OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
Advanced GCE

GEOLOGY 2834

Palaeontology

Monday **12 JUNE 2006** Morning 1 hour 30 minutes

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

Candidate Name	Centre Number	Candidate Number

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	14	
2	17	
3	18	
4	16	
5	25	
TOTAL	90	

This question paper consists of 12 printed pages.

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[Turn over

Answer **all** the questions.

1 (a) (i) A number of fossil types are described in the table below. Complete the table.

fossil	description	fossil group
A	has a columella, dissepiments and tabulae	
B	has a calyx and many arms divided into segments	
C	has 5 fold radial symmetry, a test composed of plates and a mouth and an anus on opposite surfaces	
D	has a rhabdosome and individual thecae arranged in a row	

[4]

(ii) In the space below, draw labelled diagram(s) to show the main features of fossil **C**.

[4]

(iii) Give **one** similarity and **one** difference between fossils **B** and **C**.

similarity .....

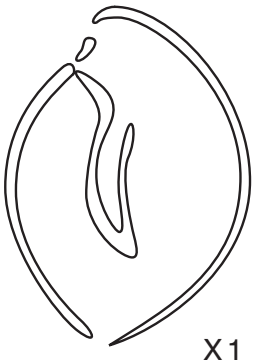
.....

difference .....

..... [1]

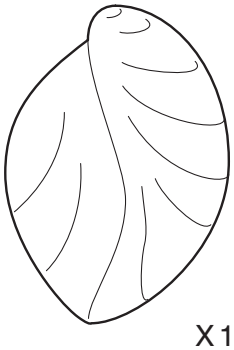
(b) The diagrams of fossil **E** below show internal and external views of a brachiopod.

fossil E – internal view



X 1

fossil E – external view



X 1

(i) Label the following morphological features on the appropriate diagram.

- **brachial valve**
- **brachidium**
- **growth line**

[3]

(ii) Brachiopods feed by using a lophophore. Explain how this structure allows the brachiopod to feed.

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.....

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..... [2]

[Total: 14]

2 (a) (i) Several descriptions are given below for different types of fossil preservation. Match the terms to the descriptions using the letters given.

description		term	description A, B, C, D or E
A	heat changes plant matter into carbon films by loss of volatiles during burial	replacement	
B	porous shells are replaced by SiO_2 from solution	carbonisation	
C	original shell is changed forming new crystals	silicification	
D	impressions of shells, usually when original minerals have dissolved away	recrystallisation	
E	minerals deposited in pore spaces of shells, commonly $CaCO_3$ or iron minerals	moulds	

[4]

(ii) Replacement by iron pyrites is called pyritisation. What environmental conditions are needed for this to occur?

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..... [2]

(iii) Aragonite often forms the shells of organisms. Explain why aragonite does not occur in fossils older than the Cainozoic.

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..... [2]

(b) The likelihood of a fossil being preserved in any environment is called the preservation potential. Explain how the following factors will affect the preservation potential of an organism.

fine grained sediment .....

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high energy conditions .....

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early diagenesis .....

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..... [6]

(c) Describe the exceptional preservation of organisms in amber and tar.

amber .....

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tar .....

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..... [3]

[Total: 17]

3 Fossil G shows a dorsal and ventral view of a benthonic trilobite.

dorsal view ventral view

An image has been removed due to third party copyright restrictions

Details:

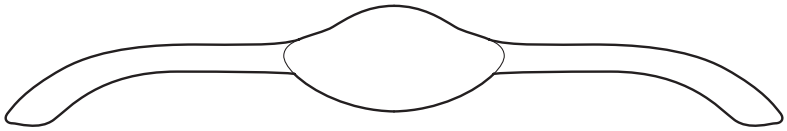
An image of a dorsal and a ventral view of a benthonic trilobite

(a) Label the following morphological features on the appropriate diagram.

- genal angle
- glabella
- mouth
- pleuron

[4]

(b) The diagram below shows a cross section through the thoracic segment shaded on fossil G.



(i) Draw and label the position of the gills and legs on the above diagram. [2]

(ii) Give two pieces of evidence to support the hypothesis that fossil G is an arthropod.

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..... [2]

(c) Describe and explain the changes in morphology that trilobites developed to enable them to adopt the following modes of life.

nektonic .....

.....

.....

infaunal .....

.....

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planktonic .....

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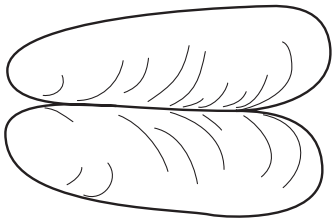
..... [6]

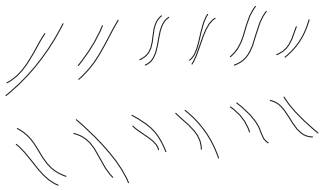
(d) Fossils **J** and **K** are trace fossils formed by trilobites.

J



X 1

K



X 1

(i) Explain how trilobites formed these trace fossils.

J .....

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K .....

..... [2]

(ii) What evidence do these trace fossils give us about the conditions on the sea floor at the time of their formation?

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..... [2]

[Total: 18]

4 **(a)** Complete the following passage using the most appropriate terms given below.

You may use each term once, more than once, or not at all.

amphibians **trilobites** **rugose corals** **brachiopods**

marine species **ammonites** **mammals**

The mass extinction event at the end of the Permian saw 95% of all ..... wiped out. This included the ..... and ..... . It also saw a huge reduction in numbers of other marine fauna, such as ..... and foraminifera (microfossils).

There was also extinction of life on land, with huge reductions in the numbers of ..... and trees. [5]

(b) **(i)** Draw a labelled diagram of a solitary rugose coral.

[2]

(ii) State **two** differences between rugose corals and scleractinian corals.

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..... [2]

(c) Another major extinction event was at the Cretaceous – Tertiary boundary.

(i) When was the Cretaceous – Tertiary mass extinction event?

..... Ma [1]

(ii) Give two types of **marine** fossil that became extinct at the Cretaceous – Tertiary boundary.

1 .....

2 ..... [2]

(iii) Describe **two** pieces of evidence that suggest the Cretaceous – Tertiary extinction event was caused by a large meteorite impact.

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..... [2]

(iv) Describe another possible theory for the Cretaceous – Tertiary mass extinction.

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..... [2]

[Total: 16]

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

5 **(a)** Describe and illustrate the morphological changes of graptolites that occurred in the Lower Palaeozoic.

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..... [11]

(b) Describe the morphological differences (internal and external) between bivalves and cephalopods, both members of the phylum Mollusca.

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For Examiner's Use

[12]

Quality of Written Communication [2]

[Total: 25]

END OF QUESTION PAPER