

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

**Advanced Subsidiary GCE**

**GEOLOGY**

**2833/01**

**Economic and Environmental Geology**

Thursday

**25 MAY 2006**

Afternoon

45 minutes

Candidates answer on the question paper.

Additional materials:

Electronic calculator

Candidate Name	Centre Number	Candidate Number											
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**TIME** 45 minutes

**INSTRUCTIONS TO CANDIDATES**

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers in the spaces provided on the question paper.
- Read the questions carefully and make sure you know what you have to do before starting your answer.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **45**.

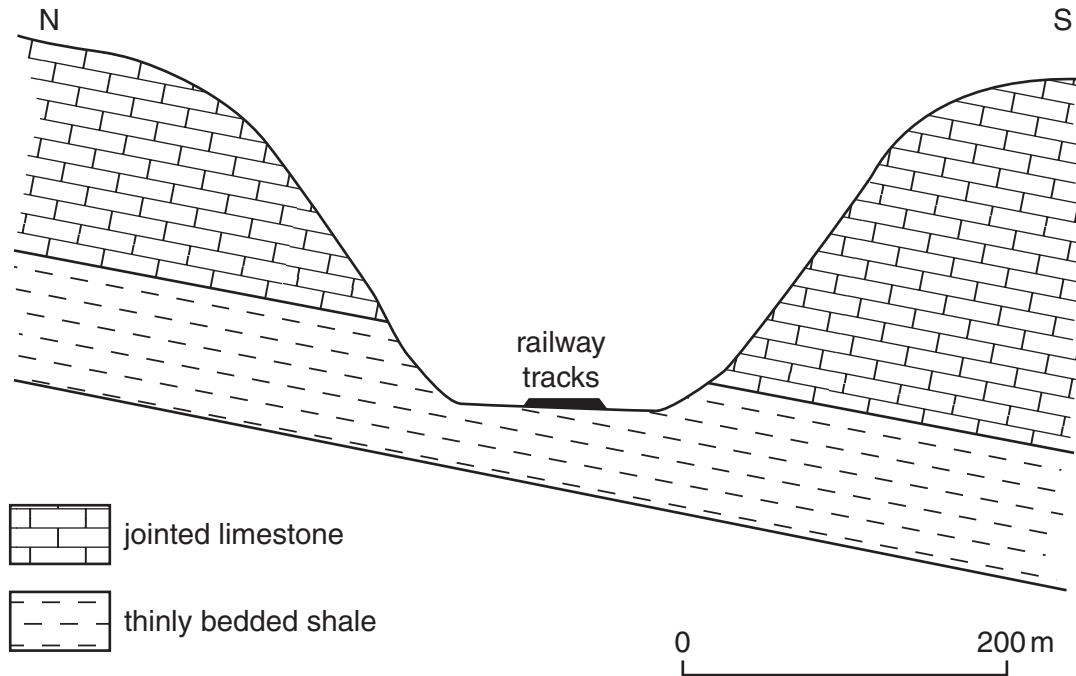
FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	13	
2	13	
3	19	
<b>TOTAL</b>	<b>45</b>	

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**This question paper consists of 8 printed pages.**

Answer **all** the questions.

- 1 Landslips and slumping hazards are important considerations in engineering geology.



- (a) Study the cross section diagram above. Give **two** reasons why the north side of the valley is likely to suffer landslips.

.....

.....

.....

.....[2]

- (b) (i) Name a rock type that is likely to fail by slumping.

.....

.....[1]

- (ii) Explain why heavy rainfall increases the risk of landslips and slumping.

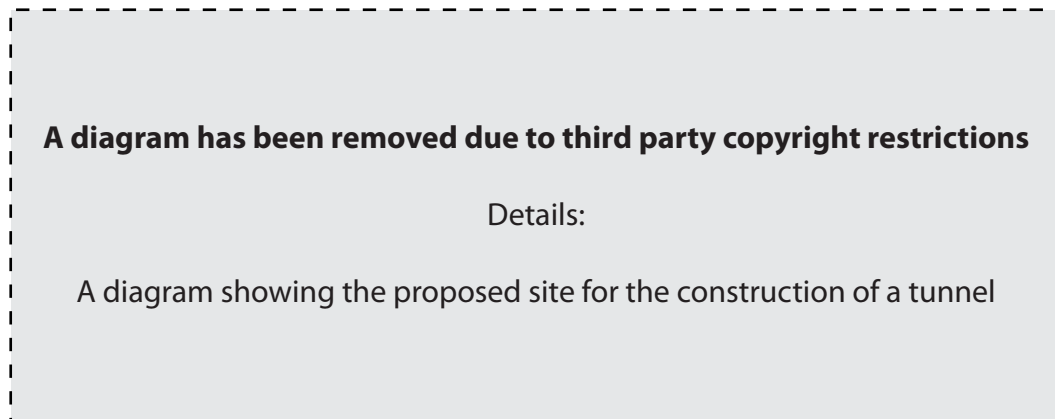
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.....[2]

- (c) The cross section diagram below shows a proposed site for the construction of a tunnel.



Describe three different geological problems that could be encountered during the construction of the tunnel.

- 1 .....
- .....
- 2 .....
- .....
- 3 .....
- .....[3]

- (d) Give one disadvantage of tunnelling through hard rock.

.....

.....[1]

- (e) Ground improvement methods can be used to stabilise rocks. Using the list below, complete the table by inserting the most suitable ground improvement method for each application.

cut-off curtain      gabions      grouting      rock bolts      rock drains

ground improvement method	application
	prevent loose blocks falling from a tunnel roof
	prevent leakage of water into a tunnel
	support the sides of a road cutting
	prevent slumping of a slope

[4]

[Total: 13]

- 2 Surface processes can be important in concentrating metals to produce economic ore deposits.

(a) (i) Define the term *concentration factor*.

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

(ii) Complete the table below using the data provided.

	average % of metal in continental crust	minimum % of metal for an economic deposit	concentration factor
tin	0.002	0.4	
copper	0.005		100

[2]

(b) Placer deposits are an important source of tin and gold.

(i) Name the main ore mineral of tin.

.....[1]

(ii) Draw a labelled diagram to explain how placer deposits of tin and gold can accumulate at a meander bend in a river.

[2]

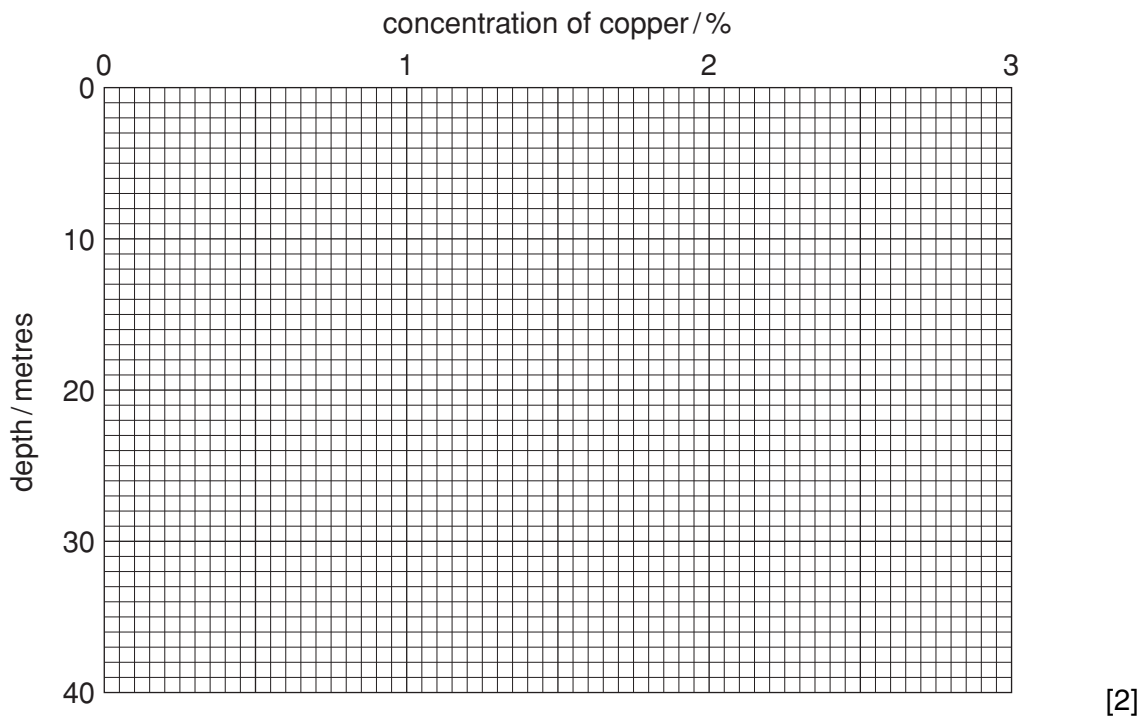
(iii) Give **one** reason why placer mining at the surface usually has a lower environmental impact compared to underground mining.

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

- (c) Secondary enrichment is a surface process that can increase the concentration of copper in an ore deposit.
- (i) The data in the table below shows the changes in copper concentration with depth in a secondary enrichment deposit.

depth/metres	copper/%
0	0.2
10	0.3
20	2.9
30	1.5
40	1.4

Plot a line graph of the data on the graph below.



- (ii) Draw and label a horizontal line on the graph to indicate the likely position of the water table. [1]
- (iii) Explain why the concentration of copper changes with depth.

.....

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.....[3]

[Total: 13]

**[Turn over**

- 3 (a) (i) Describe the origin and formation of oil in a source rock.

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.....[3]

- (ii) Describe **two** factors that control the migration of oil.

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.....[2]

- (iii) Define the terms *reservoir rock* and *cap rock*.

*reservoir rock* .....

.....

*cap rock* .....

.....[2]

- (iv) Draw a fully labelled diagram to show a fault trap containing oil.

- (b) Give **one** advantage and **one** disadvantage of surface water supply (rivers and reservoirs) rather than supply from groundwater.

advantage .....

.....

disadvantage .....

.....[2]

- (c) Describe the geological factors that are important in the siting of dams and reservoirs for water supplies. You may use diagrams to illustrate your answer.

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.....[7]

[Total: 19]

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