

Centre Number	Candidate Number	Name
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UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
 General Certificate of Education
 Advanced Subsidiary Level and Advanced Level

ENVIRONMENTAL SCIENCE **8290/01**

Paper 1 October/November 2004

1 hour 45 minutes

Candidates answer on the Question Paper.
No Additional Materials are required.

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 in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [] at the end of each question or part question.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

FOR EXAMINER'S USE	
1	
2	
3	
4	
5	
6	
7	
TOTAL	

Answer **all** questions.

1 (a) Fig. 1.1 shows the distribution of tectonic plates.

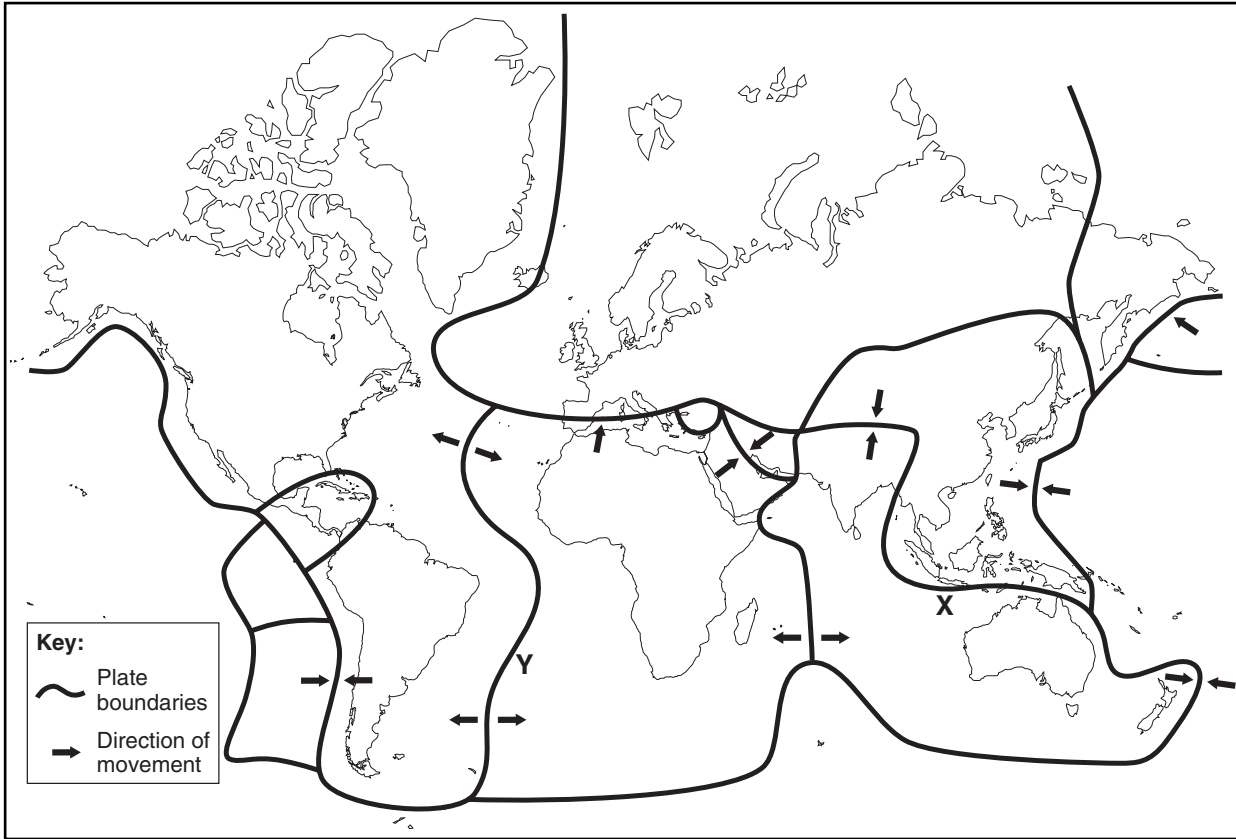


Fig. 1.1

(i) Name the type of plate boundary at places **X** and **Y**.

X =

Y = [2]

(ii) The cross-section in Fig. 1.2 shows the general shape of the Earth's surface and structure of the crust at area **X** on Fig. 1.1.

Label Fig. 1.2 with the letters **A**, **B**, **C** and **D** to show: a descending plate, an island arc, an ocean trench and an active volcanic area.

A = a descending plate,
C = an ocean trench,

B = an island arc,
D = an active volcanic area.

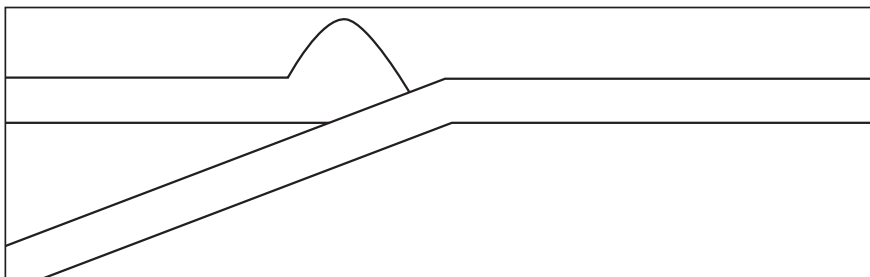


Fig. 1.2

[4]

2 (a) Distinguish between the terms *erosion* and *weathering*.

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.....[3]

(b) Fig. 2.1 (Insert photograph) shows part of the upper course of a river and its valley.

(i) Describe how frost action might have contributed to the weathering of the cliffs and accumulations of debris shown in area **A**.

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.....
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.....
.....[3]

(ii) Explain how river erosion has helped to produce the valley at point **B**.

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.....[3]

(iii) Describe the size and shape of the boulders to be seen in the river bed.

.....
.....[2]

(iv) Outline the processes that would have shaped the boulders in the river bed.

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.....
.....[2]

(c) Under what conditions would the boulders shown in the river bed in Fig. 2.1 have been deposited?

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.....
.....[2]

3 (a) (i) Describe the relationship between electromagnetic wavelength and frequency.

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.....
.....[2]

(ii) Explain why the radiation emitted by the Earth differs from that emitted by the Sun.

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.....[3]

(b) State two purposes, other than weather maps, of satellites images.

1

2[2]

(c) Fig. 3.1 is an image of part of Western Europe taken by satellite.

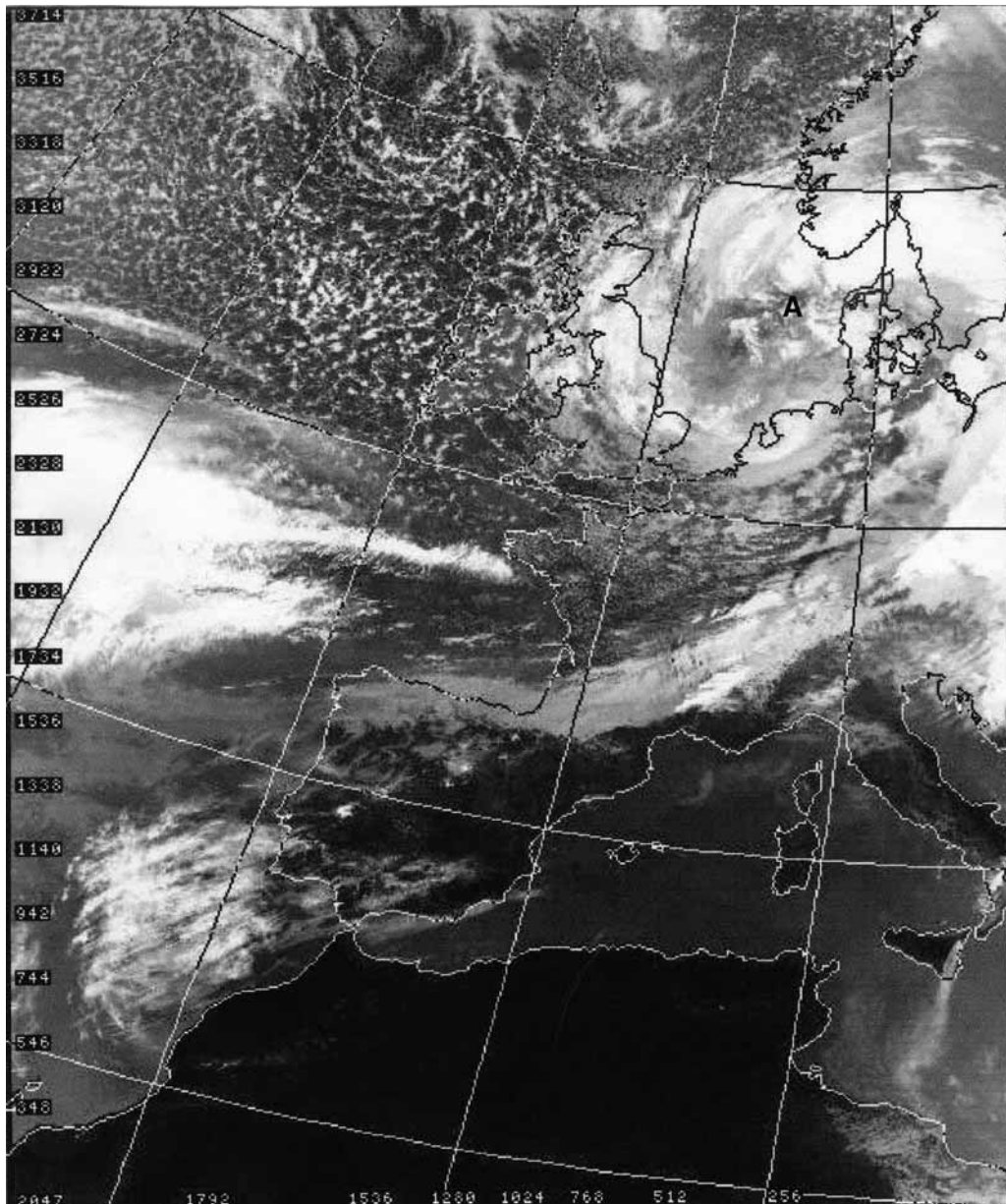


Fig. 3.1

(i) How does the image distinguish between thin and dense cloud?

.....
[2]

(ii) Name the type of weather system shown at **A** in Fig. 3.1.

.....[1]

(iii) Describe the pattern of the air movement in the region of **A**.

.....[1]

(iv) Suggest how satellite images can be used in making weather forecasts.

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.....[4]

4 (a) Within an ecosystem, what do producers and consumers use as food?

producers

.....

.....

consumers

.....

.....[4]

(b) Explain why the Sun provides the ultimate source of energy for all organisms in an ecosystem.

.....

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.....

.....[2]

(c) Explain the role of each of the following in photosynthesis.

• light

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• water

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• chlorophyll

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.....[4]

(d) Fig. 4.1 shows the absorption spectra for chlorophyll *a*, chlorophyll *b* and a group of pigments called carotenoids.

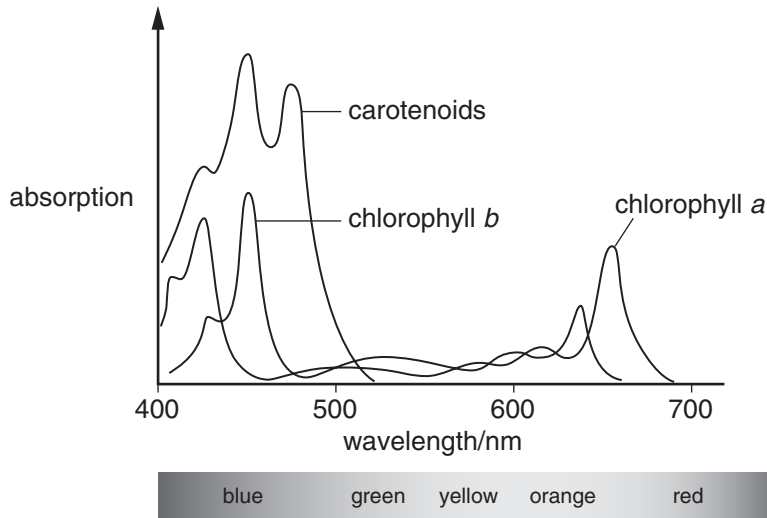


Fig. 4.1

(i) Use Fig. 4.1 to suggest why leaves containing chlorophyll appear green.

.....

[2]

(ii) Before leaves fall from a tree, chlorophyll breaks down. The leaves turn red or orange at this time. Explain this change.

.....

[2]

5 (a) Ecosystem, population and community are terms used to describe the structure of the biosphere.

Explain what is meant by the terms *ecosystem*, *population* and *community*.

- ecosystem
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-
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- population
-
-
-
- community
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-
-[6]

Many areas of coastal sand dunes show a pattern of young, immature dunes close to the sea with older, mature dunes inland. Over the course of time, vegetation and soils develop within this pattern.

Fig. 5.1 shows a transect across an area of coastal sand dunes.

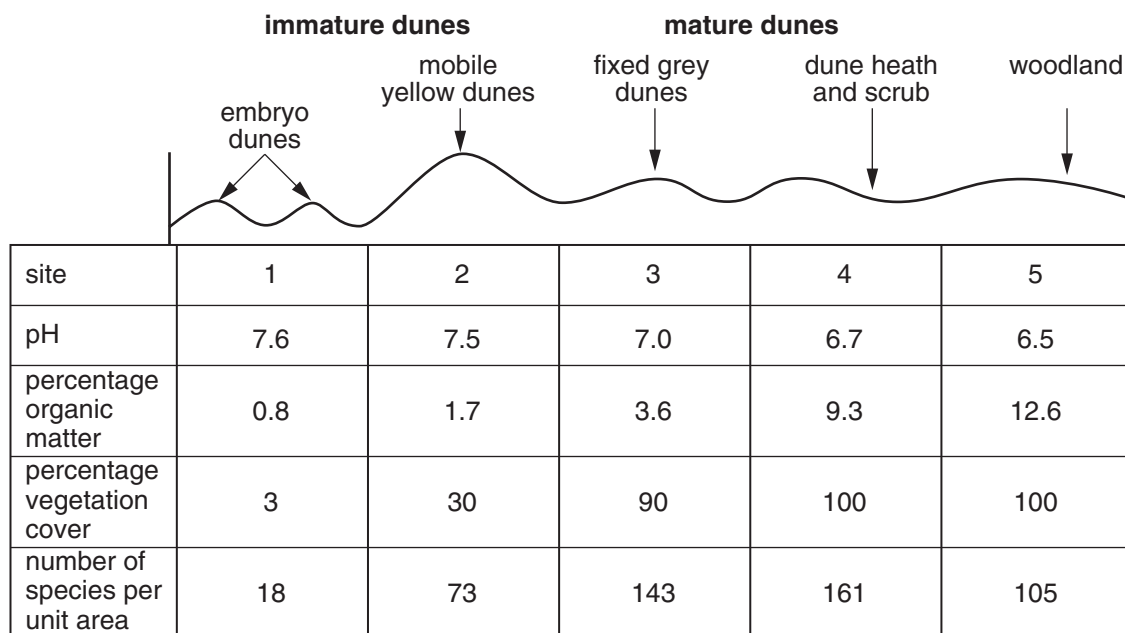


Fig. 5.1

(b) (i) By how many times does the amount of organic matter increase between site 1 and site 3? Show your working.

.....
.....
.....[2]

(ii) Name **one** site at which there is likely to be a climax plant community.

.....[1]

(iii) Suggest why the number of species per unit area increases between site 1 and site 4.

.....
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.....[3]

(c) What would be the likely properties of the soils to be found

(i) in site 2,

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(ii) in site 5?

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.....[5]

- 6 (a) Fig. 6.1 illustrates a model of the atmospheric heat transfer system. It has been suggested that global warming results from disturbance to this system.

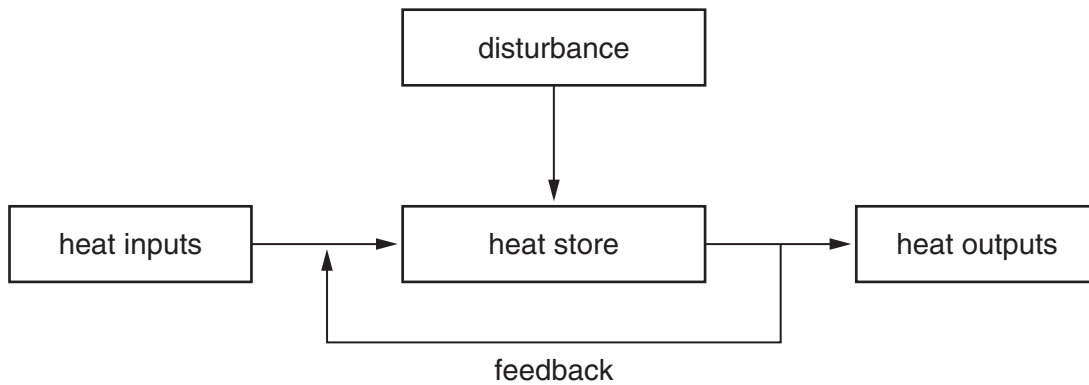


Fig. 6.1

- (i) State two inputs into the atmospheric heat transfer system.

1

2[2]

- (ii) State **one** output from the atmospheric heat transfer system.

.....[1]

- (iii) Suggest how this system might be disturbed by human activity.

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.....[2]

(b) Fig. 6.2 shows how global temperatures have changed between 1860 and 2000.

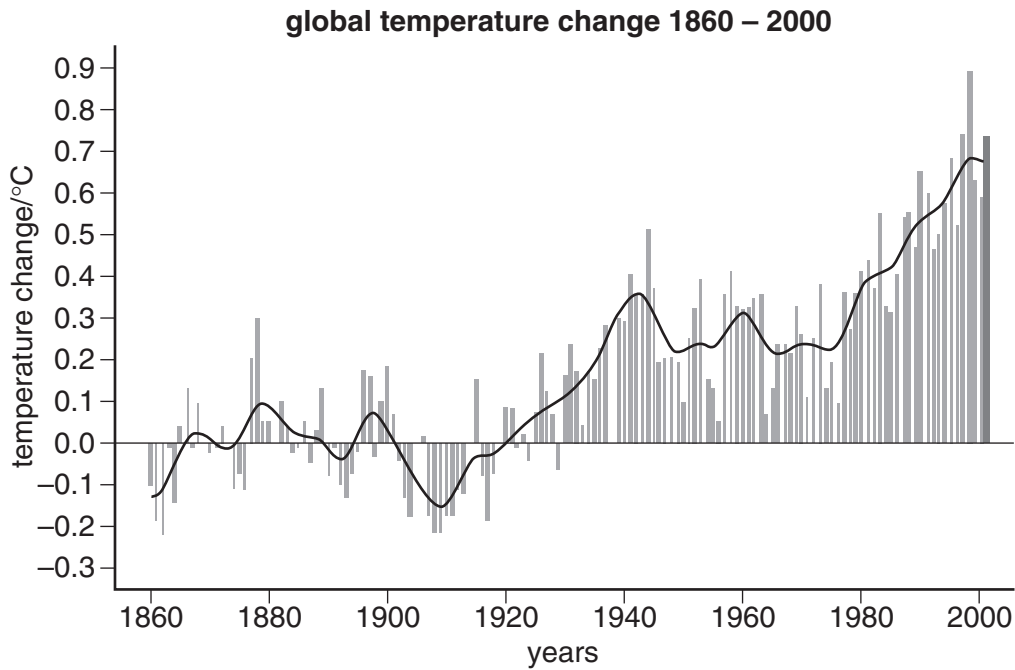


Fig. 6.2

(i) Describe the pattern of global temperature change shown in Fig. 6.2.

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.....[3]

(ii) Which factors might have contributed to the changes in temperature over the past 30 years?

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.....[3]

- 7 (a) Fig. 7.1 shows variations in moose and wolf populations on an island between 1960 and 1995. On this island wolves are the predators of moose.

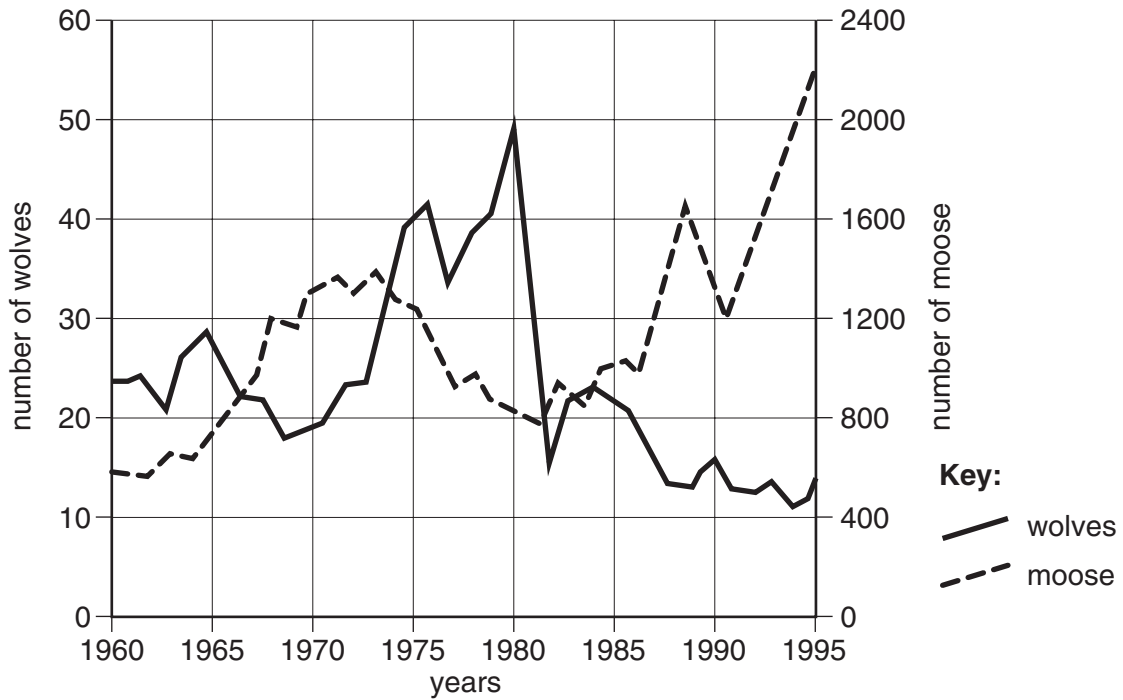


Fig. 7.1

- (i) What is the meaning of the term *predator*?

.....
.....[1]

- (ii) Using data from Fig. 7.1, describe and explain the changes in the populations of moose and wolves between 1960 and 1995.

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- (b) Fig. 7.2 shows how the size of the human population of a region changed over time. The carrying capacity of the region is also shown.

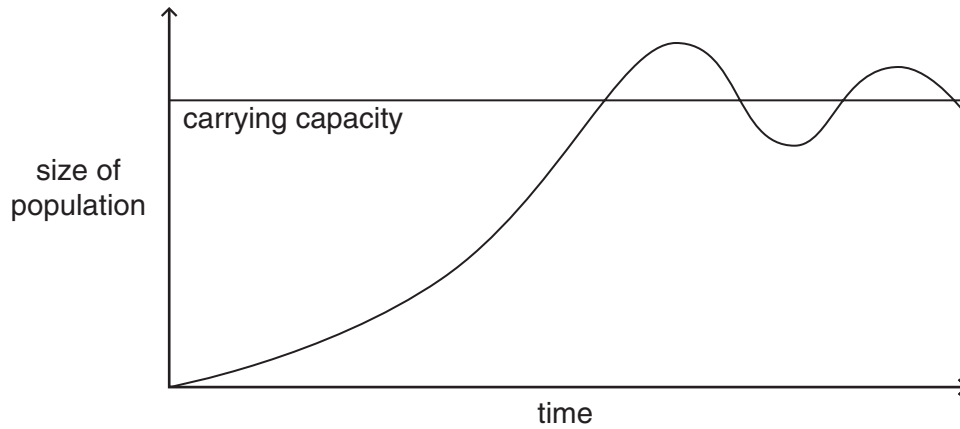


Fig. 7.2

- (i) Describe how the size of the human population is related to the carrying capacity.

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[4]

- (ii) What effects would technological improvement have upon the situation shown in Fig. 7.2?

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[2]