



**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)

**Thursday 20 May 2010**  
**Morning**

**Duration: 1 hour**



|                       |  |  |  |  |                      |  |  |  |  |
|-----------------------|--|--|--|--|----------------------|--|--|--|--|
| Candidate<br>Forename |  |  |  |  | Candidate<br>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. 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.

**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 marks for the quality of written communication in your answer.
- 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.

Answer **all** the questions.

- 1 Seismic activity is common around Japan.

- (a) (i) Define the term *focus*.

..... [1]

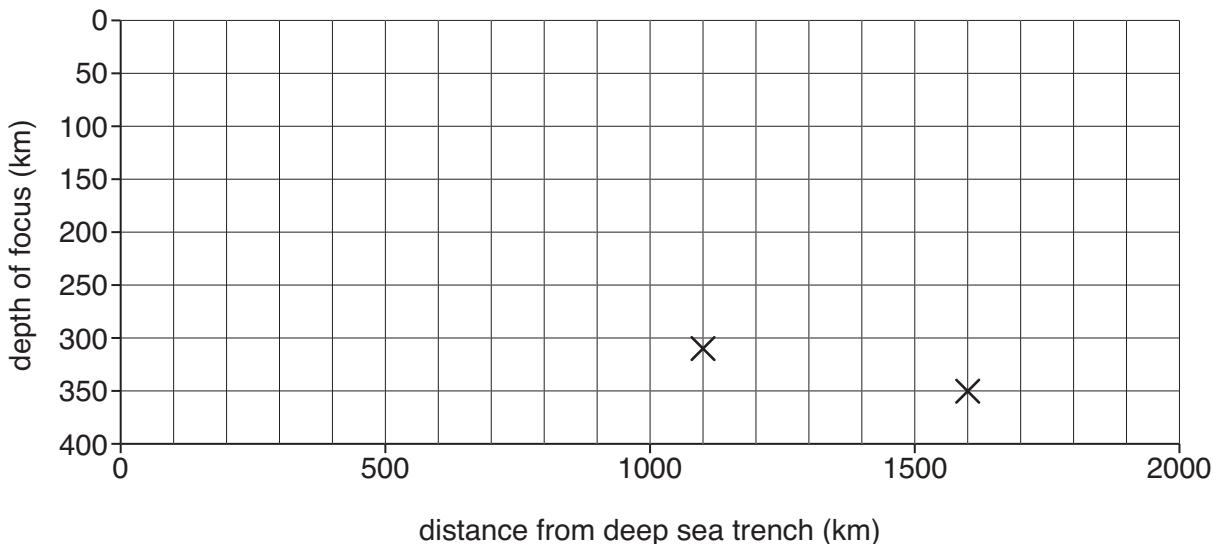
- (ii) Describe a deep sea trench.

..... [1]

- (b) The table below shows data on the depth of focus and distance from the deep sea trench near Japan.

|                                 |      |      |     |     |     |     |     |      |      |     |
|---------------------------------|------|------|-----|-----|-----|-----|-----|------|------|-----|
| distance<br>from trench<br>(km) | 1600 | 1100 | 900 | 390 | 180 | 100 | 420 | 1200 | 1000 | 260 |
| depth of focus<br>(km)          | 350  | 310  | 200 | 30  | 35  | 20  | 175 | 375  | 375  | 45  |

- (i) Plot the data on the graph below and draw the straight line of best fit.  
Data from the first two columns have been plotted for you.



[3]

- (ii) What is the name of this zone of earthquake foci?



*In your answer, you should use the appropriate technical terms, spelled correctly.*

[1]

- (iii) Explain what causes this zone.

.....  
.....  
.....

[2]

- (c) (i) Describe **two** geological hazards caused by shallow focus earthquakes in the Japan region.

hazard 1 .....

.....  
.....

hazard 2 .....

[2]

- (ii) Name and describe **two** methods of reducing the impact of a major earthquake on the built environment.

method 1 .....

.....  
.....

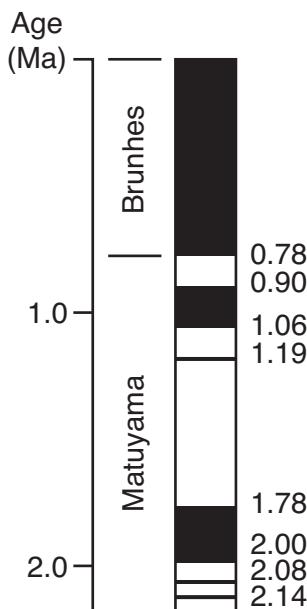
method 2 .....

.....  
.....

[4]

**[Total: 14]**

- 2 (a) The diagram below shows periods of normal and reversed polarity of the Earth's magnetic field.



- (i) Explain what may cause magnetic field reversals to take place.

.....  
.....  
.....  
.....

[2]

- (ii) Explain how some rocks retain magnetism permanently.

.....  
.....  
.....  
.....

[2]

- (b) Using the data from the diagram above calculate the average period of time between the 10 reversals from 2.14 Ma to 0.78 Ma. Give your answer to 3dp. Show your working in the space below.

..... Ma  
[2]

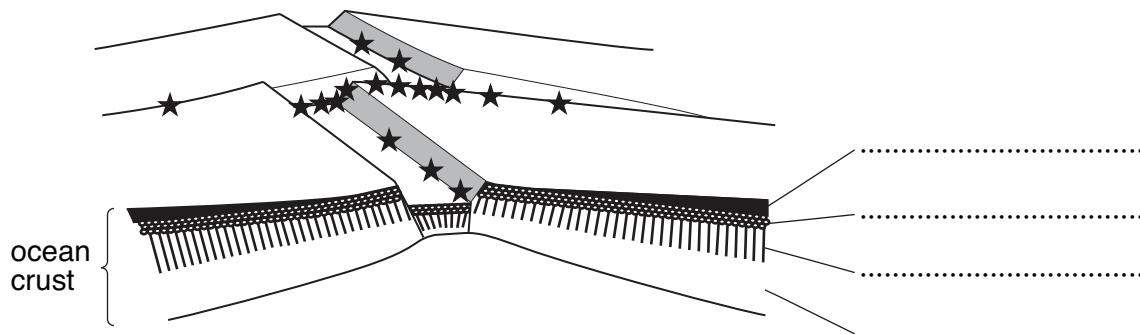
- (c) Explain how magnetic reversals can provide evidence for sea floor spreading.

.....  
 .....  
 .....  
 .....

[2]

(d)

★ — epicentres



- (i) On the block diagram above label:

- a transform fault
- a rift valley/graben

[2]

- (ii) Draw and label **two** positive and **one** negative magnetic reversals on the diagram. [1]

- (iii) Explain **two** causes of the earthquakes shown by the epicentres on the diagram.

1 .....

.....  
 2 .....

[2]

- (e) (i) Ocean crust consists of basalt, sediment, gabbro and dolerite. Label each of these in the correct order on the diagram. [2]

- (ii) Describe how the sediment forms.

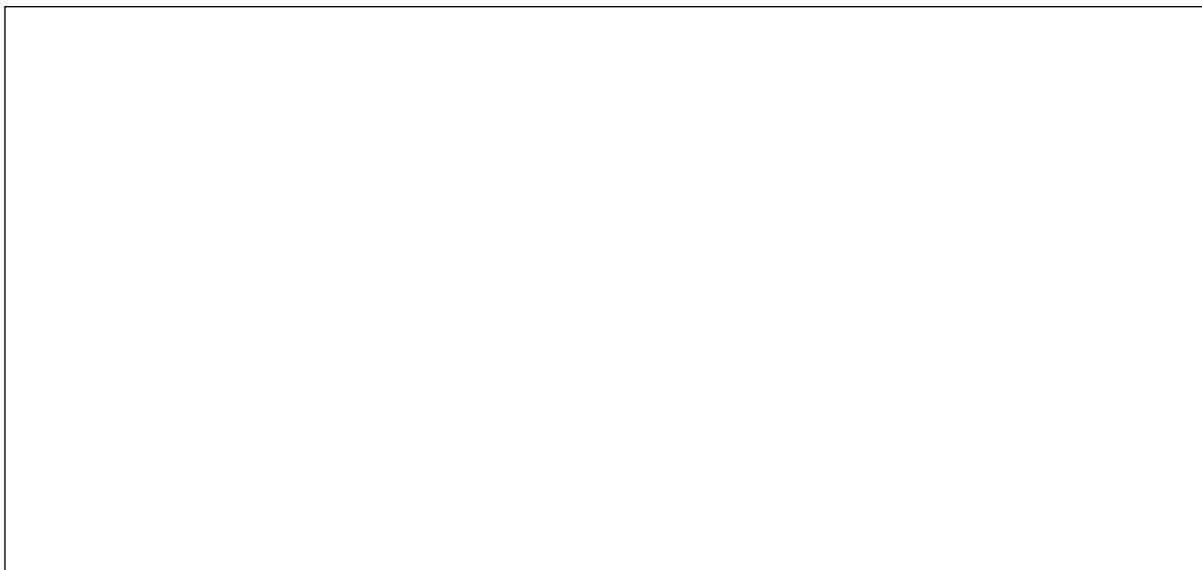
.....  
 .....

[1]

[Total: 16]

3 (a) Draw an asymmetric syncline with at least one bed.

- Label on your cross-section the position of the youngest rocks.
- Draw and label the fold axial plane on the diagram.

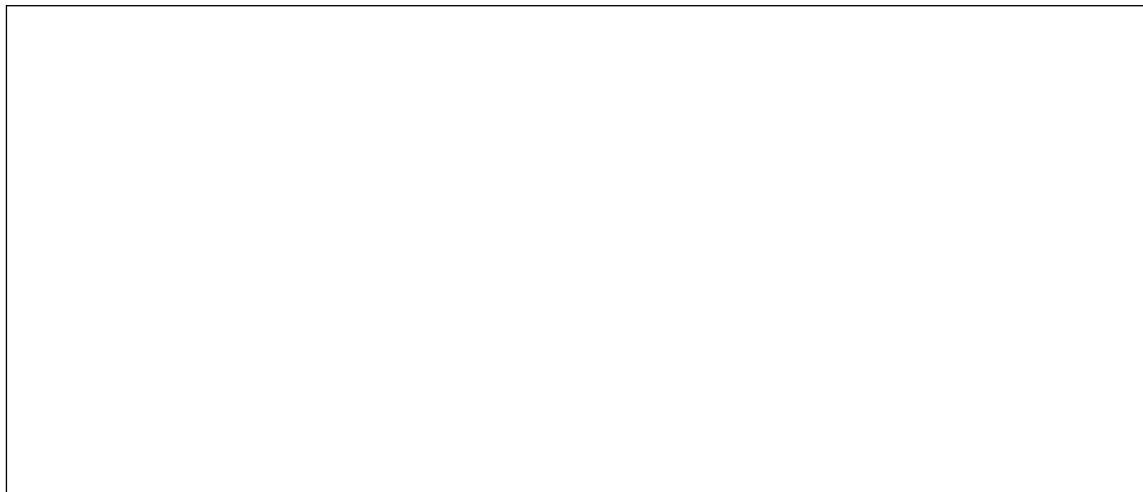


[4]

(b) Name a type of fault formed by compressive stress.

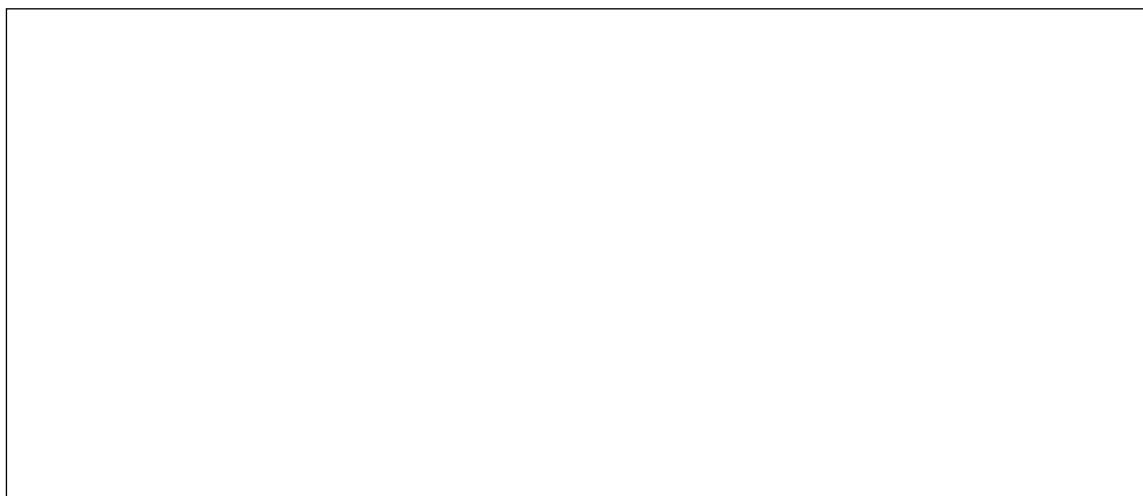
..... [1]

- (c) (i) Cleavage can occur in shales during folding. With the aid of diagrams show how cleavage forms in shales.



[3]

- (ii) Explain why sandstone does not show cleavage while shale does. Use the words *competent* and *incompetent* in your answer. You may use diagrams to illustrate your answer.

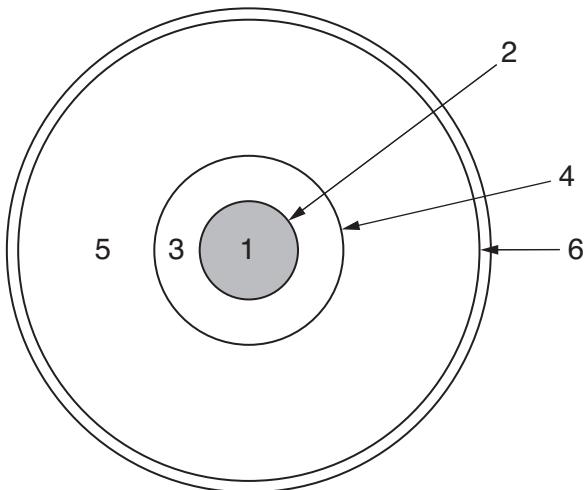


[2]

[Total: 10]

Turn over

- 4 The diagram below shows a simplified cross section through the Earth. 1, 3 and 5 are layers. 2, 4 and 6 are discontinuities.



(Not to scale)

- (a) Complete the table by writing the correct number from the diagram in each of the spaces.

| layer or discontinuity | number |
|------------------------|--------|
| Gutenberg              |        |
| inner core             |        |
| Lehmann                |        |
| mantle                 |        |
| Moho                   |        |
| outer core             |        |

[4]

- (b) Seismic waves are used to study the interior of the Earth.

- (i) Name the instrument used to detect seismic waves.



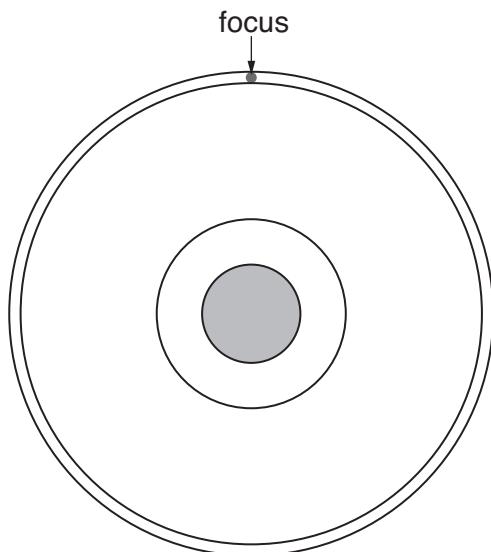
*In your answer, you should use the appropriate technical terms, spelled correctly.*

..... [1]

(ii) On the diagram below (not to scale) draw and label:

- the path of a P wave which travels through the core
- the path of an S wave
- the path of an L wave.

[3]



(c) (i) State where the P wave shadow zone is.

From ..... degrees to ..... degrees. [1]

(ii) Explain why the P wave shadow zone exists.

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

(iii) Explain why the S wave shadow zone exists.

..... [1]

**[Total: 12]**

10

- 5** Describe the following major features found under the oceans. You may use diagrams to illustrate your answer.

- abyssal plain
  - continental shelf
  - continental slope
  - seamount

. [8]

[Total: 8]

**END OF QUESTION PAPER**

11

**PLEASE DO NOT WRITE ON THIS PAGE**



**Copyright Information**

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations, is given to all schools that receive assessment material and is freely available to download from our public website ([www.ocr.org.uk](http://www.ocr.org.uk)) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.