Surname	Centre Number	Candidate Number
Other Names		2

GCE AS/A LEVEL

2110U10-1

S19-2110U10-1

TUESDAY, 14 MAY 2019 – AFTERNOON

GEOGRAPHY – AS unit 1
CHANGING LANDSCAPES

2 hours

For Examiner's use only		
Question	**Maximum Mark**	**Mark Awarded**
Either 1 and 2 or 3 and 4	**16**	
	16	
	16	
	16	
5.	**22**	
6.	**24**	
7.	**18**	
Total	**96**	

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ADDITIONAL MATERIALS

A calculator.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen. Do not use correction fluid.

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

Write your answers in the spaces provided in this booklet.

In Section A, answer **either** questions 1 and 2 **or** questions 3 and 4.

Answer **all** questions in Section B.

If further space is required you should use the additional page(s) at the back of this booklet. The question number(s) should be clearly shown.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part-question; you are advised to divide your time accordingly.

This paper requires that you make as full use as possible of appropriate examples and reference to data to support your answers. Sketch maps and diagrams should be included where relevant.

A plain page is available near the back of the booklet for you to add any relevant sketch maps and diagrams you may wish to include. The question number(s) should be clearly shown.

Section A: Changing Landscapes

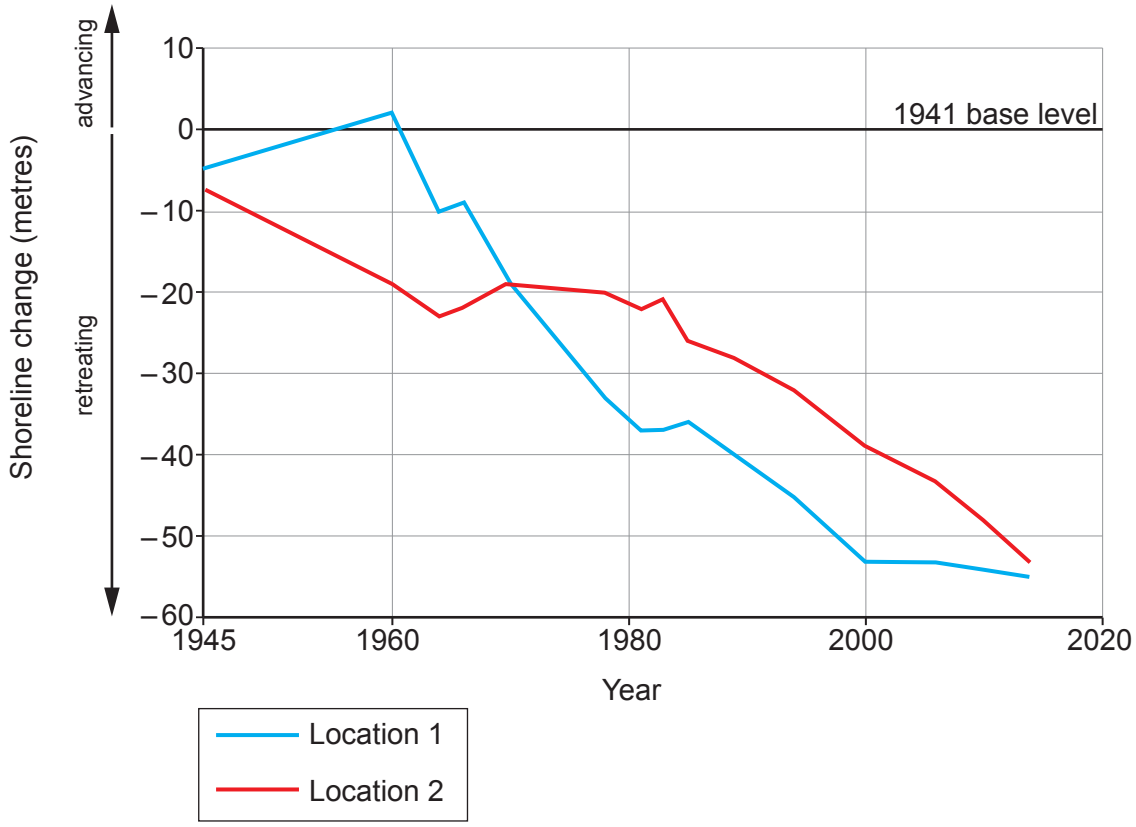
Answer **either** *questions 1 and 2* **or** *questions 3 and 4 from your chosen landscape.*

Make the fullest possible use of examples and data to support your answers.

Coastal Landscapes

Answer questions 1 and 2 if this is your chosen landscape.

Figure 1: Shoreline change on South Beach, Tenby 1945-2014



Source: www.mdpi.com

Examiner only

1. *(a)* (i) Use **Figure 1** to compare the shoreline changes shown at Location 1 and Location 2. [5]

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(ii) Suggest how wave type could explain the overall change from 1945-2014. [3]

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(b) Examine the role of coastal transport processes in the formation of **one** landform of coastal deposition. [8]

Additional space for Question **1***(b)* only:

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Figure 2: Links between time, space and process in the Louisiana coastal marshes, USA

<table>
<tr><td>Time scale</td><td>Minutes</td><td colspan="2">Days</td><td>Years</td><td>Centuries/Millennia</td></tr>
<tr><td>Spatial scale</td><td>MICRO</td><td colspan="3">← MESO →</td><td>MACRO</td></tr>
<tr><td rowspan="3">Processes</td><td colspan="4">Waves Storms Flood cycles Sea level change
← Currents →
← Wind →</td></tr>
<tr><td>Localised sediment movements</td><td colspan="2">Erosion and deposition across whole marsh</td><td>Shoreline advance and retreat</td></tr>
</table>

Source: https://pubs.usgs.gov

2. *(a)* (i) Use **Figure 2** to describe the links between time, space and process. [5]

(ii) Explain why changes in sea level take place over millennia. [3]

Examiner only

(b) Examine the importance of geology in the formation of **one** landform of coastal erosion. [8]

Additional space for Question **2***(b)* only:

Turn over.

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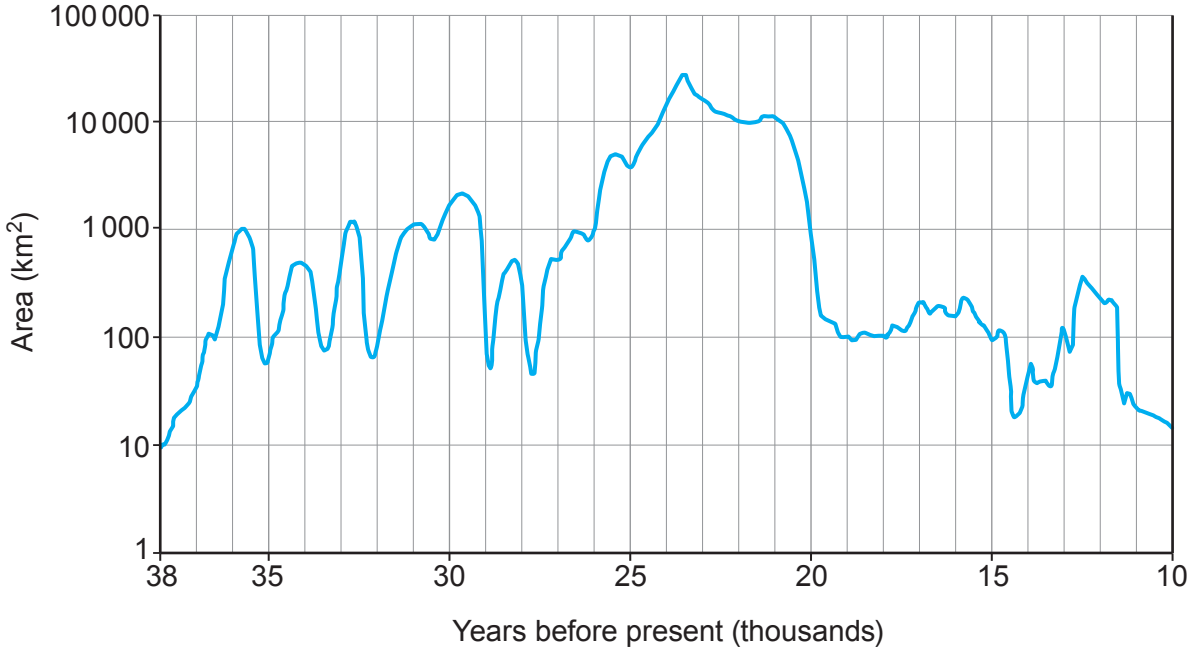
Glaciated Landscapes

Answer questions 3 and 4 if this is your chosen landscape.

Figure 3: Variations in the area of the last Welsh Ice Cap



Source: www.researchgate.net

3. *(a)* (i) Use **Figure 3** to describe variations in the area covered by the last Welsh Ice Cap. [5]

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(ii) Explain why there are periodic increases in the area covered by the last Welsh Ice Cap. [3]

(b) Examine the importance of plucking and abrasion in the formation of **one** macro-scale landform of glacial erosion. [8]

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Additional space for Question **3***(b)* only: .....

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Figure 4a: The Oso landslide, Washington, USA, 22nd March 2014

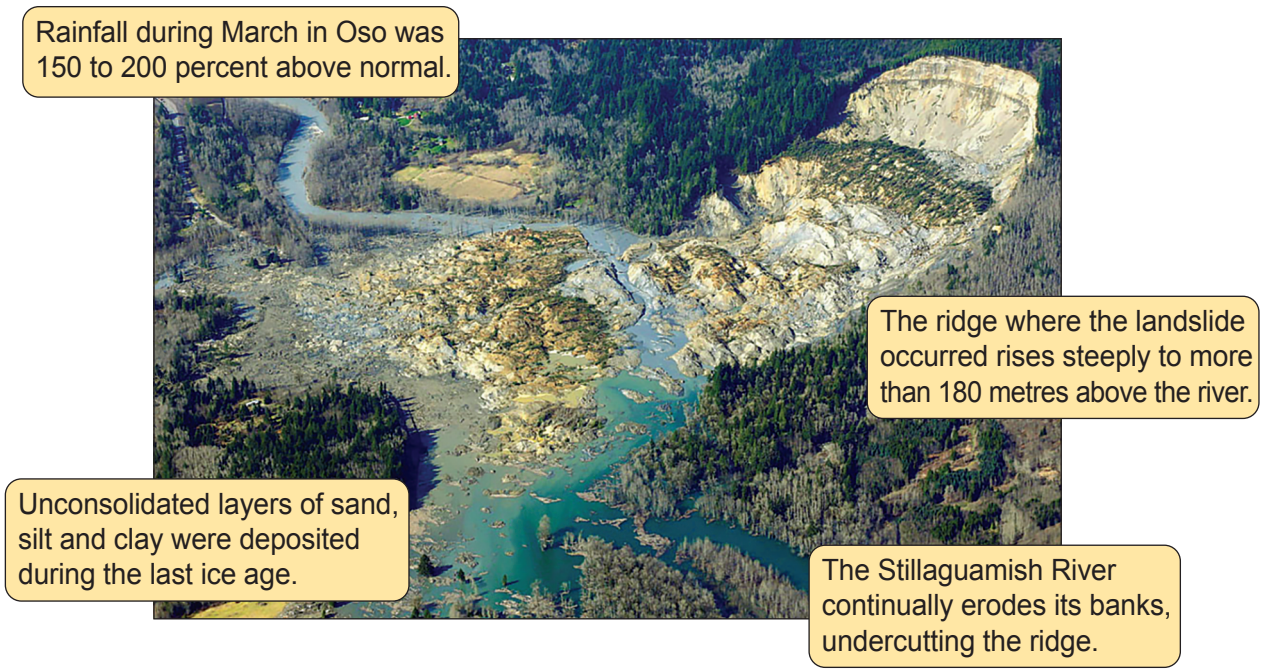
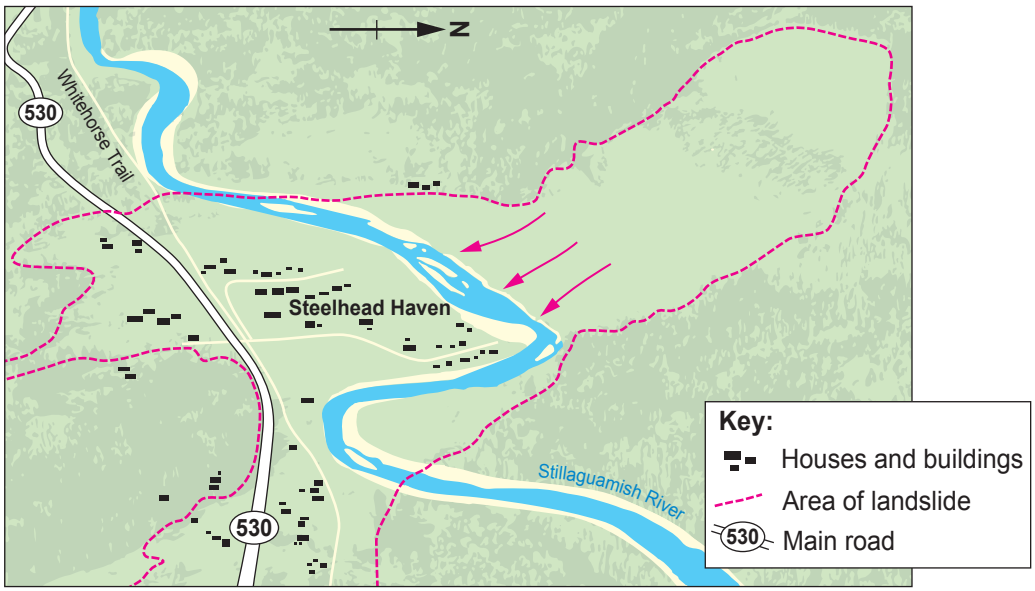


Figure 4b: Map of Steelhead Haven and area of landslide



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4. *(a)* (i) Use **Figure 4a** to outline the role of glacial and post glacial processes as causes of the Oso landslide. [5]

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(ii) Using **Figure 4b**, suggest **one** economic impact of the Oso landslide on the town of Steelhead Haven. [3]

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(b) **Either**

Examine the success of **one** strategy used to manage the impacts of glacial processes and landforms on human activity.

Or

Examine the success of **one** strategy used to manage the impacts of human activity on glacial processes and landforms. [8]

Additional space for Question **4***(b)* only:

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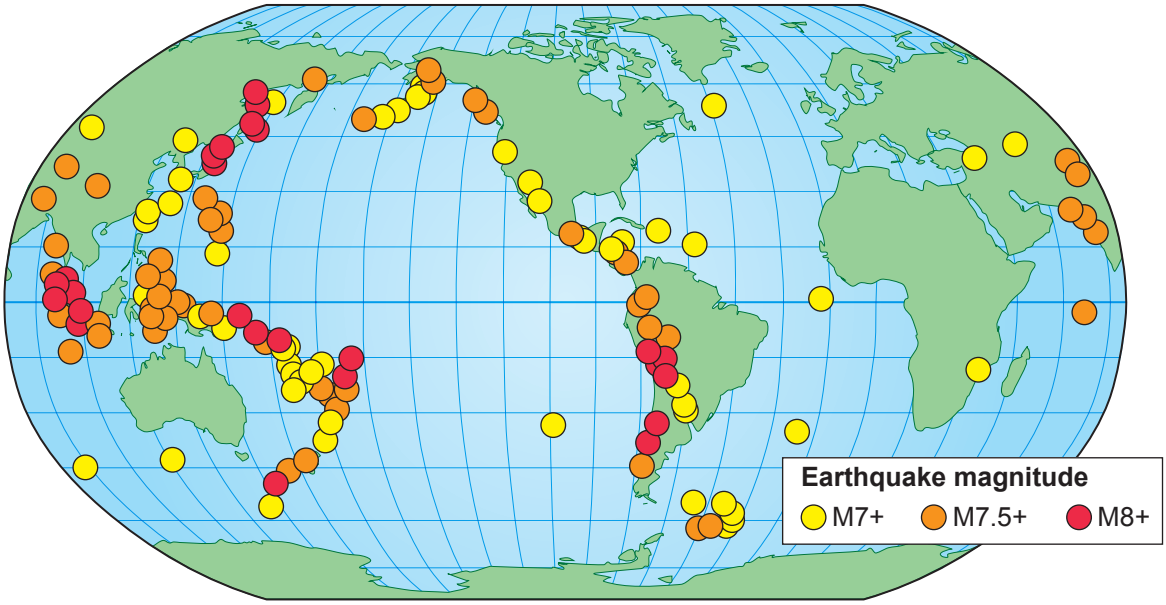
Section B: Tectonic Hazards

Answer **all** *questions.*

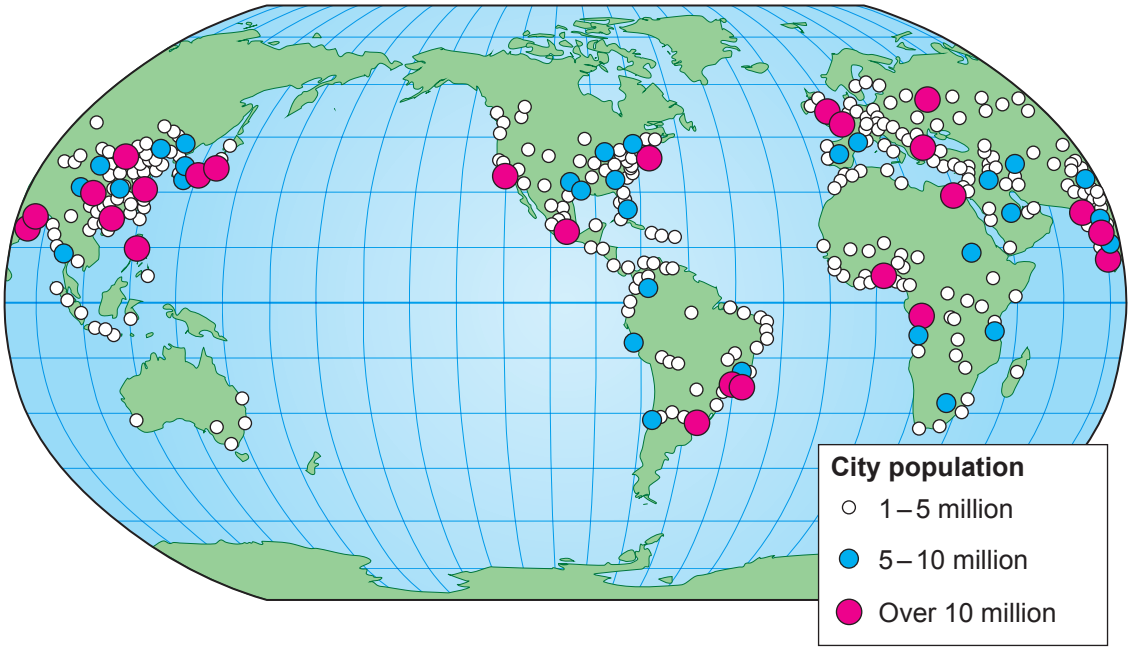
Make the fullest possible use of examples and data to support your answers.

Figure 5a: Global distribution of earthquakes above magnitude 7, 2000–2016



Source: http://srl.geoscienceworld.org

Figure 5b: Global patterns of urbanisation



Source: http://www.ecoclimax.com

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5. *(a)* (i) Use **Figure 5a** to describe the global distribution of earthquakes above magnitude 7. [5]

(ii) Use **Figures 5a** and **5b** to explain why there are global variations in tectonic risk. [9]

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Additional space for Question **5***(a)*(ii) only:

(b) Describe the following characteristics of an earthquake:

P wave [2]

S wave [2]

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focus [2]

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epicentre [2]

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Figure 6a: Impacts of some of the major earthquakes of 2016

Date	Location	Magnitude	Deaths	Economic losses (USD)	Insured losses (USD)
14th and 16th April	Japan	7.0	154	38 billion	5.5 billion
16th April	Ecuador	7.8	673	3.4 billion	551 million
24th August	Italy	6.2	299	5 billion	100 million
13th November	New Zealand	7.8	2	3.5 billion	2.1 billion

Source: Adapted from 2016 Annual Global Climate and Catastrophe Report

6. *(a)* Use the information in **Figure 6a** to compare the devastation caused by the major earthquakes of 2016. [9]

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Additional space for Question **6***(a)* only: .....

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Figure 6b: Buildings damaged and population density for the regions affected in the 2016 Ecuador earthquake

	Buildings damaged	Rank of buildings damaged	Population density (people/km^2)	Rank of population density	d	d^2
Region						
Atacames	28	11	81.6	**A**	**B**	**C**
Chone	165	8	41.6	6	2	4
Eloy Alfaro	3	12.5	9.3	13	–0.5	0.25
Esmeraldas	42	10	140.4	2	8	64
Jama	316	5	40.1	7	–2	4
Muisne	729	2	22.9	11	–9	81
Pedernales	1320	1	28.9	10	–9	81
Portoviejo	114	9	291.5	1	8	64
Quinindé	169	7	31.6	8	–1	1
Rio Verde	3	12.5	17.8	12	0.5	0.25
Rocafuerte	671	3	119.7	3	0	0
San Lorenzo	1	14	1.7	14	0	0
Santo Domingo	384	4	106.8	4	0	0
San Vicente	213	6	31.1	9	–3	9

Source: http://citypopulation.info

Figure 6c: Significance of r_s value

Calculated r_s value = 0.24

Significance (confidence) level		
Number of pairs (n)	**95% (0.05)**	**99% (0.01)**
14	0.59	0.71

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(b) Spearman's rank was used to test the correlation between number of buildings damaged and population density in the 2016 Ecuador earthquake.

(i) Calculate the values for A, B and C **in Figure 6b**. State the values below. [3]

A: .....

B: .....

C: .....

(ii) Use **Figure 6c** to comment on the nature and significance of the relationship between the number of buildings damaged and population density. [2]

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Figure 6d: Issues of aid in the Ecuador earthquake 2016

Earthquake survivors in Ecuador struggle without food and basic aid

A woman argues with police as tensions rise among people waiting for more than an hour for free food and water from the government.

The response of the government of Ecuador was swift and more than 25,000 survivors have been sheltered in stadiums and airports. However, shattered roads and infrastructure have limited the distribution of aid to many of the most vulnerable people in remote areas.

	Population 0-14 years of age (%)	Literacy rate (%)
Pedernales	41	82
Average for Ecuador	**28**	**95**

The region of Pedernales was amongst the worst hit.

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(c) Use **Figures 6a, 6b** and **6d** to suggest why it was difficult to respond to this earthquake. [10]

Additional space for Question **6***(c)* only:

Examiner only

7. *(a)* Explain why there are differences in the characteristics of shield and cinder volcanoes. [8]

Additional space for Question **7***(a)* only:

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(b) Explain variations in the impacts of **one** volcanic eruption. [10]

Additional space for Question **7***(b)* only:

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Question number	Additional page, if required for diagrams. Write the question number(s) in the left-hand margin.

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