OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE **2832**

GEOLOGY

The Rock Cycle – Processes and Products

WEDNESDAY 21 MAY 2008 Afternoon

Time: 1 hour

Candidates answer on the question paper
Additional materials (enclosed): None

Additional materials (required):
Electronic calculator
Ruler (cm/mm)

CUP/T40706

Candidate Forename		Candidate Surname	
Centre Number		Candidate Number	

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or 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.

INFORMATION FOR CANDIDATES

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

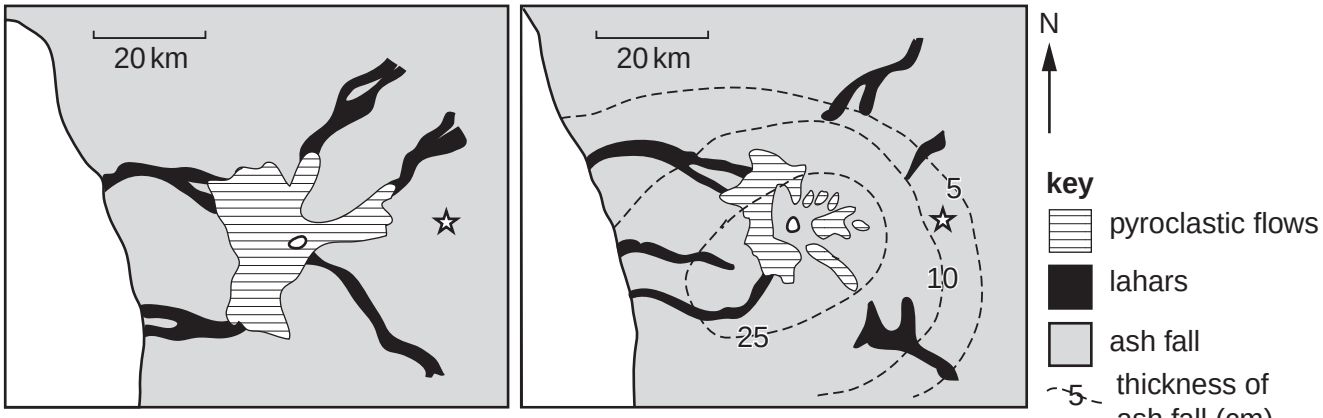
FOR EXAMINER'S USE		
Qu.	**Max.**	**Mark**
1	**16**	
2	**17**	
3	**17**	
4	**10**	
TOTAL	**60**	

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

[Turn over

Answer **all** the questions.

1 The maps below show the area around Mount Pinatubo, a volcano in the Philippines. This volcano is located on a destructive plate margin.



A hazard map produced **before** 1991 eruption

B map of deposits **after** 1991 eruption

(a) (i) Describe a *lahar*.

.....

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.....[2]

(ii) Explain why the paths of lahars were successfully predicted.

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.....[2]

(b) Suggest the probable effects of the eruption on the US air base.

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.....[2]

(c) Suggest why there were no lava flows during this eruption.

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.....[2]

(d) **(i)** Define the terms *well sorted* and *poorly sorted*.

.....

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.....[2]

(ii) Draw diagrams **to scale** showing the difference between well sorted and poorly sorted sandstones.

well sorted sandstone

poorly sorted sandstone

[2]

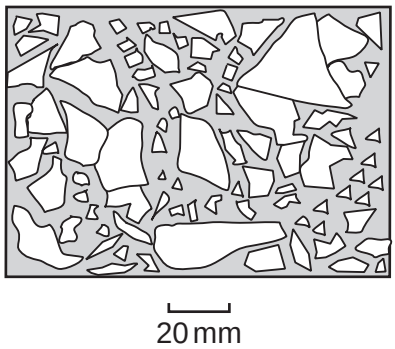
(iii) Using technical terms, describe and name the sedimentary rock below.

roundness .....

grain size .....

sorting .....

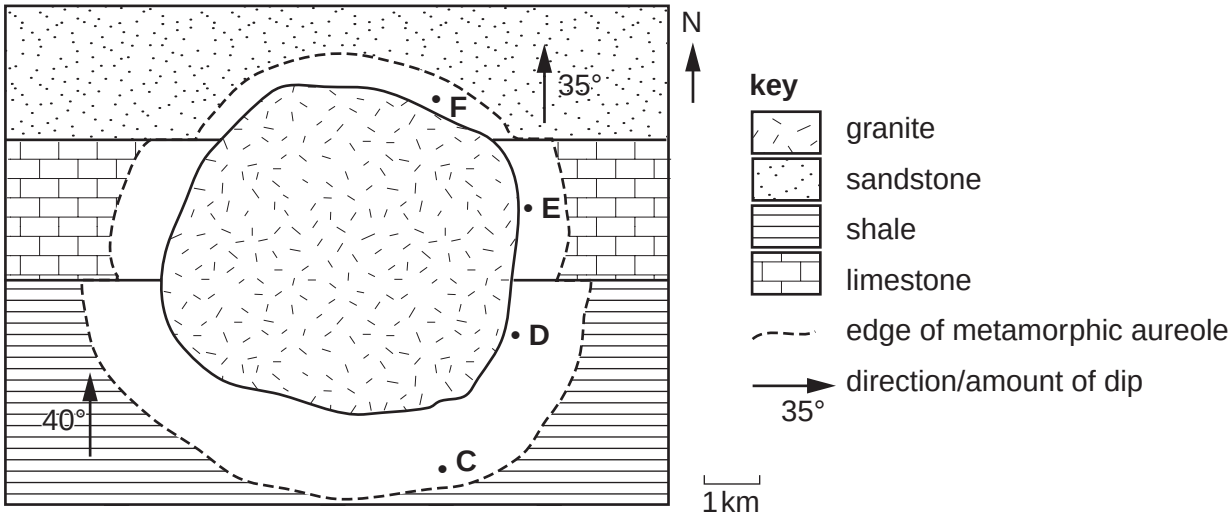
name of rock .....



[4]

[Total: 16]

2 The map below shows an igneous intrusion and the surrounding country rocks.



(a) (i) State the type of metamorphism shown on the map.

.....[1]

(ii) Explain why this type of metamorphism does **not** produce foliation.

.....

.....

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.....[2]

(iii) Define the term *metamorphic aureole*.

.....

.....

.....

.....[2]

(iv) Suggest **one** reason why the width of the metamorphic aureole is narrower in the north than in the south.

.....

.....[1]

(v) Identify the metamorphic rocks that would be found at:

C ..... **D** .....

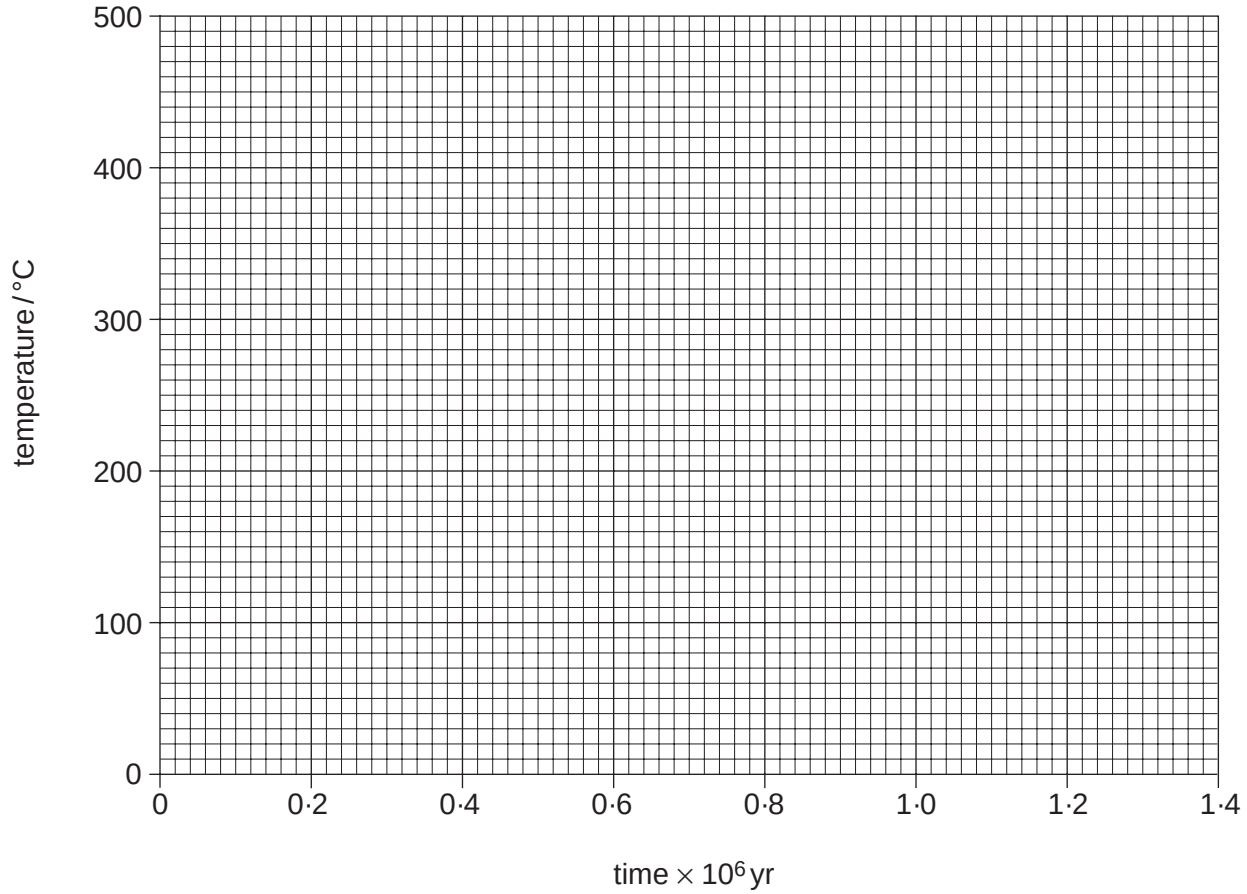
E ..... **F** .....

[4]

(b) The table below shows how the temperature of country rock surrounding a granite intrusion changes over time.

temperature / °C	320	460	410	340	290	190	100	90
time / $\times 10^6$ yr	0	0·2	0·4	0·6	0·8	1·0	1·2	1·4

(i) Plot a line graph of temperature over time. [3]



(ii) What is the time interval between maximum and minimum temperatures in the country rock?

..... $\times 10^6$ yr [1]

(iii) Calculate the average rate of cooling of the country rock in °C / yr between the times of maximum and minimum temperature.

..... °C / yr [2]

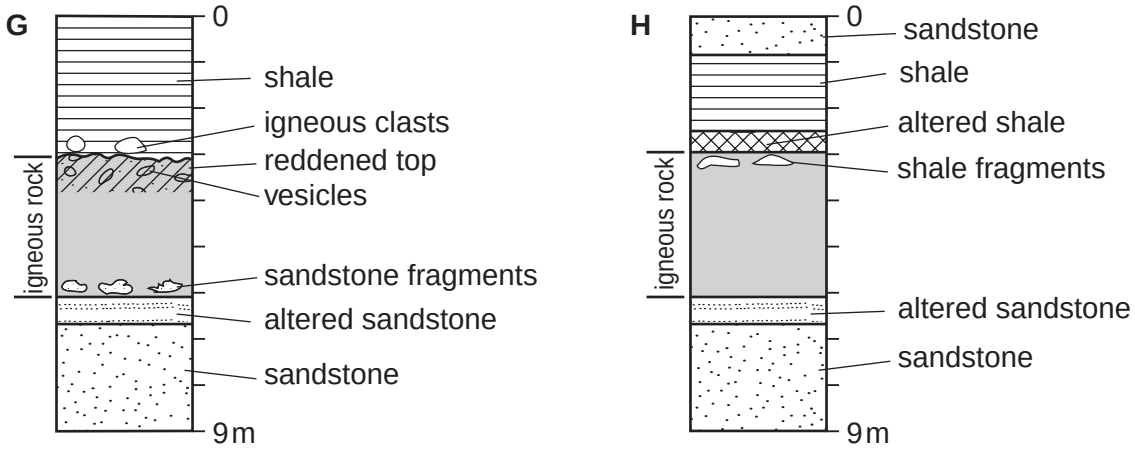
(c) The intrusion in part **(b)** is 4 km in diameter. Suggest how the average rate of cooling would differ in rocks around a granite intrusion that is 10 km in diameter.

.....

.....[1]

[Total: 17]

3 The diagrams below show two igneous bodies found in boreholes.



(a) (i) Which of the diagrams shows a sill? ……

Give a reason for your answer.

.....

.....[2]

(ii) Explain how xenoliths form.

.....

.....

.....

.....[2]

(iii) Define the term *vesicle*.

.....

.....[1]

(iv) Explain why the vesicles are at the top of igneous body **G** only.

.....

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.....[2]

(v) Explain why the top of igneous body **G** is reddened.

.....

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.....[2]

(b) (i) Give the term used to describe the 'altered' layers in the diagrams.

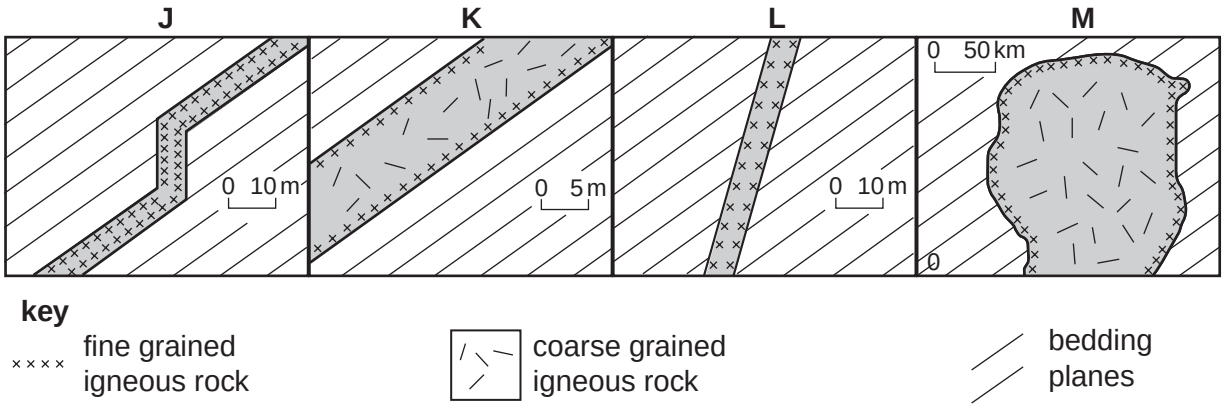
.....[1]

(ii) Describe how the 'altered' layers form.

.....

.....[1]

(c) Below are four diagrams showing a variety of igneous bodies.



(i) Define the term *discordant*.

.....

.....[1]

(ii) Define the term *concordant*.

.....

.....[1]

(iii) Using the diagrams, complete the table below.

	name of igneous body	tick (✓)	
		concordant	discordant
J		✓	✓
K			
L			
M			

[4]

[Total: 17]

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

Define the term *weathering*. Describe any **three** of the following weathering processes

- hydrolysis
- carbonation
- exfoliation
- frost shattering

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Quality of Written Communication [2]

[Total: 10]

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