

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced GCE

GEOLOGY

2834

Palaeontology

Friday **20 JANUARY 2006** Afternoon 1 hour 30 minutes

Candidates answer on the question paper.

Additional materials:

Ruler (cm/mm)

Electronic calculator

Candidate Name	Centre Number	Candidate Number												
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TIME 1 hour 30 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 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

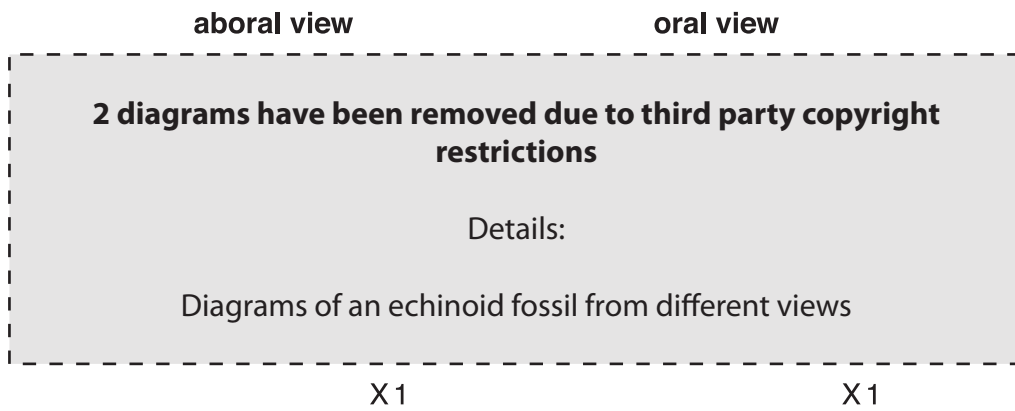
- The number of marks is given in brackets [] at the end of each question or part question.
- You will be awarded marks for the quality of written communication where this is indicated in the question.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	17	
2	13	
3	19	
4	16	
5	25	
TOTAL	90	

This question paper consists of 12 printed pages.

Answer all the questions.

1 Fossil A is an echinoid. The diagrams below show two different views of fossil A.



(a) (i) Name the group of echinoids to which fossil A belongs.

..... [1]

(ii) Describe, using technical terms, the type of symmetry shown by fossil A.

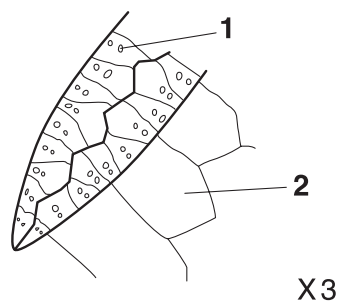
..... [1]

(iii) On the appropriate diagram, label the following morphological features.

- anterior groove
- plastron
- position of the mouth

[3]

(b) The diagram below shows a close up view of part of fossil A.



(i) Identify the morphological features 1 and 2.

1

2 [2]

(ii) Explain the function of morphological feature 1.

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..... [2]

(c) (i) Describe how regular echinoids feed.

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..... [2]

(ii) Describe how irregular echinoids feed.

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..... [2]

(iii) Explain the function of the following features found in some echinoids.

fasciole

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plastron

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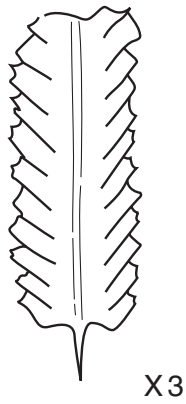
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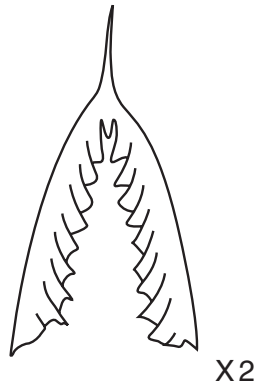
[Total: 17]

2 Fossils **C**, **D** and **E** are members of the same fossil group, but are found in different horizons from Palaeozoic rocks.

fossil C



fossil D



fossil E



(a) (i) To which fossil group do fossils **C**, **D** and **E** belong?

..... [1]

(ii) Label the following morphological features on fossil **D** above.

- **nema**
- **stipe**
- **theca**

[3]

(iii) Place fossils **C**, **D** and **E** in evolutionary order, starting with the oldest first.

..... [1]

(iv) Describe the likely mode of life of fossils **C** to **E**.

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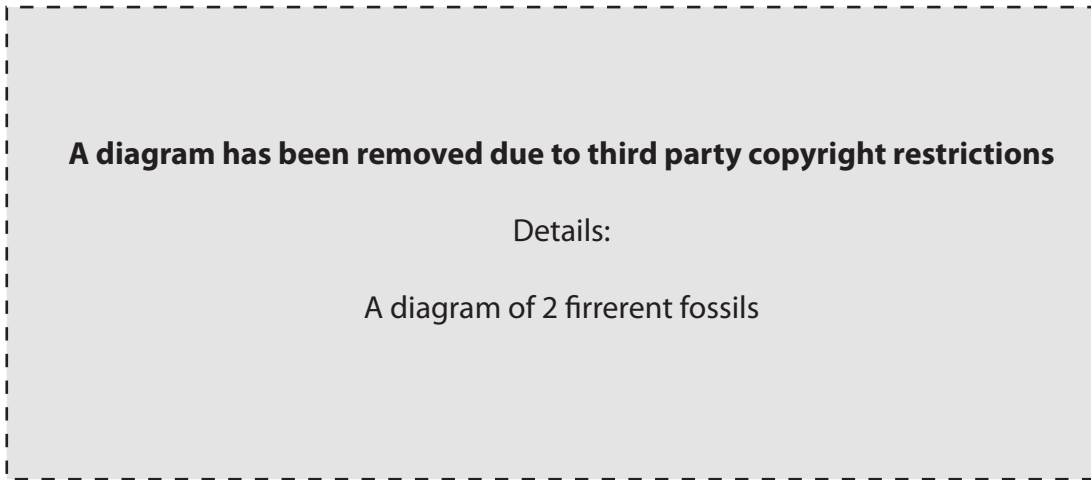
.....

..... [3]

(b) Fossil fragments F and G are found in cyclothem from the Carboniferous Period.

fossil F

fossil G



(i) Name the group to which fossils F and G belong.

..... [1]

(ii) Describe the environment of deposition that allowed the preservation of these fragments to occur.

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..... [4]

[Total: 13]

3 (a) Here is a list of six common geological terms.

biostratigraphy

Cainozoic

era

Mesozoic

Palaeozoic

period

Complete the table below by inserting the most suitable term to match each description.

description	term
began 65 Ma ago, until the present day	
began around 590 Ma ago	
Palaeozoic is an example	
dating of rocks using fossil remains	
time unit defined by specific rock and fossil types	

[5]

(b) Explain how the relative ages of rocks can be determined using the following methods. Use diagrams to illustrate your answers.

(i) way up structures

.....

 [2]

(ii) cross cutting relationships

.....

 [2]

(iii) included fragments

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

(c) (i) Name **one** method of radiometric dating of rocks.

..... [1]

(ii) Explain how absolute dates can be determined using radiometric methods.

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..... [3]

(iii) Explain why sedimentary rocks are difficult to date using radiometric methods.

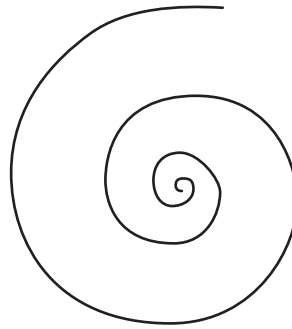
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..... [2]

(iv) Explain why metamorphism causes problems with radiometric dating.

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..... [2]

[Total: 19]

4 The diagram below shows a section through a fossil cephalopod.



(a) Draw and label the following internal morphological features on the diagram.

- septa
- septal neck
- siphuncle

[3]

(b) The suture lines of cephalopods evolved over time. In the space below, draw labelled diagrams to illustrate the differences between the suture lines of an ammonite and a goniatite.

ammonitic suture

goniatitic suture

[3]

(c) Modern day cephalopods, such as *Nautilus*, can move vertically and horizontally in the water column. Explain how this movement is brought about.

vertical movement

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horizontal movement

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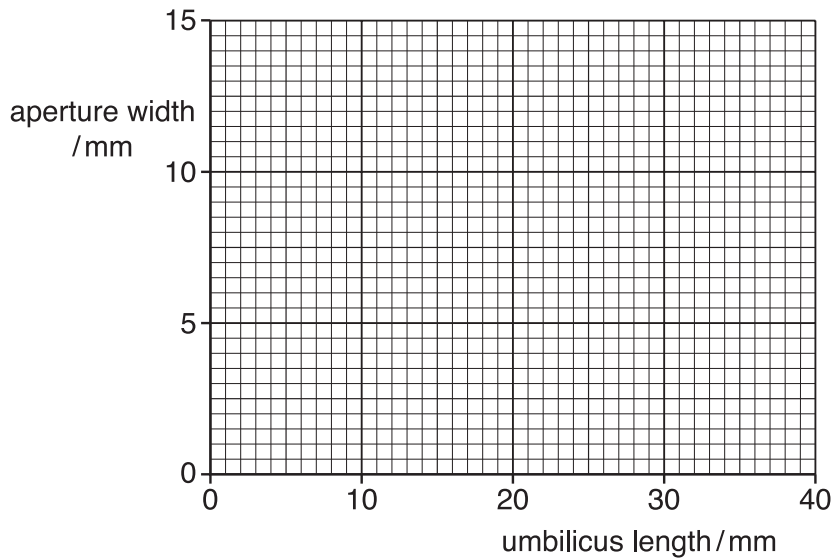
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..... [4]

(d) Data was collected from specimens of **one species** of ammonite. The results are given in the table below.

specimen number	umbilicus length / mm	aperture width / mm
1	12	3.5
2	11	4.0
3	39	10.5
4	36	8.5
5	35	7.0
6	10	2.4
7	14	2.5
8	32	8.0

(i) Plot the results on the graph below.



[2]

(ii) Calculate the mean umbilicus length and aperture width for this species of ammonite.

umbilicus length mm aperture width mm [2]

(iii) Describe and explain the distribution you have plotted.

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 [2]

[Total: 16]

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(b) Describe and explain the adaptive morphological changes that bivalves have undergone to exploit different environments.

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