THIS IS A LEGACY SPECIFICATION

OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE

GEOLOGY

2831

Global Tectonics and Geological Structures

OCE/T62810

Candidates answer on the question paper

OCR Supplied Materials:
None

Other Materials Required:
- Electronic calculator
- Ruler (cm/mm)

Wednesday 20 May 2009
Afternoon

Duration: 1 hour

2831

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

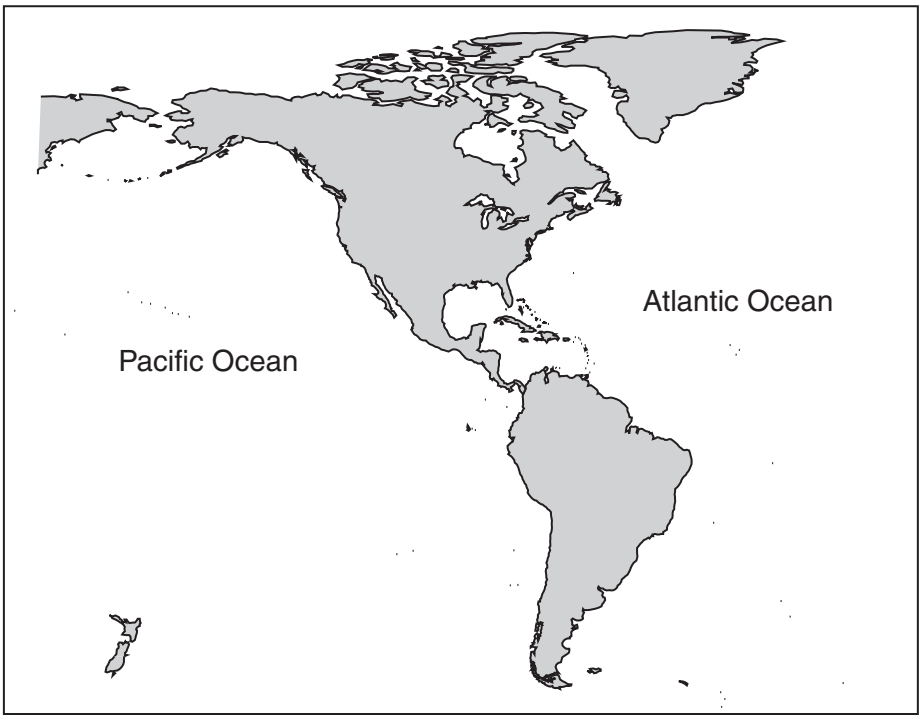
INFORMATION FOR CANDIDATES

- 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**.
- You will be awarded marks for the quality of written communication where this is indicated in the question.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.
- This document consists of **12** pages. Any blank pages are indicated.

FOR EXAMINER'S USE		
Qu.	**Max**	**Mark**
1	**17**	
2	**15**	
3	**18**	
4	**10**	
TOTAL	**60**	

Answer **all** the questions

1 The map below shows North and South America and the surrounding oceans.



(a) (i) On the map shade and label **two** areas of high heat flow from **different** types of plate boundary. Label these areas **A** and **B**. **[2]**

(ii) For each area you have shaded explain why high heat flow exists.

A .....

.....

B .....

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

(iii) On the map shade and label **one** area of low heat flow. Label this area as **C**. **[1]**

(iv) Explain why a low heat flow exists at **C**.

.....

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

(b) **(i)** In the space below draw a cross-section of a destructive oceanic-oceanic plate margin. Add the following labels:

- earthquakes
- volcanoes
- island arc
- partially melting crust
- convection currents

[5]

(ii) Explain why earthquakes occur at destructive plate margins.

.....

.....

.....

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

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

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

method 1 .....

description .....

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

method 2 .....

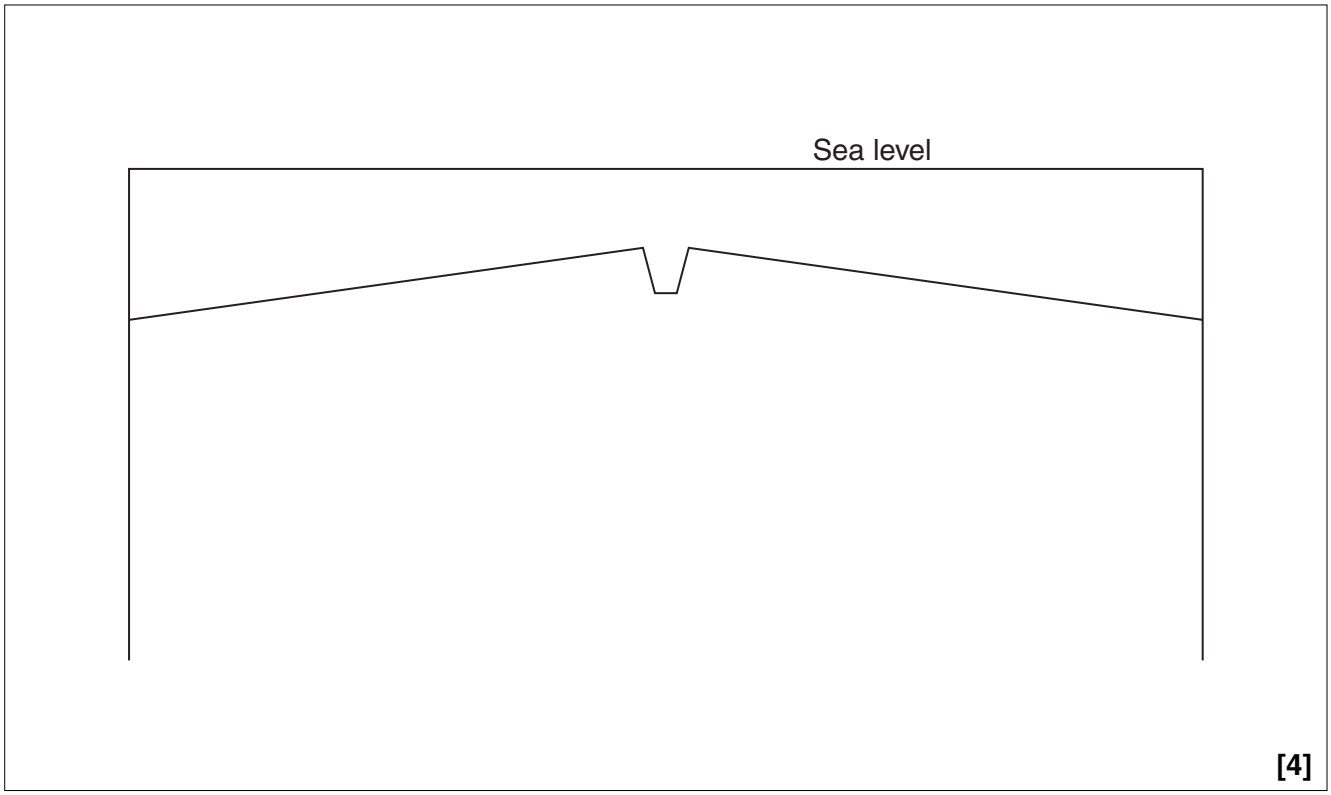
description .....

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

[Total: 17]

2 **(a)** **(i)** In the space below draw a fully labelled cross-section diagram of a constructive plate margin. Add the following labelled features:

- convection currents
- volcanic activity
- rising magma
- axial rift



[4]

(ii) Describe and explain the possible causes of plate movements at mid-ocean ridges.

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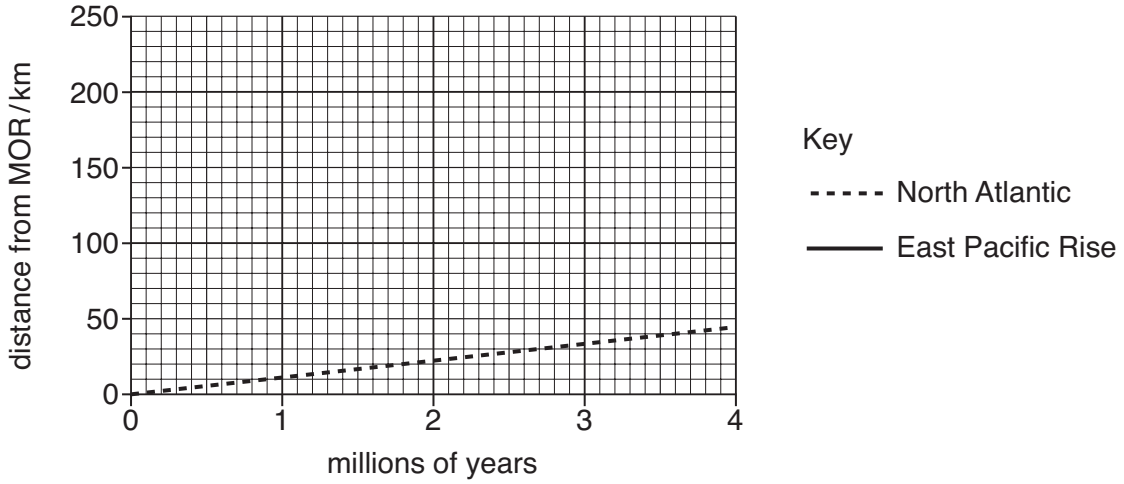
..... **[2]**

(b) The graph below can be used to calculate the rate of spreading at the North Atlantic Ridge.



(i) On the grid opposite, draw the graph to show spreading at the East Pacific Rise. Use data in the table below. **[3]**

distance from MOR/km	0	50	100	150	200
millions of years	0	0.8	1.7	2.5	3.4

(ii) Calculate the rate of spreading of the East Pacific Rise. Show your working.

..... cm / year **[2]**

(iii) How does the graph show you that the East Pacific Rise is spreading at a faster rate?

.....

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

(c) Describe the sequence of rocks that would be found in a borehole drilled through the ocean crust.

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

[Total: 15]

3 **(a)** Define the terms *stress* and *strain* in relation to rocks:

stress .....

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

strain .....

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

(b) When rocks are deformed they behave in a *competent* or *incompetent* manner. Define each term and give an example of a rock that deforms in each way.

(i) *competent* .....

.....

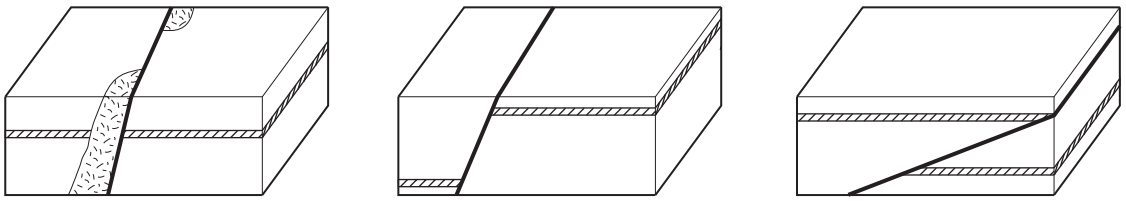
example ..... **[2]**

(ii) *incompetent* .....

.....

example ..... **[2]**

(c) The diagrams below show three types of fault.



D **F** **G**

(i) Name the fault types **D**, **F** and **G.**

D .....

F .....

G ..... **[3]**

(ii) Label the footwall on fault **F** above. **[1]**

(iii) Complete the table below using **D**, **F** and **G** to show the type of stress for each fault type.

stress type	fault (**D**, **F** or **G**)
compression	
shear	
tension	

[2]

(d) Slickensides and fault breccias are two features that can be found along fault planes.

(i) In the space below draw a labelled diagram to show slickensides.
Explain how they form.

.....

.....

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

(ii) In the space below draw a labelled diagram to show a fault breccia.
Explain how it forms.

.....

.....

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

[Total: 18]

4 In this question, two marks are available for the quality of written communication. You may use diagrams to illustrate your answer.

Describe the detailed layered structure of the Earth's mantle and core. For each layer describe its:

- depth
- physical state
- composition.

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.... **[8]**

Quality of Written Communication [2]

[Total: 10]

Optional extension sheet. If you use this lined page to complete an answer to any question, the question number **must** be clearly shown.

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END OF QUESTION PAPER

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