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| Centre Number       |  |  |  |  |  | Candidate Number |  |  |  |  |
| Surname             |  |  |  |  |  |                  |  |  |  |  |
| Other Names         |  |  |  |  |  |                  |  |  |  |  |
| Candidate Signature |  |  |  |  |  |                  |  |  |  |  |

| For Examiner's Use  |      |
|---------------------|------|
| Examiner's Initials |      |
| Question            | Mark |
| 1                   |      |
| 2                   |      |
| 3                   |      |
| 4                   |      |
| 5                   |      |
| 6                   |      |
| 7                   |      |
| 8                   |      |
| 9                   |      |
| TOTAL               |      |



General Certificate of Education  
Advanced Subsidiary Examination  
January 2010

# Environmental Studies

# ENVS2

## Unit 2 The Physical Environment

Tuesday 19 January 2010 9.00 am to 10.30 am

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

### Time allowed

- 1 hour 30 minutes

### 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. Answers written in margins or on blank pages will not be marked.
- 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 90.  
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 9 (c) should be answered in continuous prose.  
Quality of Written Communication will be assessed in this answer.

ENVS2



J A N 1 0 E N V S 2 0 1

SA0546/Jan10/ENVS2

ENVS2

**There are no questions printed on this page**

**DO NOT WRITE ON THIS PAGE  
ANSWER IN THE SPACES PROVIDED**



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

- 1** The table shows some problems caused by mining and methods of reducing them.

Complete the table.

| Problem caused by mining | Method of reducing the problem           |
|--------------------------|--|
| Turbid drainage water    |  |
|                          | Water sprays                             |
| Habitat loss             | Replanting with indigenous plant species |
|                          | Spoil compaction                         |
| Acidic leachate          |  |
|                          | Landscaping                              |

(5 marks)

5

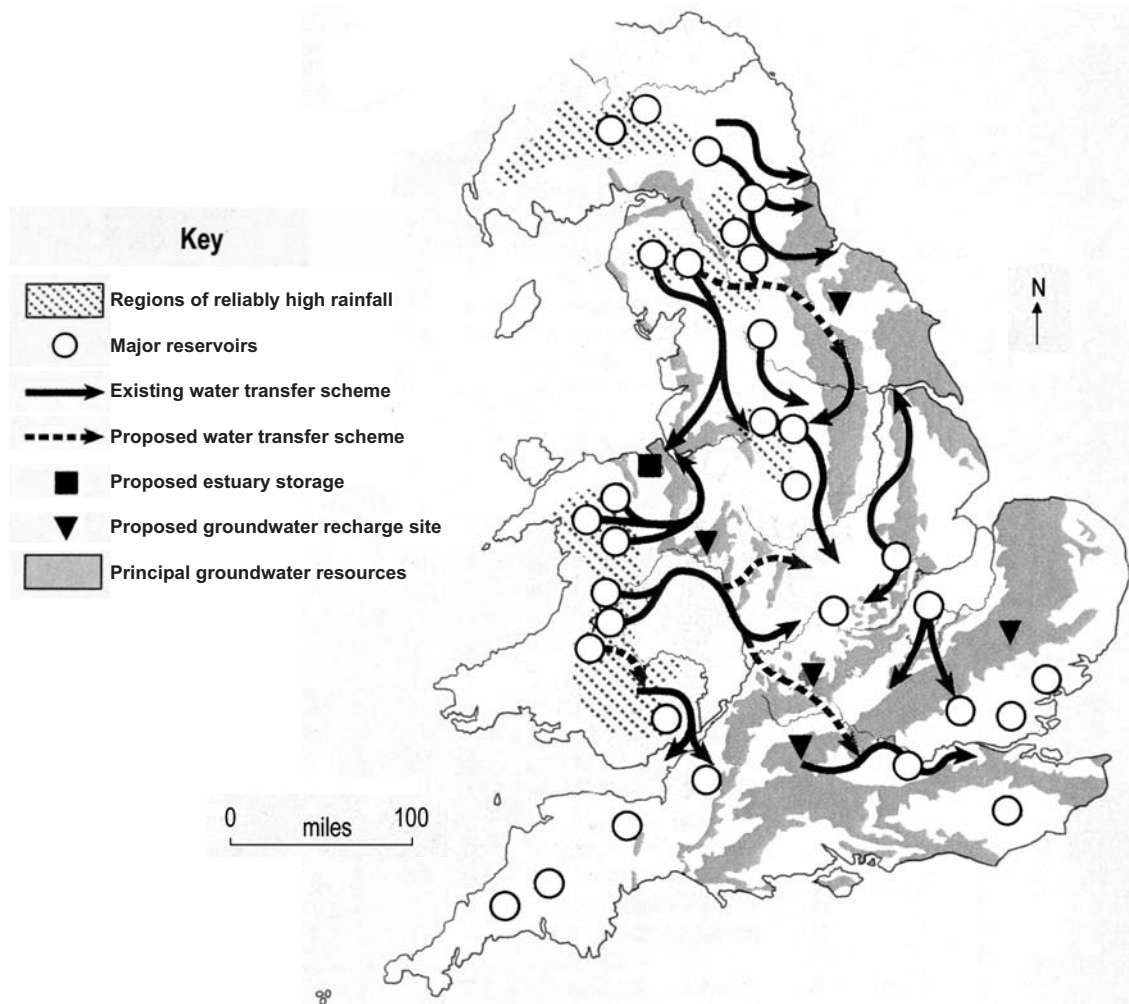
Turn over for the next question

Turn over ►



- 2 One possible solution to the spatial mismatch between the demand for water and the available supplies is the development of a water transfer scheme.

The map shows one such proposal for England and Wales.



- 2 (a) Suggest **two** reasons why most of the transferred water would be moved to the south and east.

- 1 .....
- .....
- 2 .....
- .....

(2 marks)



2 (b) Describe the geological features of a typical aquifer.

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(3 marks)

2 (c) Explain why the abstraction rate from an aquifer should not exceed the recharge rate.

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(3 marks)

2 (d) Suggest **two** advantages of exploiting an aquifer rather than building a reservoir.

1 .....

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2 .....

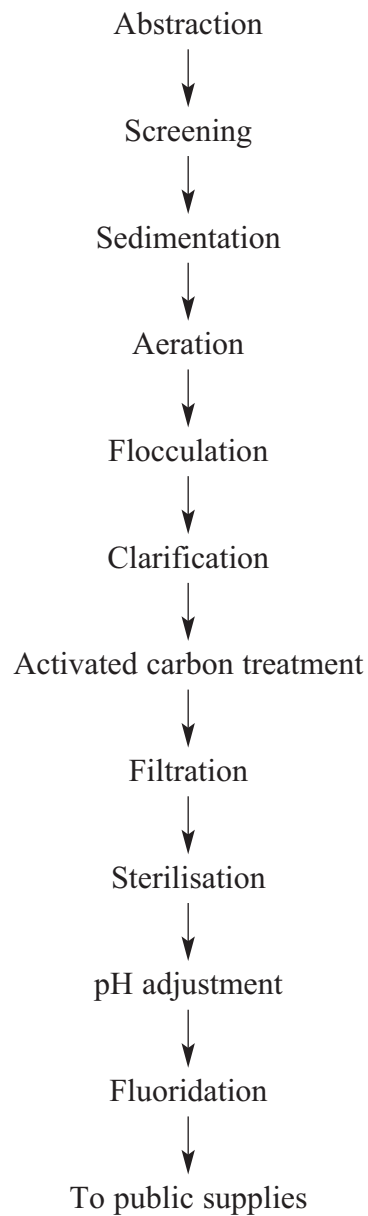
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(2 marks)

**Turn over for the next question**



3 The diagram shows some of the processes that are used to produce potable water.



3 (a) Outline how **named** processes in the diagram are used to:

3 (a) (i) reduce turbidity

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(2 marks)



3 (a) (ii) remove pathogens

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(2 marks)

3 (a) (iii) remove organic chemicals such as pesticides.

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(2 marks)

3 (b) Suggest how the lack of abundant clean water in a Less Economically Developed Country (LEDC) may affect the development of that society.

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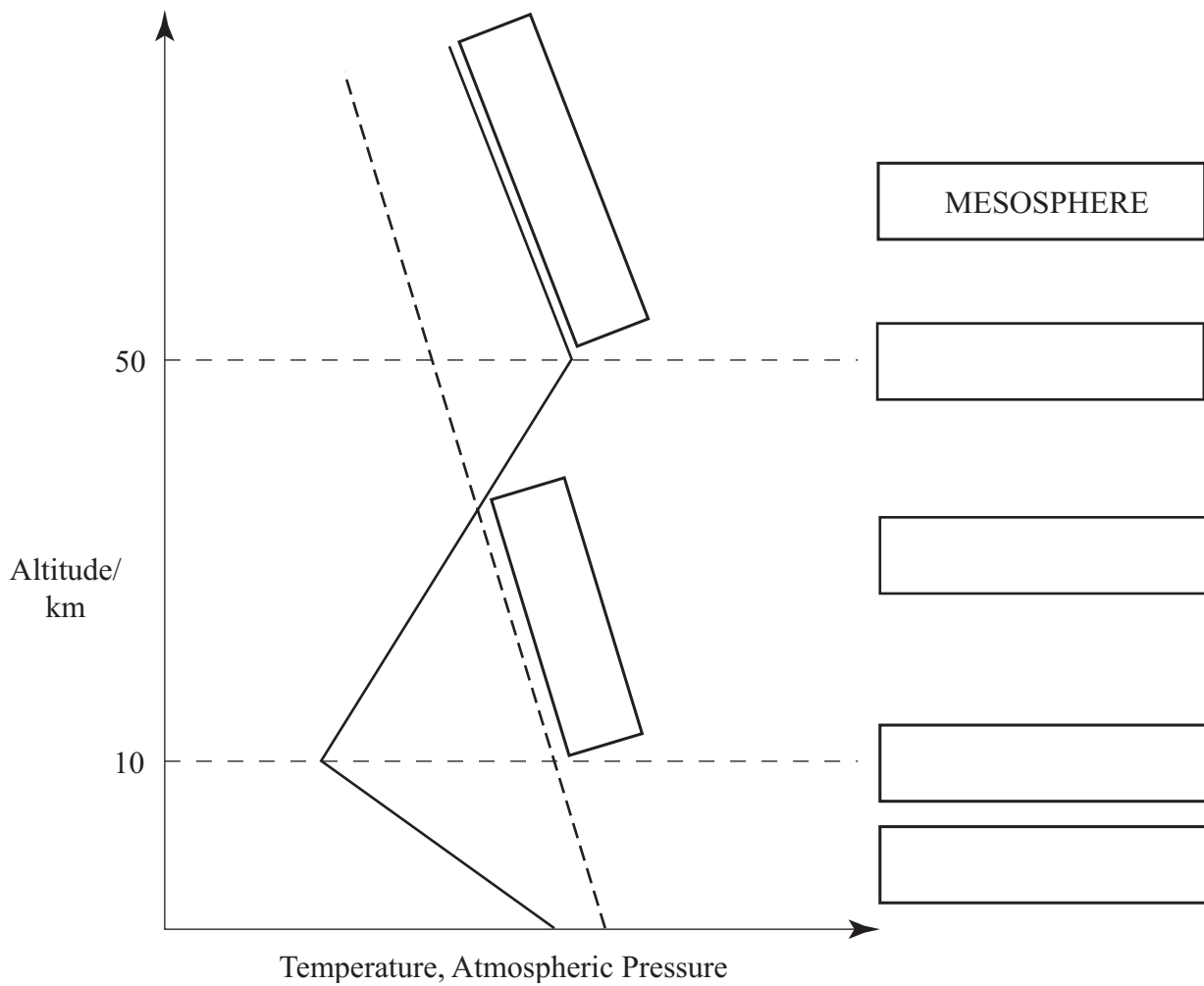
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(4 marks)

**Turn over for the next question**



4 The diagram shows the structure of the atmosphere.



4 (a) Add the missing labels to the boxes in the diagram from the list below.

**Troposphere**  
**Stratosphere**  
**Temperature**  
**Atmospheric pressure**  
**Stratopause**  
**Tropopause**

(3 marks)





- 4 (b) Different wavelengths of light are absorbed by different gases.

Use this to explain:

- 4 (b) (i) why little UV light reaches the Earth's surface

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(2 marks)

- 4 (b) (ii) how the troposphere is heated by the Earth.

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(2 marks)

- 4 (c) Outline the process which releases energy from the Sun.

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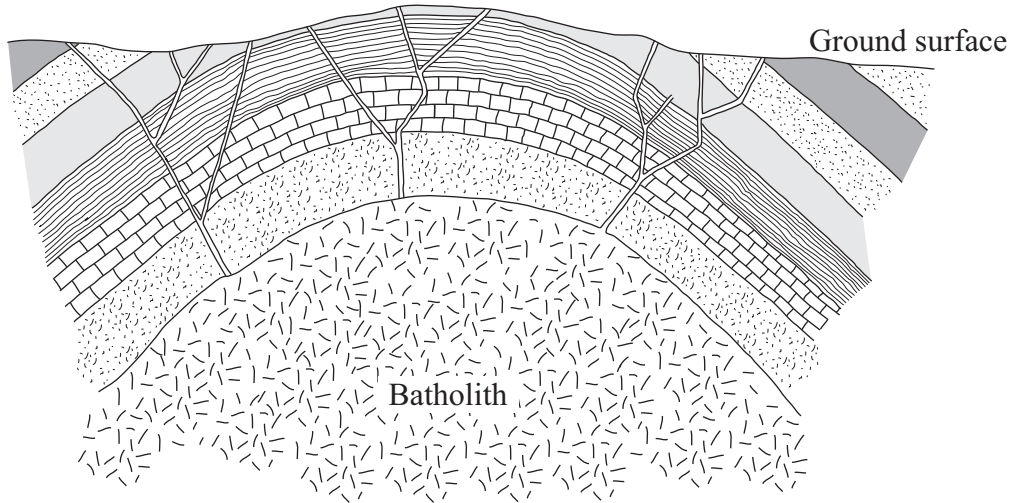
(3 marks)

**Turn over for the next question**



- 5 An understanding of geological processes can help to predict where exploitable ore deposits may be found.

The diagram shows a granite batholith and associated geological structures.



- 5 (a) Describe the igneous processes that can cause the formation of metal ores around a batholith.

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(2 marks)

- 5 (b) Describe how future mineral supplies can be increased by better exploration techniques.

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(2 marks)



- 5 (c) Explain the difference in the meanings of 'resource' and 'reserve'.

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(2 marks)

- 5 (d) Explain why the chemical form of a metal ore may affect the viability of exploitation.

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(2 marks)

- 5 (e) Outline a technique that can be used to exploit low-grade ores.

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(2 marks)

10

**Turn over for the next question**

**Turn over ►**



- 6 The photograph shows the winding gear of South Crofty tin mine in Cornwall which was closed in 1998 when extraction of the remaining ore became uneconomic.



*Photograph Richard Genn*

- 6 (a) Explain the meaning of the term ‘cut-off ore grade’.

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*(2 marks)*

- 6 (b) Describe the effect that increased mechanisation has had on the amount of metal ore that can be mined.

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*(2 marks)*



- 6 (c) Suggest how the rapidly expanding industrial economies of China and India may affect the viability of tin mining at South Crofty.

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(3 marks)

- 6 (d) Describe how the typical pH of drainage water from the mine may be measured.

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(3 marks)

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**Turn over for the next question**

**Turn over ►**



- 7 The diagram shows a soil triangle that can be used to illustrate soil texture.

*Soil triangle diagram not reproduced here due to third-party copyright constraints.*

- 7 (a) What percentage of Soil A is sand?

.....%  
(1 mark)

- 7 (b) What is the highest percentage of clay that is present in a clay loam?

.....%  
(1 mark)



- 7 (c) Describe how the organic matter content of a soil sample may be estimated.

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(4 marks)

- 7 (d) Suggest how bacteria in the soil may affect its fertility.

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(4 marks)

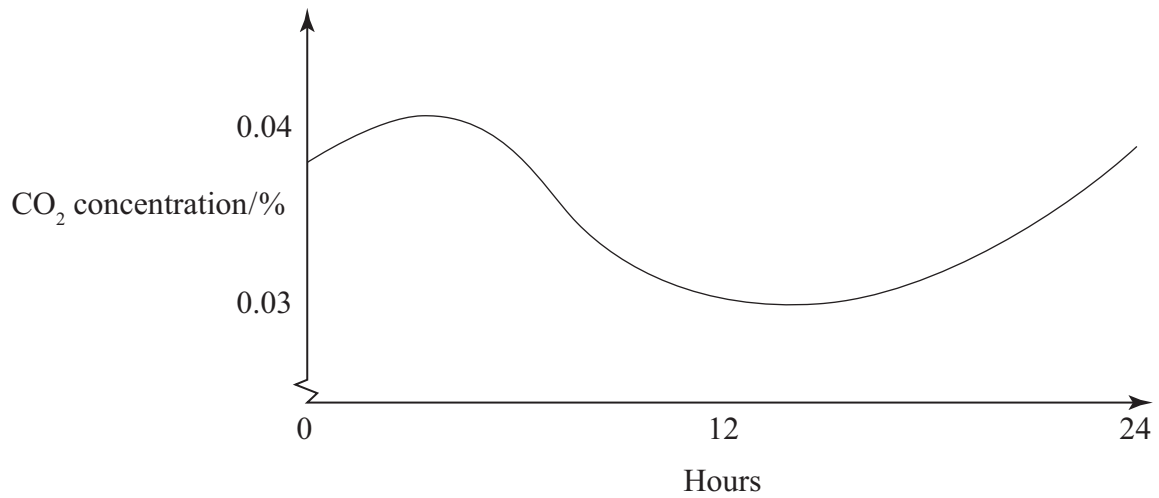
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- 8 The diagram shows the fluctuations in carbon dioxide concentration over a grassland during a 24 hour period.



- 8 (a) Use the information in the graph to explain the meaning of 'dynamic equilibrium'.

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(3 marks)





- 8 (b)** Outline **two** ways in which human activities affect atmospheric carbon dioxide concentrations.

1 .....

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2 .....

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(4 marks)

- 8 (c)** General precautions should be taken in planning and carrying out all scientific investigations.

Explain how these will ensure that reliable results are collected.

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(3 marks)

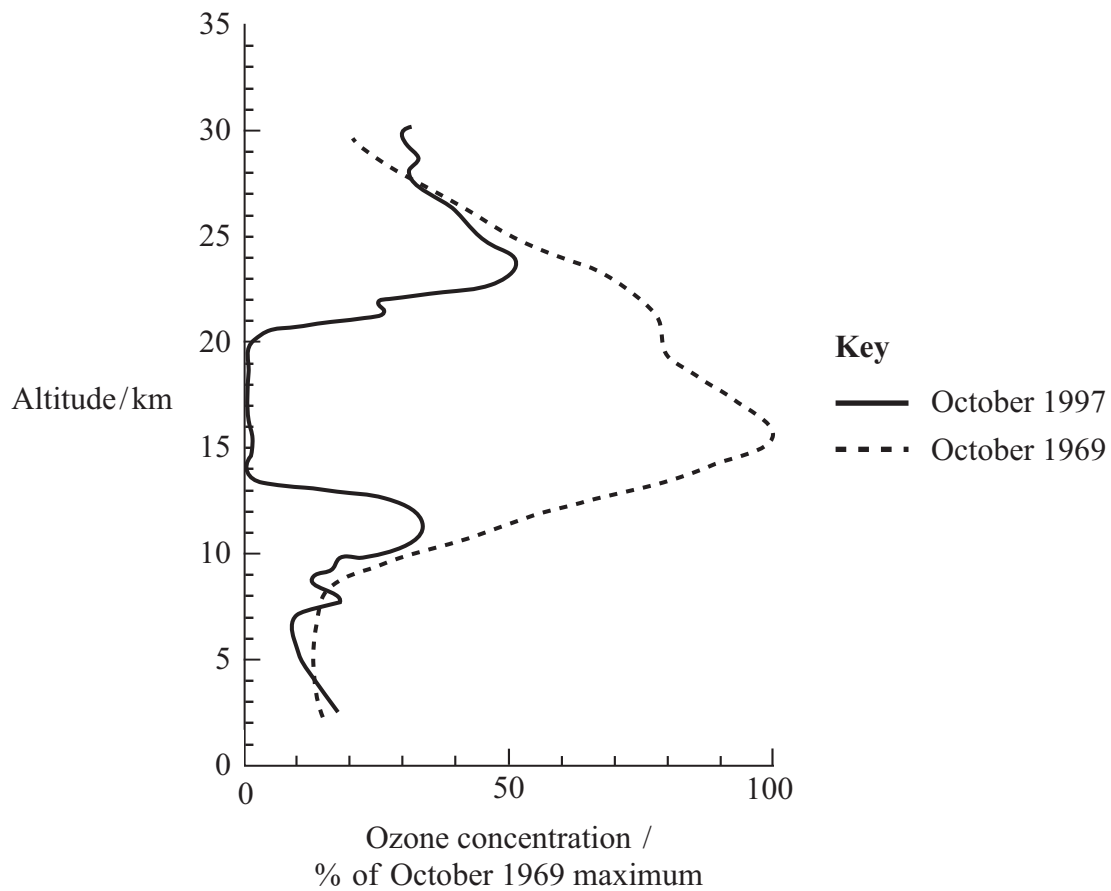
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**Turn over for the next question**

**Turn over ►**



- 9 The graph shows the concentration of ozone in the atmosphere over Antarctica on two different days.



- 9 (a) Use the graph to compare the trends in ozone concentration in October 1969 and October 1997.

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(3 marks)



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*Quality of Written Communication will be assessed in this answer.*

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(10 marks)

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**15**

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