

Surname						Other Names					
Centre Number						Candidate Number					
Candidate Signature											

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General Certificate of Education
 June 2005
 Advanced Subsidiary Examination



ENVIRONMENTAL SCIENCE
Unit 2 The Lithosphere

ESC2

Wednesday 8 June 2005 Afternoon Session

No additional materials are required.
 You may use a calculator.

Time allowed: 1 hour

Instructions

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided. All working must be shown.
- Do all rough work in this book. Cross through any work you do not want marked.

Information

- The maximum mark for this paper is 60.
- Mark allocations are shown in brackets.
- You will be assessed on your ability to use an appropriate form and style of writing, to organise relevant information clearly and coherently, and to use specialist vocabulary, where appropriate.
- The degree of legibility of your handwriting and the level of accuracy of your spelling, punctuation and grammar will also be taken into account.

For Examiner's Use			
Number	Mark	Number	Mark
1			
2			
3			
4			
5			
6			
Total (Column 1)			
Total (Column 2)			
TOTAL			
Examiner's Initials			

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

1 Mineral resources have many different uses.

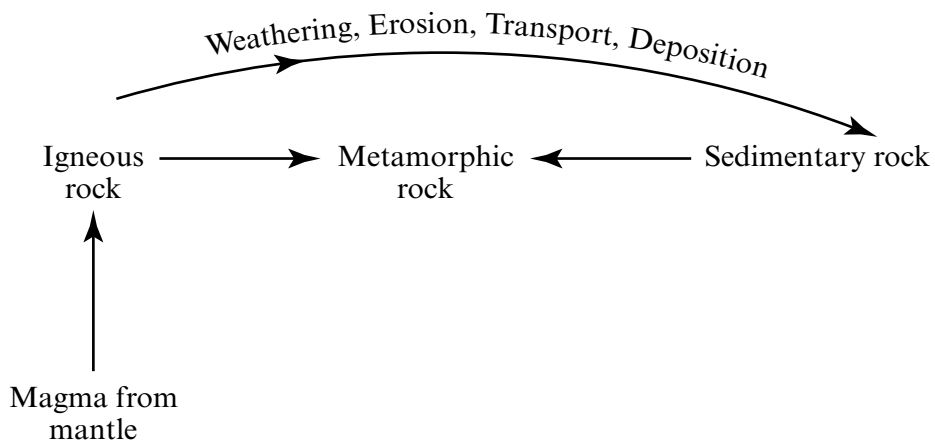
Complete the table.

Mineral resource	Main use
Gravel	
	Bricks
	Filler in concrete/mortar
	Cement, agriculture
China clay	

(5 marks)

5

2 The diagram shows some of the processes involved in the rock cycle.



(a) Name **two** igneous rocks.

1.
2.

(2 marks)

(b) Describe the processes involved in the formation of metamorphic rocks.

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(3 marks)

(c) Suggest why:

(i) kerbstones were often made of granite;

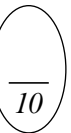
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(2 marks)

(ii) limestone has often been used for buildings.

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(3 marks)

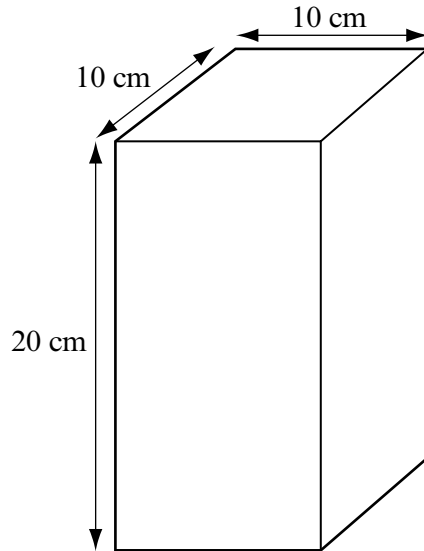


TURN OVER FOR THE NEXT QUESTION

Turn over ►

3 A student investigating the thermal capacity of soils from two different areas carried out the following procedure.

- 1. A sample of soil from each area was obtained.
Each sample measured 10 cm × 10 cm × 20 cm, as shown in the sketch below.



- 2. The samples were left intact.
- 3. Temperature probes were inserted into each sample at depths of 5, 10 and 18 cms.
- 4. Detailed notes were made on the appearance of each sample.
- 5. Each sample was heated by suspending light bulbs above the soil.
- 6. Temperature readings were taken at each depth over a 6 hour period.

(a) Suggest:

(i) **two** ways in which the student has attempted to carry out a fair test;

- 1.
-
- 2.
-

(2 marks)

(ii) **two** further precautions that the student should have taken to ensure a fair test.

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

(2 marks)

(b) (i) How does the moisture content of a soil affect its thermal capacity?

.....
.....

(1 mark)

(ii) State **one** other factor that affects the thermal capacity of a soil.

.....

(1 mark)

(c) Outline a technique that could be used to measure the organic matter content of a soil.

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(4 marks)

10

TURN OVER FOR THE NEXT QUESTION

Turn over ►

4 (a) Explain why soil may be considered a finite resource.

.....
.....
(1 mark)

(b) Describe **two** processes involved in soil formation.

Process

Description

.....

Process

Description

.....

(4 marks)

(c) The table shows the rate of soil erosion under different conditions in eastern England.

Condition	Soil loss / t ha ⁻¹
Bare soil	17.69
Grass cover	0.68
Woodland cover	0.012

Explain the data.

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(5 marks)

NO QUESTIONS APPEAR ON THIS PAGE

TURN OVER FOR THE NEXT QUESTION

Turn over ►

- 5 A student used a questionnaire to assess people's opinion of the environmental impact of a quarry in a National Park. The student conducted the survey in the village closest to the quarry on one morning in February. Thirty people were given the questionnaire (18 males and 12 females). The student's questionnaire and results are shown below.

		Respondents answering yes	
Question		Males / %	Females / %
1	Do you live in the area?	70	48
2	Do you agree that the quarry has a negative environmental impact?	40	45
3	Which of the following do you think would be useful in reducing the environmental impact of the quarry?		
	Planting trees around the edge of the quarry.	20	60
	Diverting lorries around rather than through the village.	70	60
	Transporting the rock by train rather than road.	30	25

(a) (i) Suggest how the student could have improved the reliability of the data.

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(4 marks)

(ii) Suggest **three** ways, other than those suggested in the questionnaire, by which the environmental impact of the working quarry could be reduced.

- 1.
- 2.
- 3.

(3 marks)

(b) What are the aims of designating an area as a National Park?

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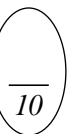
(2 marks)

(c) Suggest why most National Parks contain quarries.

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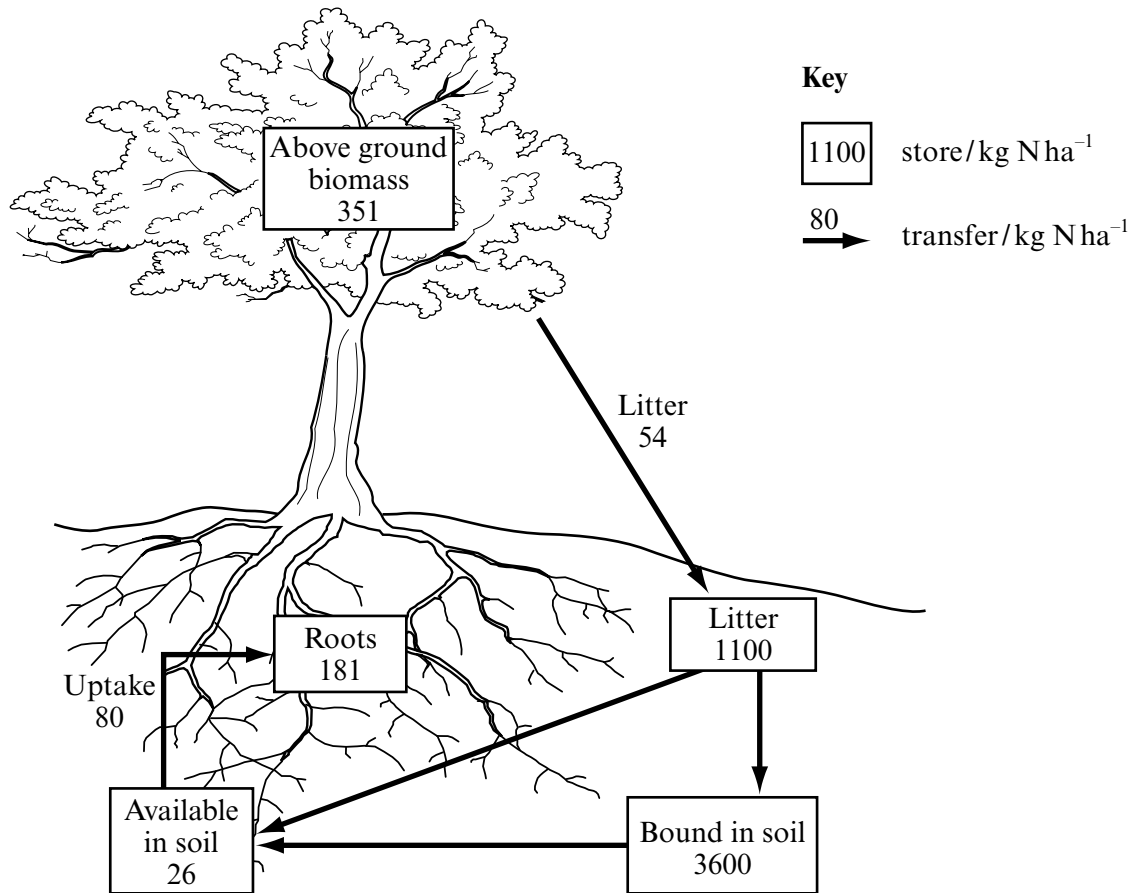
(1 mark)

TURN OVER FOR THE NEXT QUESTION



Turn over ►

6 (a) The diagram shows part of the nitrogen cycle.



(i) In what form do plants absorb nitrogen?

.....
(1 mark)

(ii) State **three** ways, not shown in the diagram, by which the amount of nitrogen compounds in the soil may increase.

1.
 2.
 3.
- (3 marks)

THERE ARE NO QUESTIONS PRINTED ON THIS PAGE