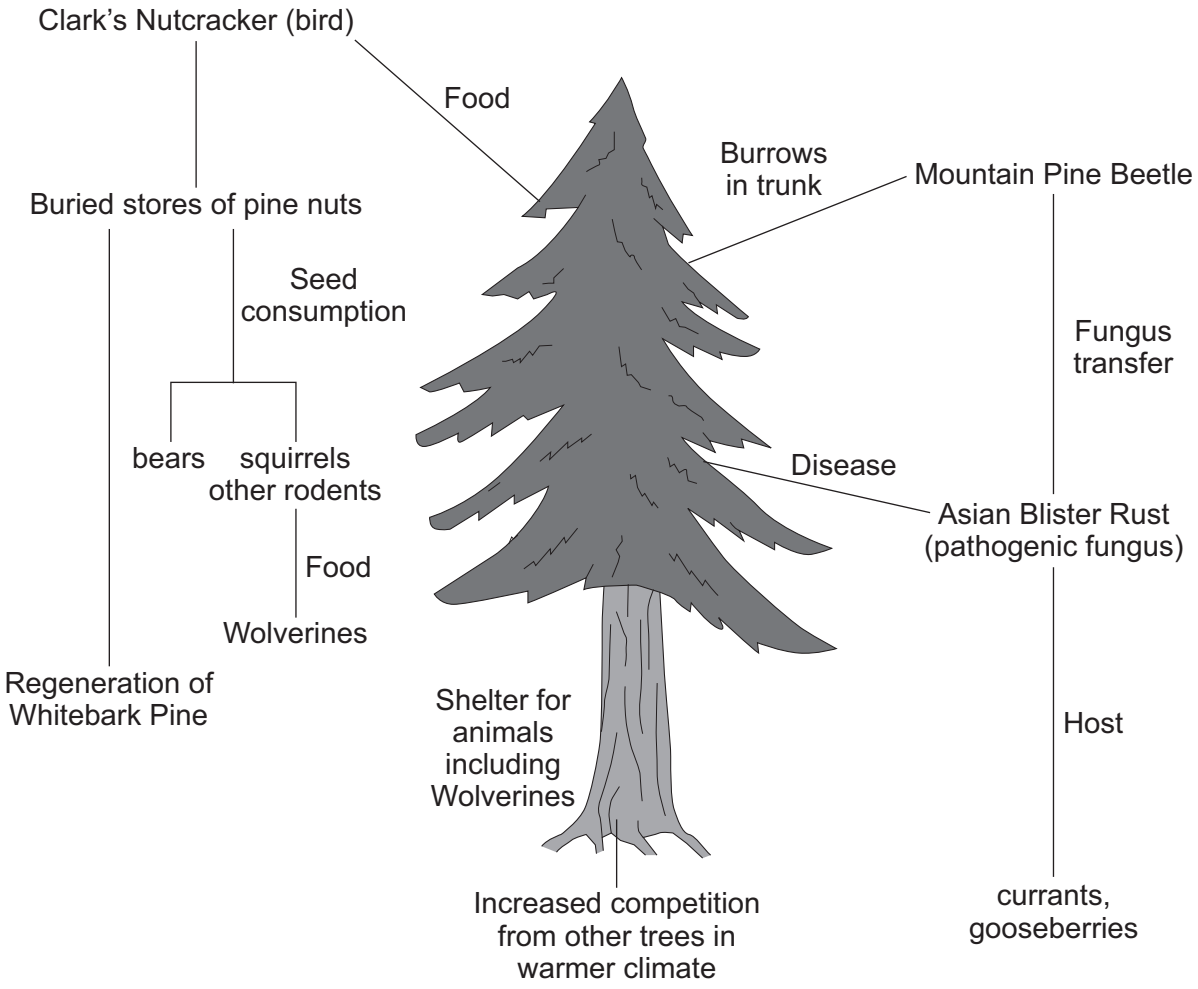
(2 marks)

Question 6 continues on the next page

6 (c) The diagram shows some of the ecological relationships of the Whitebark Pine, *Pinus albicaulis*, found in Glacier National Park.



6 (c) (i) Suggest why Wolverines benefit from the conservation of Clark's Nutcracker, *Nucifraga columbiana*.

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(2 marks)

6 (c) (ii) Explain why native currants and gooseberries, *Ribes* species, are removed from areas that are being managed to protect the Whitebark Pine.

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(2 marks)

6 (d) Suggest **two** reasons why Wolverines should be conserved.

1 .....

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2 .....

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(2 marks)

15

END OF QUESTIONS

There are no questions printed on this page

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