OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced Subsidiary GCE

GEOLOGY 2831

Global Tectonics and Geological Structures

Monday **17 JANUARY 2005** Morning 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	**19**	
2	**16**	
3	**15**	
4	**10**	
TOTAL	**60**	

This question paper consists of 8 printed pages.

Registered Charity Number: 1066969
[Turn over

Answer **all** the questions.

1 **(a)** Match the terms with the definitions.

	terms
1	recumbent
2	nappe
3	basin
4	monocline

	definitions
a	a fold with all dips pointing inwards
b	a fold with both limbs dipping in the same direction
c	a fold broken by a thrust fault
d	a fold with only one limb

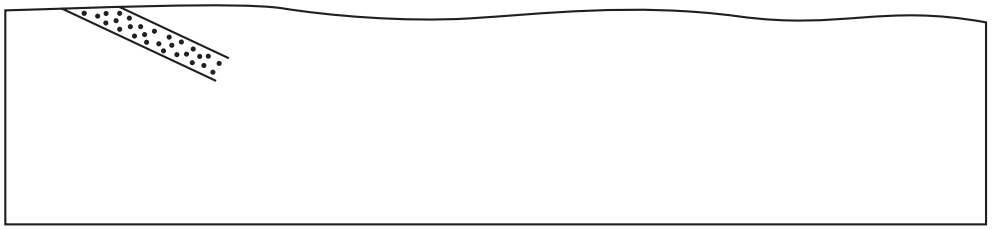
term 1 ..... term 2 .....

term 3 ..... term 4 ..... [3]

(b) **(i)** Complete the cross section below to show

- an asymmetrical syncline
- a symmetrical anticline.

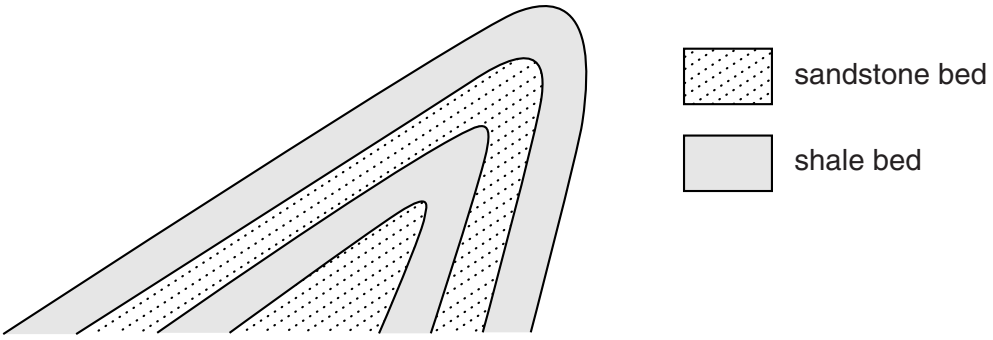
Label each structure.



[2]

(ii) Draw the axial plane for both folds. [1]

(c) The beds below consist of competent and incompetent layers.



(i) Draw tension joints in a competent bed [1]

(ii) Draw cleavage planes in the incompetent beds. [1]

(iii) Explain how slatey cleavage forms in incompetent rock.

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..... [3]

(d) Draw diagrams to show the essential stages in the formation of an angular unconformity. Describe these stages.

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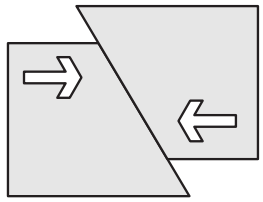
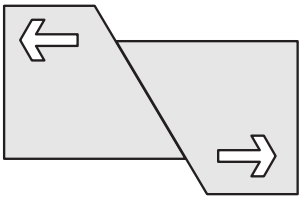
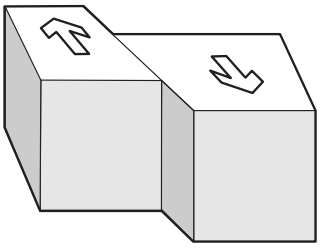
..... [4]

(e) The diagrams below show faults and the forces that caused them.

		
fault 1 (cross section)	**fault 2** (cross section)	**fault 3** (block diagram)

(i) Name the faults **1** and **3**.

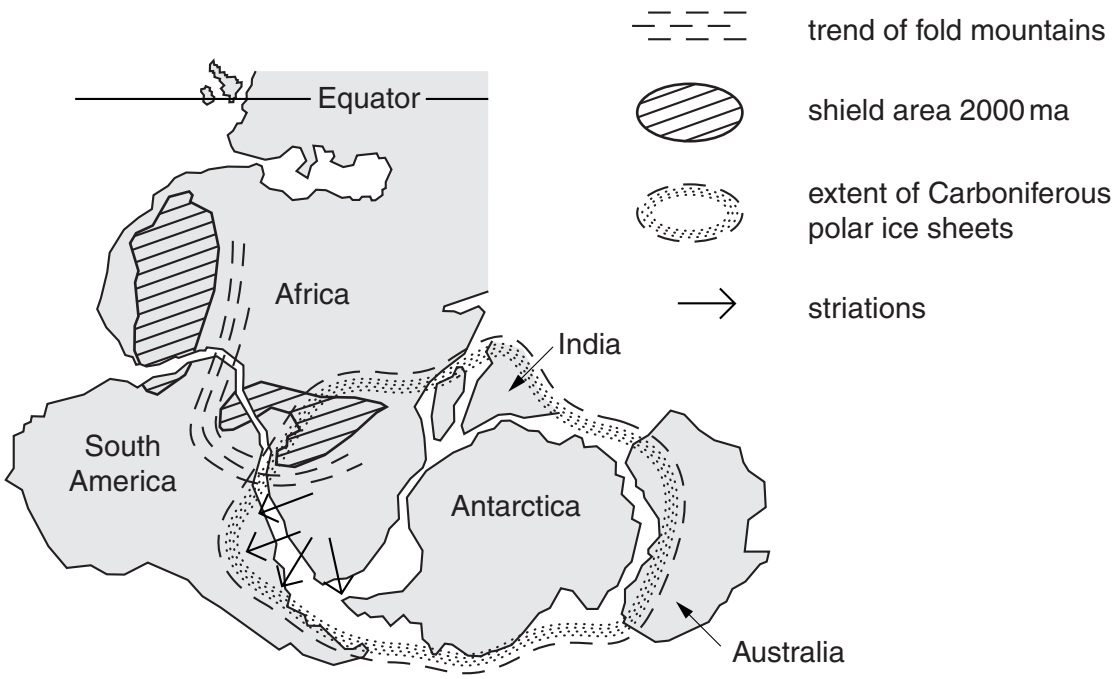
1 ..... **3** ..... [2]

(ii) Name the forces that formed faults **2** and **3**.

2 ..... **3** ..... [2]

[Total: 19]

2 The map shows Gondwanaland reconstructed from the southern continents about 250 Ma.



(a) Identify **two** pieces of evidence shown **within** the continents on the map that were used for the reconstruction of Gondwanaland. Explain how each piece of evidence was used.

1 identify .....

explain .....

.....

.....

2 identify .....

explain .....

.....

..... [4]

(b) When the continents of South America and Africa are fitted together along the edges of the continental shelf, there are areas of overlap and gaps. Explain how these can occur.

overlap .....

.....

gaps .....

..... [2]

(c) **(i)** Draw a fully labelled sketch of the tectonic feature that lies between South America and Southern Africa today.

[4]

(ii) Name this tectonic feature.

..... [1]

(iii) Describe how this tectonic feature works as a mechanism to move plates.

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..... [2]

(d) Accurate satellite measuring has been possible for the last 25 years. Between 1980 and 2000, the distance from a point in Southern Africa to a point in South America increased by 50 cm. Calculate the rate of spreading in cm per year.

rate of spreading ..... cm per year [1]

(e) Name

- a rock that can be used as palaeoclimatic evidence that a continent was near the equator when the rock formed;

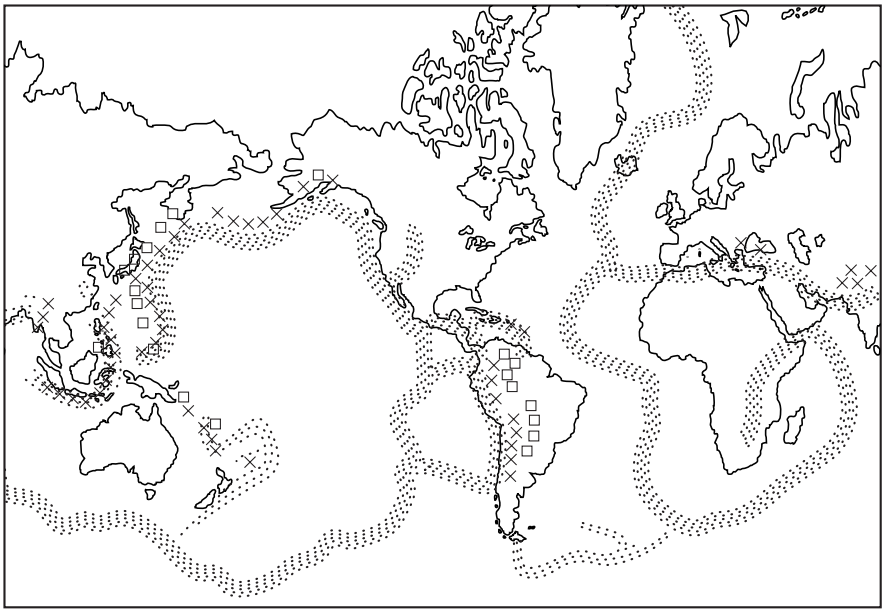
.....

- a **different** rock that can be used as palaeoclimatic evidence that a continent was in tropical areas when the rock formed.

..... [2]

[Total: 16]

3 The map shows the distribution of earthquakes by depth of focus.



Depth of focus of earthquake

shallow (0-70 km) × × × × intermediate (70-300 km) □ □ deep (301-700 km)

(a) **(i)** Describe the distribution of shallow earthquakes in relation to plate margins.

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(ii) Describe **two** different causes of shallow earthquakes.

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..... [2]

(iii) Describe the distribution of deep earthquakes in relation to plate margins.

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..... [1]

(b) Why are there no earthquakes with a focus deeper than 700 km?

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..... [2]

(c) The data table below shows some earthquakes that have caused large numbers of deaths.

magnitude	place	year	deaths	major causes of deaths
7.0	Armenia	1988	25,000	buildings collapse
7.3	USSR	1948	110,000	buildings collapse
7.5	Italy	1908	70,000	buildings collapse, tsunami
7.6	Turkey	1999	17,118	buildings collapse
7.6	Taiwan	1999	2,297	buildings collapse
7.7	Iran	1990	50,000	buildings collapse, landslides
7.8	Peru	1970	66,000	rock slides, floods
8.0	China	1976	255,000	buildings collapse
8.3	Japan	1923	143,000	fire

(i) Define the term *magnitude*.

.....

..... [1]

(ii) Explain what causes a very high magnitude earthquake.

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..... [2]

(iii) Suggest **two** reasons why the two 7.6 magnitude earthquakes in 1999 caused very different death tolls.

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..... [2]

(iv) Name **two** techniques that can be used to help stop buildings collapsing.

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..... [2]

(d) What is a tsunami?

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..... [1]

[Total: 15]

For Examiner's Use

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

Explain two sources of indirect evidence that provide information about the core and mantle of the Earth.

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Quality of Written Communication [2]

[Total: 10]

END OF QUESTION PAPER