

**ADVANCED GCE**

**GEOLOGY**

Evolution of Life, Earth and Climate

**F795**

Candidates answer on the question paper.

**OCR supplied materials:**

None

**Other materials required:**

- Electronic calculator
- Ruler (cm/mm)

**Tuesday 1 February 2011**

**Afternoon**

**Duration: 1 hour 45 minutes**




Candidate forename		Candidate surname	
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Centre number						Candidate number				
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**INSTRUCTIONS TO CANDIDATES**

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. If additional space is required, you should use the lined pages at the end of this booklet. The question number(s) must be clearly shown.
- Answer **all** the questions.
- Do **not** write in the bar codes.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **100**.
-  Where you see this icon you will be awarded a mark for the quality of written communication in your answer.
- You may use an electronic calculator.
- This document consists of **20** pages. Any blank pages are indicated.

Answer **all** the questions.

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

fossil	description	fossil group
<b>A</b>	has an evolute chambered shell with a wide umbilicus and an external ornament of ribs	
<b>B</b>	has a calyx and many arms divided into segments	
<b>C</b>	has a helically coiled unchambered shell	
<b>D</b>	has a rhabdosome and thecae	

[4]

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

[3]

(iii) Describe the mode of life of fossil **B**.

.....

.....

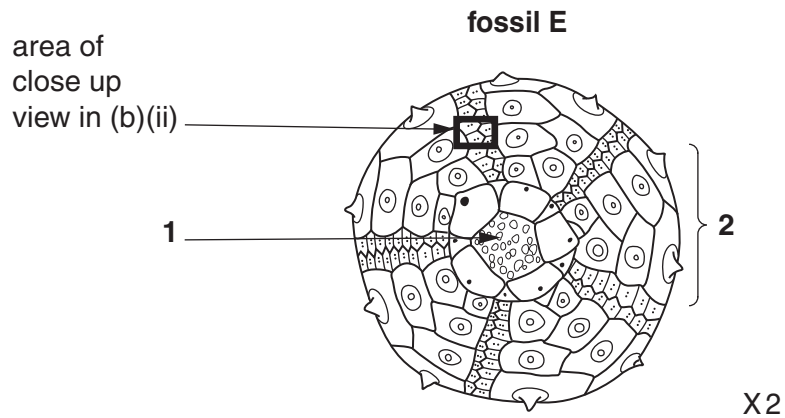
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..... [2]

(iv) Which fossil (**A**, **B**, **C** or **D**) was planktonic?

..... [1]

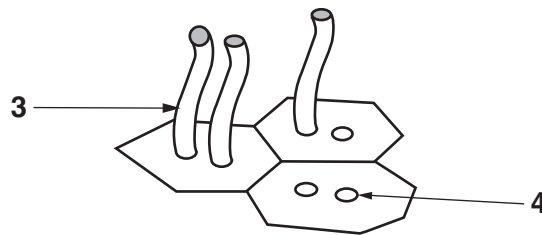
(b) Fossil E, an echinoid, is shown below.



(i) Identify the morphological features 1 and 2.

1 ..... 2 ..... [2]

The diagram below shows a close up view of part of fossil E as it might have appeared in life.



(ii) Identify the morphological features 3 and 4.

3 ..... 4 ..... [2]

(iii) Explain the function of morphological feature 3.

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

**QUESTION ONE CONTINUES ON THE NEXT PAGE**

(iv) Describe how fossil **E** moved and fed.

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..... [3]

[Total: 19]

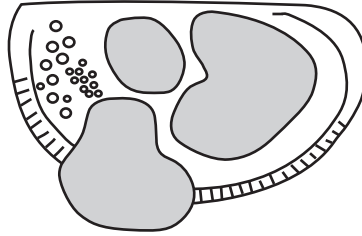
2 The fossils shown below are all microfossils.

conodont



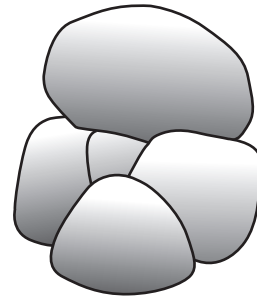
X 60

ostracod



X 30

foraminifera



X 30

(a) (i) Describe the mode of life of fossil foraminifera when they were alive.

.....  
..... [1]

(ii) State the original chemical composition of a fossil ostracod and conodont.

ostracod .....

conodont ..... [2]

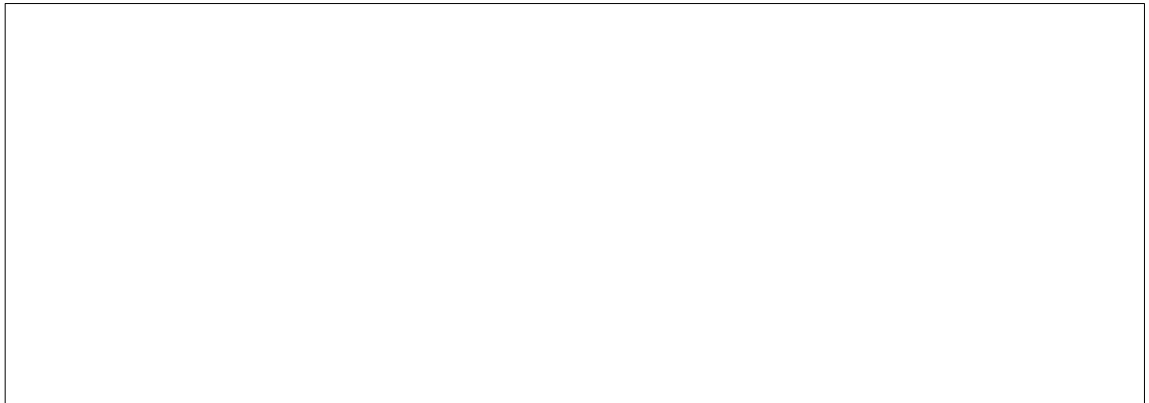
(iii) The conodont is only one small part of a larger soft bodied organism. What function did the conodont have in life?

.....  
..... [1]

(iv) Why are conodonts not found in Mesozoic rocks?

.....  
..... [1]

(b) (i) Draw and label the guard and phragmacone of a belemnite.



[2]

(ii) Describe the mode of life of a belemnite.

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

(iii) Explain why only the guard is commonly preserved.

.....  
..... [1]

(c) Distinguish between the terms *body fossil* and *trace fossil*.

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

(d) Fossils can be found pyritised. Describe and explain how pyritisation occurs.

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.....  
..... [3]

(e) Explain how diagenesis and grain size of sediment can affect the quality of fossil preservation.

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.....  
.....  
.....  
..... [4]

**[Total: 19]**

3 (a) The table below shows statements that may be true or false about brachiopods.

(i) Complete the table by circling the correct response in each case, either true or false.

features	options	
composed of chitin or calcium carbonate	true	false
can grow up to 1 metre in diameter	true	false
consists of two different sized valves	true	false
has growth lines and ribbing	true	false
has two teeth within the hinge apparatus of the pedicle valve	true	false
has a lophophore used for attachment to rocks	true	false

[4]

(ii) Describe and explain the adaptations shown by different brachiopods to live in the following environments:

soft or muddy substrate

.....

.....

.....

.....

turbulent water.

.....

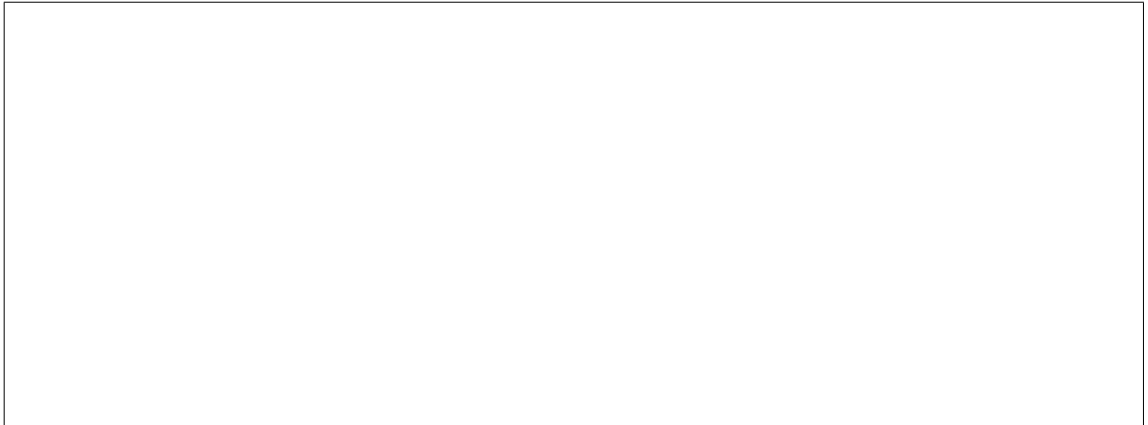
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..... [4]



- (b) (i) Draw a fully labelled diagram in the space below to illustrate the internal morphology of a deep burrowing bivalve.



[4]

- (ii) Describe how deep burrowing bivalves feed and respire.

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

- (iii) Describe **two** adaptations that deep burrowing bivalves have developed to allow easy movement through sediment.

1 .....  
.....  
2 .....  
..... [2]

- (c) (i) Describe one difference between the symmetry of brachiopods and bivalves.

.....  
..... [1]

- (ii) Describe the differences between the way brachiopods and bivalves open their shells.

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

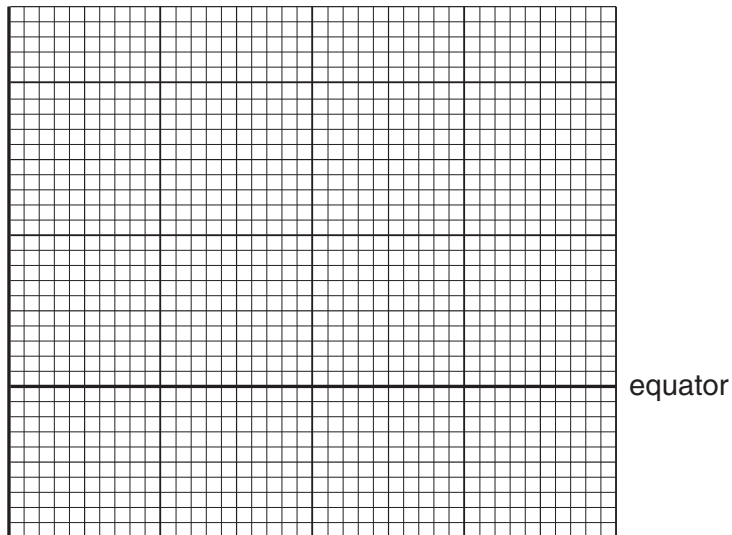
[Total: 19]  
Turn over

- 4 (a) The British Isles has moved northwards over geological time. The position in one part of the British Isles has been calculated and is shown in the table below.

time (Ma)	approximate latitude
50	42° N
100	40° N
150	36° N
200	33° N
250	15° N
300	5° S
350	12° S
400	14° S

- (i) Draw a line of the data above.

[3]



- (ii) Using your graph, estimate when this part of the British Isles was at the equator.

..... Ma [1]

- (iii) The gradient of the graph is not a straight line. Suggest reasons why.

.....  
 .....  
 .....  
 .....

[2]

(b) (i) Describe how coal deposits indicate that humid tropical conditions were present in the British Isles.

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

(ii) Describe **one** piece of lithological evidence that suggests hot arid conditions have been present in the British Isles.

.....  
..... [1]

(iii) Explain why geologists believe that the British Isles have moved over time, rather than staying in the same place and the climate becoming colder.

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

[Total: 11]

5 Dinosaurs evolved into two main classes, the **Saurischia** and **Ornithischia**.

(a) (i) Put a tick in the correct column in the table to show the class for each of the dinosaurs.

dinosaur	Saurischia	Ornithischia
<i>Tyrannosaurus</i>		
<i>Iguanodon</i>		

[1]

(ii) Describe the mode of life of the Saurischian dinosaur *Diplodocus*. Give **one** piece of evidence to support your answer.

.....

.....

.....

..... [2]

(iii) Describe **one** difference between Saurischian and Ornithischian dinosaurs.

.....

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..... [2]

(b) One evolutionary step is that dinosaurs are thought to have laid amniotic eggs.

(i) Describe and explain **two** features of the amniotic egg for life on land.

1 .....

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.....

.....

.....

2 .....

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.....

.....

..... [4]

(ii) When did the dinosaurs first appear in the geological record?

..... [1]

(c) Describe a dinosaur trace fossil and explain how it can give information about the environment and the mode of life of the dinosaur.

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

[Total: 12]

6 Write an account of the mass extinction event at the Cretaceous-Tertiary boundary. Describe the evidence for and the possible causes of this extinction event.



*You should structure your answer to include evidence for each possible cause.*

A series of horizontal dotted lines provided for writing the answer.











**19**  
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