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

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

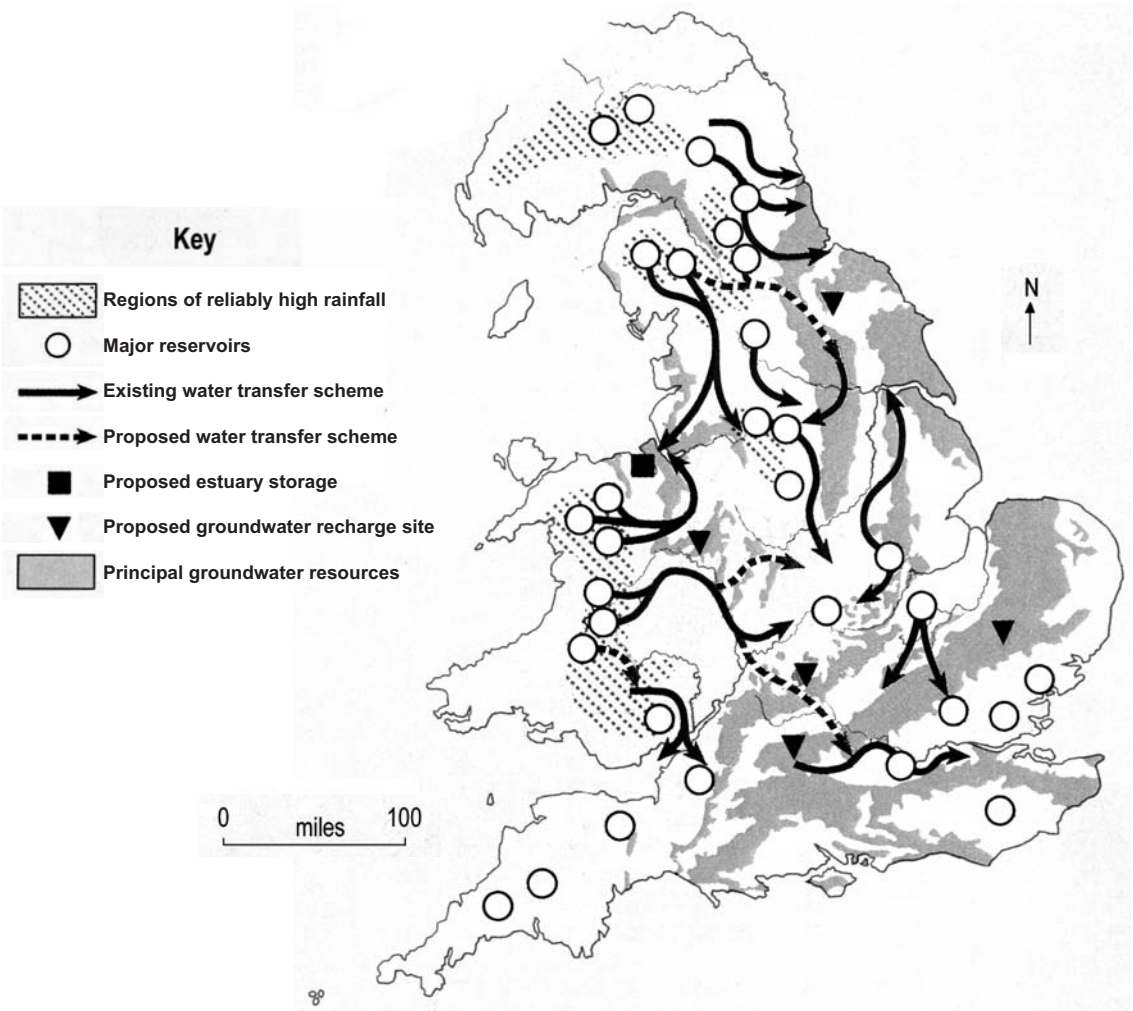
(5 marks)

5

Turn over for the next question

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 .....

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(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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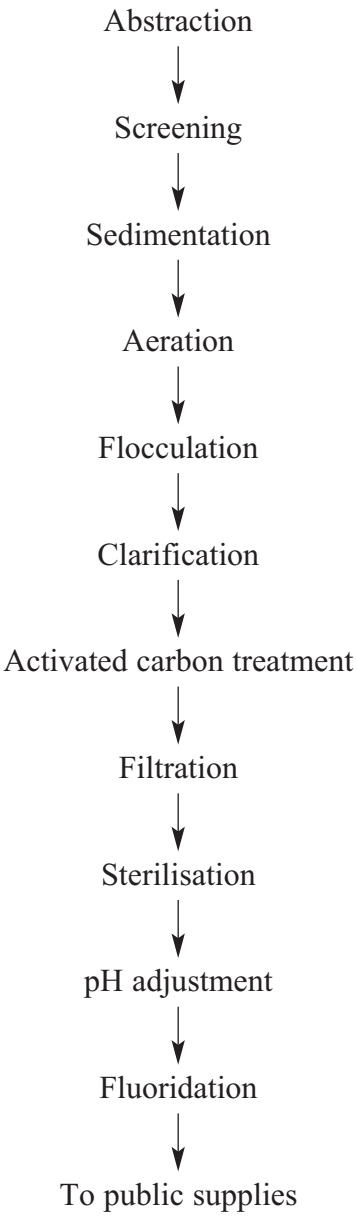
(2 marks)

10

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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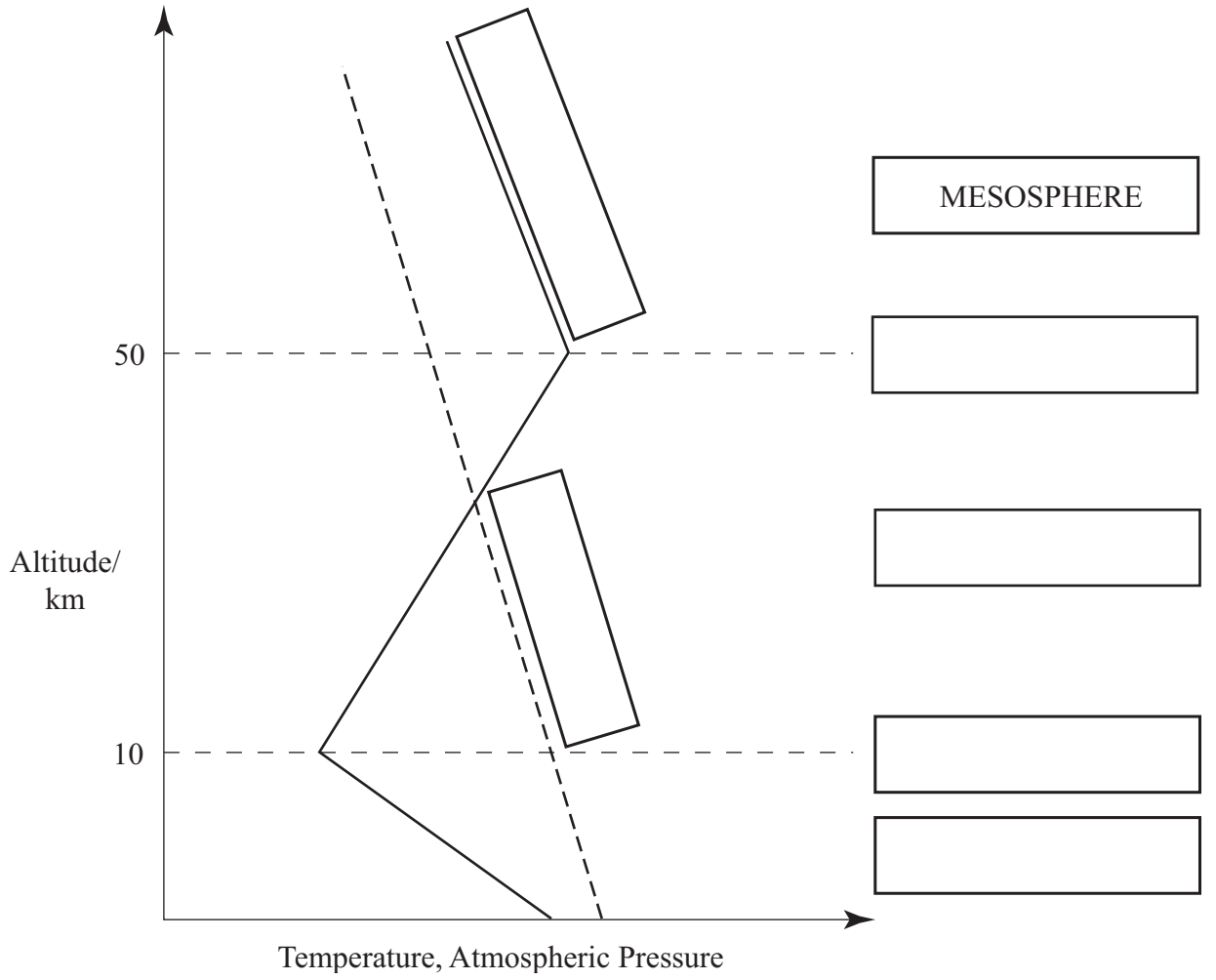
(4 marks)

10

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)

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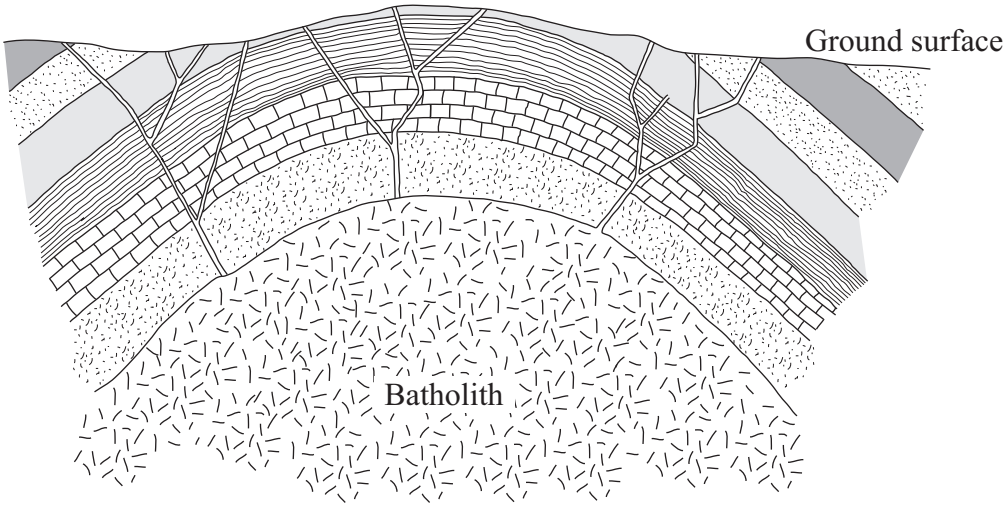
Turn over for the next question

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

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

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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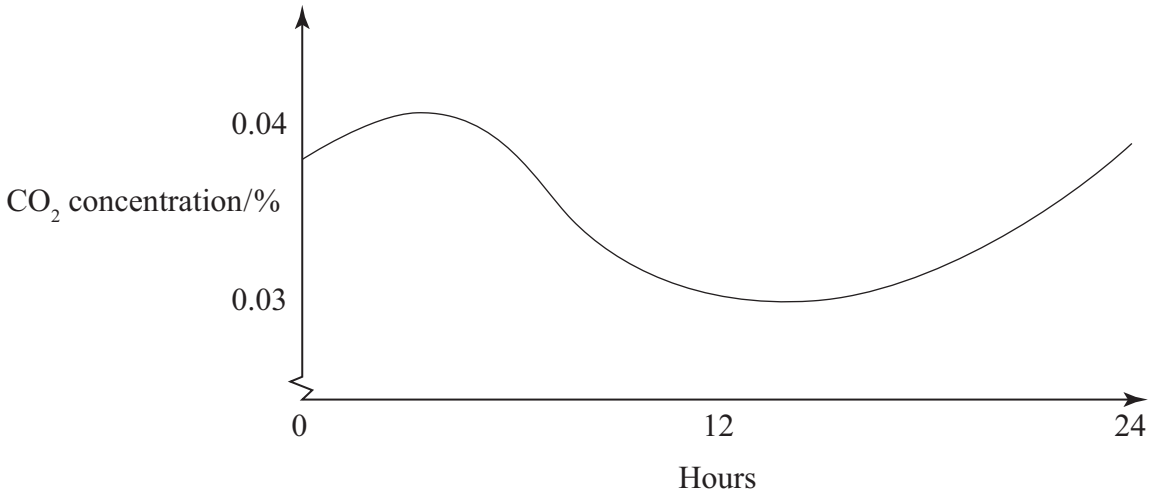
Turn over for the next question

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.

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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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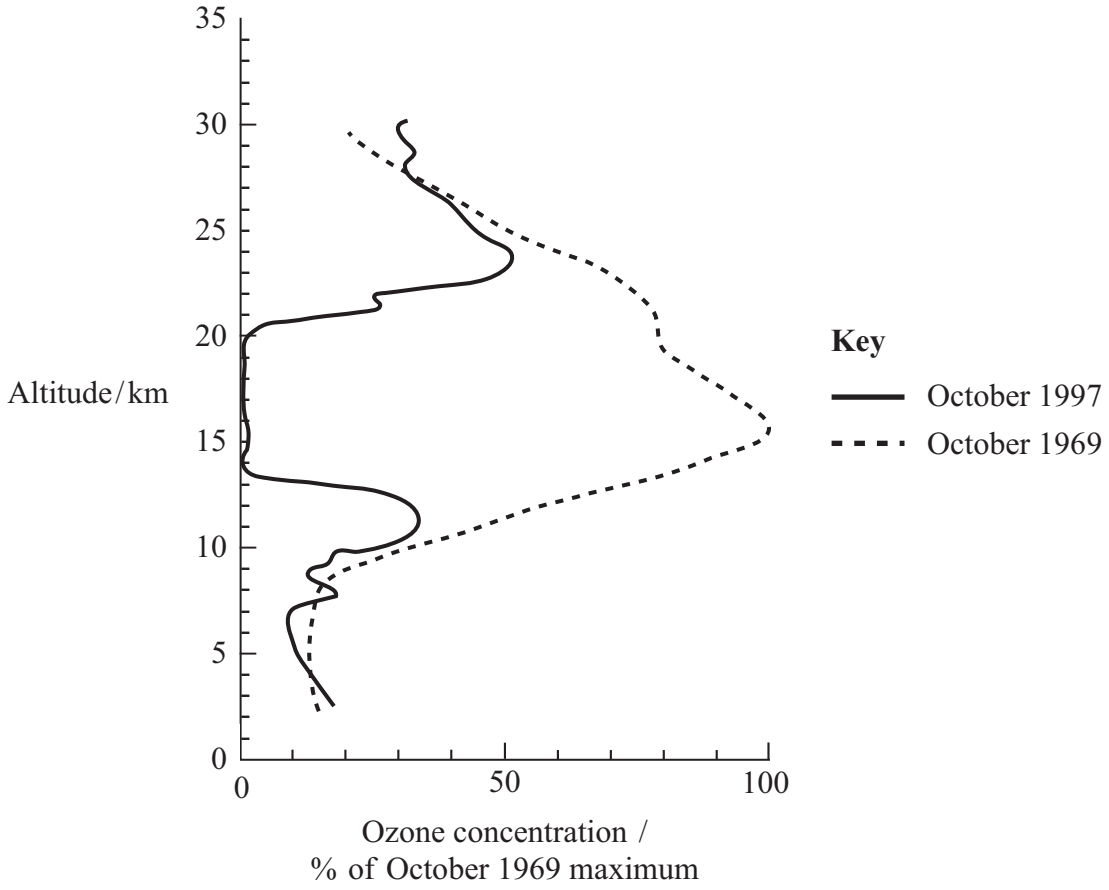
Turn over for the next question

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)

9 (b) Suggest how a reduction in stratospheric ozone may be harmful to life on Earth.

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(2 marks)

9 (c) Describe the methods used to reduce the problem of ozone depletion.

Quality of Written Communication will be assessed in this answer.

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(10 marks)

15

END OF QUESTIONS