

Surname	Centre Number	Candidate Number
Other Names		2



GCE A Level – LEGACY

1215/02



GEOLOGY – GL5
Thematic Unit 2
Geology of Natural Resources

THURSDAY, 6 JUNE 2019 – MORNING

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	

1215
020001

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).

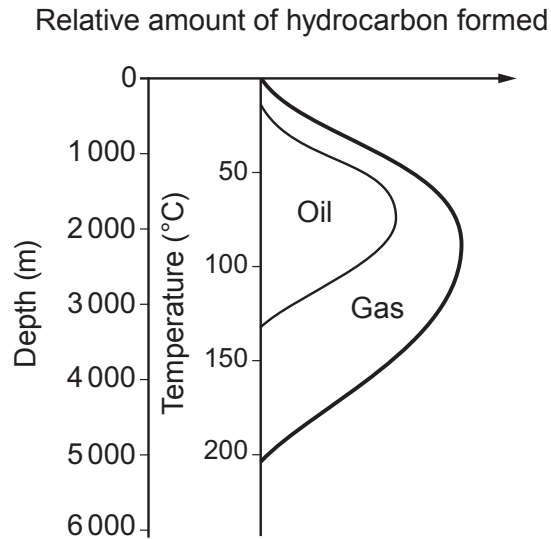
INFORMATION FOR CANDIDATES

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.



Brent hydrocarbon field

Figure 1a

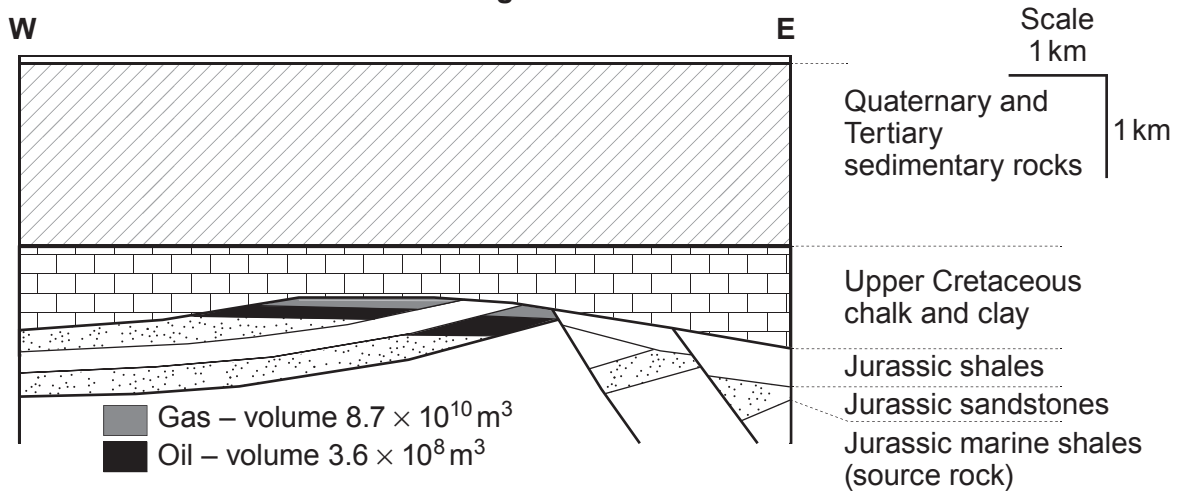


Figure 1b

Leman hydrocarbon field

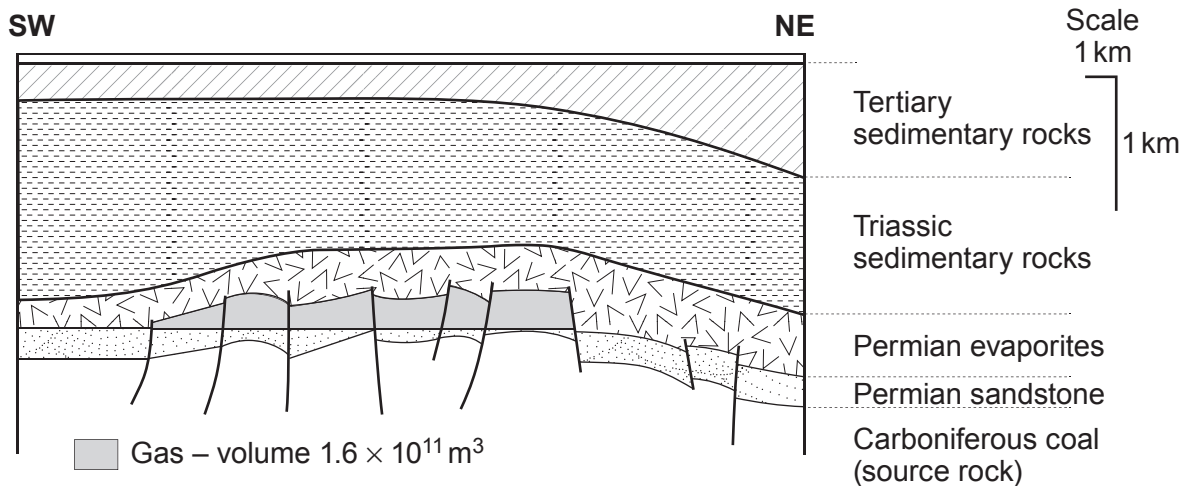


Figure 1c

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

..... metres

- (b) Refer to **Figures 1a** and **1b**.

- (i) Calculate the total volume of hydrocarbons that have accumulated in the **Brent** hydrocarbon field. Show your working. [2]

..... m³

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

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- (iii) Wells in the **Brent** hydrocarbon field can only recover between 33% and 56% of the oil stored in the reservoir. Explain **one geological** reason for this variation in oil recovery. [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 only gas 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]

Examiner
only

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SECTION B

*Answer **one** question only.*

Write your answer in the remaining pages of this booklet.

2. *“Igneous processes are the most important processes in the formation of metalliferous mineral deposits.”*

Evaluate this statement and illustrate your answer with reference to examples you have studied.
[25]

3. (a) Describe the formation of economically significant coal deposits.
- (b) Evaluate the use of **two** of the following techniques in the exploration of mineral and/or energy resources.
- (i) Geological mapping
 - (ii) Geophysical methods
 - (iii) Satellite remote sensing
- [25]

4. *“The extraction of geological raw materials interferes with the surface and/or subsurface environment.”*

Evaluate the ways in which any adverse effects can be minimized by planning and legislation.
[25]

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