OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced Subsidiary GCE

GEOLOGY 2833/01

Economic and Environmental Geology

Tuesday **24 MAY 2005** Afternoon 45 minutes

Candidates answer on the question paper.
Additional materials:
Electronic calculator
Protractor

Candidate Name	Centre Number	Candidate Number

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	**18**	
2	**12**	
3	**15**	
TOTAL	**45**	

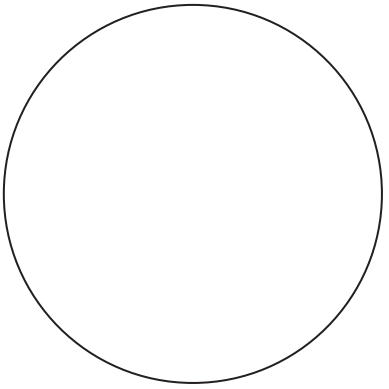
This question paper consists of 8 printed pages.

Registered Charity Number: 1066969
[Turn over

Answer **all** the questions.

1 **(a)** The table below shows the energy resources used to generate electricity in the British Isles.

energy resource	percentage
coal	30
oil and gas	40
nuclear	25
renewable	5



(i) Draw a pie chart using the data from the table. [1]

(ii) Calculate the total percentage of fossil fuels used as energy resources.

.....[1]

(iii) Define the term *non-renewable* energy resource.

.....

.....[1]

(b) Coal is an important energy resource used in the British Isles.

(i) Complete the diagram below to show the coal series of increasing rank.

peat	→		→	bituminous coal	→	

[2]

(ii) Define the term *rank*.

.....

.....[1]

(c) **(i)** Draw a labelled diagram to show the difference between an exposed and a concealed coalfield.

[3]

(ii) Some exposed coalfields are mined using opencast methods. Describe this method of mining.

.....

.....

.....

.....[2]

(iii) Describe **one** environmental problem of opencast mining.

.....

.....[1]

(d) Slope stability can be a problem in cuttings. Name and describe **one** method for stabilising a slope.

.....

.....

.....

.....[2]

(e) Geothermal energy is a renewable energy resource.

(i) Name **one** area in the British Isles where geothermal energy has the potential to be exploited.

.....[1]

(ii) Describe how geothermal energy would be exploited in the area you have named.

.....

.....

.....

.....[2]

(iii) Give **one** disadvantage of exploiting geothermal energy.

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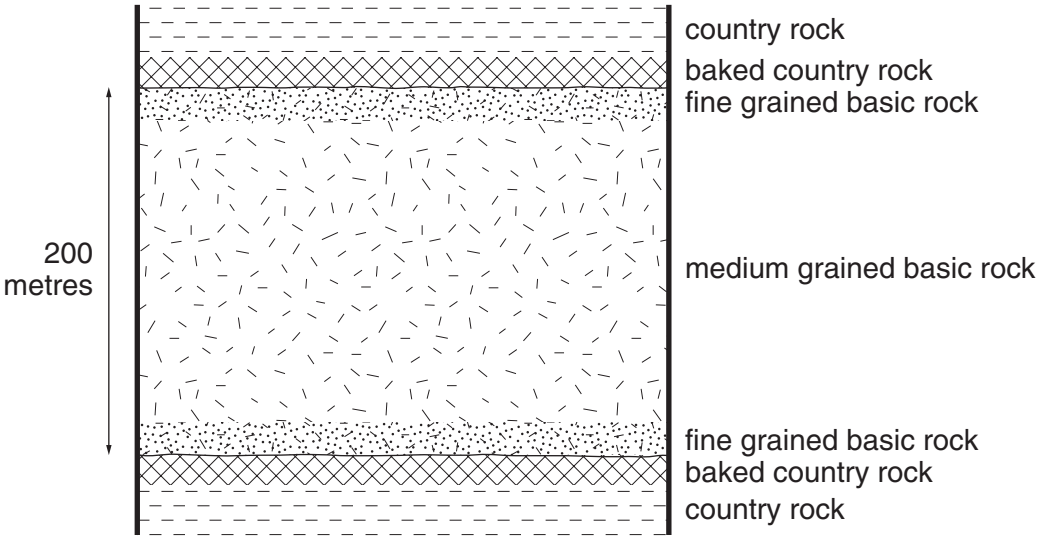
.....[1]

[Total: 18]

2 **(a)** The diagram below is a cross section through a basic igneous intrusion containing an iron ore deposit formed by gravity settling.



(i) Shade the area on the diagram where the iron ore deposit will be concentrated. [1]

(ii) Give **one** property of the iron minerals that allowed them to be concentrated in this ore deposit.

.....

.....[1]

(iii) Name the ore mineral of iron that will be found in this situation.

.....[1]

(b) Name and describe a suitable geophysical exploration technique that could be used to find this ore deposit.

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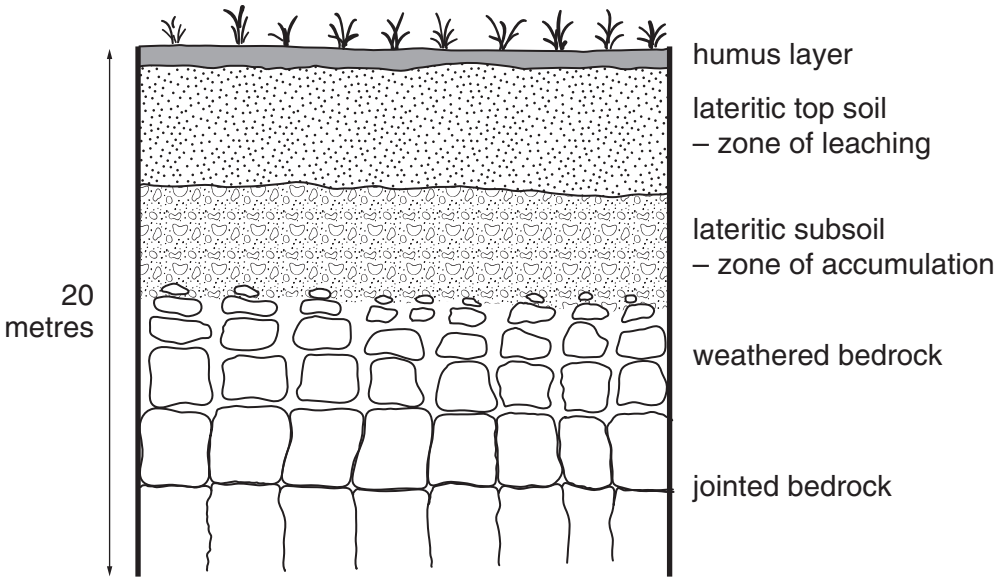
.....[2]

(c) The diagram below is a cross section through a residual ore deposit of aluminium.



(i) Shade the area on the diagram where the aluminium ore deposit will be concentrated. [1]

(ii) Name the main ore mineral of aluminium.

.....[1]

(iii) Describe the geological processes that caused the concentration of aluminium.

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.....[2]

(iv) Explain the significance of jointing in the development of residual ore deposits.

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.....[2]

(v) Name a rock type from which residual ore deposits of aluminium form.

.....[1]

[Total: 12]

3 **(a)** The British Isles has economically important reserves of offshore oil and gas.

(i) The present reserves of an oilfield are estimated to be 730 million barrels. If the rate of production of oil is 200,000 barrels per day, calculate how many years the oil will last.

.....years [1]

(ii) State **two** reasons why the reserves of oil and gas around the British Isles may be **increased** in the future.

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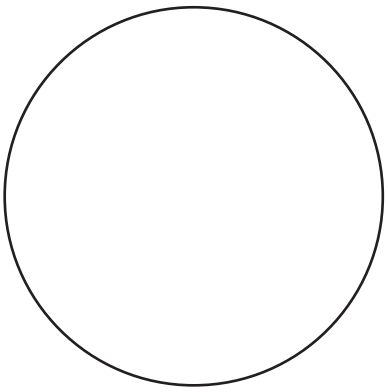
.....[2]

(b) **(i)** Draw and label a thin section diagram to show the characteristics of a good reservoir rock for oil.



[2]

(ii) Give **one** reason why typically 80% of the oil is left in the reservoir rock after primary recovery.

.....

.....[1]

(iii) Describe a secondary recovery method that could be used to increase the percentage of oil recovery.

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.....[2]

(c) Describe the geological conditions leading to the formation of springs as a result of lithology, faults and unconformities. **Diagrams are essential to illustrate your answer**.

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[Total: 15]

[Turn over

For possible continuation of extended answer.

END OF QUESTION PAPER