

Friday 18 May 2012 – Afternoon

AS GCE GEOLOGY

F791 Global Tectonics

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	
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Centre number							Candidate number				
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INSTRUCTIONS TO CANDIDATES

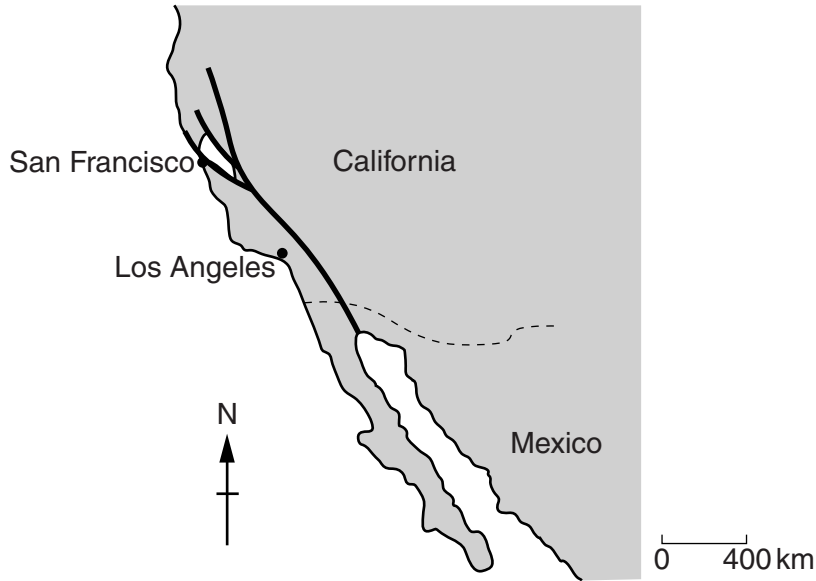
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting 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 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.

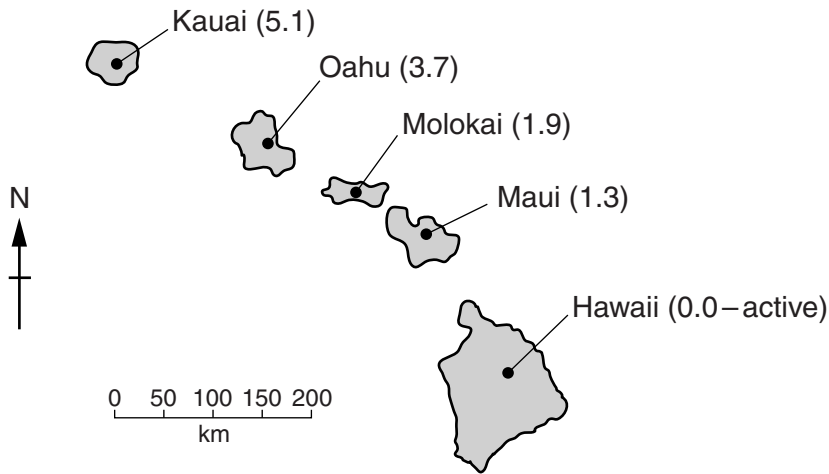
Answer **all** the questions

1 The map below shows a plate margin in California.



- (a) (i) What is the name given to this type of plate margin?
..... [1]
- (ii) Name the major fault associated with this plate margin.
..... [1]
- (iii) Mark on the map the directions of relative plate movement. [1]
- (iv) Label on the map the names of the two plates involved. [1]
- (b) Convection currents in the mantle are thought to help drive plate movement. Geophysicists have used a network of seismometers to construct a 3D image of heat flow within the Earth.
 - (i) What is the name given to this technique?
..... [1]
 - (ii) Explain how convection currents are thought to drive plate movement.
.....
.....
.....
..... [2]

(c) The map shows a small section of the Hawaiian island chain. The numbers indicate the age in millions of years (Ma).



The Hawaiian island chain can be used as evidence for continental drift and is where a mantle plume reaches the surface.

(i) Describe a mantle plume.

.....
 [1]

(ii) Explain how the Hawaiian island chain formed.

.....

 [2]

(d) (i) Use the labelled points on the islands of Hawaii and Kauai to calculate the average rate of plate movement during the last 5.1 Ma. Show your working.

..... cm/year [2]

(ii) Draw an arrow on the map to show the direction that the plate is moving. [1]

(iii) Name the most common rock type formed by the eruption of the Hawaiian volcanoes.
 [1]

[Total : 14]

Turn over

2 (a) The first manned landing on the Moon was in 1969.

(i) Describe how this manned (Apollo) landing has increased geological knowledge of the Moon.

.....
 [1]

(ii) The surface of the Moon is made up of two different types of area. Name and describe these areas.

area 1 name

area 1 description

area 2 name

area 2 description [2]

(b) Geologists have studied meteorites in order to provide evidence for the composition of the Earth.

(i) Where do meteorites come from within the Solar System?



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

..... [1]

(ii) The list and table below contain information about meteorites. Complete the table by writing the name of the correct meteorite chosen from the list:

iron stony carbonaceous chondrite

meteorite type	meteorite description
	contains water and organic compounds
	composed of a metallic alloy
	composed of silicate minerals

[2]

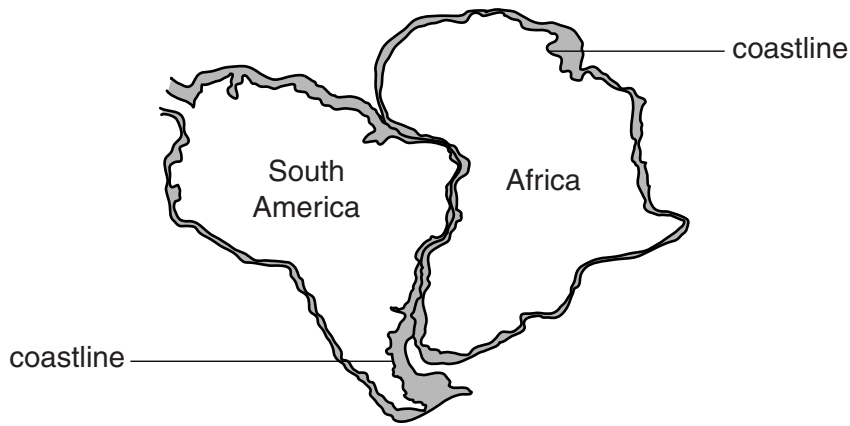
(c) Name the layer of the Earth that each meteorite listed below is thought to represent.

stony

iron [2]

[Total : 8]

- 3 (a) A great deal of geological evidence has been used to show the movements of continents over time. Below is a map of South America and Africa showing the jigsaw fit of the continents.



Give **two** reasons why the fit of the continents using coastlines is not perfect.

.....

.....

.....

..... [2]

- (b) Describe how specific rock types and ages provide evidence of continental drift.

.....

.....

.....

..... [2]

- (c) Describe how a fold mountain chain can provide evidence of continental drift. Draw and label a fold mountain chain on the map.

.....

..... [2]

- (d) Draw arrows on the map to show the pattern of glacial striations. Describe how they are used as evidence of continental drift.

.....

..... [2]

- (e) Name the supercontinent that split to form South America and Africa.



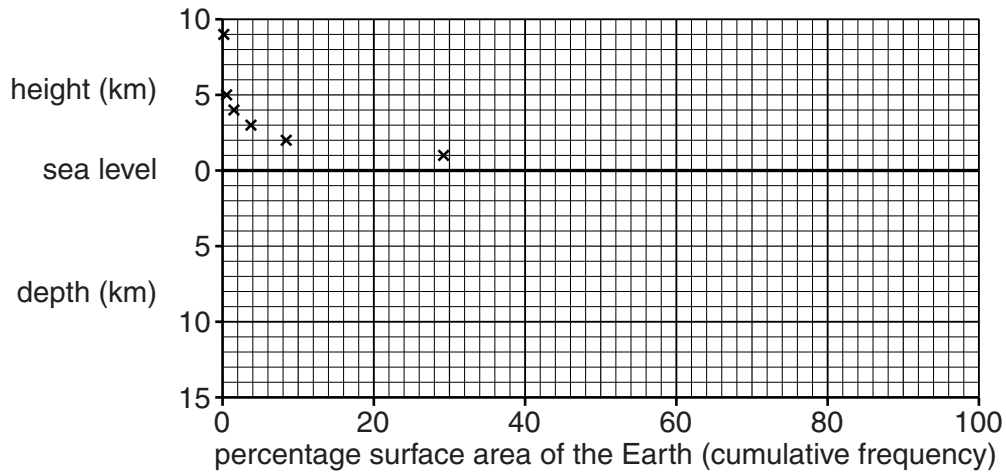
In your answer, you should use the correct technical term, spelled correctly.

..... [1]

- (f) The table below shows the distribution by height and depth of the solid Earth's surface. The data above sea level have been plotted.

height and depth interval (km)	cumulative % area
above sea level	
9	0.1
5	0.5
4	1.6
3	3.8
2	8.3
1	29.1
below sea level	
1	37.5
2	40.6
3	46.7
4	61.4
5	84.0
6	99.0
12	100.0

- (i) Plot the data below sea level and draw the cumulative frequency curve on the graph below.



[3]

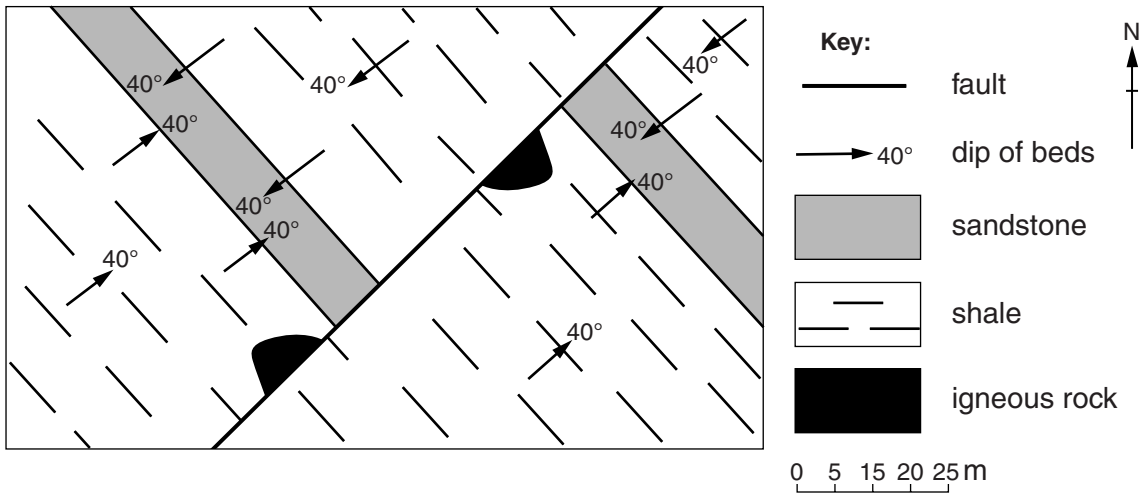
- (ii) On the **graph** label:

- the continental slope
- the abyssal plain.

[2]

[Total : 14]

4 The geological map below shows an area that has undergone earth movements over a long period of time.



(a) (i) Fully describe the fold shown on the map.

.....

 [2]

(ii) Name the type of stress required to produce the fold.

..... [1]

(b) (i) Fully describe the fault shown on the map.

.....

 [2]

(ii) Using the scale provided, measure the amount of displacement along the fault.

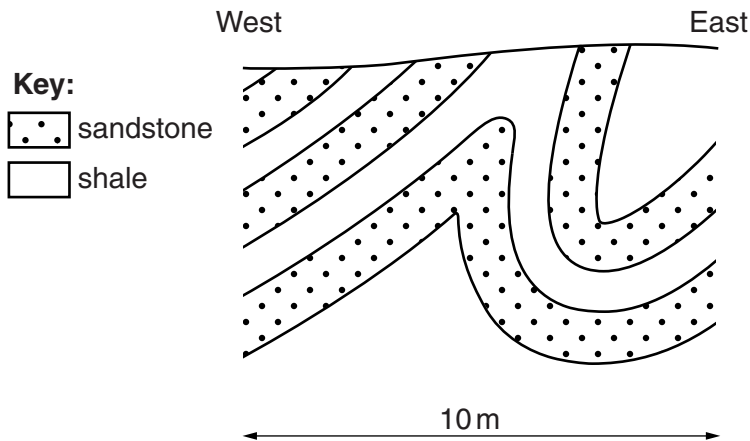
..... m [1]

(c) Draw labelled cross section diagrams to show a horst and a graben.

horst	gaben
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[2]

(d) The cross-section below shows a series of folds exposed on a cliff face.



(i) Draw and label the axial plane for each fold on the cross section.

[1]

(ii) Label the following features on the diagram:

- crest
- limb
- trough.

[2]

(iii) Which direction did the maximum pressure come from?

..... [1]

(iv) Circle the term which best describes the folds shown on the cross section:

- isoclinal nappe overfold recumbent

[1]

10

- (e) Draw a map view to show a dome and a basin. Draw a minimum of two beds and label the oldest and youngest beds. Add dip arrows.

dome	basin
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[3]

[Total : 16]

