GCE A Level – LEGACY

1215/03

GEOLOGY – GL5

Thematic Unit 3

Geological Evolution of Britain

THURSDAY, 7 JUNE 2018 – MORNING

ONE of TWO units to be completed in 2 hours plus your additional time allowance

Surname _____

Other Names _____

Centre Number _____

Candidate Number 2 _____

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

ADDITIONAL MATERIALS

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

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball-point pen or your usual method.

Write your name, centre number and candidate number in the spaces provided on the front cover.

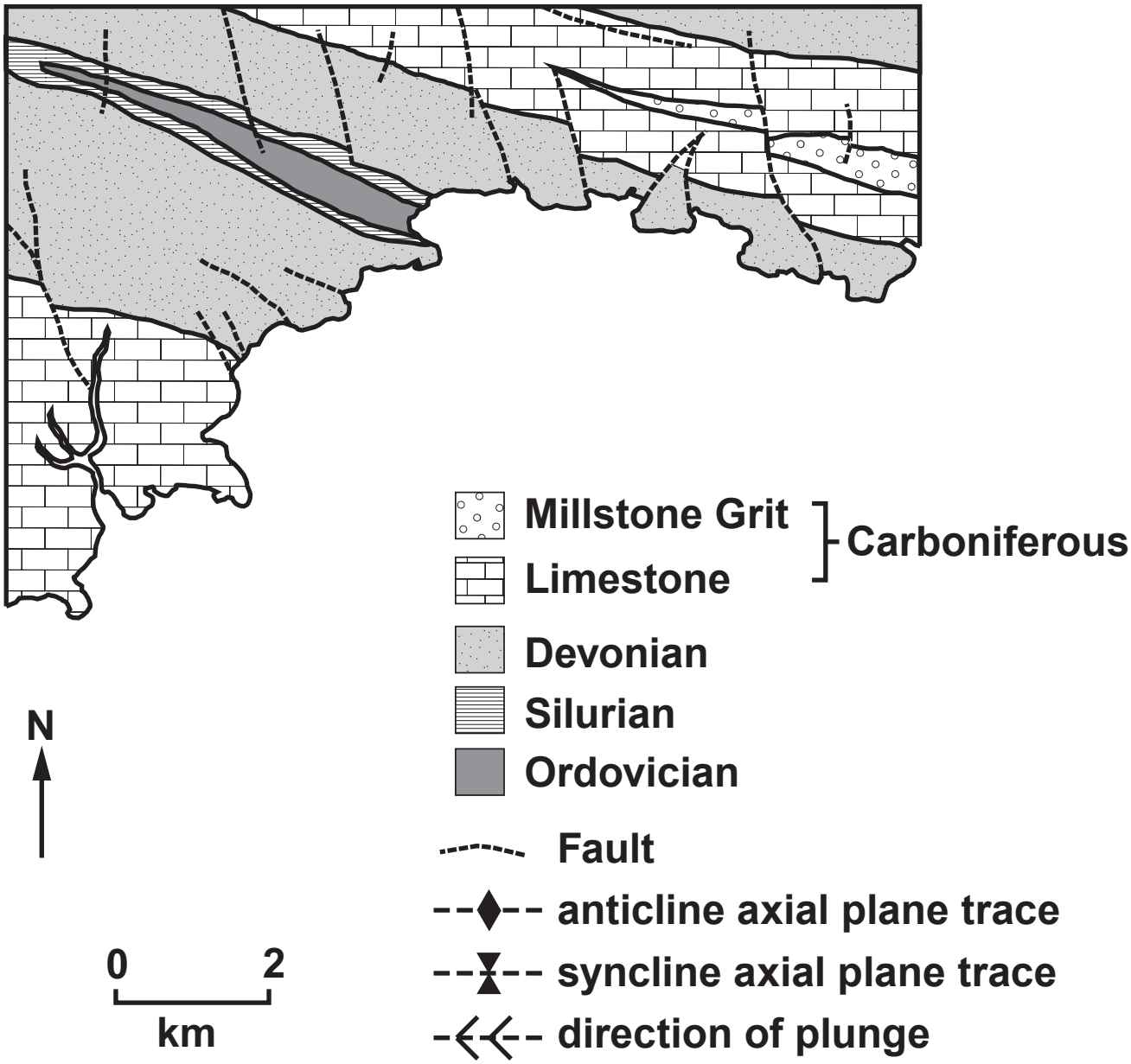
Answer QUESTION 1 in Section A (15 marks) and ONE question from Section B (25 marks).

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.

FIGURE 1A


Millstone Grit
Limestone
Carboniferous
Devonian
Silurian
Ordovician
N
Fault
anticline axial plane trace
syncline axial plane trace
direction of plunge
0
2
km

SECTION A

1. FIGURE 1A opposite is a geological map of part of Pembrokeshire, southern Wales.

(a) Refer to FIGURE 1A.

(i) Using the appropriate symbols from the key, mark on FIGURE 1A:

1. **the axial plane trace AND direction of plunge of ONE anticline**
2. **the axial plane trace AND direction of plunge of ONE syncline. [4]**

(ii) Name, with reasons, the most likely orogenic event which produced these folds. [3]

OROGENIC EVENT _____

_____

REASONS _____

_____

_____

_____

_____

_____

DESCRIPTION

black shale with marine bivalves

cross-bedded orthoquartzite

coal

cross-bedded arkose with soil horizon and rootlets

siltstone with brachiopods

cross-bedded orthoquartzite with brachiopod fragments

black shale with marine bivalves

siltstone with marine burrows

soil horizon with rootlets

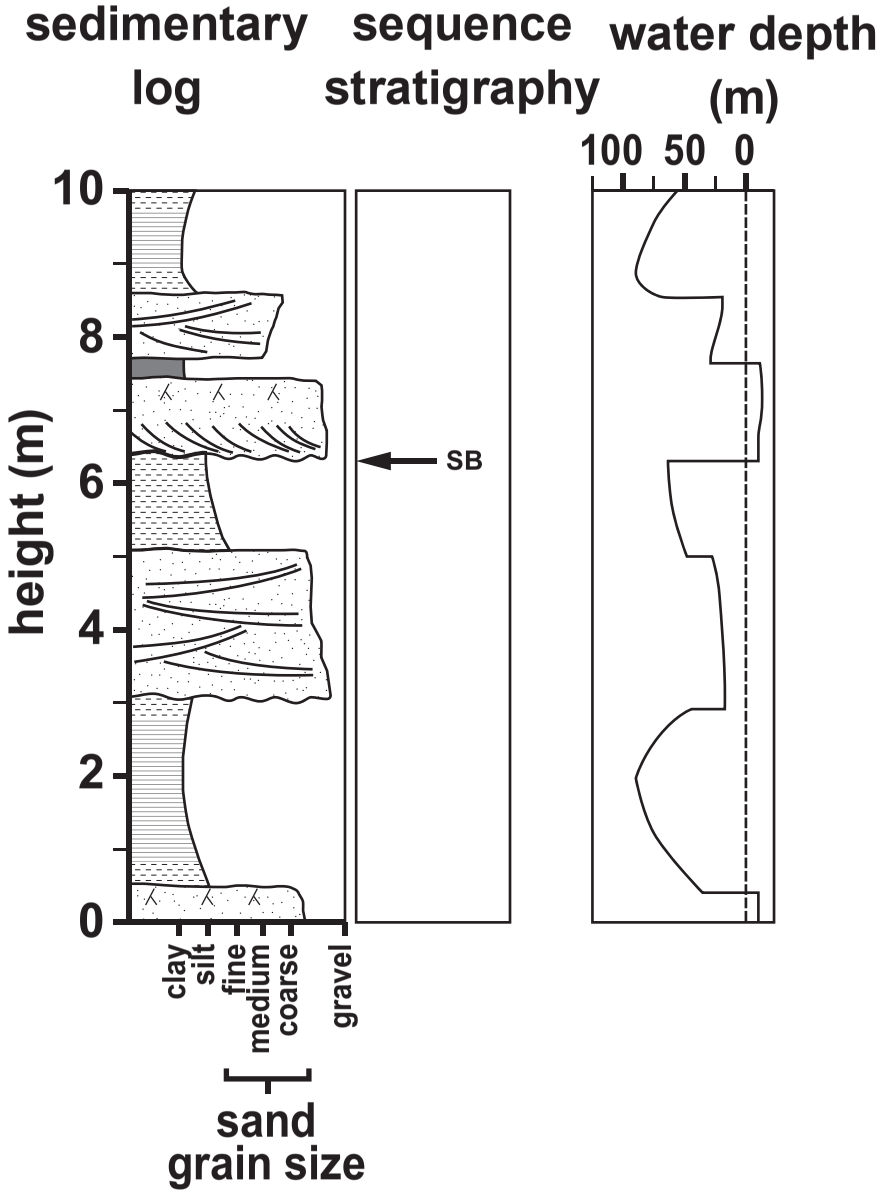


FIGURE 1B

FIGURE 1C

1(b) **FIGURE 1B opposite is a sedimentary log from the Carboniferous Coal Measures exposed just to the north of FIGURE 1A. FIGURE 1C opposite is a graph showing the changes in sea level interpreted from the sedimentary log in FIGURE 1B.**

(i) **Describe the changes in sea level which occurred during the deposition of the lowermost 5 metres of the sedimentary sequence in FIGURE 1C. [2]**

1(b) (ii) Using your knowledge, describe ONE possible mechanism to explain the changes in sea level which you described in (b)(i).

[2]

1(c) **In stratigraphy three types of boundary are used to divide sedimentary deposits into 'sequences' based upon changes in sea level. TABLE 1 describes these three boundaries.**

TABLE 1

boundary type	mode of formation
transgressive surface (TS)	formed by rapid sea level rise so that shallow marine sediments are deposited on top of eroded non-marine sediments
maximum flooding surface (MFS)	formed when sea level is highest
sequence boundary (SB)	formed by rapid sea level fall so that non-marine sediments are deposited on top of eroded marine sediments

1(c) Refer to FIGURE 1B, FIGURE 1C and TABLE 1.

(i) Draw labelled arrows in the sequence stratigraphy column on FIGURE 1B to show the position of a maximum flooding surface (MFS →) and a transgressive surface (TS →). [2]

(ii) The position of a sequence boundary (SB →) is shown on FIGURE 1B. State the evidence from FIGURE 1B for locating a sequence boundary at this position. [2]

15

SECTION B

Answer ONE question only.

WRITE YOUR ANSWER IN THE REMAINING PAGES OF THIS BOOKLET.

2(a) **Explain how evidence from fossils may be used to distinguish between different environments of deposition. Make reference to examples from the British geological record.**

(b) **Evaluate the reliability of this fossil evidence. [25]**

3(a) **Describe the sedimentary and fossil evidence for significant climatic change associated with Britain drifting northwards across the Equator during the Late Palaeozoic.**

(b) **Evaluate the reliability of palaeomagnetic evidence for this change in latitude. [25]**

4. **‘The Caledonian orogeny has had a more significant effect than other orogenies on the geology of the British Isles.’**

Describe and evaluate the geological evidence which supports this statement. [25]

END OF PAPER

ACKNOWLEDGEMENTS

FIGURES 1B and 1C: Gareth George, 2008. The geology of South Wales; a field guide.