

Please check the examination details below before entering your candidate information

Candidate surname					Other names			
Pearson Edexcel		Centre Number			Candidate Number			
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Level 3 GCE								
Wednesday 20 May 2020								
Afternoon (Time: 2 hours 15 minutes)					Paper Reference 9GE0/01			
Geography								
Advanced								
Paper 1								
You must have:							Total Marks	
Resource Booklet (enclosed)							<input type="text"/>	
Ruler, calculator								

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions in Section **A** and Section **C**.
- Answer **either** Question 2 **or** Question 3 in Section **B**.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- Calculators may be used.
- Any **calculations** must show **all** stages of **working out** and a **clear answer**.

Information

- The total mark for this paper is 105.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

Turn over ►

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SECTION A: TECTONIC PROCESSES AND HAZARDS

Answer ALL questions in this section. Write your answers in the spaces provided.

You must use the Resource Booklet provided.

- 1 Study Figure 1 below.

This data in Figure 1 was collected to investigate whether there was a significant relationship between the percentage of silica and the percentage of volatile gases in lava samples, found at 12 contrasting volcanic locations.

Lava samples from 12 contrasting volcanic locations (n=12)	% of silica in the lava	Rank	% of volatile gases*	Rank	d	d ²
1	50	9	1.9	11	-2	4
2	70	3	5.2	3	0	0
3	58	8	3.7	7	1	1
4	73	1	6.6	1	0	0
5	63	6	4.0	6	0	0
6	62	7	3.3	8	-1	1
7	45	12	3.0	9	3	9
8	71	2	4.1	5	-3	9
9	49	10	2.5	10	0	0
10	69	4	5.3	2	2	4
11	48	11	1.2	12	-1	1
12	68	5	4.5	4	1	1
					$\Sigma d^2 =$	

Figure 1

The % of silica and volatile gases in a selection of different lava samples found at 12 contrasting volcanic locations

*Volatile gases – gases emitted by volcanoes at high temperature such as water vapour, carbon dioxide and sulphur dioxide.

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(a) (i) Complete Figure 1 by calculating $\sum d^2$. (1)

(ii) The formula for Spearman's rank correlation coefficient value r_s is given below; in this data set n is equal to 12.

$$r_s = 1 - \frac{6\sum d^2}{n^3 - n}$$

Calculate the value of r_s to two decimal places for the data given.

You must show your working.

(2)

$r_s = \dots\dots\dots$

(iii) The tables below show the two hypotheses that are being tested and the critical values of Spearman's rank r_s value when $n = 12$.

Null hypothesis: There is no significant relationship between the % of silica and the % of volatile gases in these lava samples.

Alternative hypothesis: There is a significant relationship between the % of silica and the % of volatile gases in these lava samples.

Confidence level	0.10 (90% significance)	0.05 (95% significance)	0.01 (99% significance)
Critical value	0.50	0.59	0.78

Using the Spearman's rank correlation r_s value calculated in (a)(ii), state which hypothesis can be accepted.

(1)



(b) Assess the relative importance of physical factors and processes in explaining the impacts of volcanic eruptions.

(12)

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(Total for Question 1 = 16 marks)

TOTAL FOR SECTION A = 16 MARKS



Study Figure 2b in the Resource Booklet.

(b) Explain the role of mean annual air temperature in influencing the distribution of permafrost across Canada.

(6)

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(c) Explain how upland glacial landforms can be used to study former ice extent and movement.

(8)

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(d) Evaluate the view that the threats to glaciated landscapes can only be managed successfully on a global scale.

(20)

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(Total for Question 2 = 40 marks)



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Do not answer Question 3 if you have answered Question 2.

Indicate which question you are answering by marking a cross in the box ☒. If you change your mind, put a line through the box ☒ and then indicate your new question with a cross ☒.

If you answer Question 3 put a cross in the box ☐ .

Coastal Landscapes and Change

You must use the Resource Booklet provided.

3 Study Figure 3a in the Resource Booklet.

(a) Explain the role of isostatic processes in causing changes in relative sea level.

(6)

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Study Figure 3b in the Resource Booklet.

(b) Explain the role of sediment transport in the development of this coastal landscape.

(6)

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(c) Explain why sustainable management of coastlines may lead to local conflicts.

(8)

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(d) Evaluate the view that rates of coastal recession are largely controlled by geological factors.

(20)

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(Total for Question 3 = 40 marks)

TOTAL FOR SECTION B = 40 MARKS



SECTION C: PHYSICAL SYSTEMS AND SUSTAINABILITY

Answer ALL questions in this section. Write your answers in the spaces provided.

You must use the Resource Booklet provided.

4 Study Figure 4 in the Resource Booklet.

(a) Explain **one** impact of an El Niño event on the hydrological system.

(3)

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(b) Explain how the physical features of a drainage basin affect the shape of storm hydrographs.

You may draw a diagram to help your answer.

(6)

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(c) Explain why human actions often increase water insecurity.

(8)

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(d) Assess the importance of renewable energy in reducing the risks of further planetary warming.

(12)

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(e) Evaluate the view that changes to the carbon cycle pose more threats to people than changes to the water cycle.

(20)

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(Total for Question 4 = 49 marks)

TOTAL FOR SECTION C = 49 MARKS

TOTAL FOR PAPER = 105 MARKS

