



ADVANCED GCE
GEOLOGY
 Palaeontology

2834

Candidates answer on the Question Paper

OCR Supplied Materials:
 None

Other Materials Required:

- Electronic calculator
- Ruler (cm/mm)

Thursday 21 January 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			
3			
4			
5			
Total			

Answer **all** the questions.

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

Fossil	Description	Fossil group
A	has a straight guard and a phragmocone	
B	has an unchambered shell and is coiled in a spire (helical coiling)	
C	has roots, brachia and a stem made up of ossicles	
D	has a chambered shell, is coiled in one plane (planispiral coiling) and has heavy ribbing	

[4]

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

[3]

- (iii) Complete the table to show the likely mode of life of fossils **A**, **C** and **D**. Terms may be used once, more than once or not at all.

burrower

planktonic

nektonic

sessile

Fossil	Mode of life
A	
C	
D	

[3]

- (b) (i) Many fossils can be found silicified. Describe how silicification occurs.

.....

.....

.....

.....

.....

..... [3]

- (ii) Describe how moulds and casts are formed. Use diagrams to illustrate your answer.

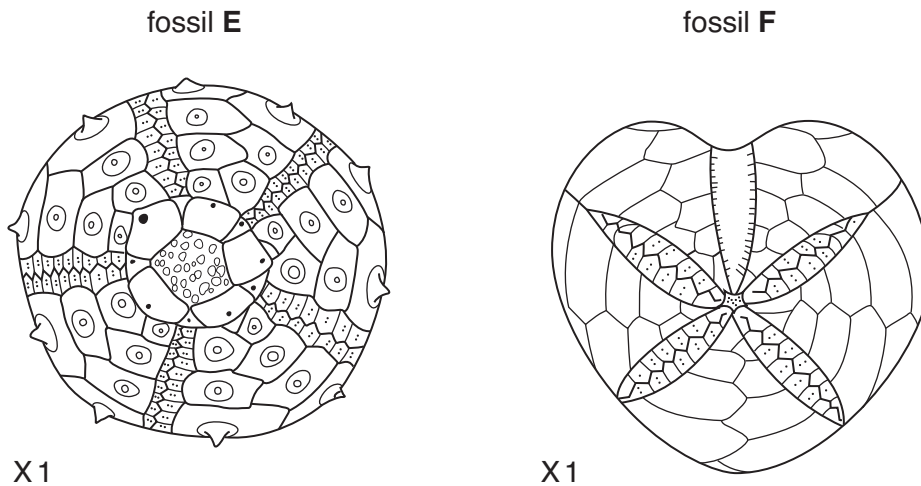
.....

.....

..... [3]

[Total: 16]

2 Fossils **E** and **F** are both echinoids. The diagrams show the aboral surface.



(a) (i) The table shows a series of features that **can be seen** on fossil **E**, **F** or **both**.

Complete the table by circling the correct option in each case. Circle only **one** answer. The first one has been done for you.

Features seen	Options		
test composed of calcite plates	E	F	both
pore pairs	E	F	both
anterior groove	E	F	both
tubercle	E	F	both
petaloid ambulacra	E	F	both
anus	E	F	both

[5]

(ii) Describe a function of the following features, found in echinoids.

tube feet

.....

plastron

..... [2]

(iii) What type of echinoid is fossil **F**?

..... [1]

(iv) State **two** functions of spines.

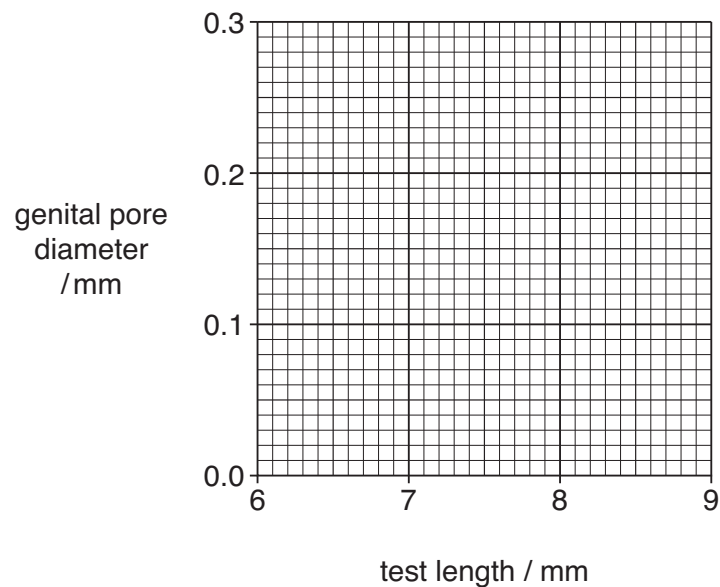
1

2

[1]

- (b) The test length and genital pore diameter of 7 specimens of echinoid were recorded at one geological horizon. The results are shown in the table below.

Echinoid number	Genital pore diameter (mm)	Test length (mm)
1	0.10	7.5
2	0.29	8.0
3	0.25	8.5
4	0.15	7.8
5	0.30	8.5
6	0.24	9.0
7	0.10	7.2



- (i) Plot the data as a scatter graph. [3]

- (ii) Describe and explain the distribution shown on your scatter graph.

.....

.....

.....

..... [2]

- (iii) Explain if the sample size is large enough to form a valid conclusion.

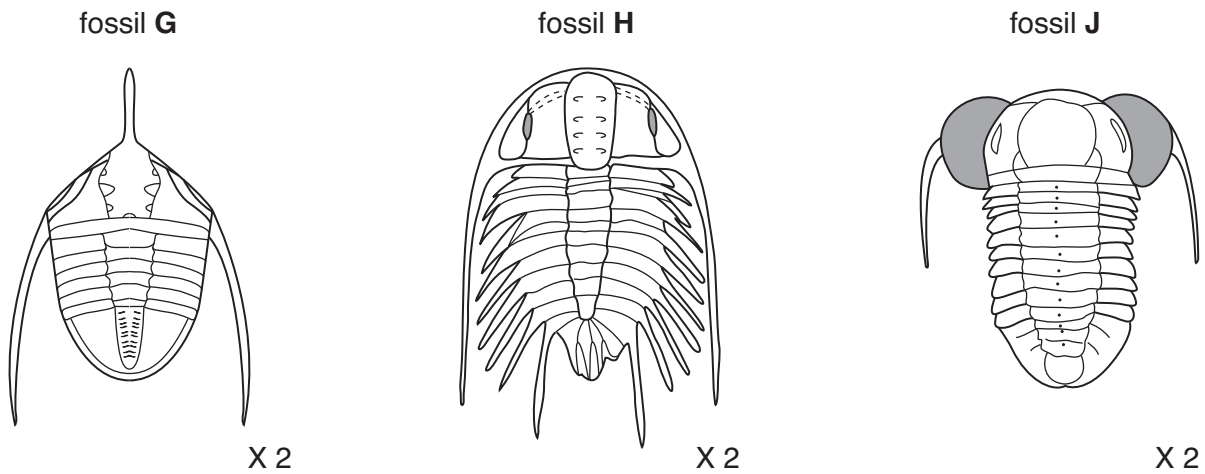
.....

..... [1]

[Total: 15]

Turn over

3 Fossils **G**, **H** and **J** are all trilobites.



(a) (i) What is the exoskeleton of a trilobite made of?

..... [1]

(ii) Label the following morphological features on the diagram of fossil **H** above.

genal spine

facial suture

glabella

pygidium

[4]

(iii) Shade **one** pleuron on fossil **J** above.

[1]

(b) (i) State the likely mode of life of fossils **G** and **H**.

G

H [2]

(ii) One interpretation for the mode of life of fossil **J** is that it swam in the water column. Discuss **two** pieces of evidence to support this idea.

.....

.....

.....

.....

.....







.....

.....

.....

..... [4]

- (c) The diagram below shows the fossil ranges for 6 species of trilobite for part of the Palaeozoic.

Trilobite Species	Silurian			Devonian	Carboniferous
	Lower	Middle	Upper		
<i>Harpes</i>					
<i>Agnostus</i>					
<i>Illenus</i>					
<i>Dalmanites</i>					
<i>Phacops</i>					
<i>Phillipsia</i>					

- (i) Which fossil is least useful as a zone fossil?

..... [1]

- (ii) Give **two** characteristics of a good zone fossil.

1

.....

2

..... [2]

- (d) Describe how trilobites formed trace fossils when they were alive. Diagram(s) are essential to illustrate your answer.

.....

.....

.....

..... [3]

[Total: 18]

Turn over

4 (a) The table below shows information about modes of life and fossil assemblages.

- (i) Complete the first column of the table by matching the correct term to its description. Choose terms from the list below.

anoxic derived fossils epifaunal heteromorph infaunal
 invertebrate fossils life assemblage pelagic toxic

term	description
	lives in the water column typically in the surface layers
	a group of fossils found in the same position they occupied during life
	water which lacks oxygen (anaerobic)
	organism lives on the sediment surface
	fossils weathered out of a rock and redeposited in another rock

[5]

- (ii) For a high energy continental shelf environment:

- state **two** fossils that could be found as part of the fossil assemblage
- describe the morphological adaptations needed to survive there.

.....

.....

.....

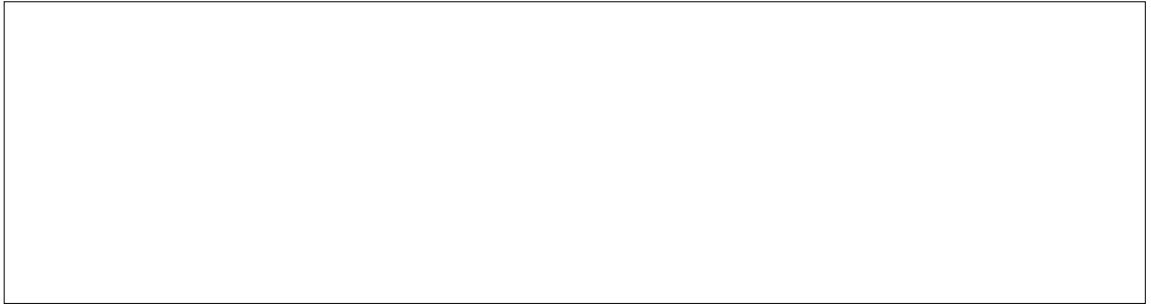
.....

.....

..... [3]

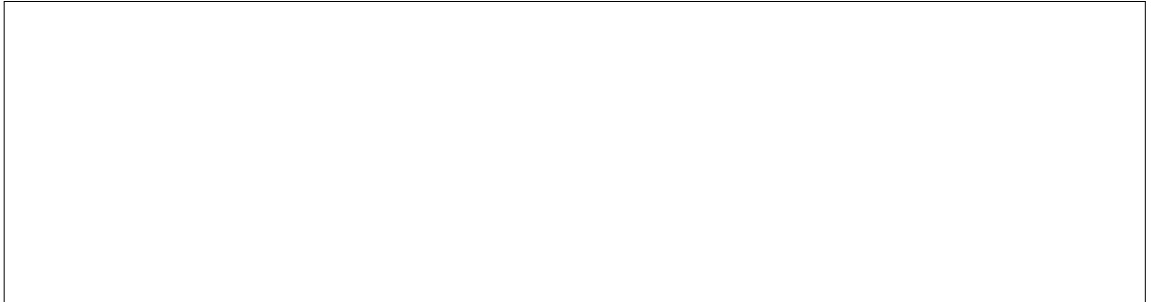
- (b)** Explain how the relative ages of rocks can be determined using the following methods. Use diagrams to illustrate your answers.

- (i)** Law of cross cutting relationships



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

- (ii)** Law of superposition



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

- (c) (i)** Describe how the Potassium-Argon method is used to date rocks.

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

- (ii)** Describe the problems in obtaining accurate dates using this method.

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

[Total: 16]

Turn over

- 5 (a)** Compare the morphological similarities and differences between brachiopods and bivalves. Diagrams are essential to illustrate your answer.



In this question, 2 marks are available for the quality of written communication.

This image shows a single page of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(b) Describe the morphology of scleractinian corals (modern). Explain how the study of modern corals can help us determine environments in the past.

This image shows a full page of white paper with horizontal dashed lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

..... [11]

Quality of Written Communication [2]

[Total: 25]

END OF QUESTION PAPER

13
BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

14
BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

15
BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

PLEASE DO NOT WRITE ON THIS PAGE



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations, is given to all schools that receive assessment material and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.