

**ADVANCED SUBSIDIARY GCE
GEOLOGY**

2832

The Rock Cycle – Processes and Products
THURSDAY 24 MAY 2007

Afternoon

Time: 1 hour

Additional materials: Electronic calculator
Ruler (cm/mm)



Candidate
Name

Centre
Number

--	--	--	--	--

Candidate
Number

--	--	--	--

INSTRUCTIONS TO CANDIDATES

- Write your name, Centre Number and Candidate Number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- **WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.**

INFORMATION FOR CANDIDATES

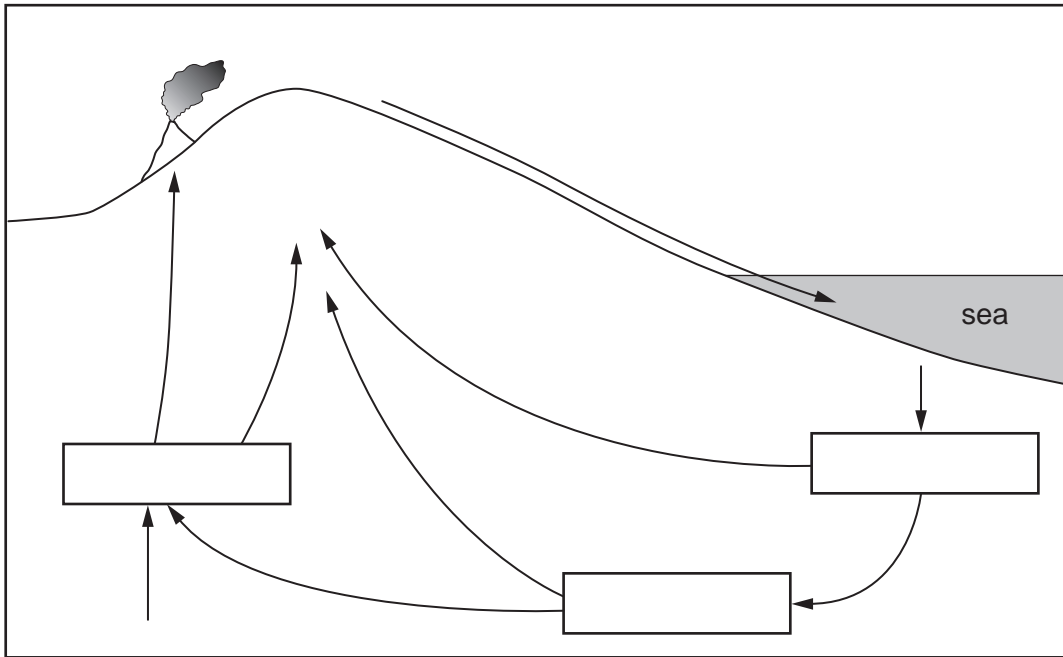
- The number of marks for each question is given in brackets [] at the end of each question or part question.
- You will be awarded marks for the quality of written communication where this is indicated in the question.
- The total number of marks for this paper is 60.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculation.

For Examiner's Use		
Qu.	Max.	Mark
1	17	
2	16	
3	17	
4	10	
TOTAL	60	

This document consists of **11** printed pages and **1** blank page.

Answer **all** the questions.

1 Below is a diagram of the rock cycle.



(a) (i) Define the term *rock cycle*.

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

(ii) Label the diagram by placing the following rock groups in the boxes

- igneous
 - metamorphic
 - sedimentary.
- [2]

(iii) Mark on the diagram

- X, where partial melting is taking place
 - Y, where lithification is taking place.
- [2]

(iv) Describe the processes that form intrusive igneous rocks.

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

(v) State **two** products of a volcano.

.....
 [2]

(b) Complete the description column in the table below by writing down the correct letters from the list. Use **all** the letters.

class of rocks	description letters
igneous	
sedimentary	
metamorphic	

list

description

- A** produced by diagenesis
- B** recrystallised at temperatures below their melting point
- C** may be intrusive or extrusive
- D** formed at contacts outside large intrusions
- E** crystallised from magma
- F** most form from deposited fragments
- G** may be formed by organic processes
- H** contain minerals that grow in the solid state

[4]

(c) The table below represents the main geological time units. Some unit names are included.

J	K
Mesozoic	
	Carboniferous
Precambrian	

(i) What name is usually given to this table?

..... [1]

(ii) On the diagram shade the most recent time unit in column **K**.

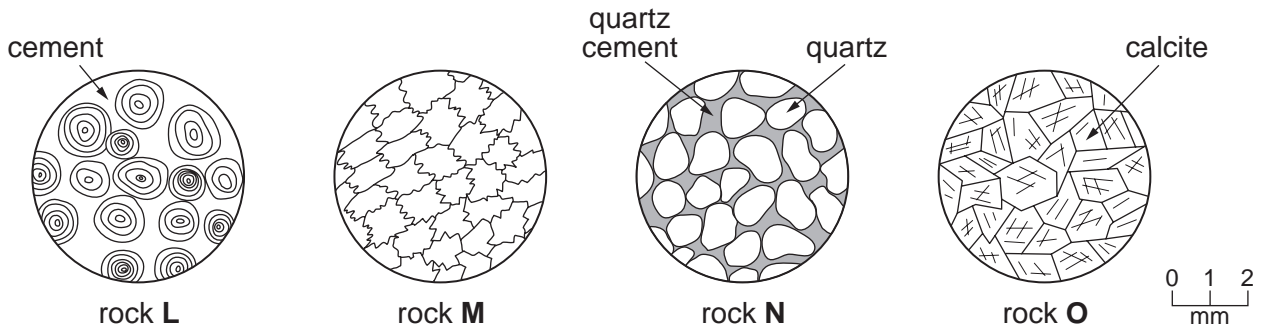
[1]

(iii) What name is given to all the geological time units in:

column **J** column **K** [2]

[Total: 17]

2 The diagram below shows thin section drawings of two metamorphic rocks and their sedimentary parent rocks.



(a) (i) Complete the sentences below by entering the correct rock letters.

Rock is the parent of rock

Rock is the parent of rock [2]

(ii) Describe how rock **L** forms.

.....

 [2]

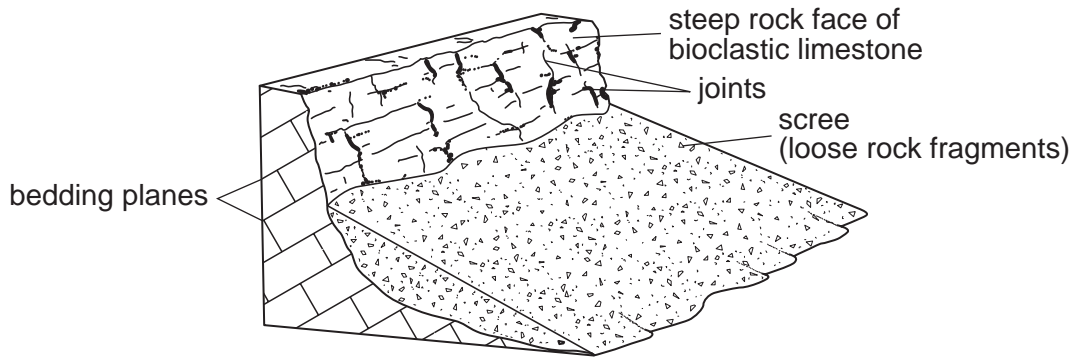
(iii) Rock **N** has symmetrical ripple marks on the bedding planes. Describe the environment in which rock **N** was deposited.

.....

 [2]

(iv) Draw a diagram with a suitable scale to show symmetrical ripple marks.

(b) The sketch below shows a limestone cliff in a mountainous area.



(i) Describe **one** mechanical weathering process, operating in a cold climate, that has affected the limestone.

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

(ii) State the shape of the scree fragments.

.....[1]

(iii) How were these fragments transported?

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

(iv) Describe **one** chemical weathering process that affects the limestone.

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

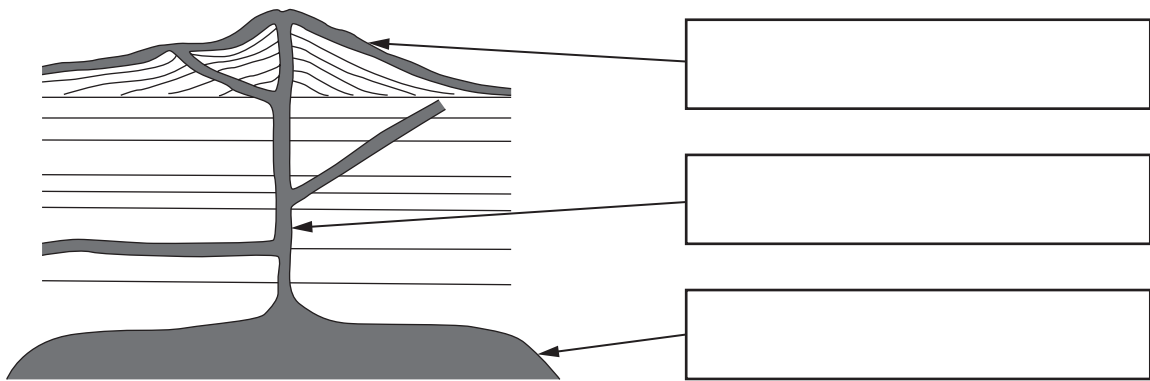
(c) Describe how bioclastic limestone forms.

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

[Total: 16]

[Turn over

3 The diagram below is a cross section through several igneous features.



not to scale

(a) (i) Label the diagram above by placing the following terms in the boxes.

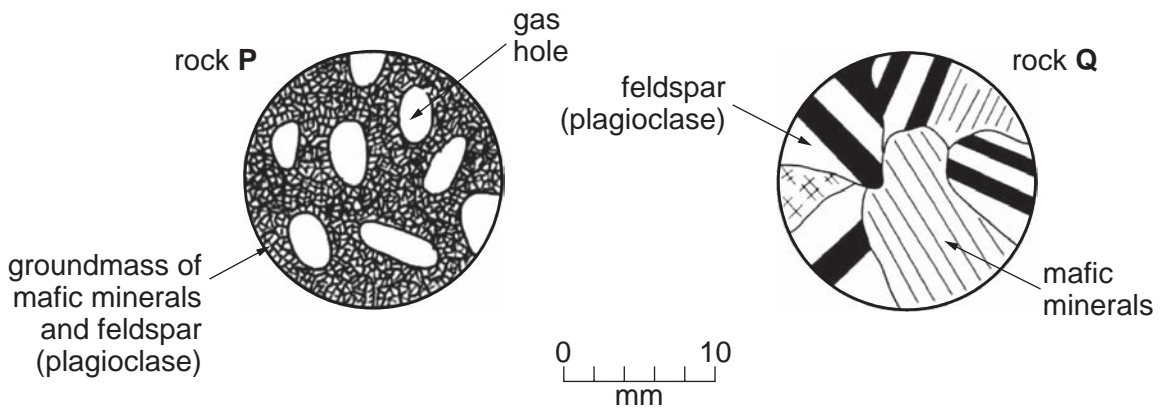
- hypabyssal
- plutonic
- volcanic

[2]

(ii) Label a sill on the diagram.

[1]

(b) Below are drawings of thin sections of two igneous rocks.



(i) State the crystal grain size of rocks P and Q.

P

Q

[2]

(ii) Describe how the texture in rock P was produced.

.....

.....

.....

.....

.....[2]

(iii) Explain how crystal grain size is related to rates of cooling at different depths in the Earth.

.....

.....

.....

.....

.....

.....

.....

.....

.....

[3]

(c) The table below shows the results of a student's research into the world's top 12 most deadly volcanic eruptions.

rank	volcano	location	year of eruption	deaths	major cause of death
1	Tambora	Indonesia	1815	92000	ash fall, starvation
2	Krakatau	Indonesia	1883	36417	ash fall, tsunami
3	Mount Pelée	Martinique	1902	29025	pyroclastic flows
4	Ruiz	Colombia	1985	25000	lahars
5	Unzen	Japan	1792	14300	volcano collapse, tsunami
6	Laki	Iceland	1783	9350	starvation
7	Kelut	Indonesia	1919	5110	lahars
8	Galunggung	Indonesia	1882	4011	lahars
9	Vesuvius	Italy	1631	3500	lava flows, lahars
10	Vesuvius	Italy	79	3360	ash falls, pyroclastic flows
11	Papandayan	Indonesia	1772	2957	pyroclastic flows
12	Lamington	Papua New Guinea	1951	2942	pyroclastic flows

(i) Explain why Indonesia has so many volcanic eruptions.

.....

 [2]

(ii) Using the table, calculate the percentage of eruptions that had **starvation** as a major cause of death. Show your working.

.....% [2]

(iii) Suggest reasons why the global summer of 1816 was very cold.

.....

 [3]

[Total: 17]

PLEASE DO NOT WRITE ON THIS PAGE

PLEASE DO NOT WRITE ON THIS PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (OCR) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

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.