

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced GCE

GEOLOGY 2836/01

Geological Skills

Wednesday 22 JUNE 2005 Afternoon 1 hour 15 minutes

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

Candidate Name	Can Centre Number Nu		didate nber					

TIME 1 hour 15 minutes

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 on the question paper.
- Read each question carefully and make sure you know what you have to do before starting your answer.

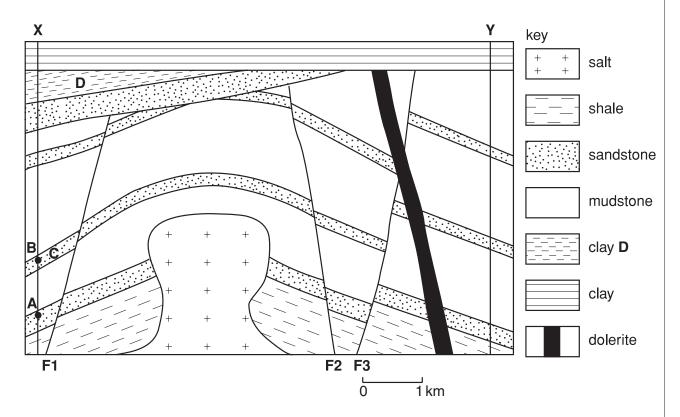
INFORMATION FOR CANDIDATES

- 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	14			
2	19			
3	15			
4	12			
TOTAL	60			

Answer all the questions.

1 The cross section below shows the geology across a potential oilfield. Two exploratory boreholes have been drilled at **X** and **Y** and traces of oil are found at **A** and **B** only.



(a) (i) Accurately mark on the cross section **two** different geological situations where oil could be trapped. Label each type of trap with its correct name. [2]

(ii)	Explain why oil is not likely to be trapped at location C .
	ra?

(b) The clay bed **D** contains plant fossils, while the mudstone beds contain ammonites and brachiopods. Describe the difference in depositional environments in which these two beds were laid down.

One mark is available for the quality of your written communication in this question.

(c)	Describe the geological history of the rocks and structures shown in the cross section, beginning with the first event to occur. Include the development of the salt dome.
	First event to occur.
	[8]
	[Total: 13]

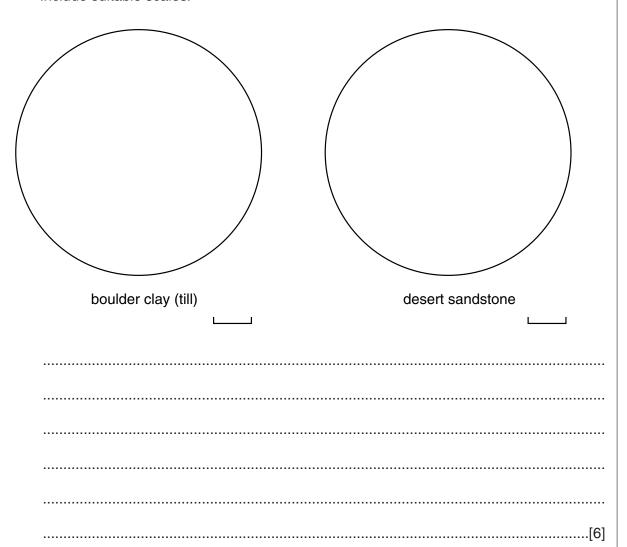
[Turn over

Quality of Written Communication [1]

2 The map below represents two areas of continental crust which have been separated by an expanding ocean.

volcanic island 40 Ma	mid-ocean ridge	key \(\lambda \)	folded metamorphic rocks showing direction of fold trends glacial deposits mudstones and siltstones freshwater fish fossil localities
(a) (i)	Fully describe three geological features within earthat suggest the continents were once joined. 1		
(ii)	The rocks of the volcanic island have been dated spreading.		
(iii)	Identify the type of fault that displaces the mid-oce	an ridge.	cm per year [1]

(b) Using labelled diagrams, **describe** and **explain** the differences in texture between glacial boulder clay (till) and sandstone formed in a desert sand dune environment. Include suitable scales.

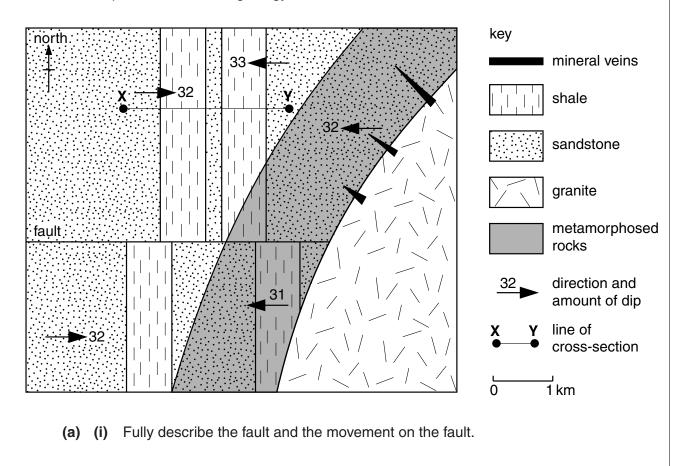


(c) Two sedimentary sequences from boreholes 10 km apart are shown below.

seque	ence 1	sequence 2	- 10 m - 10 m 20 m	
				limestone containing crinoids
	7:			mudstone containing goniatites
				sandstone
			-V-	- volcanic ash band
(i)	Correlate the two appropriate position		nostratigra	phy by drawing lines in the [1]
(ii)	Measure the thickretwo sequences.	ness of sedimentary roc	k between	the volcanic ash bands in the
	sequence 1	metres		
	sequence 2	metres		[1]
(iii)	Describe two poss	sible reasons for this diffe	erence in th	nickness.
	Reason 1			
	Reason 2			

(d) (i)	During which p the list below.	eriod of time v	vere these sequence	s formed? Circle on	e answer in
	Jurassic	Silurian	Carboniferous	Cretaceous	[1]
(ii)	Which rock in biostratigraphy	-	uences is the most	suitable for correl	ation using
					[1]
(iii)	Explain your ar	nswer.			
					[2]
					[Total: 19]

3 The map below shows the geology of a small area.



(ii) In the space below, sketch a clearly labelled cross-section along the line X-Y shown on the map, to show the structure.



[2]

(b) Fossils C and D have been found in the area and are shown below.





	C	
(i)	Name the group to which both of these fossils belong.	
		[1]
(ii)	Label two different morphological features on fossil C .	[2]
(iii)	Clearly label on the map where fossil C may be found.	[1]
(iv)	Why are fossils C and D not found in the same rock unit?	
		[1]
(c) The	ere are mineral veins in and around the granite.	
(i)	Describe the process that formed these mineral veins.	
		[3]

(ii)	The minerals galena, sphalerite and fluorite are found in the veins. Give two diagnostic physical characteristics of each mineral.
	galana
	sphalerite
	fluorite
	[3]
	[Total: 15]

4 The photograph below shows a sequence of deformed sedimentary rocks.

A photograph has been removed due to third party copyright restrictions

Details: A photograph showing a sequence of deformed sedimentary rocks

(a) In the space below, draw a fully labelled sketch to show the structural features on the photograph.

[5]

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One mark is available for the quality of your written communication in this question.

(b) The area shown on the map below consists of argillaceous rocks which have been subjected to regional metamorphism. The map shows the pattern of index mineral zones.

index minerals	C /	north
S = sillimanite K = kyanite G = garnet B = biotite	G K	†
C = chlorite	$\begin{array}{ c c c }\hline & & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & & \\ & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & $	
0 100 km	C B G	

Describe the sequence of metamorphic rocks and their types of foliation that have been

produced during the metamorphic event.
[6]

[Total: 11]

Quality of Written Communication [1]

END OF QUESTION PAPER