OCR
Oxford Cambridge and RSA

Friday 18 May 2018 – Afternoon

AS GCE GEOLOGY

F792/01 Rocks – Processes and Products

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Ruler (cm/mm)
- Protractor
- Electronic calculator

Duration: 1 hour 45 minutes

Candidate forename		Candidate surname	

Centre number						Candidate number				

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. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- 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 page(s) at the end of this booklet. The question number(s) must be clearly shown.
- Do **not** write in the barcodes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
-  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.
- You are advised to show all the steps in any calculations.
- The total number of marks for this paper is **100**.
- This document consists of **24** pages. Any blank pages are indicated.

Answer **all** the questions.

1 **(a)** There are a number of processes which operate within the rock cycle.

(i) Complete the table by entering the name of the correct process in each box below. Choose from the list of processes below.

uplift
crystallisation
magma accumulation
metamorphism
recrystallisation
burial

	Description of process	**Name of process**
A	occurs when a sediment is covered by younger layers of sediment accumulating on top of it	
B	occurs during the cooling of magma or lava so that solid mineral crystals form	
C	the return of buried rocks to the Earth's surface by tectonic forces	
D	magma has a lower density than the surrounding rocks which causes it to rise and join with other rising magma	

[2]

(ii) Lithification happens after process **A** and turns sediment into a solid rock.

Describe the process of lithification.

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

(iii) Describe two differences between a rock and a mineral.

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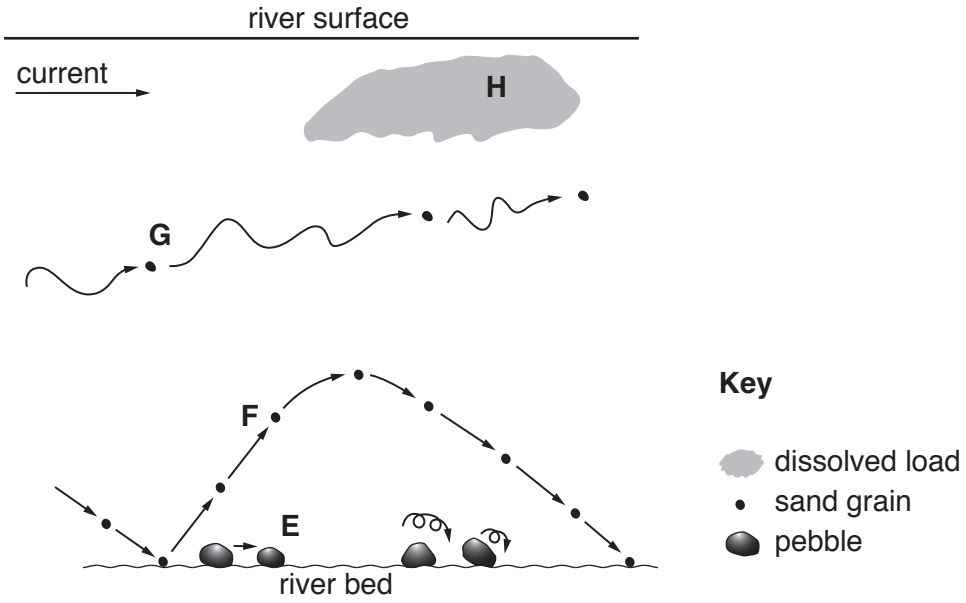
..... **[2]**

(b) The diagram below shows methods of sediment transportation.



(i) Name the methods of transportation at **F**, **G** and **H**.

Method	Name of method
F	
G	
H	

[2]

(ii) Describe the method of transportation occurring at **E**.

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

(iii) Explain what will happen to the pebbles once they have been transported by method **E** for a long period of time.

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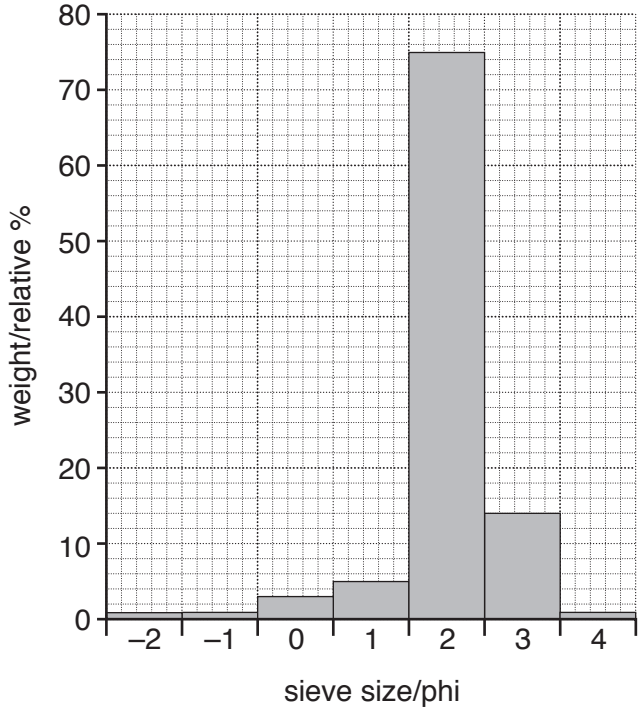
..... **[2]**

(c) The table below shows the grain size distribution of two sediments, **J** and **K**, that have been sieved. The –2 (phi) sieve contains the coarsest particles.

Sieve size/phi	Weight/relative %	
	Sample J	Sample K
–2	1	10
–1	1	20
0	3	16
1	5	8
2	75	12
3	14	18
4	1	16

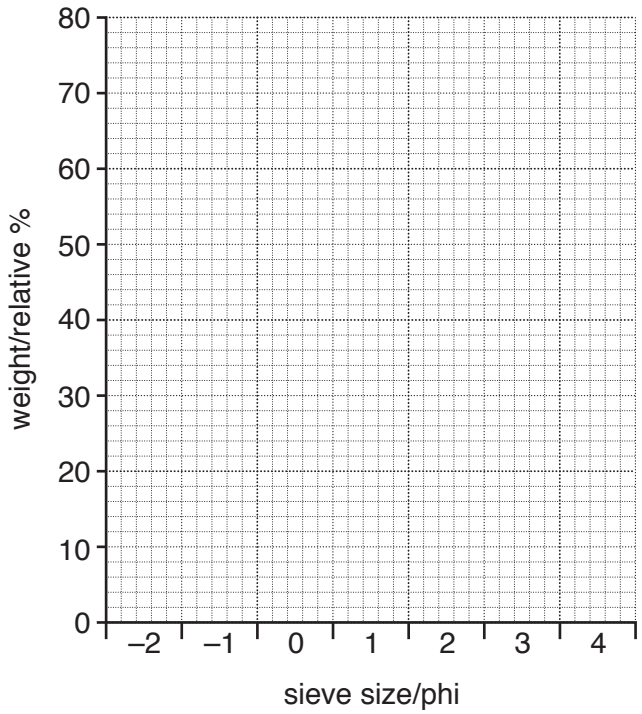
The data for sample **J** is displayed below as a histogram.

Sample **J**



(i) Using the data from the table, complete the histogram below for sample **K**.

Sample **K**



[2]

(ii) Using the data from the histograms, compare the degree of sorting between the two samples, **J** and **K**.

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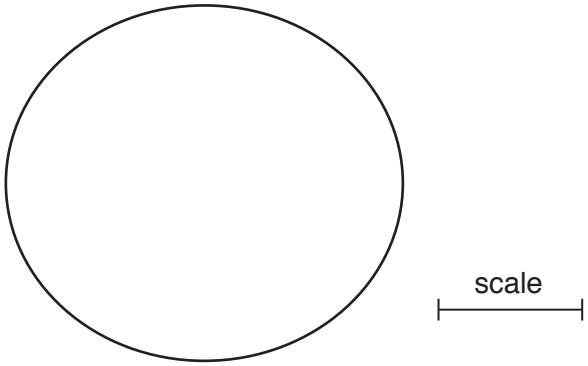
..... **[1]**

(iii) Sample **K** includes the rock type boulder clay. Draw a labelled diagram to show the main features of this rock. Include an appropriate scale.



[2]

(iv) Sample **J** is sediment from dune sand.

State the environment of deposition for Sample **K**.

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

[Total: 17]

2 **(a)** Rocks are broken down by a number of different weathering processes.

(i) With the aid of annotated diagrams, explain the process of frost shattering.

[3]

(ii) Describe the process of carbonation.

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

(iii) Explain how tree roots can break down rocks.

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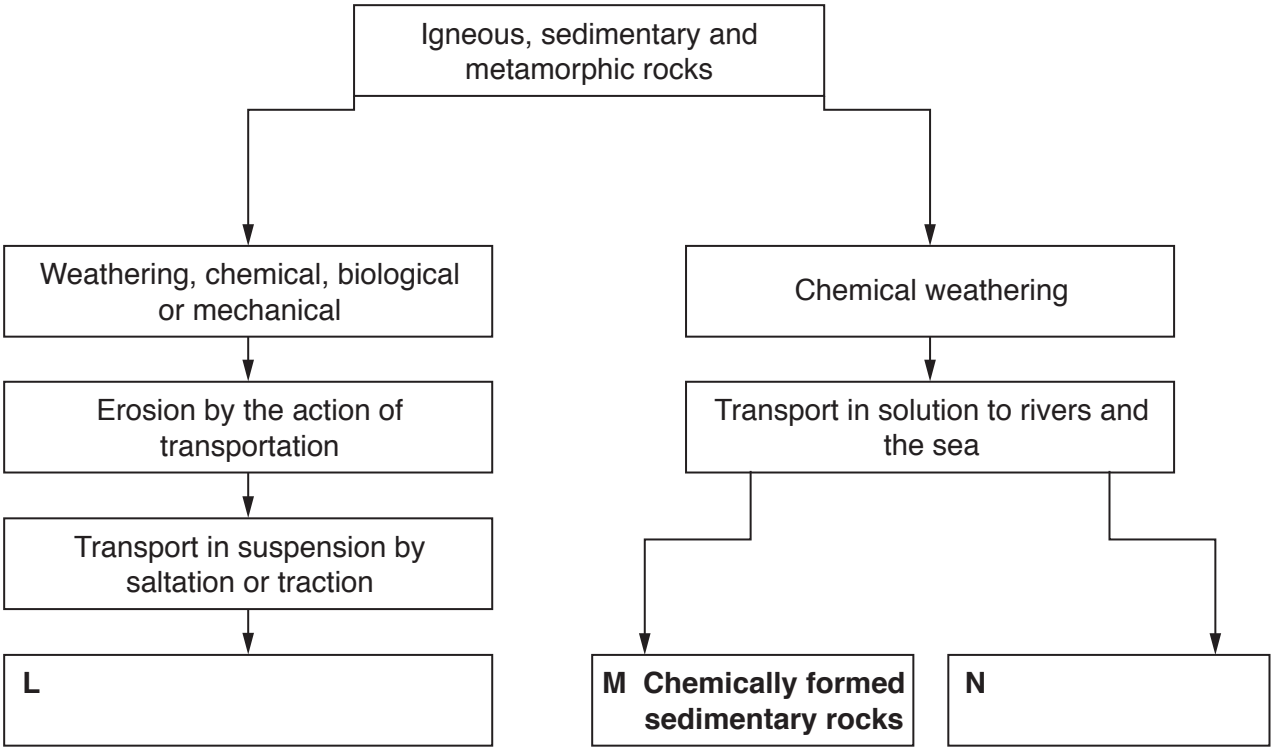
..... **[2]**

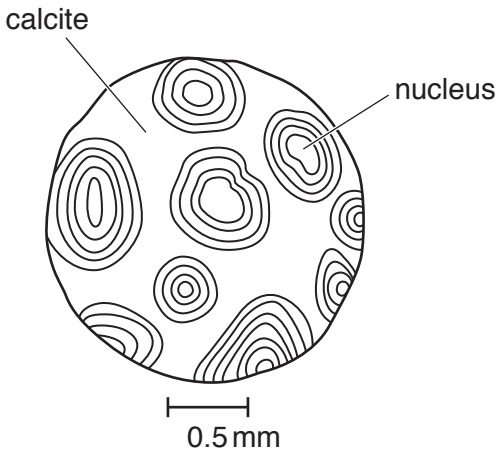
(b) The diagram below shows the classification of sedimentary rocks.



(i) Complete the diagram by naming the sedimentary rock groups **L** and **N**. **[1]**

(ii) The diagram below is oolitic limestone, which is a chemically formed sedimentary rock.

Explain how it is formed.



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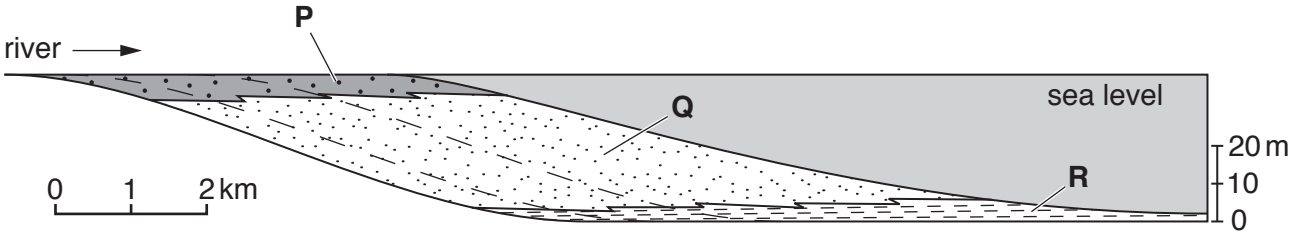
(c) The diagram below shows a cross-section through a delta, where a river flows into the sea.



(i) Describe the conditions required for a delta to form.

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

(ii) Describe the sedimentary deposits located at **P**.

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

(iii) Name the sediments located at **Q**.

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

(iv) Describe the energy levels **and** sedimentary deposits located at **R**.

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

(d) A cyclothem is a repeated sequence of deltaic sediment deposits.

Explain how it is formed.

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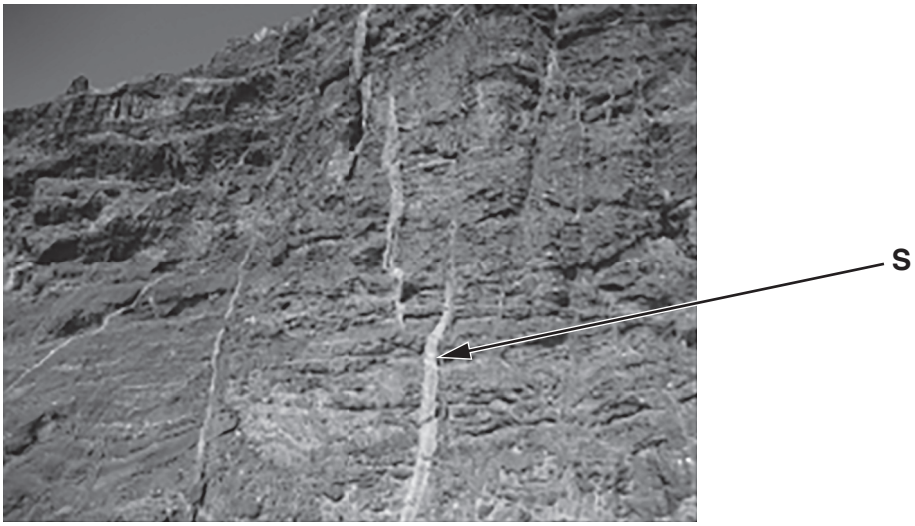
..... **[2]**

[Total: 18]

3 The photograph below shows an igneous feature visible in the cliffs along the west coast of Tenerife.



(a) (i) Name the igneous feature **S** seen in the photograph.

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

(ii) Explain how both chilled **and** baked margins form.

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

(iii) Describe and explain the difference between sills and lava flows with reference to the following:

crystal grain size .....

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xenoliths .....

.....
[2]

(iv) Explain how the texture of amygdaloidal vesicular lava forms.

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

(b) Define the following terms:

Country rock .....

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Discordant .....

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Concordant .....

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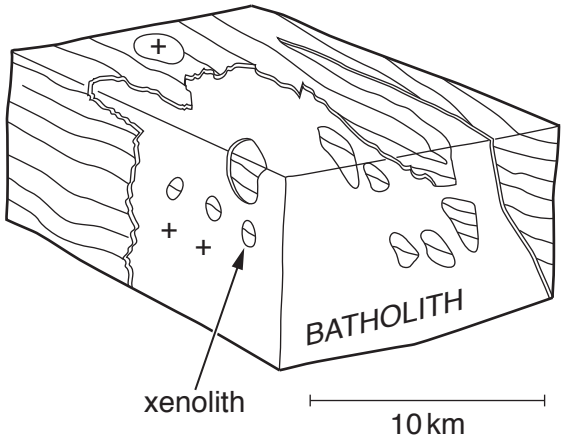
[3]

(c) Below is a diagram of part of the top of a batholith.



Explain the processes of stoping and assimilation.

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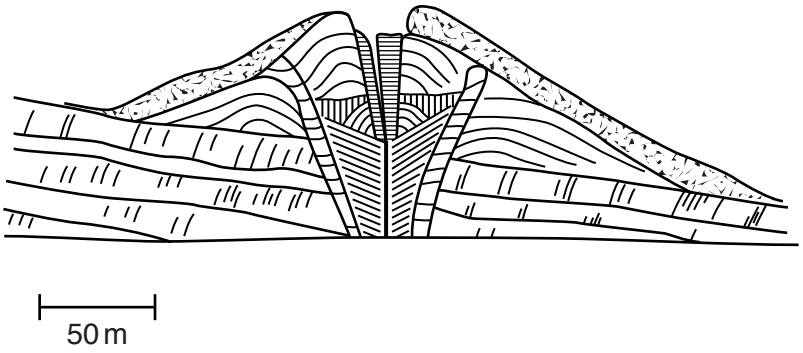
..... **[3]**

[Total: 15]

4 **(a)** Below is a cross-section of a parasitic cone built on the surface of lava flows and pyroclastic rocks on the flank of a strato-volcano.



(i) Explain how parasitic cones can form on the flank of volcanoes.

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

(ii) Complete the table below by naming the volcanic product that matches each description.

Description	**Volcanic product**
Particles are 2 mm–64 mm in size. Vesicular texture. 66%–75% silica. Glassy shards and fine crystals.	
Particles 2 mm–64 mm in size. Fragmental rock including quartz and feldspar. Formed when magma is ejected by a volcano.	

[2]

(iii) Name an example of both a mafic lava **and** a silicic lava.

Describe the difference between these two lava types.

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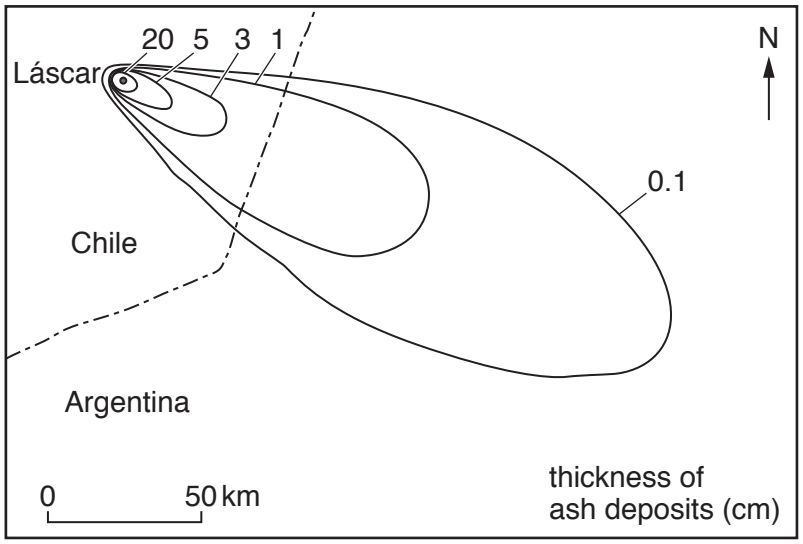
..... **[3]**

(b) Below is information about Láscar, a strato-volcano in Chile.

On October 30, 2015 a webcam recorded an ash plume rising 2.5 km above Láscar, in the northern Andes of Chile. The fact that there seemed to be little in the way of precursor earthquakes had suggested that this blast may have been a phreatic explosion driven by water flashing to steam beneath the volcano's summit crater. Prior to this eruption, precursor earthquakes had been common.



(i) Explain the reason for precursor earthquakes.

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

(ii) Describe and explain the pattern of ash fall.

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

(iii) Name the type of map shown above, used to show the thickness of ash deposits around a volcano.

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(iv) Other than precursor earthquakes, describe two additional methods for predicting volcanic activity.

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(v) Evaluate ash fall analysis as a method for identifying the risk of volcanic activity in any given location.

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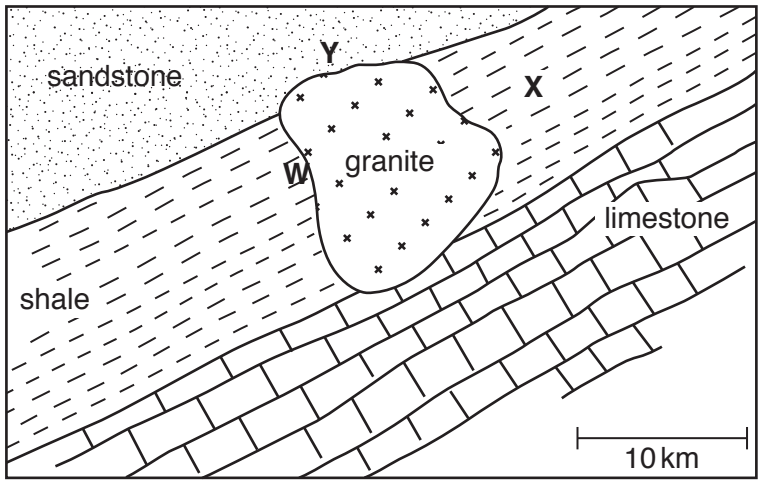
[Total: 16]

5 **(a)** The map below shows granite intruding into a series of sedimentary rocks.



(i) Name the type of metamorphism which will occur in this location.

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

(ii) Shade a 5 km metamorphic aureole around the intrusion. **[1]**

(iii) Identify the rocks found at **W**, **X** and **Y**.

W .....

X .....

Y ..... **[3]**

(iv) Describe and explain the formation of this metamorphic aureole.

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

(v) Define the term *metamorphic grade*.

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

(vi) Explain how the width of this metamorphic aureole might vary.

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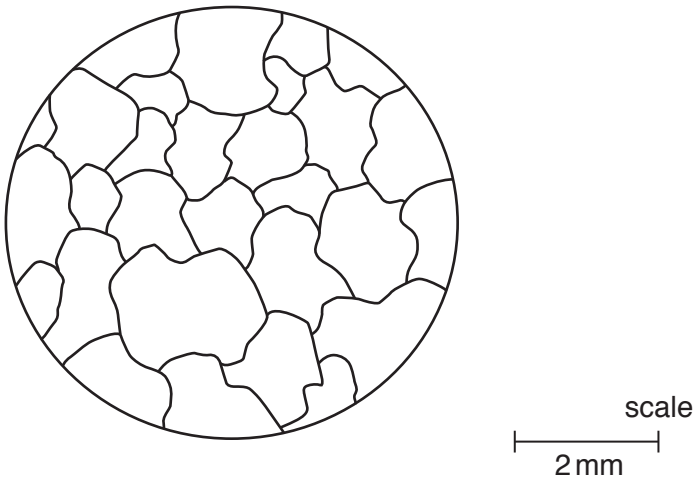
..... **[3]**

(b) The diagram below shows a thin section drawing of marble.



(i) Name the type of texture shown

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

(ii) Explain how this texture is formed.

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

[Total: 14]

6 Describe and explain how sedimentary structures can be used to determine past environments.

You may use diagrams to illustrate your answer. **[10]**

In your answer you should make clear links between the process of formation and the evidence of the past environment.

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[Total: 10]

7 Describe the three main resultant rock types that form in the Barrovian metamorphic zone from shale.

You may use diagrams to illustrate your answer. **[10]**

In your answer, you should make clear links between the Al_2SiO_5 polymorphs and their relationship to temperature and pressure.

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[Total: 10]

END OF QUESTION PAPER

ADDITIONAL ANSWER SPACE

If additional space is required, you should use the following lined page(s). The question number(s) must be clearly shown in the margin(s).