

Surname	Centre Number	Candidate Number
Other Names		2



**GCE A level**

1215/03

**GEOLOGY - GL5  
THEMATIC UNIT 3  
GEOLOGICAL EVOLUTION OF BRITAIN**

P.M. FRIDAY, 10 June 2011

ONE of TWO units to be completed in 2 hours

			Examiner only
Section A	1.	15	
Section B	2.	25	
	3.		
	4.		
Total		40	

**ADDITIONAL MATERIALS**

In addition to this and one other examination paper, you may require 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).

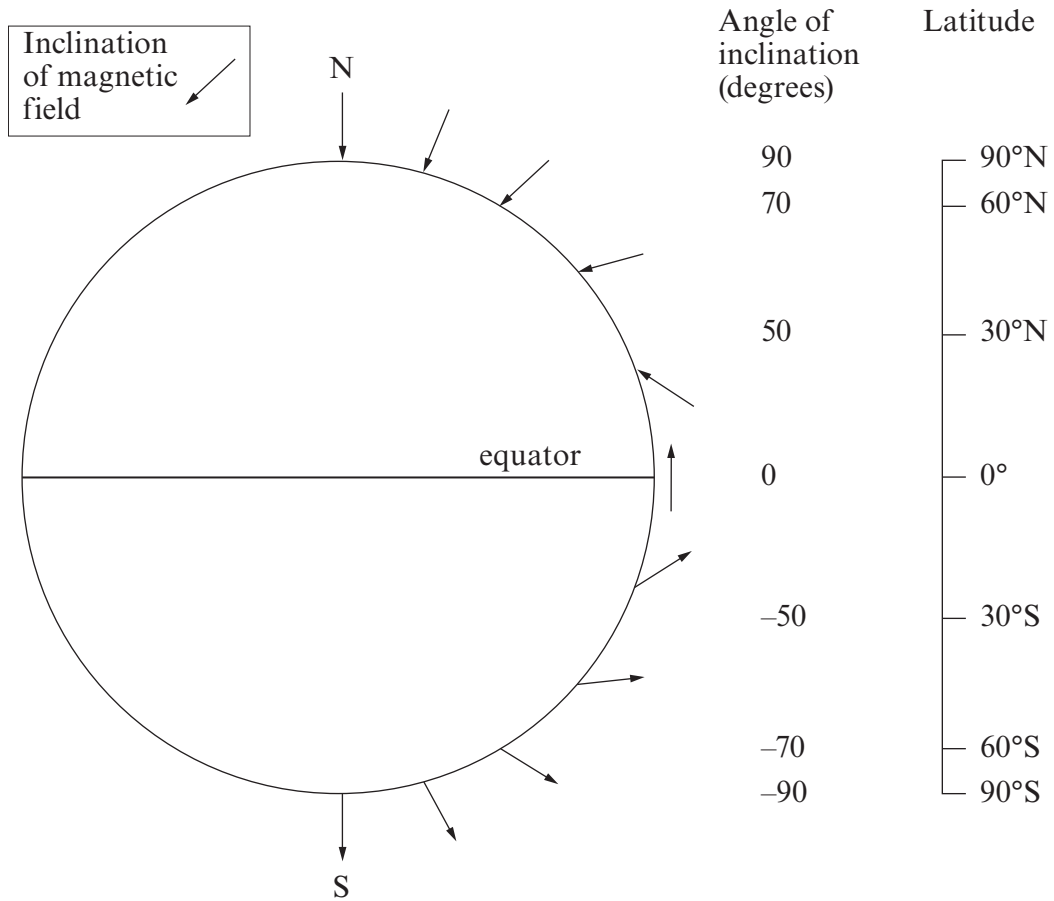
**INFORMATION FOR CANDIDATES**

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 variation in the angle of inclination of the Earth's magnetic field in relation to latitude at the present day.



**Figure 1a**

- (a) Describe how the angle of magnetic inclination in **Figure 1a** varies between the northern and southern hemispheres and between the equator and the poles. [2]

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- (b) **Table 1** shows data on palaeomagnetic inclination and palaeolatitude for rocks in Wales and Scotland during the early Palaeozoic.

Location	Palaeomagnetic inclination (degrees)	Palaeolatitude
Wales	-70	
Scotland		30°S

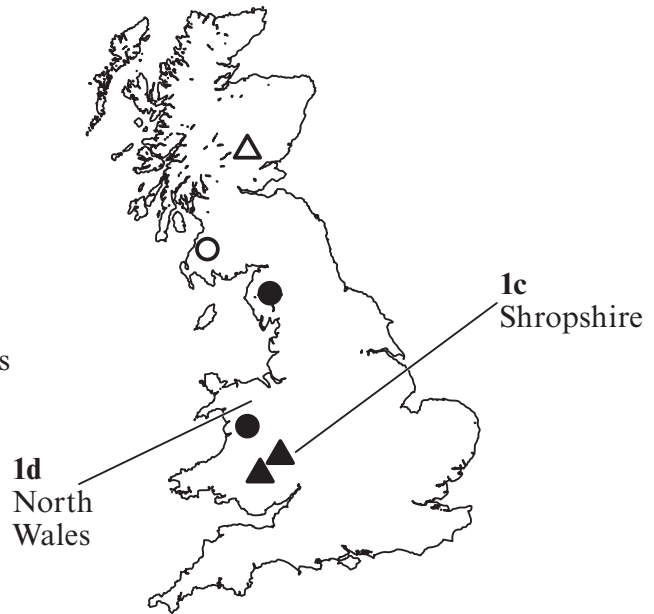
**Table 1**

Assuming that geographic and magnetic poles have always been close together, use **Figure 1a** to complete **Table 1** by:

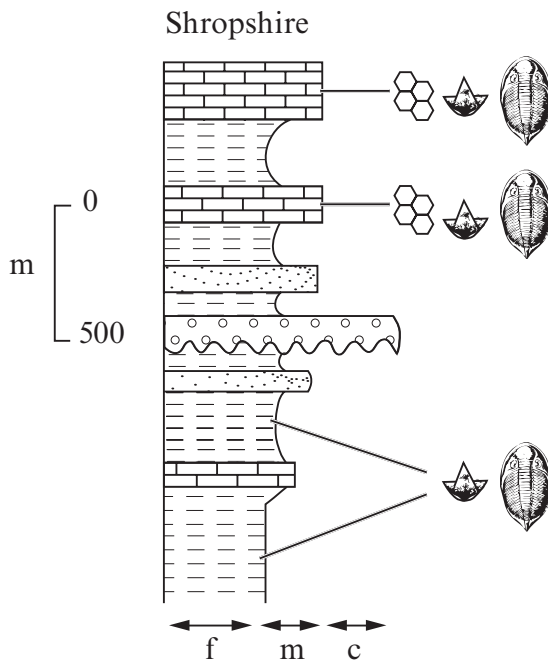
- (i) recording the palaeolatitude for rocks in Wales; [1]
- (ii) recording the palaeomagnetic inclination for rocks in Scotland. [1]

(c) **Figure 1b** is a map of the British area showing the distribution of early Palaeozoic fossils and the location of two sedimentary logs of early Palaeozoic age. These sedimentary logs are shown in **Figures 1c** and **1d**.

- Key**
- △ North American trilobites
  - ▲ European trilobites
  - North American graptolites
  - European graptolites

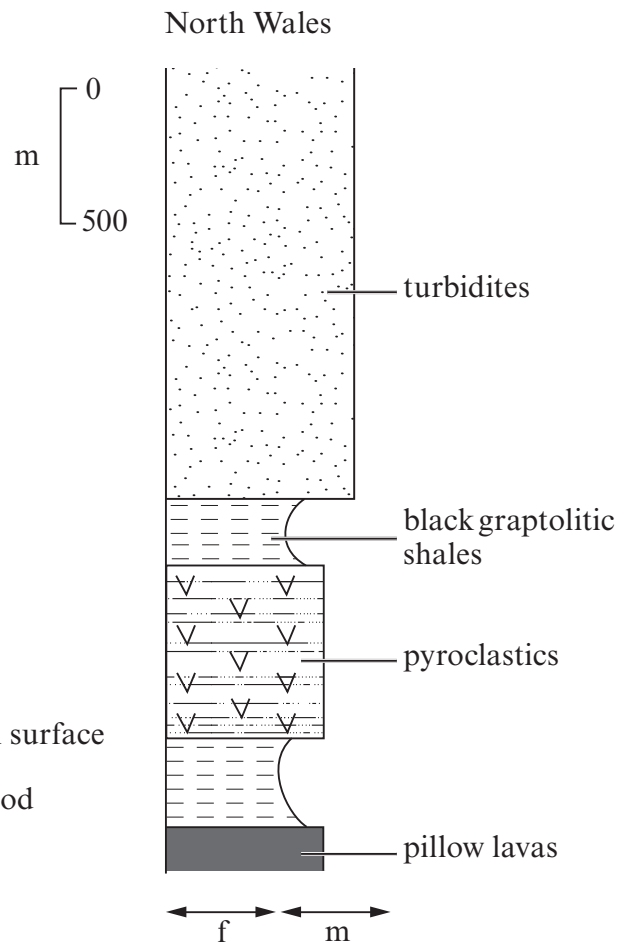


**Figure 1b**



- Key**
- sandstone
  - shale
  - limestone
  - quartz conglomerate
  - erosional surface
  - brachiopod
  - coral
  - trilobite

**Figure 1c**



- Key**
- turbidites
  - black graptolitic shales
  - pyroclastics
  - pillow lavas
  - graptolite
  - trilobite
- grain size: fine (f) medium (m) coarse (c)

**Figure 1d**

- (i) It has been concluded that the rocks shown in **Figure 1c** were deposited in a shallow marine environment. State and explain **one** piece of evidence that supports this conclusion. [3]

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- (ii) It has been concluded that the rocks shown in **Figure 1d** were deposited in a deep marine environment. State and explain **one** piece of evidence that supports this conclusion. [3]

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- (d) (i) The trilobites and graptolites located on **Figure 1b** belong to one of two different faunal provinces (North American and European), each of which is characterised by distinct faunal assemblages. Draw a line on **Figure 1b** to separate the two faunal provinces. [1]

- (ii) Using evidence from palaeomagnetism, fossils and sedimentary rocks, describe the likely plate tectonic setting of the British area during the Early Palaeozoic. [4]

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**Total 15 marks**

**SECTION B**

*Answer one question only.*

*Write your answer in the remaining pages of this booklet.*

2. (a) Describe the location and large-scale geology of the Variscan orogenic belt in the British area.
- (b) Evaluate the extent to which the geology of the Variscan orogenic belt enables a reconstruction of the plate tectonic setting in which it developed. [25]
3. (a) With reference to examples from the British stratigraphic column, explain how sedimentary rocks and their contained fossils may be used to interpret fluvial and deltaic environments of deposition.
- (b) Evaluate the reliability of the evidence. [25]
4. (a) Describe the igneous rocks and structures of the Tertiary Igneous Province of northwest Scotland and northern Ireland.
- (b) *“The igneous rocks and structures of the Tertiary Igneous Province have been interpreted as being associated with the opening of the North Atlantic.”*  
Evaluate this statement. [25]

Examiner  
only

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