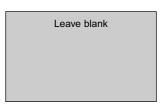
Surname				Other	Names				
Centre Nu	mber					Candio	late Number		
Candidate	Signatu	ıre							



General Certificate of Education June 2006 Advanced Subsidiary Examination

ENVIRONMENTAL SCIENCE Unit 2 The Lithosphere

ESC2



Thursday 8 June 2006 1.30 pm to 2.30 pm

You will need no other materials. 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.
- Answer the questions in the spaces provided.
- 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.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English, clear presentation and appropriate use of specialist vocabulary.
 Question 6 should be answered in continuous prose. Quality of Written Communication will be assessed in this answer.

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

SA6016/Jun06/ESC2 ESC2

Answer all questions in the spaces provided.

- 1 Complete the table by selecting the appropriate letter from the list below. The first one has been completed as an example.
 - A Neutral
 - **B** Fixation
 - **C** Turbidity
 - D Acidic
 - E Respiration
 - F Slate
 - **G** Marble
 - H Ions
 - I Nitrification
 - J Denitrification
 - **K** Salinity

Description	Letter
Process which increases carbon dioxide levels in soil	E
Product of metamorphism of shale / clay	
Conversion of nitrite ions into nitrate ions	
Term describing level of suspended sediment in water	
The pH at which most plant nutrients are available	
Conversion of nitrogen gas into ammonia	

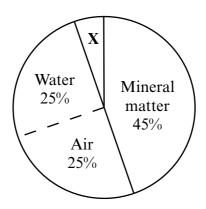
(5 marks)

5

2	(a)	Defi	ne the term weathering.
		•••••	(2 marks)
	(b)	Why	does soil usually differ chemically from its parent material?
			(2 marks)
	(c)		Dolomites are a limestone mountain range in the Italian Alps. The tions show the acid dissolution of limestone (calcium carbonate).
			carbon dioxide + water → carbonic acid
			carbonic acid + calcium carbonate → calcium hydrogencarbonate
		(i)	What name is given to this type of chemical weathering?
			(1 mark)
		(ii)	Suggest two possible sources of the carbon dioxide.
			1
			2
		(iii)	Suggest how, within a matter of months, carbon atoms in the Dolomites may become part of a sea shell.

(3 marks)

3 The graph shows the proportions of the main soil components.



Identify the missing component (X). (a)

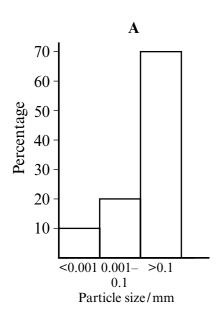
mark)

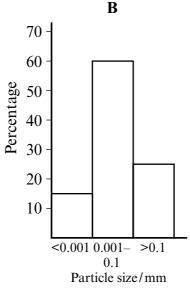
(b) State two advantages of having a high proportion of air in a soil.

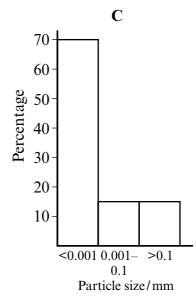
1.	
2	

(2 marks)

Graphs A, B and C show the frequency distribution of different sized particles (c) in three different soils.







Which is the clay soil?

•••••	•••••	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •
			,	(1 mark

10

	(ii)	Explain your answer.	
			••••••
			(1 mark)
(d)	Outl	line the effects of soil texture on the following soil properties:	
	(i)	drainage;	
			(2 marks)
	(ii)	nutrient levels;	
			(2 marks)
	(iii)	temperature.	(2 manes)
			(1 mark)

Turn over for the next question

Turn over ▶

4 Environmental Science students investigated the effect of a deciduous woodland on the soil properties of an adjacent field. Each year, the field was used for sheep grazing before being cut for silage (animal feed).

The diagram shows the position of four soil pits dug in the field.

Woodland A	□ B	C	D D	Key □ 10 cm × 10 cm × 10 cm soil pit
med Rest	Field			

The results of the investigation are shown in the table.

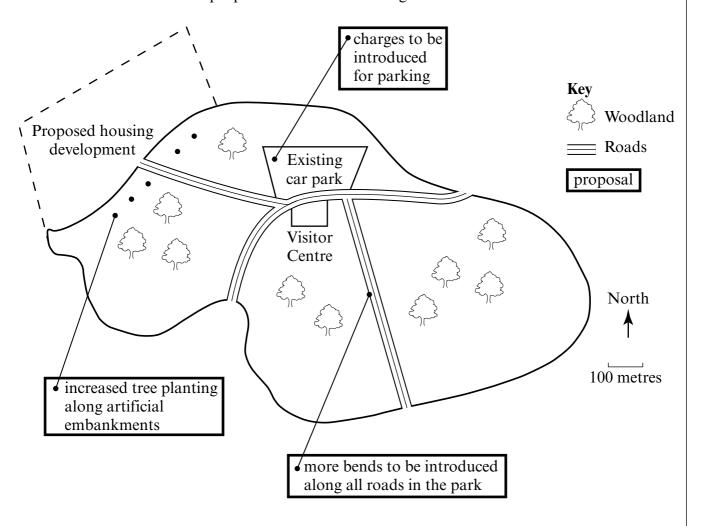
Sample	A	В	C	D
Number of earthworms / m ³	7000	6000	6000	5000
рН	7.5	7.0	7.0	7.0
Moisture content / %	22	24	18	16
Organic matter content / %	38	32	21	22

(a)	(i)	Suggest two improvements which could have been made to the sampling technique. 1
		2
		(2 marks)

	(ii)	Calculate the number of earthworms which were actually found in the soil from the pit at sampling point A .
		Show your working.
		Answer(1 mark)
(b)	The	students' conclusions were as follows.
	This incre	came as no surprise that there were more earthworms closest to the wood. It is because there is more leaf litter there. The earthworms mix this in, the easing the organic matter content and, because the leaves are wet, this eases the moisture content."
	Crit	ically comment on these conclusions.
	•••••	
	•••••	
	•••••	
	•••••	
	•••••	
	•••••	
	•••••	(4 marks)
(c)	Wha	at is the role of earthworms in soil formation?
	•••••	
	•••••	
	•••••	
	•••••	
	•••••	
	•••••	(3 marks)

5	Following a public inquiry and a cost-benefit analysis, a property developer's proposal to build high-density, low-cost housing in an area of green belt was rejected.						
	(a)	Outl	ine the principles of:				
		(i)	a public inquiry;				
			(2 marks)				
		(ii)	cost-benefit analysis;				
			(2 marks)				
		(iii)	green belts.				
			(2 marks)				

(b) The developer decided to apply to build an alternative housing development on the edge of a Country Park. An Environmental Impact Assessment (EIA) resulted in the proposals shown in the diagram.



Outline the purposes of two of the proposals shown.

1.				•••••		•••••		
••••								
••••				•••••				
2.								
••••	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •	••••••	••••••	••••••	•••••	••••••••	(4 marks)

6	(a)	Using two named examples, explain how the properties of non-metallic minerals are related to their uses. 1. Example						
		Properties						
		2 Evample						
		2. Example						
		Properties						
		(6 marks)						
	(b)	Discuss the factors which affect the viability of exploiting mineral deposits.						
		Quality of Written Communication will be assessed in this answer.						

(9 marks)	

END OF QUESTIONS

There are no questions printed on this page

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