

Surname	Centre Number	Candidate Number
Other Names		2



GCE A level

1215/02



S16-1215-02

GEOLOGY – GL5
Thematic Unit 2
Geology of Natural Resources

P.M. FRIDAY, 10 June 2016

ONE of TWO units to be completed in 2 hours

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
Section A 1.	15	
Section B 2.	25	
3.		
4.		
Total	40	

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ADDITIONAL MATERIALS

In addition to this and one other examination paper, you will need a calculator.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **question 1** in Section A (15 marks) and **one** question from Section B (25 marks).

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

SECTION A

1. **Figure 1a** shows the depth and temperature conditions under which oil and gas may form. **Figures 1b** and **1c** are cross sections through the Brent and Leman hydrocarbon fields in the North Sea showing the volume of accumulated hydrocarbons.

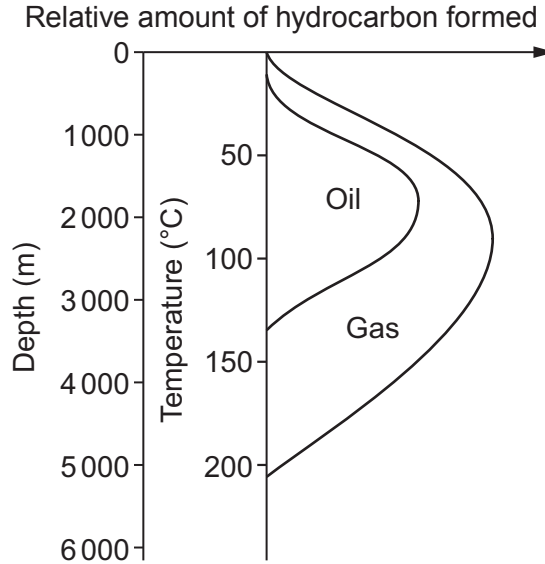


Figure 1a

Brent hydrocarbon field

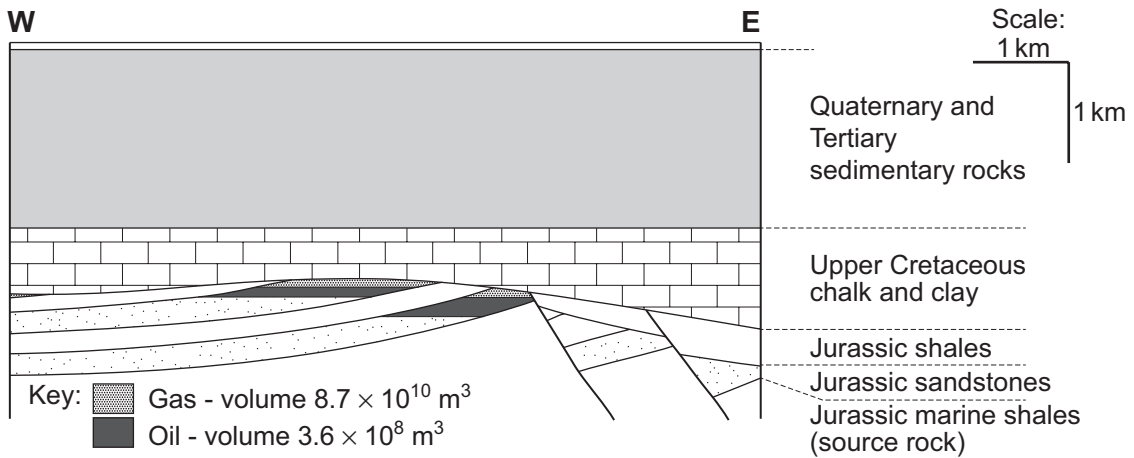


Figure 1b

Leman hydrocarbon field

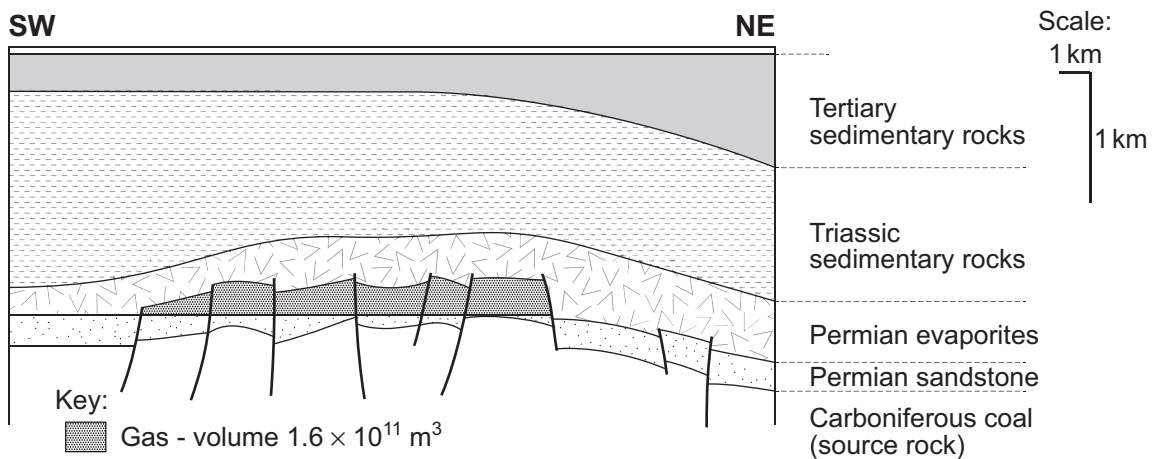


Figure 1c

(a) Using **Figure 1a**, state the maximum depth at which oil formation takes place. [1]

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(b) Use **Figures 1a** and **1b**.

(i) State the types of geological structures that form the hydrocarbon traps in the **Brent** hydrocarbon field. [2]

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(ii) Explain how hydrocarbons have accumulated within the **Brent** hydrocarbon field. [3]

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(iii) Some wells in the **Brent** hydrocarbon field can extract only 33 % of the oil whilst other wells can extract up to 56 %. Suggest **two geological** reasons for this variation. [2]

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(c) (i) Using **Figures 1a** and **1b**, suggest why oil and gas both occur in the **Brent** hydrocarbon field. [2]

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(ii) Using **Figure 1c only**, explain why no oil occurs in the **Leman** hydrocarbon field. [2]

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(d) Using **Figure 1c**, critically evaluate the use of the Permian rocks in the **Leman** hydrocarbon field as a possible CO₂ repository for carbon sequestration. [3]

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SECTION B

Answer **one** question only.

Write your answer in the remaining pages of this booklet.

2. Evaluate the use of:

- (a) geophysical surveying
- (b) geochemical prospecting techniques

in prospecting for **metalliferous** mineral resources.

[25]

3. Evaluate the importance of:

- (a) igneous processes
- (b) sedimentary processes

in the formation of **metalliferous** ores.

[25]

4. *“Interference with the surface and/or subsurface environment from the extraction of geological raw materials can be minimised by planning.”*

Evaluate this statement with reference to the ways in which any adverse effects can be limited.
[25]

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Acknowledgements

Woodcock, N (1994) Geology and Environment in Britain and Ireland. CRC Press

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