OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced Subsidiary GCE

GEOLOGY 2831

Global Tectonics and Geological Structures

Wednesday **11 JANUARY 2006** Afternoon 1 hour

Candidates answer on the question paper.
Additional materials:
Electronic calculator
Ruler (cm/mm)

Candidate Name	Centre Number	Candidate Number

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers in the spaces provided on the question paper.
- Read each question carefully and make sure you know what you have to do before starting your answer.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- You will be awarded marks for the quality of written communication where this is indicated in the question.

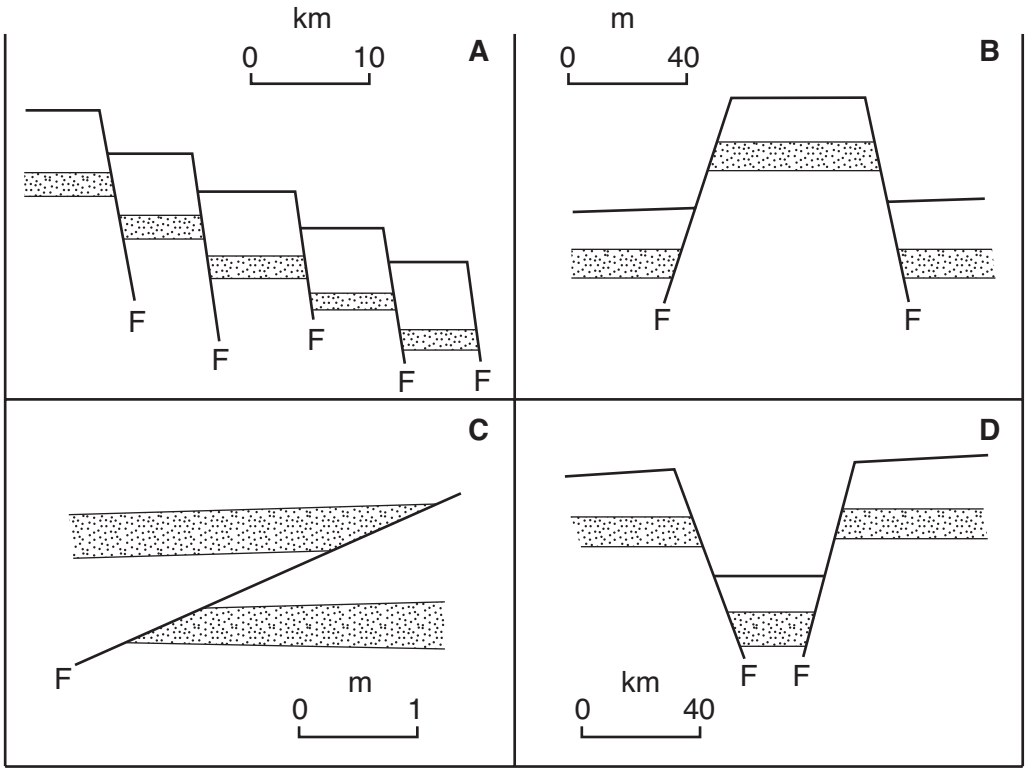
FOR EXAMINER'S USE		
Qu.	**Max.**	**Mark**
1	**16**	
2	**19**	
3	**15**	
4	**10**	
TOTAL	**60**	

This question paper consists of 11 printed pages and 1 blank page.

Registered Charity Number: 1066969
[Turn over

Answer **all** the questions.

1 The diagrams below show cross sections of four different fault structures.



(a) (i) Name the fault structures shown in the diagrams above, and for each, state whether the stresses involved are tensional or compressional.

	name	stress
A		
B		
C		
D		

[4]

(ii) Explain the difference between tensional and compressional forces.

.....

.....

.....

.....[2]

(b) Name **one brittle** and **one ductile** deformation structure.

brittle .....[1]

ductile .....[1]

(c) With the aid of a fully labelled diagram, describe a transform fault at a Mid Ocean Ridge.

.....

.....[3]

(d) The map below shows part of North America and the San Andreas Fault.

A map has been removed due to third party copyright restrictions

Details: A map showing part of North America and the San Andreas fault

(i) What type of plate margin lies along the San Andreas Fault? Circle the correct term.

conservative constructive destructive [1]

(ii) Name and label on the map the two plates involved. [1]

(iii) What type of movement occurs along the fault? Circle the correct term.

dextral dip-slip sinistral [1]

(iv) Along one section of the San Andreas Fault, rocks have been displaced by 20km over a period of 1 million years. What is the average speed of movement along this section of fault? Give your answer in mm/year.

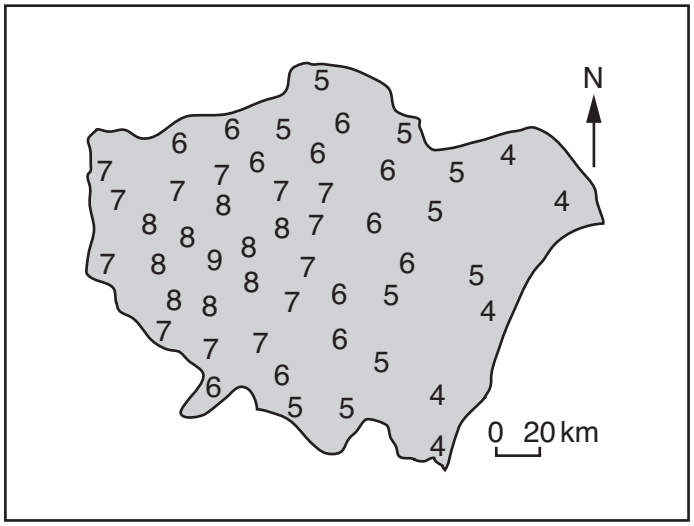
…….mm/yr [1]

(v) In another area, the rocks have been displaced for a period of 15 million years. The rate of movement has been calculated at 10mm/year. How far have the rocks been displaced? Give your answer in km.

…..…….km [1]

[Total: 16]

2 The map below shows Mercalli Scale readings for an earthquake that affected an island in Indonesia.



(a) (i) Draw isoseismal lines for this earthquake on the map above. [3]

(ii) On the map, label the epicentre of the earthquake. [1]

(iii) The epicentre is in an urban area. Describe a non-geological factor that will control the amount of damage to buildings caused by this earthquake.

.....

.....[1]

(iv) This Indonesian island belongs to a chain of seismically and volcanically active islands. Give the technical term for such a chain of islands and state the type of plate margin.

technical term .....

type of plate margin .....[2]

(b) (i) Define the term *earthquake magnitude*.

.....

.....[1]

(ii) Define the term *earthquake intensity*.

.....

.....[1]

(c) (i) Describe a geological situation where an earthquake is likely to trigger a landslide.

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.....[2]

(ii) Some buildings are built on drained reclaimed land underlain by unconsolidated sands and gravels. Explain why these buildings are likely to suffer more damage during an earthquake.

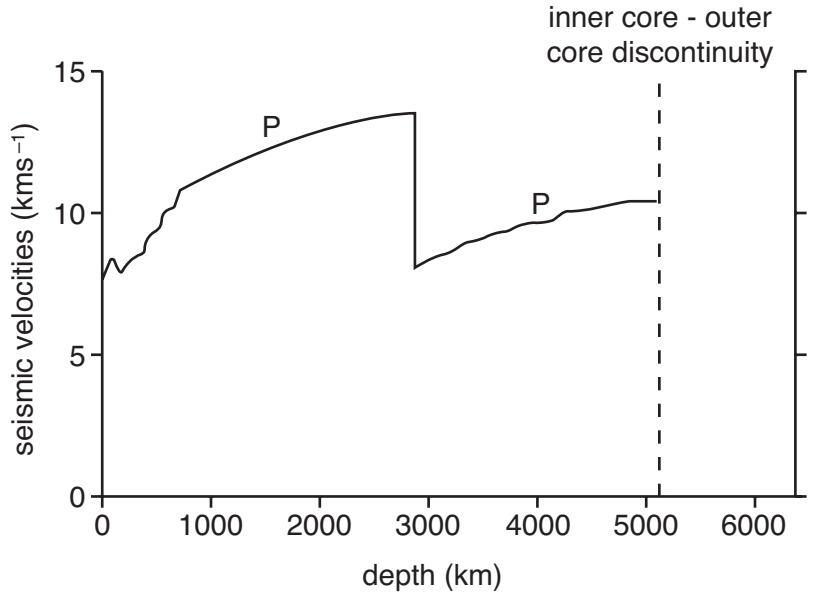
.....

.....[1]

(iii) What additional hazard can occur if an earthquake epicentre is on the ocean floor?

.....[1]

(d) The graph below shows how P wave velocity varies with depth.



(i) On the graph above, label clearly the position of

- the asthenosphere
- the core – mantle discontinuity. [2]

(ii) The inner core – outer core discontinuity has been labelled. On the graph draw and label the approximate velocities of P waves within the inner core. [1]

(iii) On the graph, draw and label a curve to show how the velocity of S waves varies with depth. [2]

(iv) Why do L waves provide little evidence for the internal structure of the Earth?

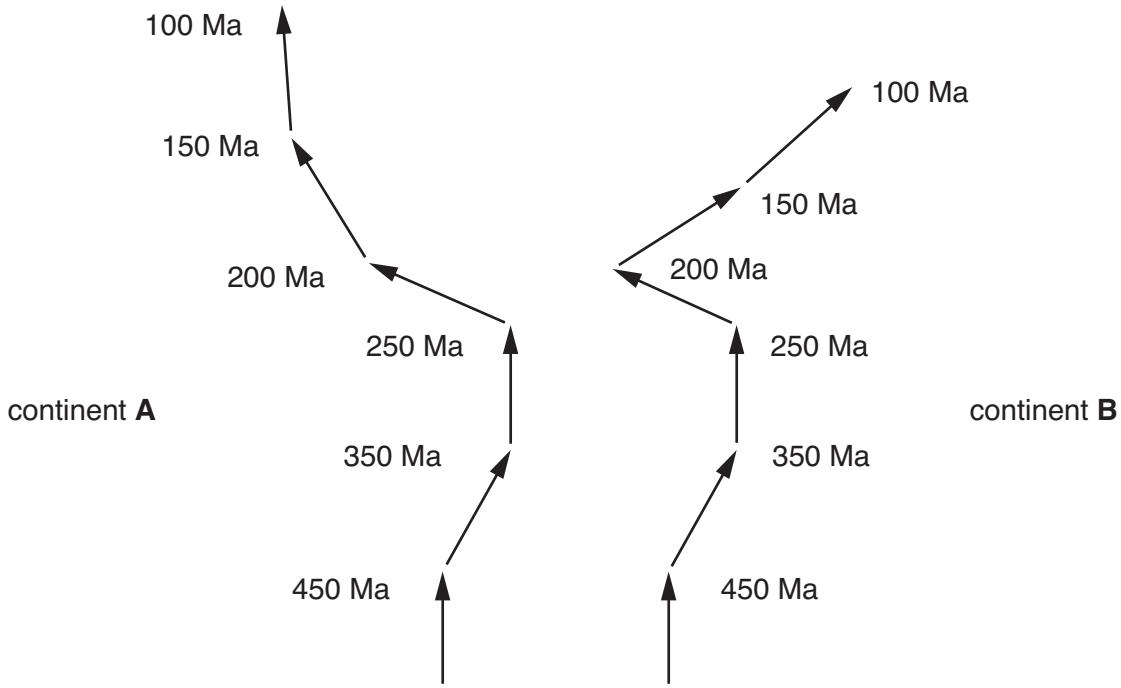
.....

.....[1]

[Total: 19]

[Turn over

3 **(a)** Measurements of palaeomagnetism have been taken in two continents **A** and **B**, from rocks of different ages. The polar wandering curves constructed for these two continents are shown below.



(i) When did the two continents **A** and **B** split apart?

.....[1]

(ii) Explain how you used the polar wandering curves to obtain your answer.

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.....[2]

(iii) From which major group of rocks is most palaeomagnetic data gained?

.....[1]

(b) Describe how continents can split and move apart.

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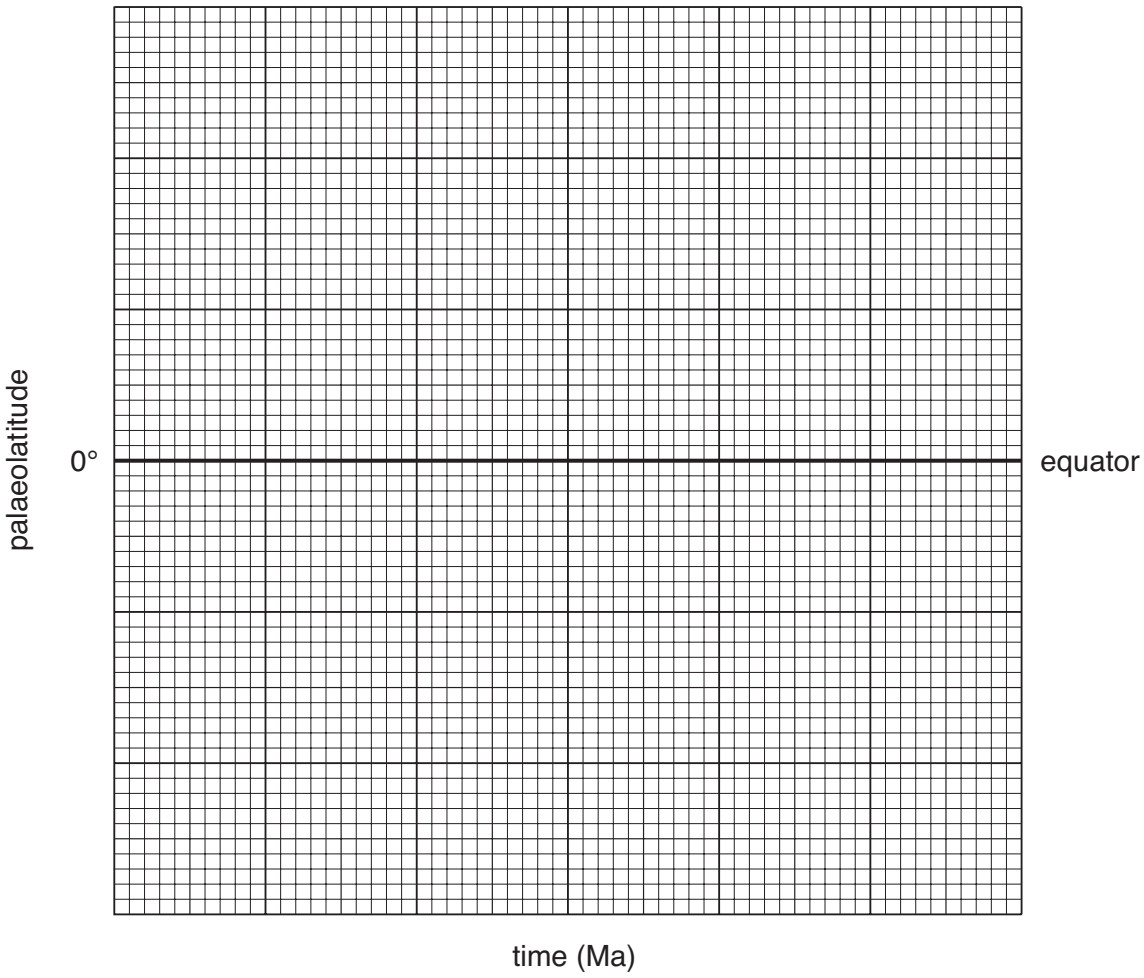
.....[2]

(c) The table below shows how the palaeolatitude of southern Britain has changed over the last 550 million years.

time in millions of years (Ma)	palaeolatitude
present day	55° N
100	40° N
165	35° N
245	25° N
325	0°
390	7° S
430	15° S
480	40° S
550	50° S

(i) Plot a line graph to show the changing palaeolatitude of southern Britain over the last 550 million years. [3]



(ii) Between which times was southern Britain moving most rapidly?

……Ma [1]

[Turn over

(d) (i) In addition to palaeomagnetism, describe **two** other pieces of evidence for the northward drift of Britain through time.

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.....[2]

(ii) What is the driving force for continental drift?

.....[1]

(e) (i) Define the term *hotspot*.

.....

.....[1]

(ii) Give a named example of a hotspot.

.....[1]

[Total: 15]

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

Outline the evidence for sea-floor spreading.

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Quality of Written Communication [2]

[Total: 10]

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