

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	Centre Number	Candidate Number												
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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

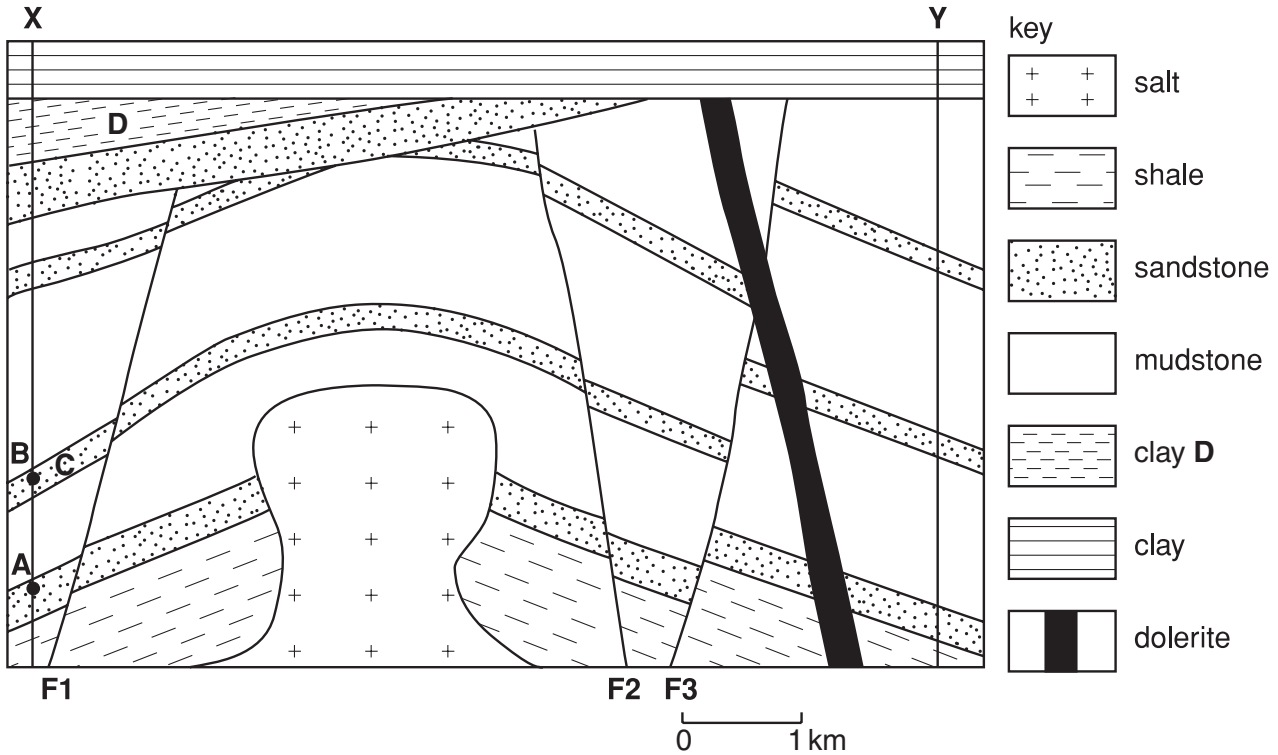
- The number of marks is given in brackets [] at the end of each question or part question.
- You will be awarded marks for the quality of written communication where this is indicated in the question.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	14	
2	19	
3	15	
4	12	
TOTAL	60	

This question paper consists of 12 printed pages.

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**.

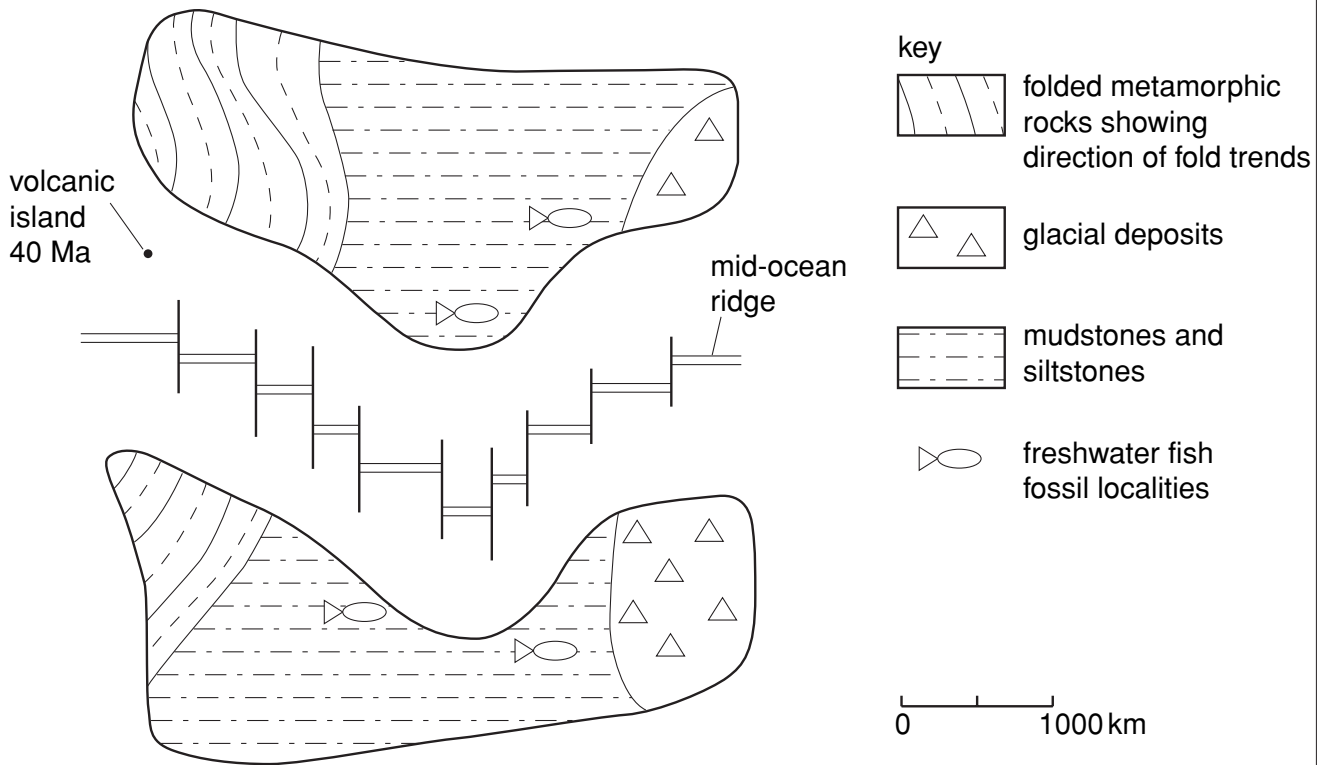
.....
[1]

- (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.

.....

[2]

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



(a) (i) Fully describe **three** geological features within each continent shown on the map that suggest the continents were once joined.

- 1
-
- 2
-
- 3
-[3]

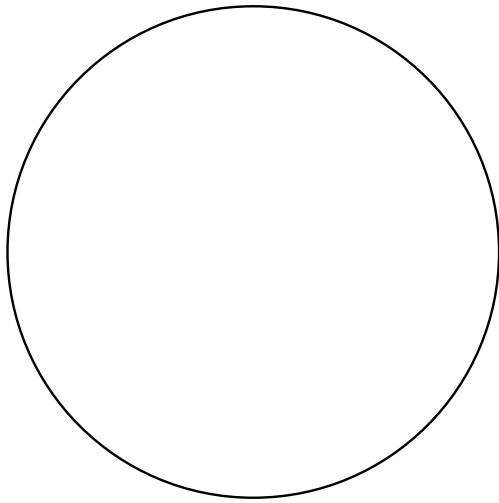
(ii) The rocks of the volcanic island have been dated at 40 Ma. Calculate the rate of spreading.

.....cm per year
[1]

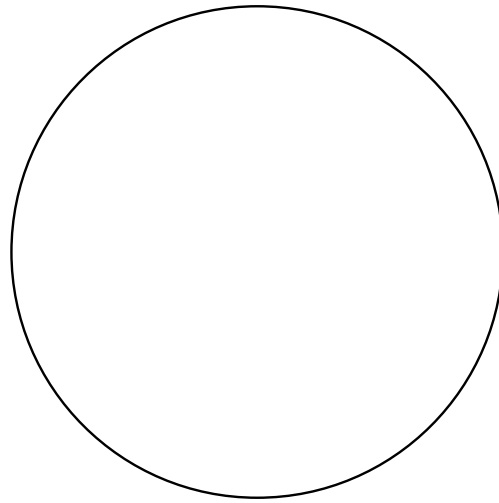
(iii) Identify the type of fault that displaces the mid-ocean ridge.

.....[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.



boulder clay (till)



desert sandstone



.....

.....

.....

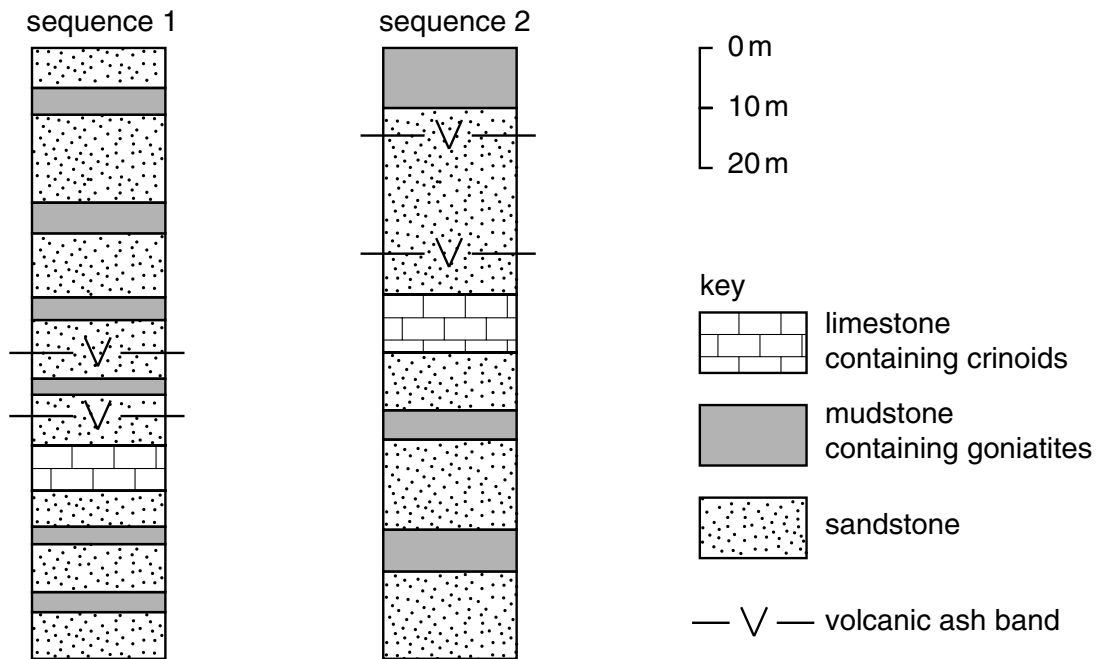
.....

.....

.....

.....[6]

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



(i) Correlate the two sequences using chronostratigraphy by drawing lines in the appropriate positions. [1]

(ii) Measure the thickness of sedimentary rock between the volcanic ash bands in the two sequences.

sequence 1 metres

sequence 2 metres [1]

(iii) Describe **two** possible reasons for this difference in thickness.

Reason 1

.....

Reason 2

.....[2]

(d) (i) During which period of time were these sequences formed? Circle one answer in the list below.

Jurassic Silurian Carboniferous Cretaceous

[1]

(ii) Which rock in the two sequences is the most suitable for correlation using biostratigraphy?

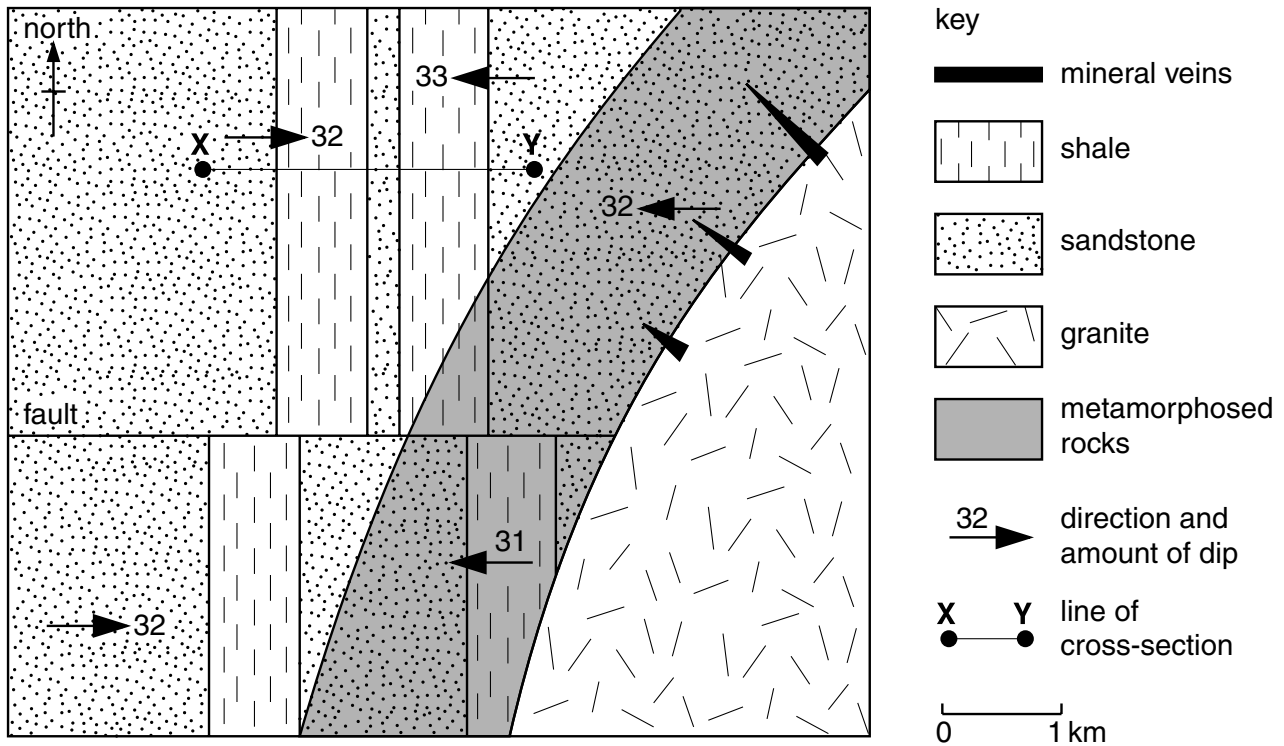
.....[1]

(iii) Explain your answer.

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

[Total: 19]

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



(a) (i) Fully describe the fault and the movement on the fault.

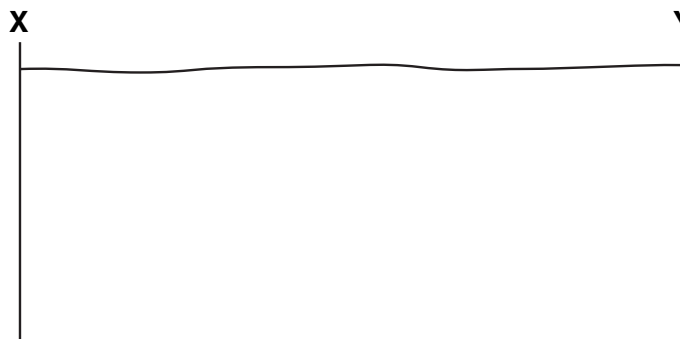
.....

.....

.....

.....[2]

(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



D

(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) There 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.

galena

.....

sphalerite

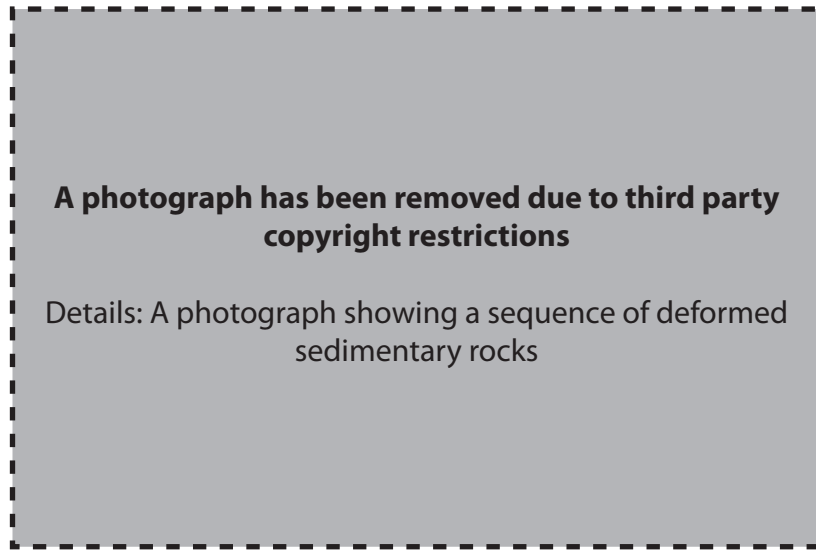
.....

fluorite

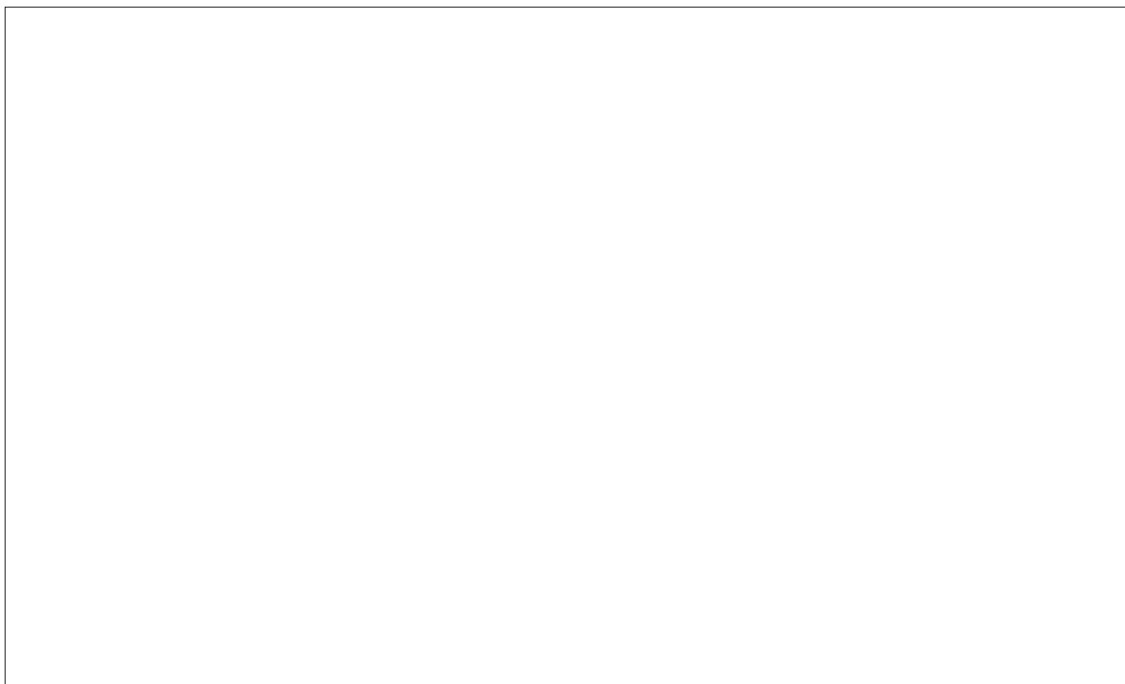
.....[3]

[Total: 15]

- 4 The photograph below shows 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]

