



Mark Scheme (Results)

June 2026

Pearson Edexcel International GCSE in Geography
Physical Geography
4GE1/01

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June 2026

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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 1

Question number	Answer Identify one type of river erosion	Mark
1(a)	AO1 (1 mark) A (abrasion) The answer cannot be B, C or D as all types of mass movement.	(1)

Question number	Answer Identify the best definition of water surplus	Mark
1(b)	AO1 (1 mark) A (more water supply than demand) The answer cannot be B (water shortage), C (irrigation), D (sewage)	(1)

Question number	Answer Define the term river drainage basin	Mark
1(c)(i)	AO1 (1 mark) Award one mark for any of the following: • an area drained by a river (1). • an area of land where water (from precipitation) drains (downhill) into a river (1). • an area of land around a river that is drained by a river (and its tributaries) (1). Accept any other appropriate response	(1)

Question number	Answer Identify the river drainage basin feature which could be found at X	Mark
1(c)(ii)	AO3 (1 mark) Award one mark for the following: • (river) source (1)	(1)

Question number	Answer Explain one way to improve river water quality	Mark
1(d)	AO2 (2 marks) Award 1 mark for initial point and a further mark for explanation up to a maximum of two marks.	

	- Regulate factories (1) to reduce the discharge of chemicals into the river (1). - Ban/restrict the use of pesticides (1) to prevent them washing off of fields (into rivers) (1). - Build water treatment works (1) to prevent sewage from entering the river (1). Accept any other appropriate response	(2)
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Question number	Answer Suggest two advantages of the flood prediction strategy shown	Mark
1(e)	AO2 (2 marks)/AO3 (2 marks) Award 1 mark (AO3) for the identification of an advantage of the flood prediction strategy and a further mark for explanation (AO2) up to a maximum of two marks each. - Areas at highest risk are identified (in brown) (1) so people know whether they are likely to be affected by flooding (1). - The warnings are issued 1-4 days in advance (1) which gives people time to evacuate (1). - Early advice is given up to 4 days beforehand (1) which means people can move belongings upstairs to reduce damage (1). - People will know where the safe areas are (1) which means they know where to go when it floods (1). Accept any other appropriate response	(4)

Question number	Answer Explain how precipitation and vegetation affect river regimes	Mark
1(f)	AO1 (2 marks)/AO2 (2 marks) Award 1 mark (AO1) for the identification of a <u>seasonal/annual variation</u> characteristic of precipitation/vegetation that affects river regimes and a further mark for explanation (AO2) up to a maximum of two marks each. Precipitation: - Very heavy rainfall in winter storms reduces infiltration (1) increasing the river discharge (1). - Very heavy rainfall during the monsoon increases	

	surface runoff (1) increasing the river level during these months (1). • High levels of snowfall in winter months will reduce the discharge (of the river) as water is stored on land (1). • Snowmelt in spring increases discharge (1) as this increases surface runoff as ground is frozen/saturated (1). Vegetation: • Deciduous trees will require more water in their growing months (spring/summer) (1) which will reduce river levels as more water is intercepted/absorbed by roots (1). • Deciduous trees will require less water in winter months (when they lose their leaves/hibernate) (1) which increases river levels as less water is intercepted/absorbed by roots (1). • Farmers' fields will intercept/absorb more water before they harvest crops (1) which will reduce the levels of river discharge as more water is used by the crops to grow (1). • Farmers' field will intercept less water after the crops are harvested/removed (1) this leaves the soil bare increasing surface runoff and therefore water levels in the river (1). Accept any other appropriate response.	(4)
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Question number	Answer Explain one way climate can affect weathering processes	Mark
1(g)	A02 (3 mark) Award 1 mark for identifying a climate factor and 2 marks for further explanation up to a maximum of 3 marks. • Seasonal variations cause temperatures to fluctuate (1) causing the rock to expand and contract (1) resulting in more physical/exfoliation/freeze-thaw weathering (1). • Warmer temperatures (1) increase chemical weathering (1) as the heat accelerates chemical reactions (1) (leading to faster breakdown of rocks) . • Cold, dry climates (1) have lower rates of chemical weathering (1) as chemical reaction rates are slower (1) (and so physical weathering is more dominant). • Warm, humid climates (1) have higher rates of chemical weathering (1) as chemical reactions are faster (1) (meaning physical weathering is less	

	significant).	
	Accept any other appropriate response	(3)

Question number	Answer Analyse the reasons for changes in the river's long profile	Mark
1(h)	A03 (4 marks)/A04 (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 analysing the significance of physical factors that cause a river to change along its long profile. Candidates should discuss the role of each factor and make some judgement regarding which factor(s) is/are dominant. A03 • A rivers long profile is a visual representation of how a river channel gradient changes from its source to its mouth. • The gradient of a river decreases along its path, being highest nearest the source and lowest nearest the mouth. • The river channel is often widest nearest its mouth (in the lower course) and narrowest nearest the source (in the upper course). • Fluvial processes are responsible for changes seen in a rivers long profile. • Subaerial processes (weathering and mass movement) are responsible for changes seen in a rivers long profile. • Vertical erosion is dominant in the upland river landscape creating narrow river channels which increase in depth. • Lateral erosion is more dominant in the middle/lower courses are the river channel becomes wider. • Weathering and mass movement play a role in the upper course creating the steep v-shaped valley. • All fluvial processes occur in every stage of the rivers course although vary depending on discharge/velocity/particle size/volume of load. • It can be said that erosional processes are most dominant in the upland river and deposition more dominant in creating the lowland river landscapes. A04 • Figure 1c shows a very steep gradient in the upland	(8)

	- area. - Figure 1c shows a very gentle slope in the lowland area. - Figure 1c shows the river channel width increases from source to mouth. - Figure 1c shows the channel depth increases along the long profile. - Figure 1c shows velocity of the river increases along the long profile. - Figure 1c shows discharge increases along the long profile. - Figure 1c shows the particle size of the rivers load is biggest in the upland area. - Figure 1c shows the river channel is rougher in the upland area of the river.	
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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 Identify the best definition of coastal erosion	Mark
2(a)(i)	AO1 (1 mark) D (wearing away of land) The answer cannot be A (deposition), B (saltation) , C (traction)	(1)

Question number	Answer Define the term longshore drift	Mark
2(a)(ii)	AO1 (1 mark) Award one mark for any of the following: • The movement of sediment <u>along</u> the coast at an angle/in a zig zag (1). • Sand/pebbles/rocks moved <u>along</u> the coast by destructive waves (1). • Movement of sediment in the direction of prevailing wind <u>along</u> the coast (1). • Zig zag movement of sand up and down the beach (1). Accept any other appropriate response.	(1)

Question number	Answer Identify one coastal soft engineering strategy	Mark
2(b)(i)	AO1 (1 mark) B (cliff regrading) The answer cannot be A, C, D as all types of (river) hard engineering.	(1)

Question number	Answer Explain one advantage of coastal hard engineering	Mark
2(b)(ii)	AO2 (2 marks) Award 1 mark for stating an advantage of hard engineering and a further mark for development up to a maximum of two marks. • It is very effective (in high-energy areas) (1) as they can deflect the wave energy (1). • They work as soon as they are built/offer immediate protection (1) which reduces erosion and flooding (promptly) (1). • Some strategies/groynes create wider beaches (1) which can increase tourism/bring in income (1). • They can provide a sense of security to local people (1) reducing stress/anxiety of homeowners (1).	

	Accept any other appropriate response.	(2)
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Question number	Answer Explain one characteristic of constructive waves	Mark
2(c)	AO2 (3 marks) Award 1 mark for the identification of one characteristic of constructive waves and 2 marks for further explanation up to a maximum of 3 marks. • (Constructive waves) are less frequent (1) as they have a longer wavelength (1) because they have less energy (1). • (Constructive waves) have a stronger swash (than backwash) (1) as they are low energy (1) formed when wind is weak(er) (1). • (Constructive waves) are low energy (1) as the fetch is shorter (1) meaning the wind transfers less energy (1). • (Constructive waves) deposit material (on beaches) (1) because they have a stronger swash (1) due to the low impact angle of the wave (1). Accept any other appropriate response.	(3)

Question number	Answer Suggest two ways a change in abiotic characteristics can affect the biotic parts of the ecosystem	Mark
2(d)	AO2 (2 marks)/AO3 (2 marks) Award 1 mark (AO3) for the identification of an abiotic change evidenced in the resource and a further mark for explanation (AO2) up to a maximum of two marks each. • The temperature rises from 27 to 35 degrees (1) which causes the coral to bleach (1). • There are less animals in the unhealthy reef (1) as the more acidic pH can disrupt the food chain/prevent shell-building by (some) organisms (1). • If the water depth is too deep (1) the algae in the corals cannot photosynthesise (and die) (1). • When nitrogen/phosphorus levels increase (1) they cause algae blooms which block out sunlight (1). • When salinity rises to 60ppt (1) which increases stress weakening corals immune system (1).	

	Accept any other appropriate response.	(4)
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Question number	Answer Identify one store shown in the nutrient cycle	Mark
2(e)	AO3 (1 mark) Award one mark for the following: • Litter (1) • (Sea) water (1) • Biomass (1)	(1)

Question number	Answer Explain two features of a mangrove ecosystem	Mark
2(f)	AO1 (2 marks)/AO2 (2 marks) Award 1 mark (AO1) for the identification of a feature of a mangrove ecosystem and a further mark for explanation (AO2) up to a maximum of two marks each. • Mangroves have salt tolerant trees (1) as they grow in areas of high salinity (1). • Complex root system (1) that can absorb wave energy (1). • They are halophytes/salt tolerant (1) which means they can grow in the sea as the salt does not harm them (1). • Mangrove plants can secrete salt from their leaves (through salt glands) (1) to balance their salt intake (1). • Mangrove trees have stilt roots (1) to be able to survive in waterlogged/oxygen poor soils (1). • Mangroves have plants with roots that contain pores (pneumatophores) (1) this allows oxygen to enter the roots (1). • Some mangrove vegetation have ultra-filtration in their roots (1) to remove salt from the water (1). Accept any other appropriate response.	(4)

Question number	Answer Analyse the causes of coastal flooding	Mark
2(g)	A03 (4 marks)/A04 (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 analysing the causes of coastal flooding in Florida and requires some judgement about which cause may be more significant. A03 - Coastal flooding is the inundation of dry land along the coast by seawater. - Coastal flooding is often caused by high tides, storms, storm surges, tsunamis and climate change. - Sea level is rising often as a result of climate change meaning height of the land above sea level will be a risk factor for flooding. - Tropical cyclones cause storm surges which are a frequent cause of coastal flooding. - Areas between the tropics are more prone to tropical cyclones. - The frequency of high strength tropical cyclones is likely to increase due to climate change. - Tides are linked to the moon influence and this can cause very high tides are certain times of year. A04 - Figure 2c shows southern Florida has a large area of land less than 1 m above current sea level. - Figure 2c shows that in 2024 Florida experienced 11 cyclones. - Figure 2c shows the average number of cyclones in Florida is one every 3 years. - Figure 2c shows tides have caused 18 flood events. - Figure 2c shows the number of floods are rising. - Figure 2c shows the number of floods caused by tides has the biggest increase. - Figure 2c shows only 3 floods have been caused by storms surges.	
		(8)

Question number	Answer
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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 Identify one type of tectonic plate boundary	Mark
3(a)	AO1 (1 mark) B (conservative) Answer cannot be A (type of volcano), C (type of volcano), D (landforms)	(1)

Question number	Answer Identify the best definition of tsunami	Mark
3(b)	AO1 (1 mark) D (a tall wave caused by displacement of a large volume of water) Answer cannot be A (pyroclastic flow), B (lahar), C (earthquake)	(1)

Question number	Answer Define the term epicentre	Mark
3(c)	AO1 (1 mark) Award one mark for any of the following: • Point on the Earth's surface directly above the focus (1). • Point on the Earth's surface vertically above the focus (1). • Point on the Earth's surface directly above where the earthquake starts (1). Accept any other appropriate response.	(1)

Question number	Answer Suggest one advantage and one disadvantage of using remote sensing and GIS in earthquake hazard management	Mark
3(d)	A02 (2 marks)/A03 (2 marks) Award 1 mark (A03) for the identification of an advantage/disadvantage based on evidence from resources and a further mark for explanation (A02) up to a maximum of two marks each. Advantage: • It is quick and easy to see how many buildings are damaged (1) meaning responses can be directed more strategically (1).	

	- You can see which areas have higher levels of damage (1) which makes it easier to direct people to areas of safety (1). - It shows 19,188 buildings are not damaged (1) making rescue efforts more targeted (1). - You can prioritise the 1,164 buildings which are unusable first (1) to make them safe before they cause more damage (1). Disadvantage: - It does nothing to prevent damage (1) as 1,342 buildings are unusable (1). - It does not predict damage only assesses damage afterwards (1) meaning you wouldn't know where the green areas are until the earthquake had happened (1). - There is no data on roads/infrastructure (1) which would make it difficult to know if access routes were clear (1). - The red buildings are dispersed across the city (1) making it more difficult to target one area (1). Accept any other appropriate response. Do not double credit direct mirrors	(4)
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Question number	Answer Identify the type of hazard this scale is used to measure	Mark
3(e)	A03 (1 mark) Award one mark for the following: Earthquakes	(1)

Question number	Answer Explain how the Coriolis force can affect the formation of tropical cyclones	Mark
3(f)	A02 (2 marks) Award 1 mark for initial point and a further mark for development up to a maximum of two marks. - The Coriolis force deflects moving air (1) this causes the air to spiral inwards towards the centre (of a low pressure area) (1). - Cyclones have circulating/spinning winds (1) because air is deflected (due to the Earth's rotation) (1). - The Coriolis force causes cyclones to spin (clockwise in southern hemisphere/anti clockwise in northern hemisphere) (1) as the air is deflected around the centre (of the cyclone) (1).	

	Accept any other appropriate response.	(2)
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Question number	Answer Explain how one scale measures tropical cyclones	Mark
3(g)	A02 (3 marks) Award 1 mark for the initial explanation and 2 marks for further explanation up to a maximum of 3 marks. • The Saffir-Simpson scale (1) classifies hurricanes based on their sustained wind speed (1) and links this to the potential level of damage expected (1). • The scale is based on average wind speed over one minute (1) this then helps to predict the potential for damage (1) to give clear/understandable information to the public (1). • The scale consists of a five-point scale (1) based on wind speed (1) this is used to indicate the cyclones severity/estimate potential property damage (1). Accept any other appropriate response.	(3)

Question number	Answer Explain two long-term impacts from tropical cyclones	Mark
3(h)	A01 (2 marks)/A02 (2 marks) Award 1 mark (A01) for the initial impact and a further mark for explanation focused on a long term impact (A02) up to a maximum of two marks each. • Tropical cyclones can damage/destroy mangroves/coral reefs, wetlands (1) which can lead to extinction of species (1). • Damages coral reefs (1) which decreases the natural protection for the coastline (1). • Agricultural land can become infertile (due to salt intrusion) (1) which means the farmer loses their livelihood (1). • The infrastructure can be damaged/destroyed (1) which can increase the vulnerability /destruction when the next cyclone hits (1). • People can be left without a home (1) which take a long time to rebuild (1). • Loss of income from tourism (1) as tourists are scared to visit for fear of another cyclone happening (1).	

	• The country's GDP can fall/decrease (1) as they are unable to trade/have to spend millions on repairs (1). • People die (1) due to waterborne diseases (1). Accept any other appropriate response.	(4)
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Question number	Answer Analyse the reasons why people continue to live in areas that have volcanoes on constructive plate boundaries	Mark
3(i)	A03 (4 mark)/A04 (4 mark) 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 analysing the reasons people choose to live near volcanoes on constructive plate boundaries and make judgements regarding to which factor is most significant in influencing people's behaviour. A03 • Constructive/divergent plate boundaries occur where two tectonic plates are moving away from one another. • Volcanoes often found at these boundaries are shield volcanoes. • Volcanoes are often more active at constructive plate boundaries. • Volcanoes at these plate boundaries tend to have less violent eruptions. • Less violent eruptions reduces the range of hazards meaning pyroclastic flows/lahars/landslides do not occur. • Volcanoes are a tourist attraction especially ones which eruption frequently but not violently. • Tourism from volcanoes can contribute to the country's economy. • These areas are a source of geothermal energy. A04 • Figure 3c shows that Iceland has 19 volcanoes. • Figure 3c shows that there are 3 volcanoes located close to Iceland's capital city Reykjavik. • Figure 3c shows that 33% of Iceland's GDP come from tourism. • Figure 3c shows 30% of Iceland's energy comes from geothermal power.	

	- Figure 3c shows that there have been 7 eruptions in Iceland since 2010. - Figure 3c shows that all the eruptions since 2014 have been 0 or 1 on the VEI scale.	
		(8)

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

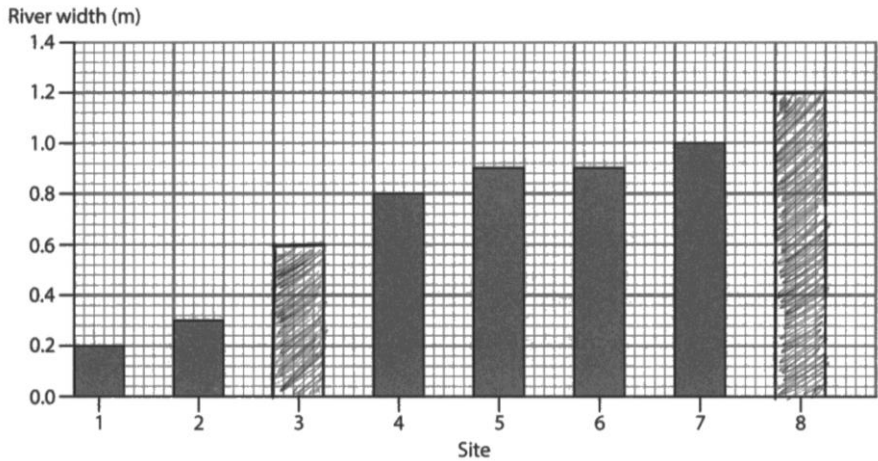
Question number	Answer Identify one health and safety risk the students may have faced when collecting their data for their river investigation	Mark
4(a)	AO3 (1 mark) C (Slipping on rock) Cannot be A (data accuracy risk), B (data accuracy risk) or C (data reliability risk).	(1)

Question number	Answer State one type of qualitative data the students could use in their enquiry	Mark
4(b)	AO3 (1 mark) • (Annotated) (field) sketches (1) • (Annotated) photographs (1) • Interviews (1) • Open question questionnaires (1) • Sketch maps (1) Accept any other acceptable response.	(1)

Question number	Answer Explain one reason why the students' quantitative data might be inaccurate	Mark
4(c)	AO3 (2 marks) Award 1 mark for initial point and a further mark for development up to a maximum of two marks. • Quantitative data can be influenced by external factors (1) such as measuring errors (which makes the data incorrect) (1). • Often measuring equipment is required (1) which can be uncalibrated/inaccurate/break (causing the numbers/data recorded to be wrong) (1). • Some types of equipment are difficult to read (1) which makes the data wrong (1). Accept any other acceptable response.	(2)

Question number	Answer	Mark
	Calculate the upper quartile for the river depth at site 4	
4(d)(i)	A04 (2 marks) Award 2 marks for correct answer. Where incorrect answer is provided 1 mark can be awarded for correct working (if shown). Upper Quartile: $32+47=79/2$ Answer = 39.5	(2)

Question number	Answer	Mark
	Calculate the interquartile range for the river depth at site 4	
4(d)(ii)	A04 (1 mark) Award 1 mark for correct answer. Interquartile range: $39.5-8.5$ Answer = 31	(1)

Question number	Answer	Mark
	Plot the data for site 3 and site 8	
4(e)	A04 (2 marks) Award 1 mark for each correct plot. Plots: Site 3 = 0.6 m, Site 8 = 1.2 m  River width (m) Site	(2)

Question number	Answer Explain one limitation of the data presentation technique	Mark
4(f)	A03 (3 marks) Award 1 mark for initial point and a further mark for development up to a maximum of two marks. - Bar graphs can only display two variables (1) which limits their ability to explore complex relationships (1) when multiple factors cannot be shown (1). (The graph) does not say which (of the 3) river the data is showing (1) which means accurate conclusions cannot be reached (1) as cannot identify similarities/differences between the 3 rivers (1). - With a large data set bars can become too narrow/cluttered (1) which can make it difficult to identify patterns (1) making it more difficult to reach a conclusion (1). - The way the axis are scaled can alter the visual representation of the data (1) which can exaggerate/minimise patterns (1) leading to unreliable conclusions (1). Accept any other acceptable response.	(3)

Question number	Answer Evaluate how useful your secondary data was in helping you to read a valid conclusion	Mark
4(g)	A03 (4 marks)/A04 (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 evaluating the usefulness of the candidates secondary data. The candidate needs to evaluate the strengths and weaknesses of several different secondary data sources they used in their enquiry and reach an overall judgement on how helpful these were in enabling them to	(8)

reach a valid conclusion in their enquiry.

A03

- Secondary data is data collected by someone else.
- Primary data is data collected by the individual.
- A valid conclusion is reached when findings are supported by reliable data which means the conclusion accurately reflects the evidence and provides a trustworthy answer to the initial enquiry question.
- Reliable data is needed to reach a valid conclusion.
- Secondary data sources are easily accessible, particularly from the internet.
- Secondary data sources can provide large data sets which include historical trends/expert opinion.
- Secondary data collected by reputable organisations will often have less bias and be more accurate than primary data.
- Secondary data can provide valuable background research on the area to help identify sites, relevant variables to investigate, formulate a question/hypothesis.
- There are disadvantages to secondary data sources as it may have been collected for a different purpose and so not perfectly align with the current investigation.
- The information can be out of date.
- It can be difficult to determine how accurate/reliable secondary data is.
- A judgement about which secondary data source was most useful in helping to reach a valid conclusion.
- A judgement about overall usefulness of their secondary data in helping them reach a valid conclusion.

A04

- Detail about the specific secondary data sources used in their own enquiry.
- Detail about rationale for choosing the secondary data source.
- Detail about the advantages of the secondary data sources used in their enquiry.
- Detail about the disadvantages of the secondary data sources used in their enquiry.
- Detail about the conclusions they drew and which elements were influenced by their secondary data.

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

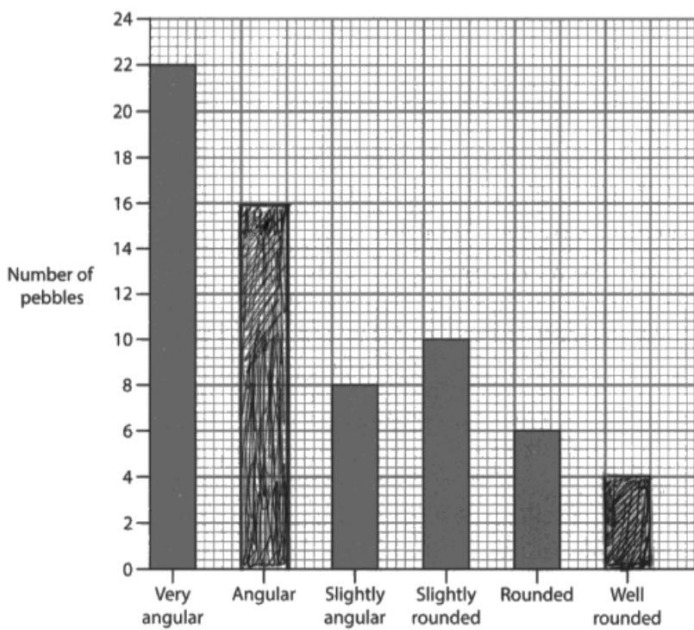
Question number	Answer Identify one health and safety risk the students may have faced when collecting their data for their coastal investigation	Mark
5(a)	A03 (1 mark) C (Slipping on rock) Cannot be A (data accuracy risk), B (data accuracy risk) or C (data reliability risk).	(1)

Question number	Answer State one type of qualitative data the students could use in their enquiry	Mark
5(b)	A03 (1 mark) • (Annotated) (field) sketches (1) • (Annotated) photographs (1) • Interviews (1) • Open question questionnaires (1) • Sketch maps (1) Accept any other acceptable response.	(1)

Question number	Answer Explain one reason why the students' quantitative data might be inaccurate	Mark
5(c)	A03 (2 marks) Award 1 mark for initial point and a further mark for development up to a maximum of two marks. • Quantitative data can be influenced by external factors (1) such as measuring errors (which makes the data incorrect) (1). • Often measuring equipment is required (1) which can be uncalibrated/inaccurate/break (causing the numbers/data recorded to be wrong) (1). • Some types of equipment are difficult to read (1) which makes the data wrong (1). Accept any other acceptable response.	(2)

Question number	Answer	Mark
	Calculate the upper quartile for the pebble size at site 4	
5(d)(i)	AO4 (2 marks) Award 2 marks for correct answer. Where incorrect answer is provided 1 mark can be awarded for correct working (if shown). Upper Quartile: $32+47=79/2$ Answer = 39.5	(2)

Question number	Answer	Mark
	Calculate the interquartile range for the pebble size at site 4	
5(d)(ii)	AO4 (1 mark) Award 1 mark for correct answer. Interquartile range: $39.5-8.5$ Answer = 31	(1)

Question number	Answer	Mark
	Plot the data for angular and well rounded pebble shape	
5(e)	AO4 (2 marks) Award 1 mark for each correct plot. Plots: Angular = 16, Well rounded = 4  Number of pebbles Site 4 pebble shape category	

Question number	Answer Explain one limitation of the data presentation technique	Mark
5(f)	A03 (3 marks) Award 1 mark for initial point and a further mark for development up to a maximum of two marks. - Bar graphs can only display two variables (1) which limits their ability to explore complex relationships (1) when multiple factors cannot be shown (1). (The graph) does not say which (of the 3) beaches the data is showing (1) which means accurate conclusions cannot be reached (1) as cannot identify similarities/differences between the 3 beaches (1). - With a large data set bars can become too narrow/cluttered (1) which can make it difficult to identify patterns (1) making it more difficult to reach a conclusion (1). - The way the axis are scaled can alter the visual representation of the data (1) which can exaggerate/minimise patterns (1) leading to unreliable conclusions (1). Accept any other acceptable response.	(3)

Question number	Answer Evaluate how useful your secondary data was in helping you to read a valid conclusion	Mark
5(g)	A03 (4 marks)/A04 (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 evaluating the usefulness of the candidates secondary data. The candidate needs to evaluate the strengths and weaknesses of several different secondary data sources they used in their enquiry and reach an overall judgement on how helpful these were in enabling them to reach a valid conclusion in their enquiry.	(8)

	AO3 • Secondary data is data collected by someone else. • Primary data is data collected by the individual. • A valid conclusion is reached when findings are supported by reliable data which means the conclusion accurately reflects the evidence and provides a trustworthy answer to the initial enquiry question. • Reliable data is needed to reach a valid conclusion. • Secondary data sources are easily accessible, particularly from the internet. • Secondary data sources can provide large data sets which include historical trends/expert opinion. • Secondary data collected by reputable organisations will often have less bias and be more accurate than primary data. • Secondary data can provide valuable background research on the area to help identify sites, relevant variables to investigate, formulate a question/hypothesis. • There are disadvantages to secondary data sources as it may have been collected for a different purpose and so not perfectly align with the current investigation. • The information can be out of date. • It can be difficult to determine how accurate/reliable secondary data is. • A judgement about which secondary data source was most useful in helping to reach a valid conclusion. • A judgement about overall usefulness of their secondary data in helping them reach a valid conclusion. AO4 • Detail about the specific secondary data sources used in their own enquiry. • Detail about rationale for choosing the secondary data source. • Detail about the advantages of the secondary data sources used in their enquiry. • Detail about the disadvantages of the secondary data sources used in their enquiry. • Detail about the conclusions they drew and which elements were influenced by their secondary data.	
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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

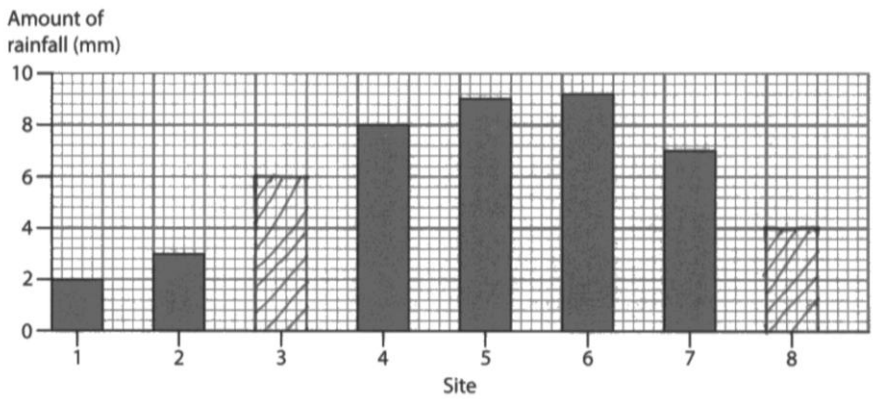
Question number	Answer Identify one health and safety risk the students may have faced when collecting their data for their weather hazard investigation	Mark
6(a)	AO3 (1 mark) A (blown over) Cannot be B (data accuracy risk), C (data accuracy risk) or D (data reliability risk).	(1)

Question number	Answer State one type of qualitative data the students could use in their enquiry	Mark
6(b)	AO3 (1 mark) • (Annotated) (field) sketches (1) • (Annotated) photographs (1) • Interviews (1) • Open question questionnaires (1) • Sketch maps (1) Accept any other acceptable response.	(1)

Question number	Answer Explain one reason why the students' quantitative data might be inaccurate	Mark
6(c)	AO3 (2 marks) Award 1 mark for initial point and a further mark for development up to a maximum of two marks. • Quantitative data can be influenced by external factors (1) such as measuring errors (which makes the data incorrect) (1). • Often measuring equipment is required (1) which can be uncalibrated/inaccurate/break (causing the numbers/data recorded to be wrong) (1). • Some types of equipment are difficult to read (1) which makes the data wrong (1). Accept any other acceptable response.	(2)

Question number	Answer	Mark
	Calculate the upper quartile for temperature at site 4	
6(d)(i)	A04 (2 marks) Award 2 marks for correct answer. Where incorrect answer is provided 1 mark can be awarded for correct working (if shown). Upper Quartile: $33+36=69/2$ Answer = 34.5	(2)

Question number	Answer	Mark
	Calculate the interquartile range for temperature at site 4	
6(d)(ii)	A04 (1 mark) Award 1 mark for correct answer. Interquartile range: $34.5-24.5$ Answer = 10	(1)

Question number	Answer	Mark
	Plot the data for site 3 and site 8	
6(e)	A04 (2 marks) Award 1 mark for each correct plot. Plots: Site 3 = 6.0 mm, Site 8 = 4.0 mm  Figure 6c	(2)

Question number	Answer Explain one limitation of the data presentation technique	Mark
6(f)	A03 (3 marks) Award 1 mark for initial point and a further mark for development up to a maximum of two marks. - Bar graphs can only display two variables (1) which limits their ability to explore complex relationships (1) when multiple factors cannot be shown (1). (The graph) does not say which (of the 3) locations the data is showing (1) which means accurate conclusions cannot be reached (1) as cannot identify similarities/differences between the 3 locations (1). - With a large data set bars can become too narrow/cluttered (1) which can make it difficult to identify patterns (1) making it more difficult to reach a conclusion (1). - The way the axis are scaled can alter the visual representation of the data (1) which can exaggerate/minimise patterns (1) leading to unreliable conclusions (1). Accept any other acceptable response.	(3)

Question number	Answer Evaluate how useful your secondary data was in helping you to read a valid conclusion	Mark
6(g)	A03 (4 marks)/A04 (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 evaluating the usefulness of the candidates secondary data. The candidate needs to evaluate the strengths and weaknesses of several different secondary data sources they used in their enquiry and reach an overall judgement on how helpful these were in enabling them to reach a valid conclusion in their enquiry. A03 Secondary data is data collected by someone else.	(8)

	• Primary data is data collected by the individual. • A valid conclusion is reached when findings are supported by reliable data which means the conclusion accurately reflects the evidence and provides a trustworthy answer to the initial enquiry question. • Reliable data is needed to reach a valid conclusion. • Secondary data sources are easily accessible, particularly from the internet. • Secondary data sources can provide large data sets which include historical trends/expert opinion. • Secondary data collected by reputable organisations will often have less bias and be more accurate than primary data. • Secondary data can provide valuable background research on the area to help identify sites, relevant variables to investigate, formulate a question/hypothesis. • There are disadvantages to secondary data sources as it may have been collected for a different purpose and so not perfectly align with the current investigation. • The information can be out of date. • It can be difficult to determine how accurate/reliable secondary data is. • A judgement about which secondary data source was most useful in helping to reach a valid conclusion. • A judgement about overall usefulness of their secondary data in helping them reach a valid conclusion. AO4 • Detail about the specific secondary data sources used in their own enquiry. • Detail about rationale for choosing the secondary data source. • Detail about the advantages of the secondary data sources used in their enquiry. • Detail about the disadvantages of the secondary data sources used in their enquiry. Detail about the conclusions they drew and which elements were influenced by their secondary data.	
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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)