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AS
GEOGRAPHY

Paper 1 Physical Geography and People and the Environment

Tuesday 14 May 2019 Afternoon Time allowed: 1 hour 30 minutes

Materials
For this paper you must have:
- a pencil
- a rubber
- a ruler.

You may use a calculator.

For Examiner's Use	
Section	Mark
A	
B	
TOTAL	

Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **either** Question 1 **or** Question 2 **or** Question 3 in Section A.
- Answer **either** Question 4 **or** Question 5 in Section B.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The total number of marks available for this paper is 80.

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For the multiple-choice questions, completely fill in the circle alongside the appropriate answer.

CORRECT METHOD ● WRONG METHODS ⊗ ⊙ ≈ ✓

If you want to change your answer you must cross out your original answer as shown. ⊠

If you wish to return to an answer previously crossed out, ring the answer you now wish to select as shown. ⊗

Section A

Answer **one** question in this section.

Answer **either** Question 1 **or** Question 2 **or** Question 3.

Question 1 Water and carbon cycles

0 1 . 1 Which of the following is a human intervention in the carbon cycle designed to mitigate the impacts of climate change?

[1 mark]

A Carbon dioxide produced at coal-fired power stations is captured, liquefied and stored deep underground, known as carbon capture and storage. ○

B Changes to rural land use leads to increased deforestation, which decreases the amount of carbon dioxide removed from the atmosphere by vegetation. ○

C Increased use of concrete as a building material. Cement production involves the heating of calcium carbonate releasing carbon dioxide into the atmosphere. ○

D Higher global gas and oil prices makes exploiting untapped fossil fuel reserves via processes like fracking more viable than renewable sources of energy. ○

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0 1 . 2 In the water cycle, what is condensation?

[1 mark]

A Water transfers from a solid state as ice to water vapour in the atmosphere without first melting. ⬭

B Water transfers directly from water vapour in the atmosphere to solid ice without becoming liquid. ⬭

C Water vapour in the atmosphere is changed into liquid water. ⬭

D Where water moves down from the surface store into the soil. ⬭

0 1 . 3 Outline the process of infiltration as a flow of water within a drainage basin system.

[3 marks]

Question 1 continues on the next page

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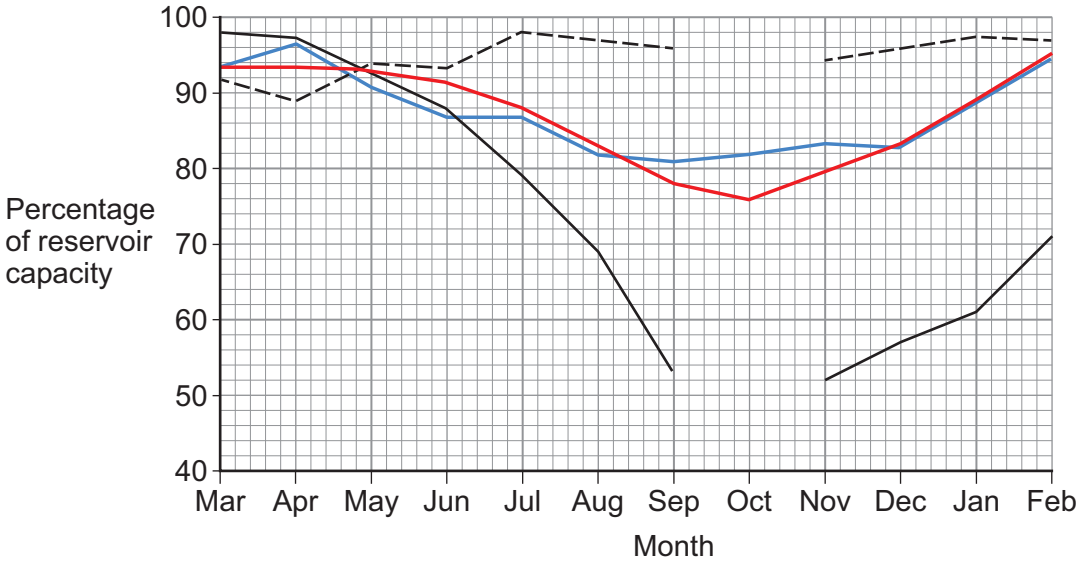
Figure 1 shows data about water stored in reservoirs in England and Wales in recent years.

Figure 1



Key

1989 – 2017 average

March 1995 – February 1996

March 2012 – February 2013

March 2017 – February 2018

0 1 . 4 Complete **Figure 1** by adding the data shown below, and then analyse the data shown in the completed **Figure 1**.

[6 marks]

Month	Percentage of reservoir capacity
October 1995	48
October 2012	95

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0 1 . 5 Assess the relative importance of carbon sequestration and fossil fuel combustion on major stores of carbon.

[9 marks]

Question 1 continues on the next page

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0 1 . 6 'Human activity has a significant impact on flows of water in tropical rainforests.'

With reference to a tropical rainforest you have studied, to what extent do you agree with this view?

[20 marks]

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End of Question 1

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Question 2 Coastal systems and landscapes

0 2 . 1 What is a sediment cell?

[1 mark]

A A defined area of coastline, usually between two prominent headlands, where inputs and outputs of sediment are theoretically balanced. ⬭

B A section of coastline for which a certain coastal management strategy has been defined. ⬭

C A stretch of coastline where the different rock layers run parallel to the coast. ⬭

D A zone extending from the low water mark to a water depth of about 15 m that is permanently covered with water. ⬭

0 2 . 2 What are sustainable approaches to flood risk and coastal erosion?

[1 mark]

A Actions that advance the line and build new defences with no assessment of their potential economic and environmental impacts. ⬭

B Integrated plans that seek to manage coastal risks using appropriate technology in an economically viable and environmentally acceptable way. ⬭

C Physical changes to coastal landscapes using resistant materials like concrete, large boulders, wood and metal structures. ⬭

D Strategies that successfully protect one stretch of coastline but have a significant negative impact on the environment in a neighbouring coastline. ⬭

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0 2 . 3 Outline characteristics of high energy coasts.

[3 marks]

Question 2 continues on the next page

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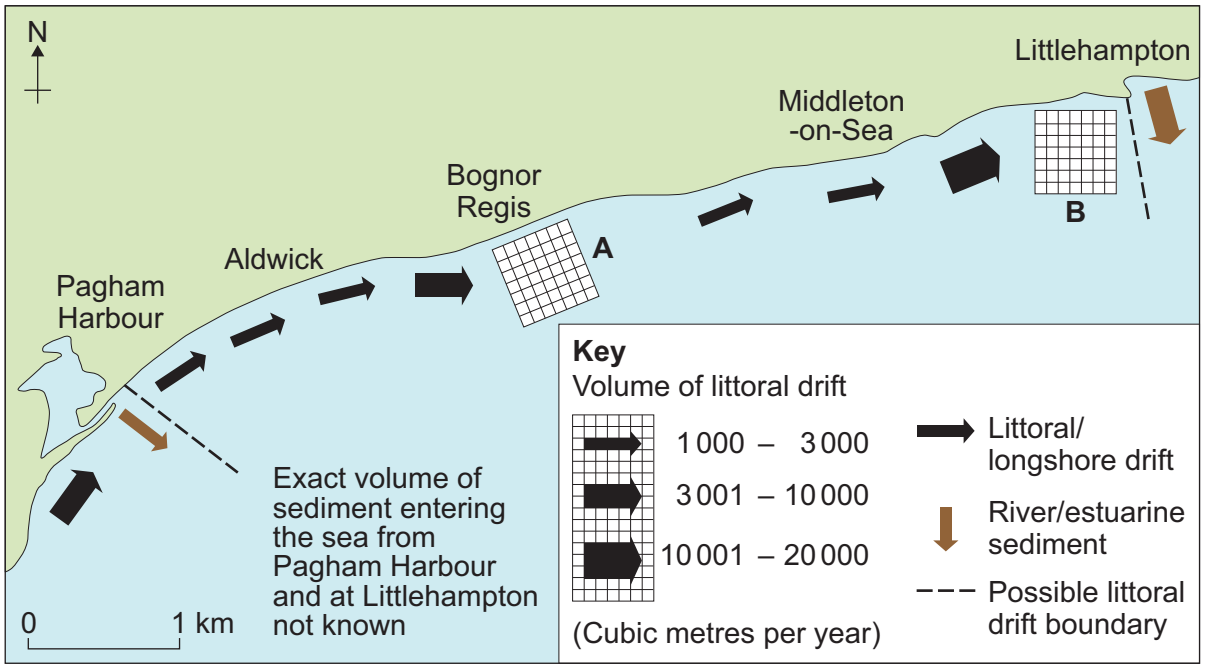
Figure 2 shows information about the transport of sediment along the West Sussex coast between Pagham Harbour and Littlehampton.

Figure 2



0 2 . 4 Complete **Figure 2** by using the data shown below, and then analyse the data shown in the completed **Figure 2**.

[6 marks]

Location	**Volume of littoral drift** (cubic metres per year)
A	7 600
B	19 100

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0 2 . 5 Assess the view that tides are the most important factor in the development of mudflats in estuarine environments.

[9 marks]

Question 2 continues on the next page

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0 2 . 6 'Human activity always has a negative impact on the development of landforms of coastal deposition.'

To what extent do you agree with this view?

[20 marks]

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End of Question 2

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Question 3 Glacial systems and landscapes

0 3 . 1 Which of the following describes inputs in a glacier system?

[1 mark]

A Ablation results in the loss of ice from a glacier through processes such as melting and iceberg calving. ⬭

B As temperatures rise above 0°C the active layer may melt and the process of solifluction occurs on slopes. ⬭

C In the accumulation zone precipitation, rock falls and windblown snow add material to the surface of a glacier. ⬭

D Meltwater flows from the snout of valley glaciers forming features such as eskers and kames. ⬭

0 3 . 2 In periglacial landscapes, what is the active layer?

[1 mark]

A Alternating bands of light coloured sand and darker silt deposited in proglacial lake beds. ⬭

B An elongated narrow sinuous ridge composed of stratified sediment. ⬭

C Ground that remains permanently below 0°C for at least two consecutive years. ⬭

D Soil lying above the permafrost that thaws and freezes seasonally. ⬭

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0 3 . 3 Outline the process of frost action in glacial landscapes.

[3 marks]

Question 3 continues on the next page

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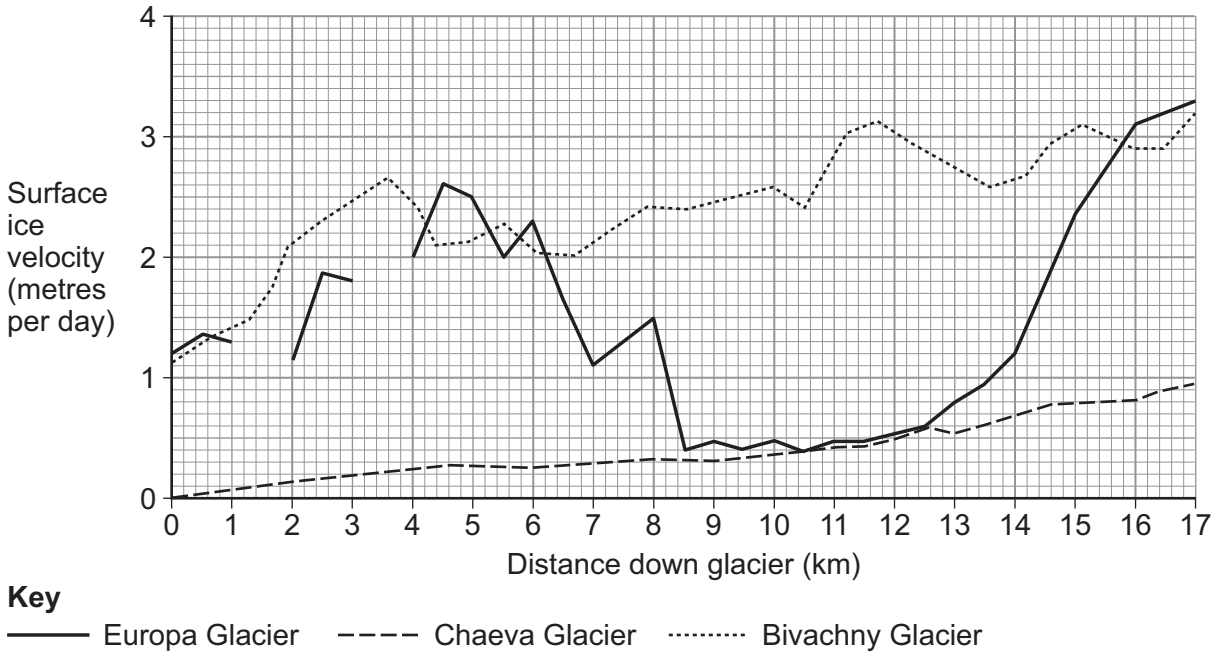
Figure 3 shows data about the surface velocity of three glaciers: the Europa Glacier in Chile, the Chaeva Glacier in Russia and the Bivachny Glacier in Tajikistan.

Figure 3



0 3 . 4 Complete **Figure 3** by adding the data for the Europa Glacier shown below, and then analyse the data shown in the completed **Figure 3**.

[6 marks]

Distance down glacier (km)	Surface velocity (metres per day)
1.5	1.0
3.5	1.75

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0 3 . 5 Assess the extent to which geomorphological processes, such as ice movement and erosion, differ between warm and cold based glaciers.

[9 marks]

Question 3 continues on the next page

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0 3 . 6 'Fluvioglacial landscapes are dominated by processes of deposition.'

To what extent do you agree with this view?

[20 marks]

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End of Section A

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Section B

Answer **one** question in this section.

Answer **either** Question 4 **or** Question 5.

Question 4 Hazards

0 4 . 1 Which of the following is a long-term response to a wildfire event?

[1 mark]

A Deployment of firefighters to try to bring the blaze under control and prevent the further spread of flames. ⬭

B Fires significantly reduce vegetation cover leaving exposed soils vulnerable to soil erosion. ⬭

C New buildings are designed with driveways and patios made from incombustible materials to act as a barrier to fires. ⬭

D Residents at risk of an approaching blaze are instructed to evacuate and temporary accommodation is made available. ⬭

0 4 . 2 Which of the following is **not** a characteristic of a tropical storm?

[1 mark]

A As it reaches land, air pressure drops further and the storm intensifies. ⬭

B Intense low pressure weather system. ⬭

C Low level convergence of air close to the centre of the low pressure zone. ⬭

D Rapid outflow of the air that has risen in the storm into the upper atmosphere. ⬭

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0 4 . 3 Outline the characteristics of liquefaction as a seismic hazard.

[3 marks]

Question 4 continues on the next page

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Figure 4 provides data about the number of deaths caused by tropical storms originating in the North Atlantic each year between 1996 and 2005, and between 2006 and 2015. The data is being analysed using standard deviation.

Figure 4

Tropical storm deaths, 1996 – 2005	
Year	x
1996	3 483
1997	3 126
1998	50
1999	23
2000	92
2001	30
2002	78
2003	9 715
2004	4
2005	126
	$\sum x$ = 16 727
	$\bar{x}$ = 1 672.70
	σ = 2 972.20

Tropical storm deaths, 2006 – 2015			
Year	x	$x - \bar{x}$	$(x - \bar{x})^2$
2006	89	–96.20	9 254.44
2007	17	–168.20	28 291.24
2008	47	–138.20	19 099.24
2009	199		
2010	100	–85.20	7 259.04
2011	287	101.80	10 363.24
2012	6	–179.20	32 112.64
2013	761	575.80	331 545.64
2014	341	155.80	24 273.64
2015	5	–180.20	32 472.04
	$\sum x$ = 1852	$\sum (x - \bar{x})^2$ = 494 861.60	
	$\bar{x}$ = 185.20		
	σ =		

Where:

x = number of deaths

$\bar{x}$ = mean

$\sum$ = sum of

σ = standard deviation

n = number of values

Formula for calculating standard deviation:

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

0 4 . 4 Complete **Figure 4**, and then analyse the data in the completed **Figure 4**.

[6 marks]

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0 4 . 5 With reference to a place which has experienced a recent volcanic event, assess the importance of exogenous factors (links with other places) in responding to the event.

[9 marks]

Question 4 continues on the next page

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0 4 . 6 'The impacts experienced in multi-hazardous environments make them uninhabitable.'

With reference to a multi-hazardous environment beyond the UK that you have studied, to what extent do you agree with this view?

[20 marks]

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End of Question 4

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Question 5 Contemporary urban environments

0 5 . 1 What are SUDS?

[1 mark]

A Artificial drainage systems that are installed in urban areas to rapidly transfer surface water so reducing lag time and decreasing flood risk. ⬭

B River channels are dredged in urban areas to increase channel capacity, so decreasing flood risk in the area. ⬭

C Strategies that reduce flood risk in urban areas by straightening rivers to increase flow rates through the area. ⬭

D Strategies using natural approaches in the landscape to reduce flood risk and provide amenities for the community in urban areas. ⬭

0 5 . 2 Which of the following describes the process of decentralisation?

[1 mark]

A Areas of countryside surrounding urban areas are protected from future development. ⬭

B Central urban areas experience both economic and structural regeneration. ⬭

C The movement of industry and population from urban centres to outlying areas. ⬭

D Wealthy individuals buy and renovate properties in more run-down urban areas. ⬭

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0 5 . 3 Outline what is meant by the concept of the post-modern western city.

[3 marks]

Question 5 continues on the next page

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Figure 5 shows population data for the ten largest metropolitan urban areas in South America and the European Union (EU). The data is being analysed using standard deviation.

Figure 5

South American urban areas population (millions)	
Urban area	x
São Paulo	21.10
Buenos Aires	14.10
Rio de Janeiro	12.70
Lima	10.80
Bogota	9.80
Belo Horizonte	5.20
Guayaquil	5.00
Quito	4.70
Porto Alegre	4.40
Fortaleza	4.00
	$\sum x = 91.80$
	$\bar{x} = 9.18$
	$\sigma = 5.34$

EU urban areas population (millions)			
Urban area	x	$x - \bar{x}$	$(x - \bar{x})^2$
London	14.00	7.90	62.41
Paris	12.00	5.90	34.81
Madrid	6.40	0.30	0.09
Barcelona	5.00		
Berlin	4.30	–1.80	3.24
Ruhr area	4.30	–1.80	3.24
Rome	4.10	–2.00	4.00
Birmingham	3.90	–2.20	4.84
Athens	3.70	–2.40	5.76
Warsaw	3.30	–2.80	7.84
	$\sum x = 61.00$	$\sum (x - \bar{x})^2 = 127.44$	
	$\bar{x} = 6.10$		
	$\sigma =$		

Where:

x = population (millions)

$\bar{x}$ = mean

$\sum$ = sum of

σ = standard deviation

n = number of values

Formula for calculating standard deviation:

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

0 5 . 4 Complete **Figure 5**, and then analyse the data in the completed **Figure 5**.

[6 marks]

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0 5 . 5 Assess the extent to which local weather and climate in an urban area might affect its character and/or people's lived experience.

[9 marks]

Question 5 continues on the next page

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0 5 . 6 'The greatest challenge for mega/world cities is managing waste.'

To what extent do you agree with this view?

[20 marks]

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END OF QUESTIONS

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