



ADVANCED GCE
GEOLOGY
 Palaeontology

2834

Candidates answer on the Question Paper

OCR Supplied Materials:
 None

Other Materials Required:

- Electronic calculator
- Ruler (cm/mm)

Monday 21 June 2010
Morning

Duration: 1 hour 30 minutes



Candidate
Forename

Candidate
Surname

Centre Number

Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

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 **90**.
- You will be awarded marks for the quality of written communication where this is indicated in the question.
- You may use an electronic calculator.
- This document consists of **16** pages. Any blank pages are indicated.

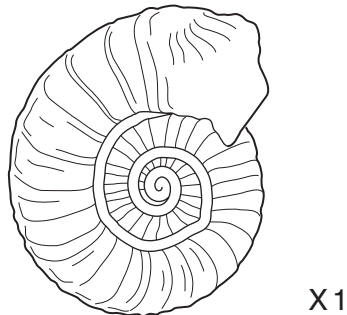
Examiner's Use Only:

1			
2			
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Total			

Answer **all** the questions.

- 1 The diagram below shows a cephalopod, fossil **A**.

fossil A



- (a) (i) Label the following morphological features on the diagram.

aperture

protoconch

rib

[3]

- (ii) Describe the type of coiling seen in fossil **A**.

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

- (b) (i) 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]

- (ii) Which of the following cephalopods had the simplest suture? Circle the correct answer.

ammonite

ceratite

nautiloid

[1]

- (iii) What function do the following features have in a cephalopod?

body chamber

.....

septa

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

- (iv) Describe **one** different evolutionary change that occurred in the cephalopods. You may use diagrams to illustrate your answer.

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..... [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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.....

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horizontal movement

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..... [4]

- (d) Describe how modern day cephalopods feed.

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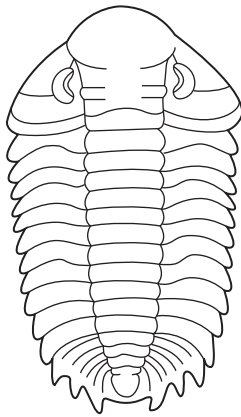
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[Total: 19]

Turn over

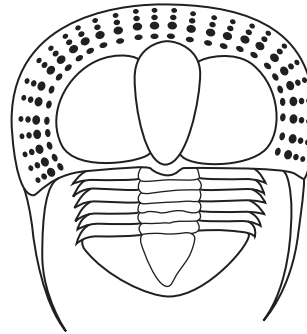
2 Fossils **B** and **C** are both arthropods.

fossil B



X1

fossil C



X5

(a) (i) What class do both fossils **B** and **C** belong?

..... [1]

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

compound eye

genal spine

glabella

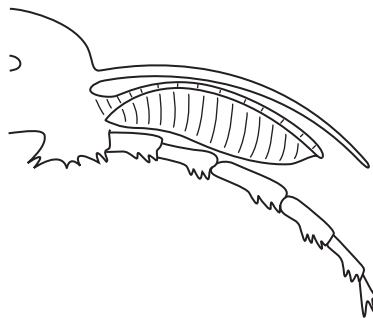
facial suture

[4]

(iii) Shade the pygidium on fossil **B**.

[1]

(b) The diagram below shows a cross section through part of the thorax of fossil **B**.



(i) Label the following morphological features.

gill

jointed appendage

[2]

- (ii) Describe how fossil **B** moved around when it was alive.

.....

.....

.....

..... [2]

- (c) Describe and explain the morphological features that trilobites have evolved to enable them to live in the following ways.

nektonic

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.....

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infaunal

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.....

.....

planktonic

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..... [6]

[Total: 16]

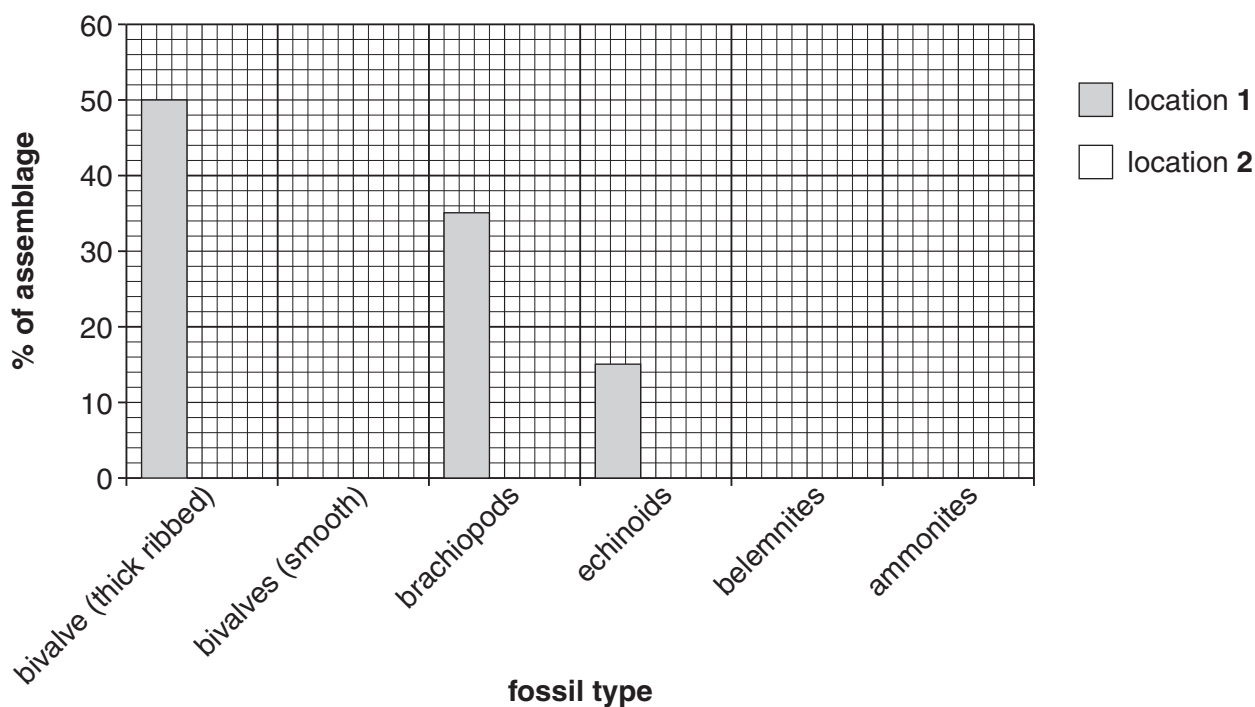
- 3 (a) Fossils were collected from two different locations (1 and 2) from rocks of the same age. The percentage of each assemblage was recorded in the table below.

	percentage (%) of assemblage	
fossil type	location 1	location 2
bivalve (thick ribbed)	50	0
bivalves (smooth)	0	30
brachiopods	35	52
echinoids	15	0
belemnites	0	5
ammonites	0	13
% of total which are unbroken fossils	30	60

- (i) What percentage of the fossils in the assemblage from location 2 were free swimming?

..... % [1]

- (ii) Complete the bar chart to show the differences in fossil assemblages between locations 1 and 2.



[2]

- (iii) Describe the type of environment in which the assemblage from location **2** was laid down. Give **two** reasons for your answer.

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..... [3]

- (b) (i) The table below shows a list of fossil features that can be found in either brachiopods, bivalves or both. Place a tick in the correct box to indicate if the features listed are present.

	brachiopod	bivalve
lophophore		
ligament		
permanent gape between shells		
made of CaCO_3		
diductor and adductor muscle scars		
zig-zag commissure		

[5]

- (ii) In the space below, draw a labelled diagram to show an internal view of a deep burrowing bivalve.

[3]

- (iii) Describe **two** features found in attached bivalves but are absent from burrowers.

1

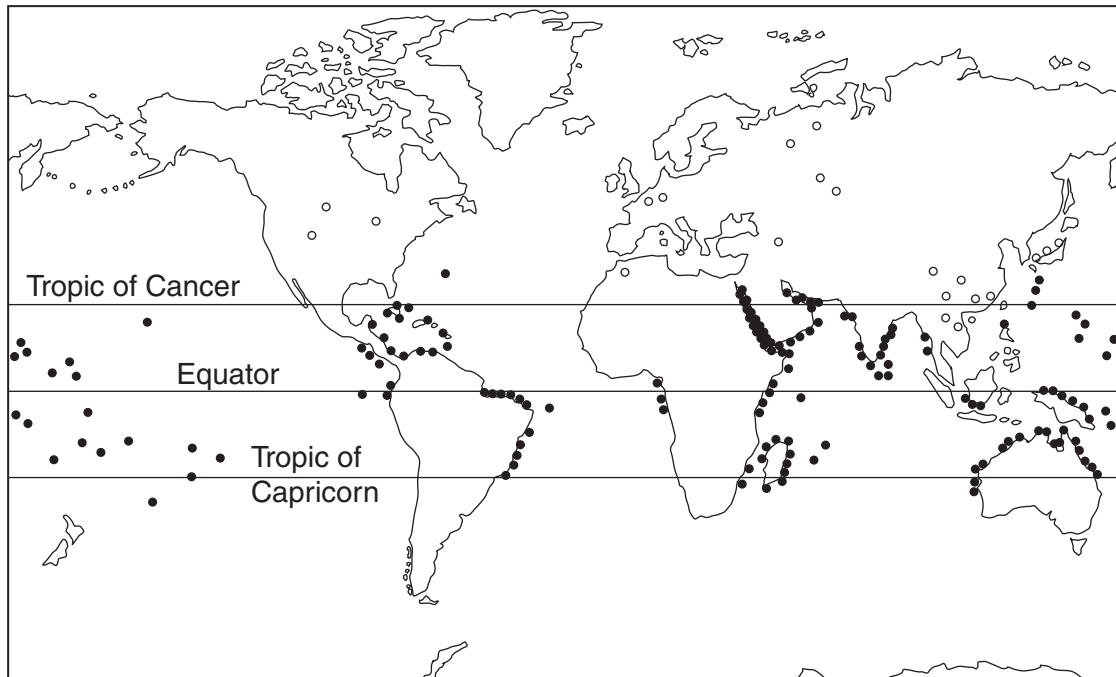
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2

..... [2]

[Total: 16]

- 4 The map below shows the present day global distribution of colonial coral reefs (solid circles) and the distribution of reefs that were present during the Lower Carboniferous (open circles).



- (a) (i) Explain the difference between the global distribution of coral reefs at the present day and in the Lower Carboniferous.

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..... [3]

- (ii) Describe in detail the conditions that corals require to develop major coral reefs.

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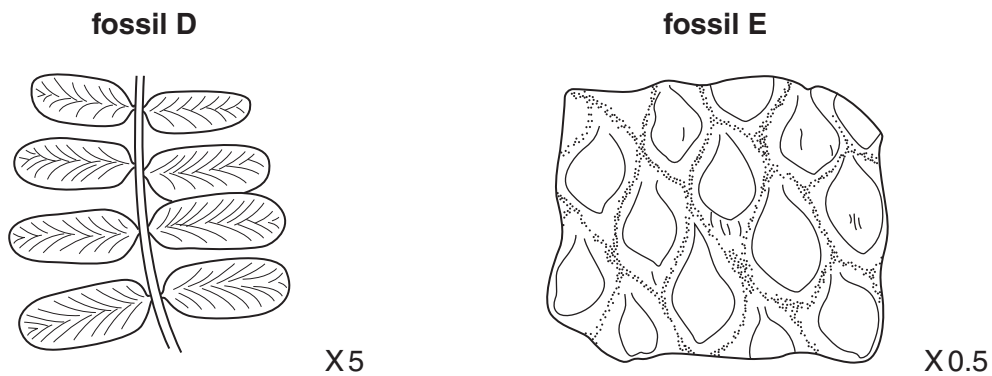
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..... [3]

- (iii) Draw a labelled diagram of a Carboniferous rugose solitary coral in the space below.

[3]

- (b) Fossil fragments **D** and **E** are found in rocks from the Carboniferous Period.



- (i) What type of organism do fossil fragments **D** and **E** originate from?

..... [1]

- (ii) Name **one** other organism that may have lived in the same environment.

..... [1]

- (iii) Describe the environment of deposition that allowed the preservation of these fossil fragments.

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..... [3]

[Total: 14]

In this question, two marks are available for the quality of written communication. Diagrams are essential to illustrate your answers.

- 5 (a)** Write an account of the mass extinction event at the Permo-Triassic boundary. Describe the main characteristics and the possible causes of this extinction event.

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..... [12]

- a way up structure
- included fragments
- a cross cutting relationship.

[illegible]

[Total: 25]

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