

**ADVANCED SUBSIDIARY GCE**  
**GEOLOGY**  
Global Tectonics

**F791**

Candidates answer on the question paper.

**OCR supplied materials:**

None

**Other materials required:**

- Ruler (cm/mm)
- Protractor

**Wednesday 12 January 2011**  
**Afternoon**

**Duration: 1 hour**




Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**INSTRUCTIONS TO CANDIDATES**

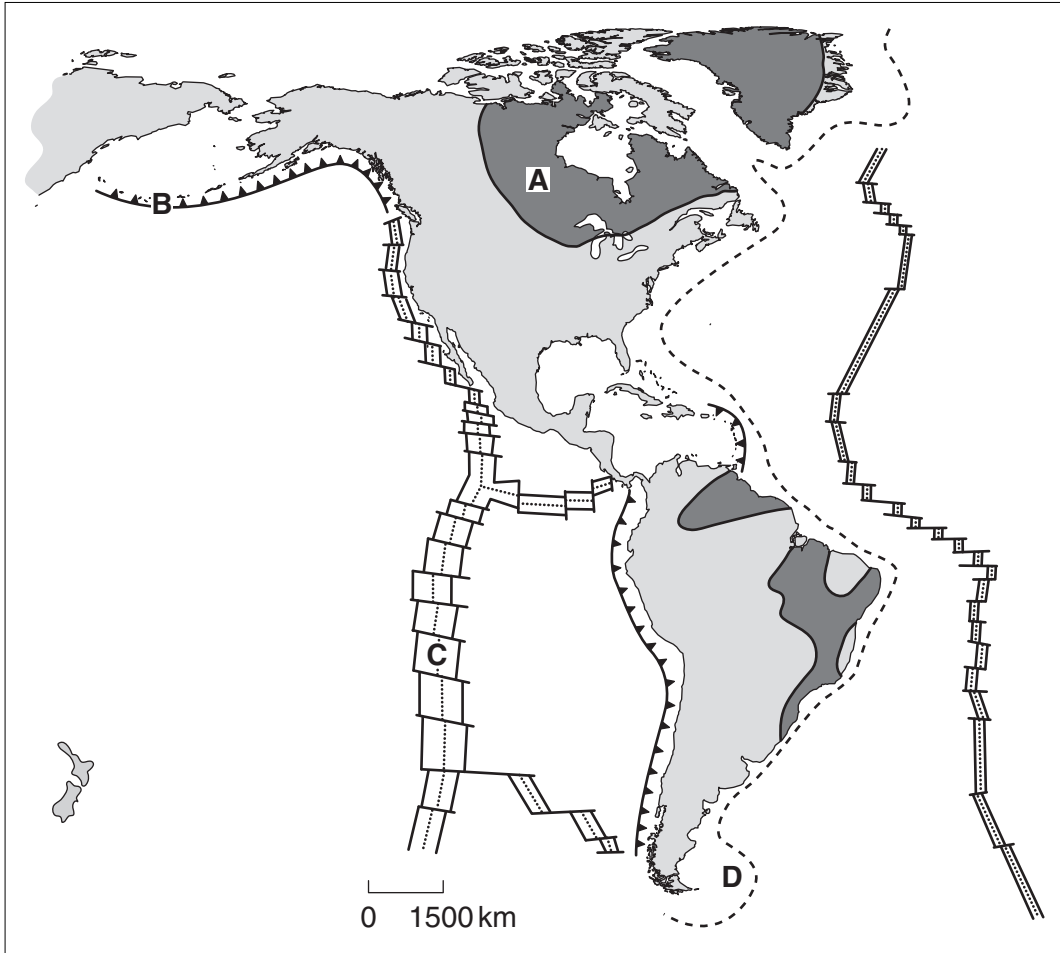
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. If additional space is required, you should use the lined pages at the end of this booklet. The question number(s) must be clearly shown.
- Answer **all** the questions.
- 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 a mark for the quality of written communication in your answer.
- 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 The map below shows some of the tectonic features found in the North and South American region.



- (a) (i) Match each of the tectonic features in the table below with their location, **A, B, C** and **D** on the map.

feature	location
mid-ocean ridge	
continental shelf	
continental shield or craton	
deep-ocean trench	

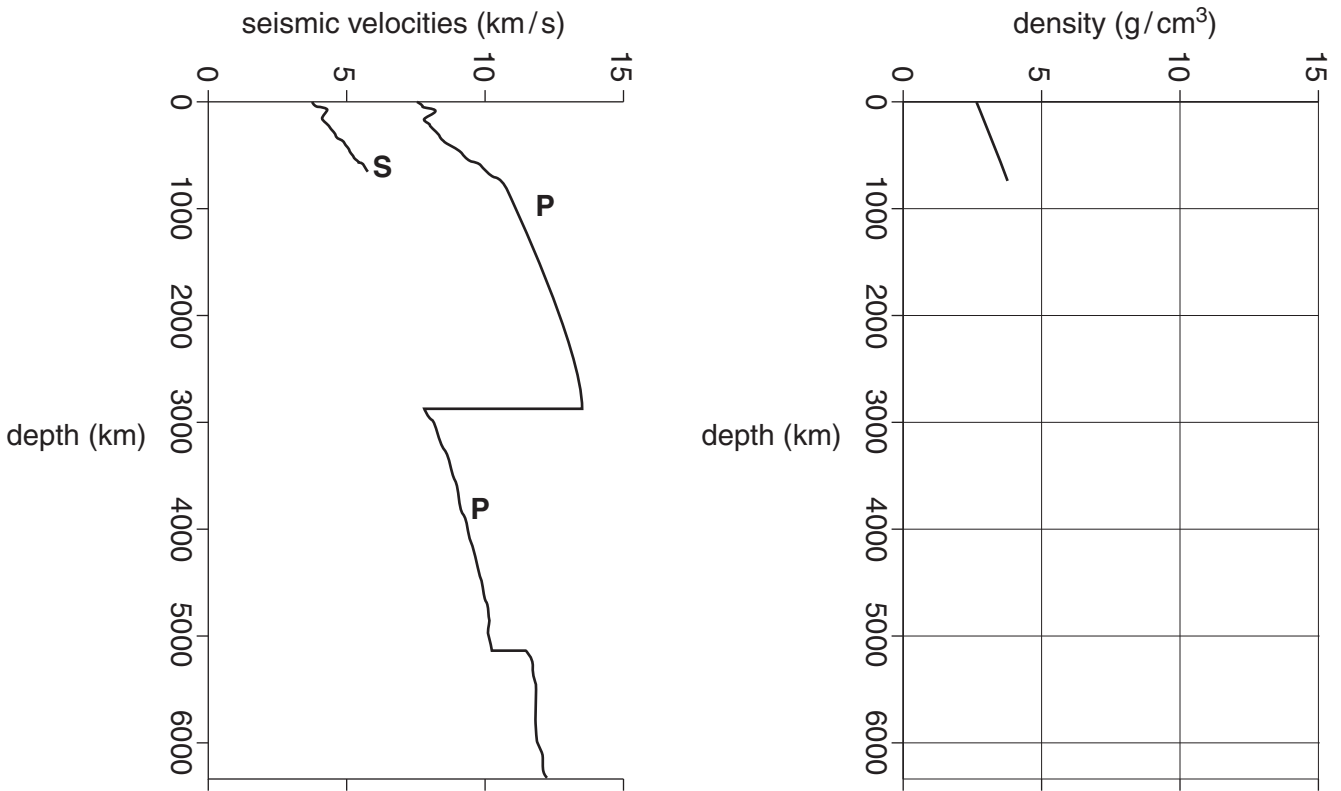
[2]

- (ii) Shade and label an area with fold mountains.

[1]



2 The graph on the left below shows the velocity of **P** waves through the Earth. The graph on the right is to show density changes through the Earth.



(a) (i) Complete the line on the graph for the velocity for **S** waves. [2]

(ii) Label the asthenosphere on the velocity graph. [1]

(iii) How do seismic waves help to locate the asthenosphere?

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

(iv) Label the Lehman discontinuity on the velocity graph. [1]

(b) Density varies with depth in the Earth as shown in the table below.

depth (km)	2890	2900	4000	5100	5150	6371
density (g/cm <sup>3</sup> )	5.6	9.9	11.3	12.1	12.8	13.1

(i) Complete the line on the graph for density using the data in the table. [2]

(ii) Explain why there is a sudden change in density at 2900 km.

.....

.....

.....

..... [2]

(c) Earthquakes are capable of causing huge amounts of damage to the built environment.

Name and describe **two** different methods used by engineers to reduce the impact of earthquakes on a built structure.

method .....

description .....

.....

method .....

description .....

..... [4]

[Total: 13]

3 (a) (i) How has the age of the Earth been determined accurately?

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

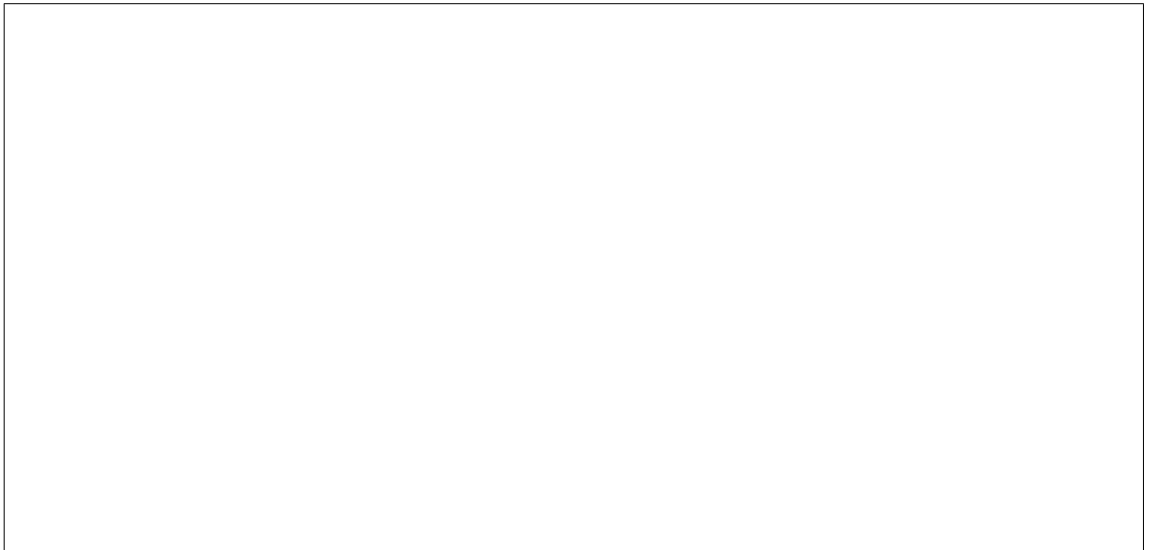
(ii) State the age of the Earth.

..... [1]

(iii) State the age of the oldest rocks on Earth.

..... [1]

(b) (i) Explain, with the aid of a diagram, how the age pattern of rocks in the ocean crust provides evidence for sea floor spreading.



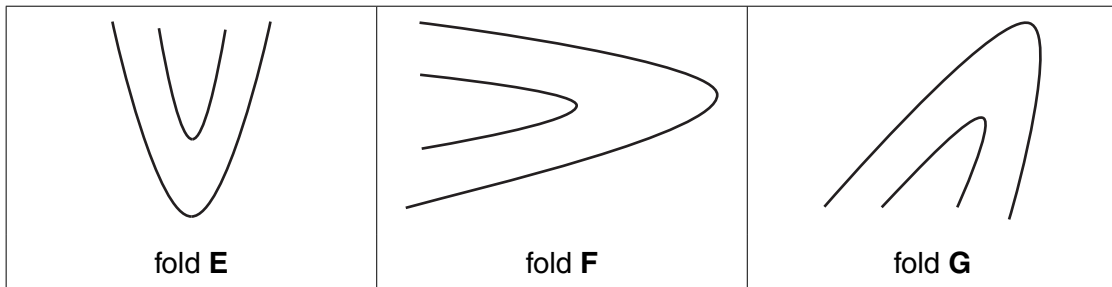
.....  
.....  
.....  
..... [3]

(ii) Describe and explain **one** other piece of evidence for sea floor spreading.

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

[Total: 8]

4 (a) The cross-sections below are of three different types of fold.



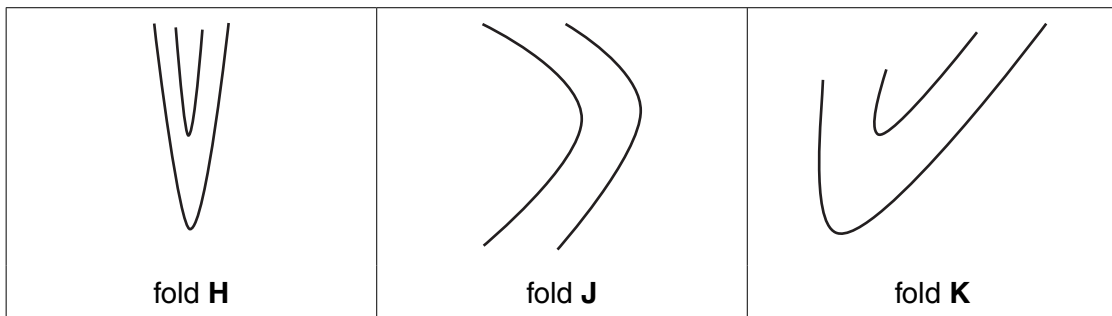
(i) Draw the axial plane on fold **G** above. [1]

(ii) Complete the table giving the correct letter for each fold type.

fold type	letter
overfold	
recumbent	
upright	

[2]

(b) Below are cross section diagrams of three folds **H**, **J** and **K**.

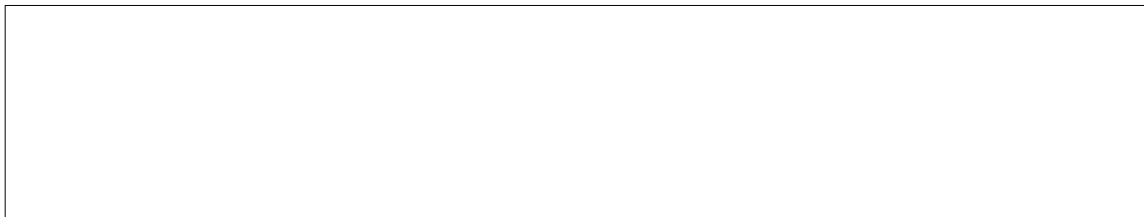


(i) Identify the isoclinal fold. .... [1]

(ii) Label on the cross section of fold **K**:

- the trough [1]
- a limb.

(c) Draw a fully labelled cross section diagram of a nappe.

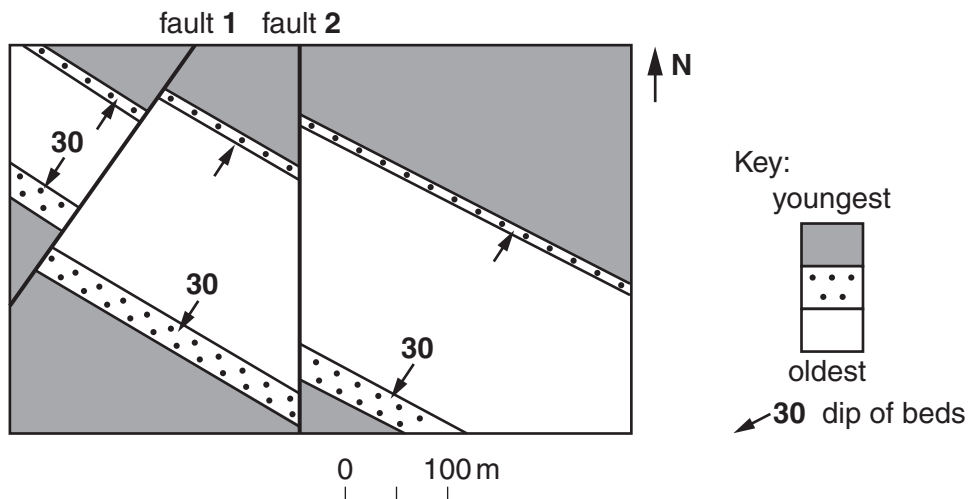


[2]

[Total: 7]

Turn over

5 Below is a geological sketch map. The land is flat.



- (a) (i) Using all the information provided, state the type of fold shown in the map. .... [1]
- (ii) Explain how you determined the fold type. .... [1]
- (iii) Draw the axial plane trace along the full length of the fold. .... [1]
- (iv) State a possible angle of dip for the northern part of the fold. .... [1]
- (v) Explain how you estimated this possible angle of dip. .... [1]
- (b) (i) How can you tell from the map that fault 1 is a dip-slip fault? .... [1]
- (ii) State which side of fault 1 is the downthrow side. .... [1]
- (iii) Explain how you determined the downthrow side. .... [1]



(c) (i) Identify fault 2.



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

..... [1]

(ii) Use the scale to measure the displacement along fault 2.

..... m [1]

(d) Striations can form along the fault plane in the direction of fault movement. What is the correct term for this feature?



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

..... [1]

**[Total: 11]**





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