

ADVANCED SUBSIDIARY GCE

GEOLOGY

Economic and Environmental Geology

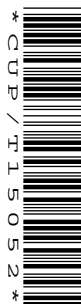
THURSDAY 24 MAY 2007

2833/01

Afternoon

Time: 45 minutes

Additional materials: Electronic calculator
Ruler (cm/mm)



Candidate
Name

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Centre
Number

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Candidate
Number

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INSTRUCTIONS TO CANDIDATES

- Write your name, Centre Number and Candidate Number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [] at the end of each question or part question.
- You will be awarded marks for the quality of written communication where this is indicated in the question paper.
- The total number of marks for this paper is 45.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculation.

FOR EXAMINER'S USE

Qu.	Max.	Mark
1	12	
2	14	
3	19	
TOTAL	45	

This document consists of **10** printed pages and **2** blank pages.

Answer **all** the questions.

- 1 (a) State **two** properties of a rock that could make it a good aquifer.

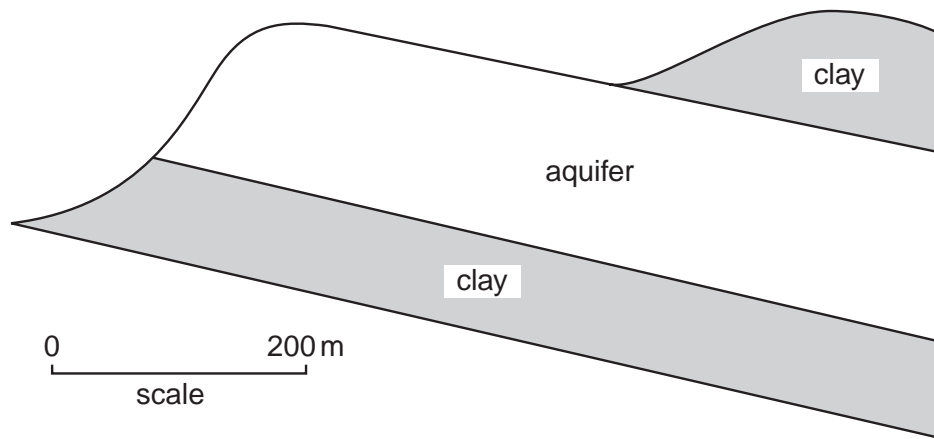
1

.....

2

.....[2]

- (b) The diagram below shows a cross section through part of an aquifer.



On the diagram

- draw a line to show the position of the water table
- label the position of a spring
- shade the area of the aquifer that is confined.

[3]

- (c) (i) If a well is dug into a confined aquifer describe and explain what will happen to the groundwater.

.....

.....

.....

.....[2]

- (ii) What is the name given to this type of well?

.....[1]

- (iii) State **one** problem that may occur when water is extracted from the well over a period of time.

.....

.....[1]

- (d) Define the terms *hydrostatic pressure* and *hydraulic gradient*.

hydrostatic pressure

.....

hydraulic gradient

.....[2]

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

.....

.....[1]

[Total: 12]

- 2 (a) Complete the table below to compare the conditions required for the origin and formation of oil and coal.

	oil	coal
sedimentary environment	deep marine	
type of organic matter		terrestrial vegetation
oxygen conditions	anoxic sea bed conditions	
rate of sedimentation	slow	

[4]

- (b) (i) Name the main source rock for the oil in the northern basin of the North Sea.

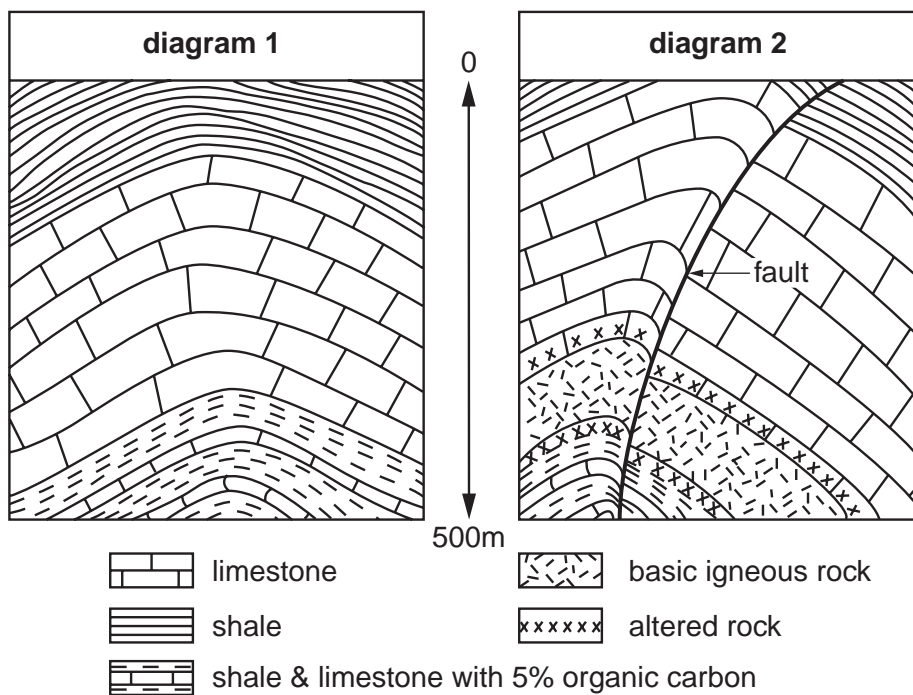
.....[1]

- (ii) Explain why only gas is found in the southern basin of the North Sea.

.....

[2]

- (c) The cross section diagrams below show two potential sites for the accumulation of oil.



(i) Shade the area on **diagram 1** where you might expect to find oil. [1]

(ii) Explain why oil may be found in the area you have shaded.

.....

.....

.....

.....[2]

(iii) Give **two** reasons why oil is unlikely to be found in the geological situation shown in **diagram 2**.

1

.....

2

.....[2]

(iv) Describe how primary recovery oil production could take place from the area shown in **diagram 1**.

.....

.....

.....

.....[2]

[Total: 14]

3 Coal can be extracted by underground or surface methods.

(a) Name **and** describe one method of underground coal mining.

name.....

description

.....

.....

.....[3]

(b) Draw labelled diagrams in the boxes below to illustrate how washouts and faults can cause problems for underground coal mining.

(i) washout

[2]

(ii) fault

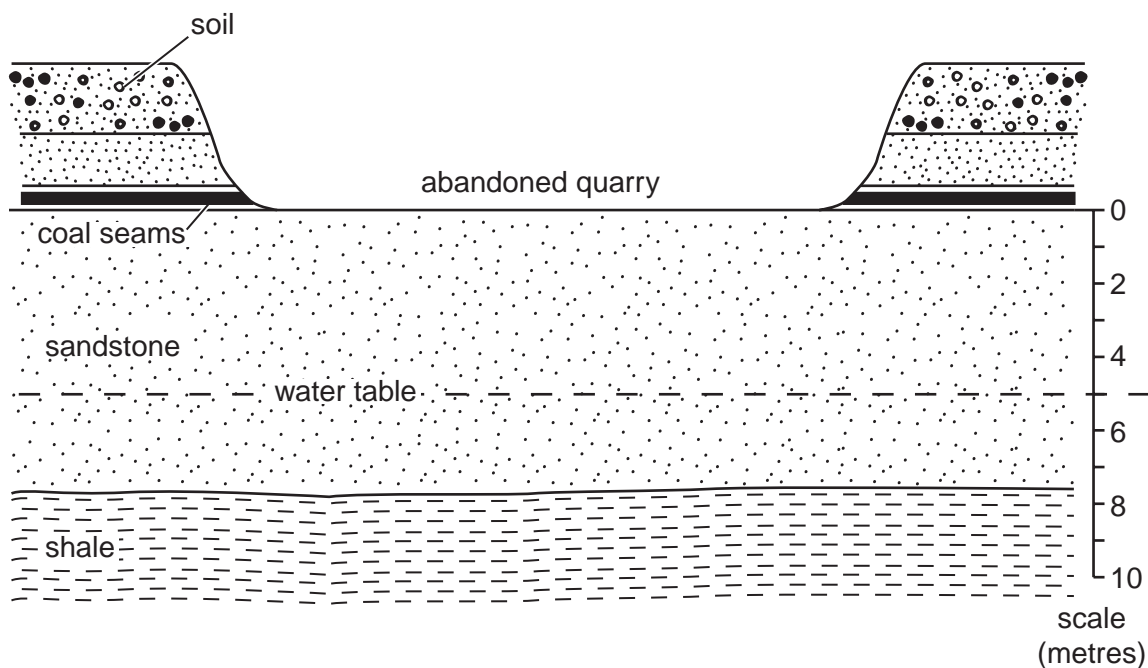
[2]

(c) Describe **one** advantage of opencast coal mining compared to underground mining.

.....

.....[1]

- (d) The diagram below shows an abandoned opencast quarry that is being considered for landfill waste disposal. There are concerns that toxic fluids may leak from the site into the groundwater supply.



- (i) Use the diagram to explain why there are concerns that toxic fluids may leak from the landfill into the groundwater supply.

.....
[1]

- (ii) If the toxic fluids can move down through the sandstone at a rate of 10 centimetres per day, calculate how long they will take to reach the water table.

..... days [1]

- (iii) Describe what could be done to the abandoned quarry, prior to it being used for waste disposal, to prevent any such leakage occurring.

.....

[2]

.....[7]

Optional extension sheet. If you use this lined page to complete an answer to any question, the question number **must** be clearly shown.

[illegible]

END OF QUESTION PAPER

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11
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