

ADVANCED SUBSIDIARY GCE
GEOLOGY
Global Tectonics

F791

Candidates answer on the question paper.

OCR supplied materials:

None

Other materials required:

- Electronic calculator
- Ruler (cm/mm)
- Pair of compasses

Thursday 19 May 2011
Morning

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 page 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 may use an electronic calculator.
- You are advised to show all steps in any calculations.
- This document consists of **12** pages. Any blank pages are indicated.

Answer **all** the questions.

1 The structure and composition of the crust and mantle can be obtained from direct evidence.

(a) (i) Name and describe **one** type of direct evidence for the composition of the crust.

.....

 [2]

(ii) Name and describe **one** type of direct evidence for the composition of the mantle.

.....

 [2]

(b) (i) Complete the table below showing the characteristics of oceanic and continental crust.

crust type	age of the oldest rocks (Ma)	average composition	average thickness (km)	density (g/cm ³)
oceanic	200		7	
continental		silicic / intermediate		2.7

[4]

- (ii) Draw a fully labelled cross section through the oceanic crust to show the sequence of rocks.

[2]

[Total: 10]

- 2 (a) (i) Describe how volcanic activity has been identified on Mars, Venus and the moons of Jupiter.

.....

.....

.....

..... [2]

- (ii) One of the moons of Jupiter shows a lot of volcanic activity. Name this moon.

..... [1]

- (b) State the region of the Solar System where most meteorites are thought to originate.



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

..... [1]

[Total: 4]

3 (a) There are thought to be a number of processes that drive plate movement, including mantle convection.

(i) Describe the process that may “push” plates apart at ocean ridges.

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

(ii) Describe the process that may “pull” plates apart.

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

(iii) Describe **one** piece of evidence for rising convection currents.

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

(iv) Explain why no oceanic crust is older than 200 Ma (Jurassic).

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

(b) Describe **two** pieces of evidence from the oceanic crust for sea floor spreading.

1
.....
.....
.....

2
.....
.....
..... [4]

(c) (i) In the space below, draw a diagram of a convergent plate margin involving continental plates only. Label the following on the diagram:

- fold mountains
- batholiths
- rocks being metamorphosed
- an area of partial melting
- the directions of plate movement.



[4]

(ii) What is the name of the fold mountain range formed by the convergence of the Indian and Eurasian plates?

..... [1]

(iii) Name a type of fault that is responsible for thickening of the crust.

..... [1]

(iv) Slabs of oceanic crust may be broken off and included in fold mountains. What is the name for these slabs of oceanic crust?



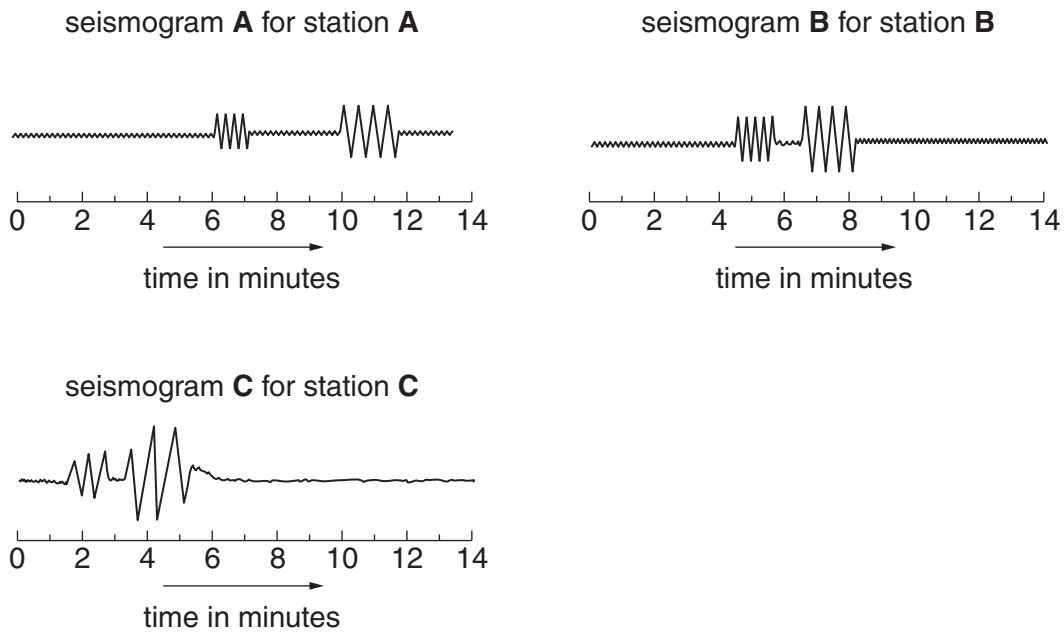
In your answer, you should use an appropriate technical term, spelled correctly.

..... [1]

[Total: 15]

- 4 Information from seismograms can be used by seismologists to locate the epicentre of an earthquake.

Simplified seismograms from three seismometers are shown below:



- (a) Calculate the arrival times to the nearest half minute for the P and S waves for seismograms **B** and **C**. Seismogram **A** has been completed for you.

	P wave arrival time (min)	S wave arrival time (min)
seismogram A	6	10
seismogram B		
seismogram C		

[2]

- (b) Using the P wave arrival time data from the seismograms and assuming that P waves travel at 500km/min, calculate the distance from the epicentre for stations **B** and **C**. Station **A** has been calculated for you.

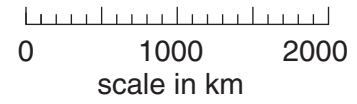
station **A** distance 3000 km

station **B** distance km

station **C** distance km

[2]

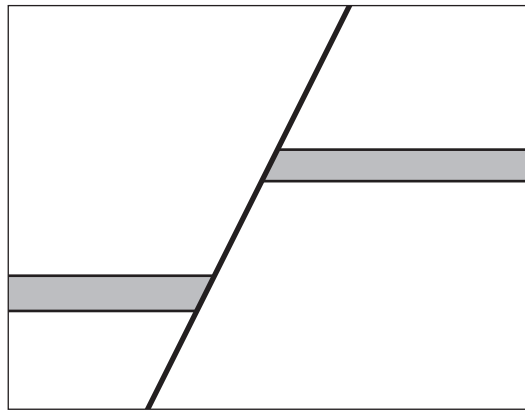
- (c) Using the distance from epicentre data for all 3 stations, locate the epicentre of the earthquake.



[3]

[Total: 7]

(c) The cross section below shows faulted strata.



(i) On the cross section, clearly label the following features:

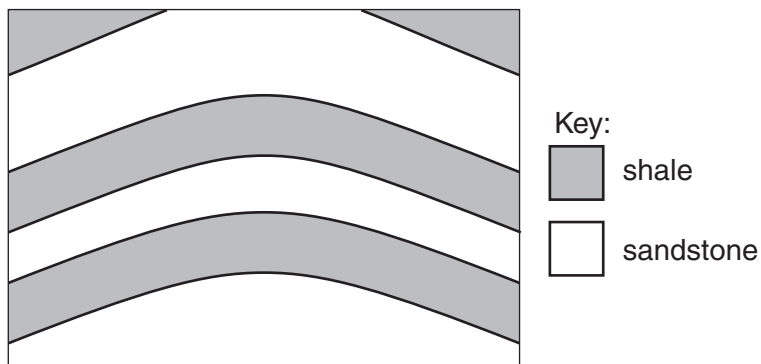
- fault plane
- fault dip
- hanging wall
- downthrow side.

[4]

(ii) Identify the type of fault.

..... [1]

(d) (i) On the diagram below, draw joints where they are most likely to form.



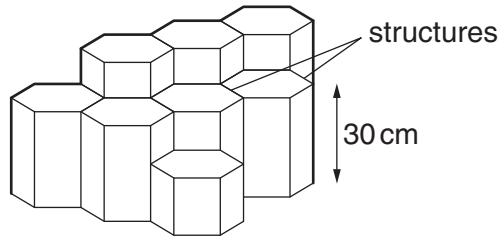
[1]

(ii) Explain your choice of location for the joints.

..... [1]

..... [1]

(iii) The diagram below shows a structure found in igneous rocks. Identify the structure and explain how it forms.



name of structure

how it forms

..... [2]

[Total: 16]

