Surname

2



Other Names

GCE AS/A Level

1213/01

GEOLOGY – GL3 Geology and the Human Environment

MONDAY, 22 MAY 2017 - MORNING

1 hour 15 minutes

	For Examiner's use only		
	Question	Maximum Mark	Mark Awarded
Section A	1.	13	
	2.	12	
Section B	3.		
	4.	25	
	5.		
	Total	50	

ADDITIONAL MATERIALS

A calculator.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions from Section **A** and **one** from Section **B**.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

Candidates are reminded that marking will take into account the use of examples and the quality of communication used in answers, especially in the structured essay.

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Turn over.

(b) **Figure 1c** is a model showing two of three commonly observed stages during the course of a typical eruption cycle of Mauna Loa.



Figure 1d is a partially completed graph showing changes in the width of Mauna Loa's caldera during a typical eruption cycle.



Figure 1d

(i)	With reference to Figure 1c , complete the graph Figure 1d to show how the width of the caldera at Mauna Loa is likely to change before and during a typical eruption. [2]	Examiner only
(ii) 	Refer to Figures 1a , 1b and 1c . Evaluate the use of the data in Figures 1a and 1b in predicting the timing of a future eruption at Mauna Loa. [4]	
(iii)	Using Figure 1c explain how the monitoring of gas emissions could provide additional information in the prediction of future eruptions at Mauna Loa. [3]	5

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Turn over.

2. Figure 2a is a table showing rock strength information for sandstone and shale. The higher the value the stronger the rock.

6

Rock	Unweathered rock strength MPa	Weathered rock strength MPa	Dip of Beds
sandstone	40	5	45°
shale	30	5	45°

Fia	ure	2a
		_

Figure 2b is a map of a coastal area with a railway line.





(a)	Describe and explain the difference in rock strength between weathered and unweathered sandstone in Figure 2a. [2]	Examiner only
(b)	Refer to Figure 2b . Explain why the presence of the breakwater has put the stability of the railway line at Middle Beach at risk. [3]	
(C)	 (i) With reference to Figures 2a and 2b compare the risk of mass movement to the railway line at locations A and B. [4] 	
	 (ii) For either location A or location B in Figure 2b, describe and explain one method that could be used on the cliff face to stabilise the slope. [3] Location A or B 	
		12

SECTION B

8

Answer one question from this section on the following pages.

The marks you will be awarded in your essay take into account:

evidence of geological knowledge and understanding; the use of geological examples; legibility, accuracy of spelling, punctuation and grammar; the selection of an appropriate form and style of writing; the organisation of material, and use of geological vocabulary.

EITHER,

- **3.** (a) Describe the potential volcanic hazards that may result from ash fall and pyroclastic flows. [10]
 - (b) Explain how the destructive effects of lava flows, lahars and volcanic gases can be effectively controlled to reduce risk. [15]

OR,

- 4. (a) Describe and explain the causes of tsunamis. [10]
 - (b) Discuss the factors that affect the level of devastation in coastal areas following a tsunami. [15]

OR,

- 5. (a) Describe the problems associated with the overuse of aquifers. [10]
 - (b) With reference to **three** of the following explain the geological factors that have to be taken into consideration in the construction of a multi storey building.
 - rock type
 - rock structure
 - depth to water table
 - depth to rock head
 - radon gas

[15]

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