Mark Scheme (Results)

Summer 2023

Pearson Edexcel International GCSE in Geography (4GE1)
Paper 01R: Physical Geography

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question number	Answer	Mark
1(a)	**AO1 (1 mark)** **B Meander** The answer cannot be A, C or D as these are not features created by erosion.	**(1)**

Question number	Answer	Mark
1(b)(i)	**AO1 (1 mark)** **D** when a river has a slow velocity The answer cannot be A, B or C as these are usually associated with fast flowing river and erosion rather deposition.	**(1)**

Question number	Answer	Mark
1(b)(ii)	**AO1 (1 mark)** Award one mark for a suitable definition. • An area of land around the river that is drained by the river and its tributaries (1). Accept any other appropriate response.	**(1)**

Question number	Answer	Mark
1(b)(iii)	**AO1 (1 mark)/AO2 (1 mark)** Award 1 mark for a suitable reason and a further 1 mark available for explanation. • Presence of industry (1) can lead to pollution from industrial waste reaching the river (1). • Agriculture nearby (1) can lead to fertiliser reaching the river causing eutrophication (1). • Leakage from sewage pipes (1) can cause polluted water (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
1(c)	**AO2 (2 marks)/AO3 (2 marks)** Award 1 mark for identification of a transfer (AO2) and a second mark for a further development or explanation (AO3). • Evaporation is a transfer (1) this occurs when water changes from a liquid to water vapour due to increased temperatures (1). • Condensation is a transfer (1) occurs when water vapour turns into liquid (1). • Precipitation is a transfer (1) this occurs when water forms in the atmosphere and falls to earth (1). • Snowmelt (1) occurs when water changes from a solid to a liquid as temperature increases (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
1(d)	**AO2 (3 marks)** Award 1 mark for identification of a way physical factors can affect river regimes and 2 marks for development and further explanation, up to a maximum of 3 marks. • Steep slopes (1) cause fast run off (1) leading to greater river discharge (1). • Impermeable rock (1) creating fast run off (1) which leads to flashy river regimes (1). • Climate change (1) can reduce amounts of precipitation (1) which leaders to lower river discharge (1). Regime is about the whole basin so accept reference to either river regimes or storm hydrograph. Accept any other appropriate response. **No credit for references to water quality.**	**(3)**

Question number	Answer	Mark
1(e)	**AO3 (1 mark)** Flood plain (1)	**(1)**

Question number	Answer	Mark
1(f)	**AO1/AO2 (4 marks)** Award 1 mark for each initial point (AO1), and 3 further marks (AO2) for the extension of this point up to maximum of 4 marks, or up to 2 marks for different initial points and a further mark for extension of these points up to a maximum of 4 marks. • Construction of dam (1) which can withhold water from further downstream (1). • Industrialisation (1) leading to high use of water sources as part of industrial processes such as cooling (1). • Persistent drought conditions (1) which mean that waters sources dry up/are not replenished (1). Accept any other appropriate response.	**(4)**

Question number	Answer indicative content
1(g)	**AO3 (4 marks) AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. To access level 3 candidates will be able to link the increased intensity of rainfall in a short space of time with stress on water management. If response only focuses on impacts shown in Figure 1d rather than causes cap at Level 2, 4 marks. **AO3** • Levels of flood risk are affected by a range of factors both human and physical.

	• Urban areas can increase flood risk as they increase surface run off reducing lag time. • Dams are put in place to help manage water supply, but they only have a certain capacity. • Forecasts are not always correct increasing the flood risk. • High relief around urban areas can increase the flood risk. • High drainage density/large number of tributaries leading to increased flood risk. **AO4** • Figure 1c shows that a large amount of rainfall fell in a short space of time. • Figure 1c shows that the actual rainfall was much higher than predicted. The low forecast meant that preparation had not been made for a flood event, therefore taking the catchment by surprise. • Figure 1c shows that the rainfall was at its highest intensity over a 2-day period. • Figure 1d suggests that the Winvenhoe dam was opened to release swollen flood storage. • Figure 1d shows the Bremer river runs through a very densely populated area. • Figure 1d shows that even in areas outside the main population areas flash floods occurred.

Question number	**Answer**	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)

Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question 2

Question number	Answer	Mark
2(a)	**AO1 (1 mark)** **D** is the correct response Beach replenishment is the only soft engineering technique. The answer cannot be A, B or C as these are all hard engineering techniques.	**(1)**

Question number	Answer	Mark
2(b)(i)	**AO1 (1 mark)** **B** is the correct answer – this is the accurate definition of a coral reef ecosystem The answer cannot be A (sand dune ecosystem), C (mangrove ecosystem), or D (salt marsh ecosystem).	**(1)**

Question number	Answer	Mark
2(b)(ii)	**AO1 (1 mark)** Award 1 mark for a correct feature including: • light (1) • water levels (1) • salinity (1) • pH (1) • temperature (1) • soil (1) • rock type / geology (1) The response is specifically about non-living elements of an ecosystem.	**(1)**

Question number	Answer	Mark
2(b)(iii)	**AO1 (1 mark)/AO2 (1 mark)** Award 1 mark for identifying factor (AO1) and a second mark for an appropriate development (AO2). • Salinity of water (1) as mangrove trees can grow in salty water (1). • Warm temperatures (1) as mangroves need water around 19oC (1). • Inter-tidal / shallow water / water depth (1) which allows the mangrove roots to grow above the water (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
2(c)	**AO2 (2 mark)/AO3 (2 mark)** Award 1 mark (AO2) for identification of how deposition affects the coastline (1) and a second mark for a further development (1) (AO3). • Beaches can increase in size (1) which creates greater protection against coastal erosion (1). • Deposition of sediment can cause a bar to form across a bay (1) which can lead to salt marsh formation behind the bar (1). • Deposition to form a beach / curved spit / tombolo (1) can protect coastlines absorbing the energy from the waves (1). • Deposition of sediment through longshore drift (1) can lead to the creation of a spit if the coastline changes direction (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
2(d)	**AO2 (3 marks)** Award 1 mark for identification of a way and 2 marks for development and further explanation, up to a maximum of 3 marks. For example: • Geology of rocks will vary the hardness of the rock (1) this means that rocks will erode at different rates (1) resulting in variation in landforms in coastal areas (1). • Hard rock erodes more slowly (1) resulting in the formation in headlands or bays (or variation in coastal landforms) (1) as the surrounding rock is eroded more quickly (1). • Coastal protection (1) like a sea wall will decrease erosion (1) as it deflects the waves energy (1). • Sea level rise (1) can lead to waves attacking the cliff face more regularly (1) increasing rates of erosion (1). • Climate change (1) can increase the number of intense storms increasing frequency of destructive waves (1) which can increase erosion rates (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
2(e)	**AO3 (1 mark)** Award 1 mark for the following: Biological (weathering) (1)	**(1)**

Question number	Answer	Mark
2(f)	**AO1 (1 mark) / AO2 (3 marks)** Award 1 mark for the initial point (AO1) and 3 further marks (AO2) for the extension of the point up to 4 marks. • Arches form at headlands (1) • Waves erode the base of the cliff either side of the headland (1) • This forms a cave on each side of the headland (1) • As the erosion continues caves become wider until the water breaks through the other side (1) • As further undercutting takes place the arch becomes wider and more developed (1) Candidates may develop further ideas around types of erosion acting on the headland. Accept any other appropriate response. Credit annotated diagrams.	**(4)**

Question number	Answer indicative content
2(g)	**AO3 (4 marks) AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. In this question the candidates will need to make the distinction between development and conservation. The resources identify the benefits of specifically developing tourism against the needs of conservationists. Candidates should explore both elements this would be expected in level 2 responses but maybe unbalanced. **AO3** • Development of tourism can work in partnership with conservation, but it is a delicate balance. • When coastal areas are badly managed conflict can result. • Coastal areas provide a clear opportunity for countries to develop their economies. • Commercialised fishing may have a negative effect on the coastal environment. **AO4** • Figure 2c suggests that tourism employs a large number of people in the Caribbean islands. • Figure 2c states that healthy oceans attract divers. • Figure 2c suggests that the development of Mangroves can also provide income through fishing to generate food and income for the local community. • Figure 2d suggests that coral reefs act as a barrier to storm surges protecting people and buildings. • Figure 2d suggests that mangroves reduce flood risk.

Question number	Answer	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question 3

Question number	Answer	Mark
3(a)	**AO1 (1 mark)** **D** volcanic eruption. (1). The answer cannot be A, B or C as these are hazards created by human intervention.	**(1)**

Question number	Answer	Mark
3(b)(i)	**AO1 (1 mark)** **B** warm sea surface temperatures (1). The answer cannot be A, C or D as these are not features associated with the development of cyclones.	**(1)**

Question number	Answer	Mark
3(b)(ii)	**AO1 (1 mark)** Award 1 mark for any of the following: • Saffir-Simpson scale (1)	**(1)**

Question number	Answer	Mark
3(b)(iii)	**AO1 (1 mark) / AO2 (1 mark)** Award 1 mark for an initial point, and a further mark for explanation or development. • Force created by the Earth's rotation (1) that deflects moving objects at the Earth's surface (1). • The deflection of the air moving along the surface of the Earth (1) rightward in the Northern Hemisphere / leftward in the Southern Hemisphere (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
3(c)	**AO2 (3 mark)** Award 1 mark for identification of a way and 2 marks for development and further explanation, up to a maximum of 3 marks. • Constructive plate margins form due to tectonic plate moving apart (1) this occurs due to hot magma under the earth's crust rising due to convection currents (1) as the molten material rises it forms new land (1). • Divergent plate margins form where plates move away from each other (1) this occurs due to ridge push/slab pull (1) allowing magma to rise to fill the gap and solidify (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
3(d)	**AO2 (2 marks) / AO3 (2 marks)** Award 1 mark (AO2) for identification of a short-term impact and a further mark (AO3) for further development shown on Figure 3a. Candidates should respond with two different factors, if responses just list two types of infrastructure damage limit to 1 mark max. • Infrastructure such as buildings and roads are destroyed (1) this may result in injury or death to the population (1). • Water supplies maybe damaged (1) which leads to the contamination of water and disease (1). • Need for medical supplies and aid (1) to cope with injuries caused by the earthquake (1). • Emergency relief (1) looking for trapped people (1). Accept any other appropriate response.	**(4)**

Question number	Answer	Mark
3(e)	**AO3 (1 mark)** Award 1 mark for one of the following. • Focus (1)	**(1)**

Question number	Answer	Mark
3(f)	**AO1 / AO2 (4 marks)** Award 1 mark for each initial point (AO1), and 3 further marks (AO2) for the extension of this point up to maximum of 4 marks, or up to 2 marks for different initial points and a further mark for extension of these points up to a maximum of 4 marks. Responses could focus on explaining one particular impact or focus on more than one impact: • Road and rail links may be destroyed (1) meaning it is difficult to get longer term assistance to areas that are affected (1). This leads to a negative effect on economic growth (1) because countries take a long time to recover from the initial short-term effects (1). • Power cables may be destroyed (1) which may limit communication to coordinate responses (1). This can lead to more deaths if those injured are not treated (1) and can slow down the long term recovery of the area (1). Accept any other appropriate response.	**(4)**

Question number	Answer indicative content
3(g)	**AO3 (4 marks) AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. **AO3** • There are a wide variety of reasons why people live around volcanoes. • Tradition can play an important role for some cultures. • Volcanoes provide a valuable source of income. The income gained can help offset some of the risk that people face. • Many people regard the risk from the volcano as a natural part of life. **AO4** • Figure 3c shows subsistence farmers working in the shadow of the Volcano. • Figure 3c shows how in some countries Volcanoes provide a source of energy. • Figure 3d shows how rich countries are able to manage the risk of volcanoes through prediction and prevention. • Figure 3d shows how volcanoes provide a source of income at a national, local and individual level. • Figure 3d suggest for some people moving away from volcanoes is not an option due to their traditions or financial position.

Question number	Answer	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question 4

Question number	Answer	Mark
4(a)	**AO4 (2 marks)** Award 1 mark for a suitable reason and 1 further mark for explanation or development. • There was a river which had different landforms which were accessible (1) which meant that I could compare characteristics (1). • I wanted to investigate river depth (1) and this river was close to school so we could access it a number of times easily (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
4(b)	**AO4 (3 marks)** Award 1 mark for identification of suitable method, and a further 2 marks for explanation or development. • Measuring river velocity (1) which meant we had to collect quantitative data on velocity and a specific distance of the river (1) which we could then use to calculate river discharge (1). • Measuring river channel depth (1) we had to use a measuring stick at various points across the river (1) and then record the depths so they could be used to create a graph (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
4(c)	**AO4 (3 marks)** Award 1 mark for identification of a suitable advantage, and a further mark for development through further description or exemplification. • I used a scattergraph (1) which allowed me to see a correlation between factors (1) which meant I could produce a clear conclusion (1). • I used graphs to create river profiles (1) which meant I could easily compare across different sites (1) and recognise any differences (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
4(d)	**AO3 (2 marks) /AO4 (2 marks)** Award 1 mark for identification of data analysis technique used and a further mark for development through further description or exemplification. • I calculated the mean (1) to try and smooth out any variations in the data (1). • I created a scattergraph of bedload size and velocity to be able to analyse the data for any correlations (1) and identify anomalies/outliers (1). • I used Spearman's rank correlation (1) to be able to indicate any strong or weak correlations between my data on discharge and bedload (1). • Calculated a percentage (1) which means different sets of data can be compared (1). • Calculated the interquartile range (1) to remove the outliers in the data (1). Accept any other appropriate response.	**(4)**

Question number	Answer indicative content
4(e)	**AO3 (4 marks) AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. This question is about the candidates being able to evaluate whether the data collection methods used were effective in helping the student achieve their aim. • At level 1 candidates will likely describe the data collection methods that are used and may make simple statements about how they can be used for analysis at the top of the level. • At level 2 candidates may describe all of the techniques used as well as making simple statements about how they could be used to by the candidate to reach their aim. • For level 3 candidates would be expected to make a judgement on the suitability of the collection methods and how they would support the analysis for the student to be able to achieve their aim. **AO3** • Recognition of limitations in the data collection/sampling techniques may be flawed in terms of the number of sites and the time of year. • Recognition that the data collection methods used are appropriate to support a range of data presentation methods. • Reliability and accuracy of the student's methods may be evaluated with reference to the potential evaluation, including equipment errors and operator errors. • Recognition of sampling strategy e.g. random, stratified and/or systematic is important, and could have affected data collected. • An evaluation of how far the student's data collection methods would also depend on the accuracy of how they were carried out could also be included.

	AO4 • In this response there would be an expectation for the students to evaluate the different data collection methods and how they relate to later stages of the enquiry (data analysis and reaching conclusions). • Students should look to identify the appropriateness of data collection methods. • There could be an evaluation of the lack of secondary data to support primary data. • A view could be given on how successful or unsuccessful the data collection methods were and how they could be improved to help students gather more effective results.	
Question number	**Answer**	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question 5

Question number	Answer	Mark
5(a)	**AO4 (2 marks)** Award 1 mark for a suitable reason and 1 further mark for explanation or development. • There was a coastline which had different coastal management techniques in different sections (1) which meant that I could compare characteristics (1). • I wanted to investigate changes in beach profiles (1) and this was the closest beach to our school (1). • Access to this beach was possible (1) it was not private land (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
5(b)	**AO4 (3 marks)** Award 1 mark for identification of suitable method, and a further 2 marks for explanation or development. • Measuring beach features (1) which meant we had to collect quantitative data on beach height and angles of the beach (1) which we could then use to create the beach profile graph (1). • Measuring pebble size (1) we had to use a ruler (1) and then record the sizes so they could be used to create a graph showing size of pebbles on different sections of the beach (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
5(c)	**AO4 (3 marks)** Award 1 mark for identification of a suitable advantage, and a further mark for development through further description or exemplification. • I used a scattergraph (1) which allowed me to see a correlation between factors (1) which meant I could produce a clear conclusion (1). • I used graphs to create beach profiles (1) which meant I could easily compare across different sites (1) and recognise any differences (1). Accept any other appropriate response.	**(3**

Question number	Answer	Mark
5(d)	**AO3 (2 marks) /AO4 (2 marks)** Award 1 mark for identification of data analysis technique used and a further mark for development through further description or exemplification. • I calculated the mean (1) to try and smooth out any variations in the data (1). • I created a scattergraph of sediment size and distance from the sea to analyse the data for any correlations (1) and identify anomalies/outliers (1). • I used Spearman's rank correlation (1) to be able to indicate any strong or weak correlations between my data on beach distance and bedload (1). • Calculated a percentage (1) which means different sets of data can be compared (1). • Calculated the interquartile range (1) to remove the outliers in the data (1). Accept any other appropriate response.	**(4)**

Question number	Answer indicative content
5(e)	**AO3 (4 marks) AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. This question is about the candidates being able to evaluate whether the data collection methods used were effective in helping the student achieve their aim. • At level 1 candidates will likely describe the data collection methods that are used and may make simple statements about how they can be used for analysis at the top of the level. • At level 2 candidates may describe all of the techniques used as well as making simple statements about how they could be used to by the candidate to reach their aim. • For level 3 candidates would be expected to make a judgement on the suitability of the collection methods and how they would support the analysis for the student to be able to achieve their aim. **AO3** • Recognition of limitations in the data collection/sampling techniques may be flawed in terms of the number of sites and the time of year. • Recognition that the data collection methods used are appropriate to support a range of data presentation methods. • Reliability and accuracy of the student's methods may be evaluated with reference to the potential evaluation, including equipment errors and operator errors. • Recognition of sampling strategy e.g. random, stratified and/or systematic is important, and could have affected data collected. • An evaluation of how far the student's data collection methods would also depend on the accuracy of how they were carried out could also be included.

	AO4 • In this response there would be an expectation for the students to evaluate the different data collection methods and how they relate to later stages of the enquiry (data analysis and reaching conclusions). • Students should look to identify the appropriateness of data collection methods. • There could be an evaluation of the lack of secondary data to support primary data. • A view could be given on how successful or unsuccessful the data collection methods were and how they could be improved to help students gather more effective results.

Question number	**Answer**	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3)

		• Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

Question 6

Question number	Answer	Mark
6(a)	**AO4 (2 marks)** Award 1 mark for a suitable reason and 1 further mark for explanation or development. • My hometown experience significant changes in the weather during the summer (1) which meant that I could examine changes over time (1). • I wanted to investigate weather characteristics over time (1) and setting up recording equipment at school and at home were the most practical options (1). Accept any other appropriate response.	**(2)**

Question number	Answer	Mark
6(b)	**AO4 (3 marks)** Award 1 mark for identification of suitable method, and a further 2 marks for explanation or development. • Measuring wind speed (1) which meant we had to collect data using an anemometer (1) which we could then use to track changes over a ten day period (1). • Measuring rainfall (1) we had to use a rain gauge which I set up in two locations in the city (1) and would return to check measurements each day in the morning before school (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
6(c)	**AO4 (3 marks)** Award 1 mark for identification of a suitable advantage, and a further mark for development through further description or exemplification. • I used a scattergraph (1) which allowed me to see a correlation between factors (1) which meant I could produce a clear conclusion (1). • I used graphs to plot temperatures (1) which meant I could easily compare across different sites (1) and recognise any differences (1). Accept any other appropriate response.	**(3)**

Question number	Answer	Mark
6(d)	**AO3 (2 marks) /AO4 (2 marks)** Award 1 mark for identification of data analysis technique used and a further mark for development through further description or exemplification. • I calculated the mean (1) to try and smooth out any variations in the data (1). • I created a scattergraph of rainfall and wind speed to analyse the data for any correlations (1) and identify anomalies/outliers (1). • I used Spearman's rank correlation (1) to be able to indicate any strong or weak correlations between my data on rainfall and air pressure (1). • Calculated a percentage (1) which means different sets of data can be compared (1). • Calculated the interquartile range (1) to remove the outliers in the data (1). Accept any other appropriate response.	**(4)**

Question number	Answer indicative content
6(e)	**AO3 (4 marks) AO4 (4 marks)** **Marking instructions** Markers must apply the descriptors in line with the general marking guidance and the qualities outlined in the level based mark scheme below. **Indicative content guidance** The indicative content below is not prescriptive and candidates are not required to include all of it. Other relevant material not suggested below must also be credited. This question is about the candidates being able to evaluate whether the data collection methods used were effective in helping the student achieve their aim. • At level 1 candidates will likely describe the data collection methods that are used and may make simple statements about how they can be used for analysis at the top of the level. • At level 2 candidates may describe all of the techniques used as well as making simple statements about how they could be used to by the candidate to reach their aim. • For level 3 candidates would be expected to make a judgement on the suitability of the collection methods and how they would support the analysis for the student to be able to achieve their aim. **AO3** • Recognition of limitations in the data collection/sampling techniques may be flawed in terms of the number of sites and the time of year. • Recognition that the data collection methods used are appropriate to support a range of data presentation methods. • Reliability and accuracy of the student's methods may be evaluated with reference to the potential evaluation, including equipment errors and operator errors. • Recognition of sampling strategy e.g. random, stratified and/or systematic is important, and could have affected data collected. • An evaluation of how far the student's data collection methods would also depend on the accuracy of how they were carried out could also be included.

	AO4 • In this response there would be an expectation for the students to evaluate the different data collection methods and how they relate to later stages of the enquiry (data analysis and reaching conclusions). • Students should look to identify the appropriateness of data collection methods. • There could be an evaluation of the lack of secondary data to support primary data. • A view could be given on how successful or unsuccessful the data collection methods were and how they could be improved to help students gather more effective results.

Question number	**Answer**	
Level	**Mark**	**Descriptor**
	0	No rewardable material.
Level 1	**1–3**	• Attempts to apply understanding to deconstruct information but understanding and connections are flawed. An unbalanced or incomplete argument that provides limited synthesis of understanding. Judgements that are supported by limited evidence. (AO3) • Uses some geographical skills to obtain information with limited relevance and accuracy, which supports few aspects of the argument. (AO4)
Level 2	**4–6**	• Applies understanding to deconstruct information and provide some logical connections between concepts. An imbalanced argument that synthesises mostly relevant understanding, but not entirely coherently, leading to judgements that are supported by evidence occasionally. (AO3) • Uses geographical skills to obtain accurate information that supports some aspects of the argument. (AO4)
Level 3	**7–8**	• Applies understanding to deconstruct information and provide logical connections between concepts throughout. A balanced, well-developed argument that synthesises relevant understanding coherently, leading to judgements that are supported by evidence throughout. (AO3) • Uses geographical skills to obtain accurate information that supports all aspects of the argument. (AO4)

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