

Thursday 14 June 2012 – Afternoon

A2 GCE GEOLOGY

F794 Environmental Geology

Candidates answer on the Question Paper.

OCR supplied materials:

None

Other materials required:

- Electronic calculator
- Ruler (cm/mm)

Duration: 1 hour




Candidate forename		Candidate surname	
--------------------	--	-------------------	--

Centre number							Candidate number				
---------------	--	--	--	--	--	--	------------------	--	--	--	--

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. If additional space is required, you should use the lined page at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the bar codes.

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 **60**.
-  Where you see this icon you will be awarded marks for the quality of written communication in your answer.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.
- This document consists of **12** pages. Any blank pages are indicated.

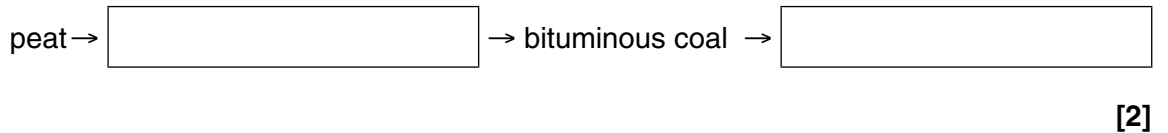
Answer **all** the questions.

1 Coal is an important energy resource used in the British Isles.

(a) (i) Define the term *rank*.

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

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



(iii) Describe and explain the process that causes the rank to increase.

.....
.....
.....
..... [2]

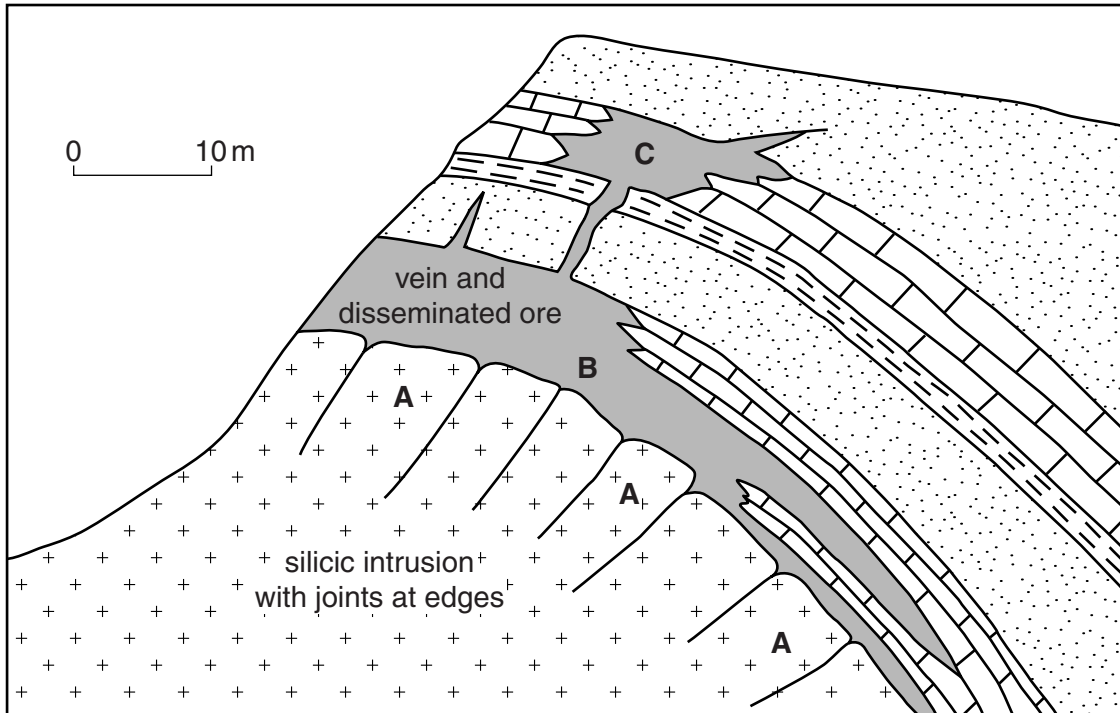
(iv) Describe the physical and chemical properties of bituminous coal.

.....
.....
.....
..... [2]

(v) Suggest a common impurity found in coal.

..... [1]

2 The cross section below shows a silicic igneous intrusion and the surrounding country rocks which contain metal ore deposits.



Key: sandstone limestone shale ore silicic intrusion

(a) (i) What name is given to the part of the intrusion labelled A?

In your answer, you should use the appropriate technical term, spelled correctly.

..... [1]

(ii) How did the jointing at the edges of the intrusion form?

.....

 [2]

(iii) What is the significance of this jointing in relation to the formation of the ore deposits?

.....

 [2]

(b) (i) Describe and explain why the ore formed mainly in the limestone.

.....
.....
.....
..... [2]

(ii) Suggest why the sandstones and shales are poorly mineralised.

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

(iii) Name the ore minerals likely to be found in the limestone at **B** and at **C**. Explain why these minerals are different.

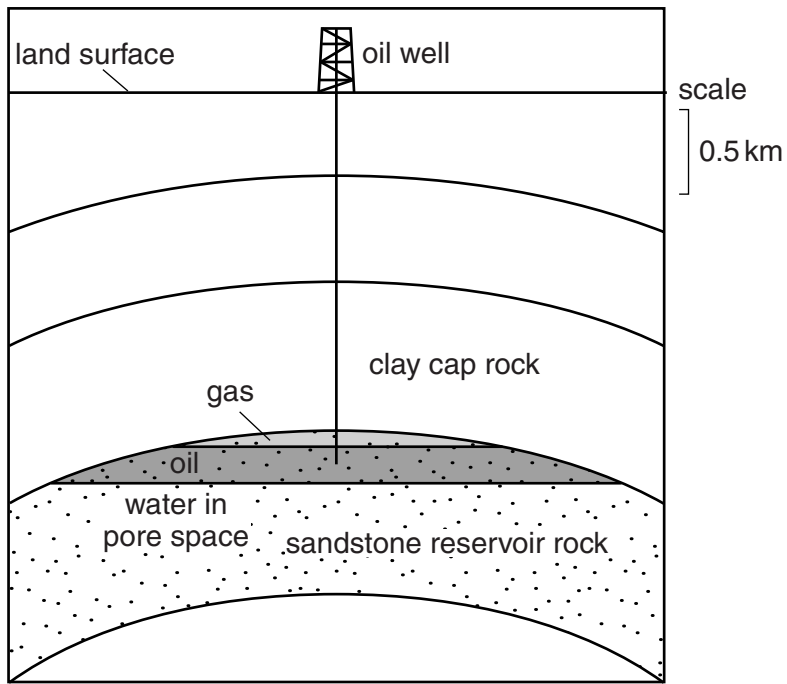
at **B**..... at **C**.....
.....
.....
..... [2]

(c) Describe **two** geophysical methods that could be used to determine the extent of these ore deposits.

.....
.....
.....
.....
.....
..... [3]

[Total: 13]

3 The cross section diagram below shows a reservoir of oil and gas within a sandstone formation.

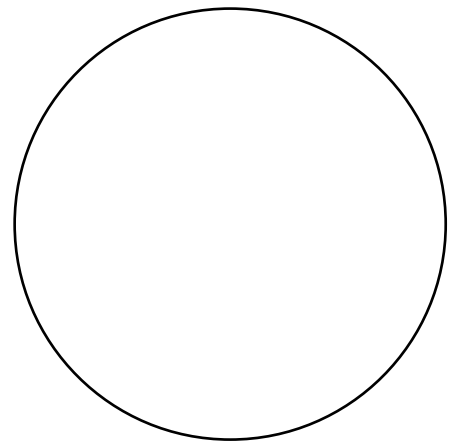


(a) (i) Explain why the gas and oil are always found at the top of the reservoir rock.

.....
 [1]

(ii) Draw a fully labelled thin section diagram of the sandstone to help describe the characteristics of a good reservoir rock for oil.

.....



[3]

(b) (i) The pressure in the rocks increases by 200 atmospheres per kilometre. Use information from the cross section diagram to determine the pressure at:

- the top of the gas fieldatmospheres
- the base of the sandstone directly beneath the oil well.
.....atmospheres [2]

(ii) Explain the significance of this pressure difference in relation to primary and secondary recovery of oil.

.....

.....

.....

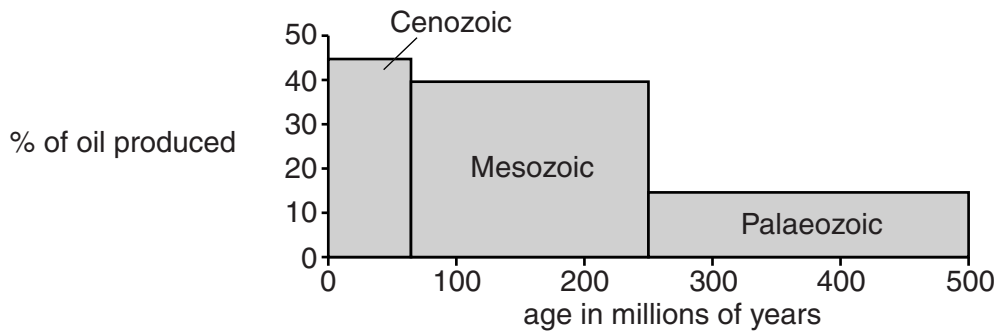
.....

.....

.....

..... [3]

(c) The graph below shows the percentage of oil produced from rocks of different ages.



Suggest reasons for the pattern of oil production shown on the graph.

.....

.....

.....

.....

.....

.....

.....

.....

..... [3]

4 Groundwater and surface water are the two main sources of useable fresh water.

(a) Explain why drinking water in the northwest of Britain mainly comes from surface water supplies but in the southeast of England it mainly comes from groundwater supplies.

.....
.....
.....
..... [2]

(b) (i) Define the term *aquifer*.

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

(ii) What condition is required for an aquifer to be artesian?

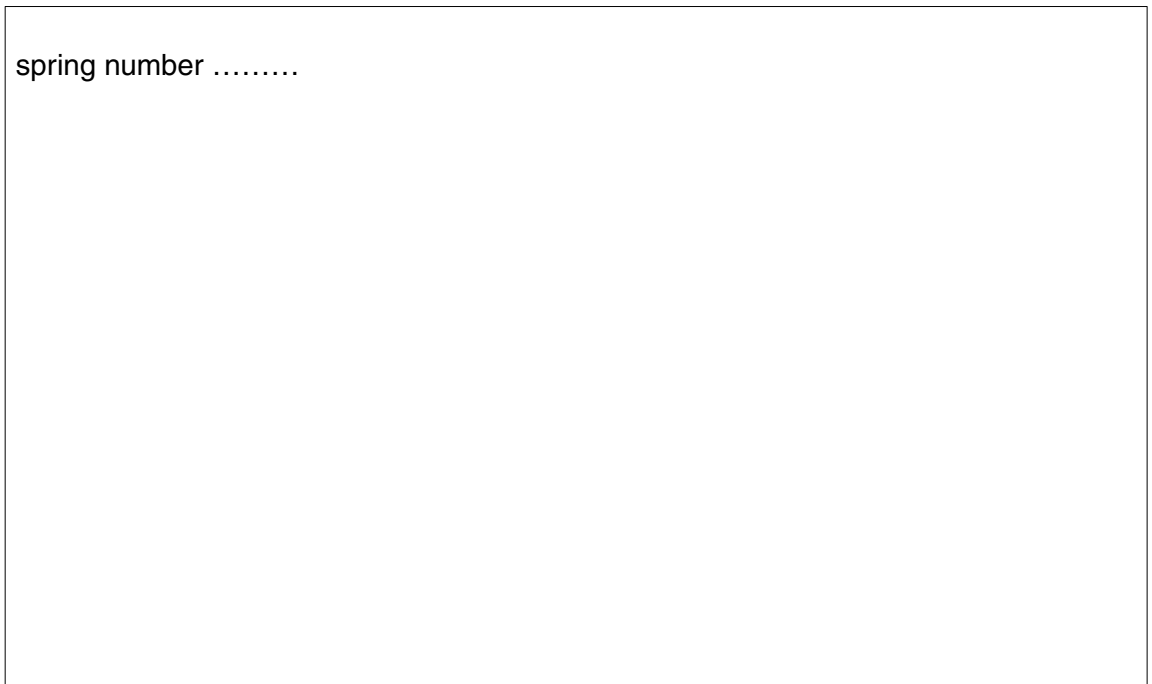
.....
..... [1]

(c) (i) Give **two** situations where a groundwater spring could result from a change in lithology.

1
2 [1]

(ii) Draw a fully labelled diagram to show how **one** of these springs forms.

spring number



[2]

(d) (i) State **one** important use for a dam and reservoir other than for drinking water supply.

..... [1]

(ii) Describe **two** environmental consequences of dams and reservoirs.

.....
.....
.....
..... [2]

(iii) Explain why there may be an increase in seismic activity as reservoirs fill with water.

.....
.....
.....
..... [2]

[Total: 12]

PLEASE DO NOT WRITE ON THIS PAGE



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.