GCSE
GEOGRAPHY
8035/1

Paper 1 Living with the physical environment

Mark scheme

June 2024

Version: 1.1 Final

8035/1/MS

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

Further copies of this mark scheme are available from aqa.org.uk

Copyright information

AQA retains the copyright on all its publications. However, registered schools/colleges for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to schools/colleges to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Copyright © 2024 AQA and its licensors. All rights reserved.

Point marked questions marking instructions

The mark scheme will state the correct answer or a range of possible answers, although these may not be exhaustive. It may indicate how a second mark is awarded for a second point or developed idea. It may give an indication of unacceptable answers. Each mark should be shown by placing a tick where credit is given. The number of ticks must equal the mark awarded. Do not use crosses to indicate answers that are incorrect.

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor is linked to the assessment objective(s) being addressed. The descriptor for the level shows the average performance for the level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme. You should read the whole answer before awarding marks on levels response questions.

Step 1 Determine a level

Descriptors for the level indicate the different qualities that might be seen in the student's answer for that level. When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly Level 2 with a small amount of Level 3 material it would be placed in Level 2 but be awarded a mark near the top of the level because of the Level 3 content. For instance, in a 9 mark question with three levels of response, an answer may demonstrate thorough knowledge and understanding (AO1 and AO2) but fail to respond to command words such as assess or evaluate (AO3). The script could still access Level 2 marks. Note that the mark scheme is not progressive in the sense that students don't have to fulfil all the requirements of Level 1 in order to access Level 2.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will also help. There will generally be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example. You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Assessment of spelling, punctuation, grammar and use of specialist terminology (SPaG)

Accuracy of spelling, punctuation, grammar and the use of specialist terminology will be assessed via the indicated 9 mark questions. In each of these questions, three marks are allocated for SPaG as follows:

- **High performance** – 3 marks
- **Intermediate performance** – 2 marks
- **Threshold performance** – 1 mark.

Responses with SPaG marks that gain a mark of 0 for the content/skills of the question can still be awarded SPaG marks if the response is judged to be a genuine attempt to answer the question.

General guidance

- Mark schemes should be applied positively. Examiners should look for qualities to reward rather than faults to penalise. They are looking to find credit in each response they mark. Unless the mark scheme specifically states, candidates must never lose marks for incorrect answers.
- The full range of marks should be used. Examiners should always award full marks if deserved, ie if the answer matches the mark scheme.
- 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.
- Do NOT add ticks to level-marked questions – use the highlight tool/brackets to signify what is relevant.
- Sometimes there are specific "triggers" in the mark scheme that enable higher level marks to be awarded. For instance, an example or case study may be required for Level 3 if it is stated within the question.
- Where a source, such as a photograph or map, is provided as a stimulus it should be used if requested in the question, but credit can often be given for inferred as well as direct use of the source.
- Always be consistent – accept the guidelines given in the mark scheme and apply them to every script.
- If necessary make comments to support the level awarded and to help clarify a decision you have made.
- Examiners should revisit standardised script answers as they apply the mark scheme in order to confirm that the level and the mark allocated is appropriate to the response provided.
- Mark all answers written on the examination paper.

Section A

Qu	Pt	Marking guidance	Total marks
01	1	**Using Figure 1, compare the extent of Arctic sea ice in September 2020 with the average extent of Arctic sea ice in September from 1981 to 2010.** 1 × 2 or 1 + 1 It is less now (1) It covered a greater area in the past (1) Sea ice is still found along the north coast of Greenland. (1) The ice covered much of the Arctic ocean in the past (1) but had retreated by 2020 (d) (1) The ice has shrunk (1) by approximately 50% (allow 40-60%) (d)(1) The ice extended to Svalbard in the past (1) but has retreated (1) (d) The ice extended across to Russia between 1981–2010 (1) but the edge retreated by 2020. (1) (d) The ice extended further along the coast of Greenland and Northern Canada (1) but retreated (around many of the islands) by 2020. (1) (d) Allow max of 1 mark for any valid description of ice extent without comparison. Comparisons can be inferred. No credit for explanations of changing extent. AO4 – 2 marks	2
01	2	**Using Figure 2, calculate the mean volume of Arctic sea ice in April from 1980 to 2020.** **D.** 27 200 km^3 No credit if two or more answers are circled. AO4 – 1 mark	1
01	3	**Using Figure 2, calculate the difference in the volume of Arctic sea ice from September 1980 to September 2020.** 11 900 (km^3) Allow -11900 AO4 – 1 mark	1
01	4	**Suggest how changes in the extent of Arctic sea ice are evidence of climate change.** The reduced extent of ice indicates ice is melting (1) The ice is shrinking which suggests that temperatures are increasing (1) Global warming (1) is causing ice to melt (and reduce in extent) (d) (1)	2

		No credit for simply stating that the ice extent is reducing AO3 – 2 marks	

01	5	**'International agreements are essential for managing climate change.' Do you agree?** **Explain your answer. Use Figure 3 and your own understanding.**	4

Level	Marks	Description
2 (Clear)	3–4	AO2 Shows a clear understanding of the role of international agreements in managing climate change. Explanations are developed. AO3 Demonstrates reasonable application of knowledge and understanding to **Figure 3** in judging the critical importance of international agreements to the management of climate change.
1 (Basic)	1–2	AO2 Shows a limited understanding of the role of international agreements in managing climate change. Explanations are basic. AO3 Demonstrates limited application of knowledge and understanding to **Figure 3** in judging the critical importance of international agreements to the management of climate change.
	0	No relevant content.

- **Level 2 (clear)** responses will be clear explanation(s) or linked statements. Some accurate use of geographical terms. Uses **Figure 3** with some elaboration and own understanding.

- **Level 1 (basic)** responses are likely to be simple statements with little or no development. Limited subject vocabulary used. May rely on direct or lifted use of **Figure 3** only.

<u>Indicative content</u>

- The instruction is 'do you agree?', so responses may make a judgement about the role of international agreements in managing climate change, making use of **Figure 3**.
- Alternatively, responses may briefly explain both sides of the argument and debate the pros and cons of international agreements.
- Application of understanding to **Figure 3** may include:
  - The idea that climate change is a global issue and requires global solutions. Carbon emissions spread across the world and affect everyone.
  - It is essential that countries around the world agree to implement targets set at international conferences.
  - The aim is to restrict global temperature increase to 1.5 °C above pre-industrial levels. Anything above that figure would have damaging impacts.
  - Agreements to reduce use of fossil fuels are crucial. Burning fossil fuels in industry and power stations to produce electricity, and car exhausts

		are major sources of carbon dioxide. CO^2 accounts for an estimated 60% of the enhanced greenhouse effect. • Some of the poorest countries are affected most by climate change, although their emissions are much lower than richer countries. They will need international support to mitigate the worst effects or to adapt to climate change. • International agreements are now vital because the problems of climate change are so serious and the evidence is overwhelming. • Accept arguments that dispute the role of international agreements. There have been criticisms that many agreements are 'promises' or aims and not firm commitments. They need to be universal and legally binding to be effective. Some countries have opted out or refused to sign agreements, and some agreements have been watered down. AO2 – 2 marks AO3 – 2 marks	

01	6	**Using Figure 4, name the type of plate margin shown at X.** Destructive/convergent AO4 – 1 mark	1

01	7	**Using Figure 4, which statement describes the movement of plates at X?** **B.** The Nazca Plate is moving under the South American Plate. No credit if two or more answers are circled. AO4 – 1 mark	1

01	8	**Using Figure 4, suggest one reason why new crust is formed at the location labelled Y.** **Y** is located along a constructive margin. (1) Magma is rising to the surface at **Y** (and spreading on the sea floor). (1) At **Y**, two plates are moving apart. (1) Convection currents cause plates to move apart (1) Ridge push is taking place at Y (1) AO3 – 1 mark	1

01	9	**Explain why people continue to live in areas that are at risk from a tectonic hazard.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO1 Demonstrates detailed knowledge of reasons for living in areas at risk from a tectonic hazard. AO2 Shows thorough geographical understanding of reasons why people continue to live in areas at risk of tectonic hazards.
2 (Clear)	3–4	AO1 Demonstrates reasonable knowledge of reasons for living in areas at risk from a tectonic hazard. AO2 Shows clear geographical understanding of reasons why people continue to live in areas at risk of tectonic hazards.
1 (Basic)	1–2	AO1 Demonstrates basic knowledge of reason(s) for living in areas at risk from a tectonic hazard. AO2 Shows limited geographical understanding of reason(s) why people continue to live in areas at risk of tectonic hazards.
	0	No relevant content

- **Level 3 (detailed)** responses will be developed. Some geographical terms will be applied.
- **Level 2 (clear)** responses are likely to have linked or elaborated statements and some use of geographical terms.
- **Level 1 (basic)** responses may comprise simple/partially inaccurate statements with very limited subject vocabulary. Partial sequence or random points made. May simply be a list of points
- Max Level 1 if the answer focuses on a non-tectonic hazard and the comments can only apply to that hazard

<u>Indicative content</u>

- The command word is 'explain', so responses should provide a reasoned account of how and why people choose to live in tectonically hazardous areas.
- Credit reference to any tectonic hazard, including volcanic eruptions, earthquakes and tsunamis.
- Credit answers that focus on a single hazard as well as those that consider more than one.

Reasons for living in areas at risk from volcanic eruptions.

- In volcanic areas geothermal energy can be harnessed by using steam from underground heated by magma. Geothermal power stations produce electricity eg Iceland and New Zealand.
- Volcanoes, including hot springs and geysers, attract tourists. This creates employment and may have a multiplier effect.
- Magma and lava may contain minerals including gold, silver, diamonds, copper and zinc. Basalt can be used in construction and to build roads.
- Weathered lava may form nutrient rich soil which can be cultivated to produce crops and rich harvests.

		• New land may be created following a volcanic eruption. • People believe the chances of the volcano erupting are very slim. Many people cannot afford to live away from volcanoes as they provide jobs, and their families and friends live there. • Some places are well prepared for volcanic hazards so people feel safe. Reasons for living in earthquake zones. • Plate margins often coincide with favourable areas for settlement, such as coastal areas where ports are developed. • Large settlements in seismic zones offer job opportunities, such as San Francisco and Los Angeles. • Perception that risk is outweighed by economic or social opportunities. • Engineering can make people feel safe eg buildings can constructed to be earthquake proof. • Protection, planning and monitoring may be advanced, so potential risks are reduced. • Fault lines associated with earthquakes can allow water supplies to reach the surface. General reasons applicable to any tectonically hazardous area. • People have always lived there – moving away may mean leaving friends and family. • People are employed in the area. If they move they would have to find new jobs. • People living in poverty have other things to think about on a daily basis – money, food, security and family. • People can't afford to move/housing might be cheaper in some hazardous zones. • Credit knowledge of specific volcanic areas and earthquake zones, although this is not essential for access to Level 3 eg Naples area in Italy has olives, vines, nuts and fruit (mainly oranges and lemons) growing on volcanic soils close to Mount Vesuvius. In Iceland volcanoes provide cheap geothermal power, 28% of all its energy, including heating of pavements in winter in Reykjavik. The Blue Lagoon in Iceland is heated by geothermal heat, with 1.5 million visitors per year. AO1 – 3 marks AO2 – 3 marks	

01	10	**Using Figure 5 or Figure 6, give two primary effects of either volcanic eruptions or earthquakes.** Primary effects should be evident in **Figure 5** or **Figure 6**, either directly or inferred. **Figure 5 Volcanic eruption** Houses submerged under lava flow (1) Properties destroyed (by fire) (1) Swimming pool destroyed (1) People (likely to be) injured/killed (1) Roads blocked by lava (1) Trees/crops burnt or covered by lava (1) Air pollution (1) People made homeless (1) (Accept as primary) Fire (1) **Figure 6 Earthquake** Buildings collapse (1) Communications links damaged or destroyed (1) Loss of power/water supply (1) People (likely to be) injured or killed/trapped under rubble (1) People made homeless (1) (Accept as primary) Credit other valid observations No credit for longer term/secondary effects or for responses to the hazard. No credit for effects that cannot be deduced (directly or indirectly) from **Figure 5** or **Figure 6**. It is not necessary to specify earthquake or volcanic eruption- it can be inferred from answer. Allow any two observations from Figure 5 and/or Figure 6 Allow both effects if written on the same line AO4 – 2 marks	2

01	11	**'Both immediate and long-term responses are needed after a tropical storm.'** **Discuss this statement.** **Use Figure 7 and an example of a tropical storm you have studied.**	9

Level	Marks	Description
3 (Detailed)	7–9	AO1 Demonstrates detailed knowledge of immediate and long-term responses to a tropical storm. AO2 Shows thorough geographical understanding of ways that responses to a tropical storm help to reduce its effects. AO3 Demonstrates thorough application of knowledge and understanding in assessing the importance of immediate and long-term responses to a tropical storm.
2 (Clear)	4–6	AO1 Demonstrates clear knowledge of immediate and/or long-term responses to a tropical storm. AO2 Shows clear geographical understanding of ways that responses to a tropical storm help to reduce its effects. AO3 Demonstrates reasonable application of knowledge and understanding in assessing the importance of immediate and/or long-term responses to a tropical storm.
1 (Basic)	1–3	AO1 Demonstrates limited knowledge of immediate and/or long-term responses to a tropical storm. AO2 Shows basic geographical understanding of ways that responses to a tropical storm help to reduce its effects. AO3 Demonstrates limited application of knowledge and understanding in assessing the importance of immediate and/or long-term responses to a tropical storm
	0	No relevant content.

- **Level 3 (detailed)** answers will be developed. Appropriate use of **Figure 7** (direct or inferred) and specific own understanding. Responses are related to a named example, with some assessment. Must cover immediate and long-term responses.

- **Level 2 (clear)** answers are likely to be linked statements with some elaboration. Some use of **Figure 7** (direct or inferred) and own understanding. Likely to make reference to immediate and/or long term responses. May refer to named example. May start to assess responses.

- **Level 1 (basic)** responses are likely to consist of simple statements, with limited use of subject vocabulary. Likely to be generic statements. May only use information derived from **Figure 7** and/or be restricted to one type of response.

- An answer that lacks consideration of both immediate and long-term responses is limited to Level 2.

		• Allow access to Lower Level 3 if there is thorough AO1 and AO2 but only limited AO3 • Allow L1 for correct subdivision of statements from Figure 7. • Reject discussion of impacts unless directly related to responses. • A purely generic answer without exemplification is limited to top Level 2. • Answers that are entirely about volcanic eruptions or earthquakes are capped at Level 1. <u>Indicative content</u> • The command word is 'discuss this statement' so responses may include an assessment of the degree to which long-term responses are more or less important than responses in the short term. Many may feel that short-term responses are more significant. Answers may consider their relative importance, supported by evidence. Some will suggest that both are equally important, but in different ways. • Credit only responses (not causes or effects). Answers should refer to a named example, although general answers are creditworthy to the top of Level 2. Answers may include just one exemplar but credit can be given for others if relevant. They may make distinctions between responses in HIC and LICs/NEE countries. • Understanding of immediate responses, ie the first/emergency actions taken by people after an event. These include the need to search for and rescue people cut off by flooding, getting them to safety or to hospital; a need to try to provide medical help, to ensure there is clean water (and food); a need to bury the dead, often in mass graves to stop the spread of disease. All of this may require international aid with teams of sniffer dogs, heavy equipment, medical staff, provisions of water purifying tablets, blankets, setting up shelters, tents etc. Evacuate people before the storm arrives. Foreign governments or NGOs may send aid workers, supplies, equipment or financial donations to the area. Tech companies may set up disaster response tools, allowing damage to be recorded, people to confirm their safety and alerts about areas at risk from the storm to be shared. • Long-term responses are responses by people that occur over weeks, months or years. These involve the need to rebuild houses, ideally using different materials and designs, to make them less easy to destroy, and to rebuild public buildings and infrastructure. There may be a requirement to rebuild roads and railways; to ensure jobs are being created; to help people to come to terms with a traumatic event and loss of parents and children; to predict and prepare for future events and introduce measures to reduce the effects of future hazards. Aid, grants or subsidies can be given to residents to repair and strengthen homes. Economic recovery may be provided in the area, encouraging people to return eg with tax breaks or other incentives. • Application to **Figure 7**. Immediate responses are emergency measures designed to keep people alive and provide essential supplies for survival. Evacuate people before the storm arrives. Rescue people who have been	

		cut off by flooding and treat injured people. Set up temporary shelters for people whose homes have been flooded or damaged. Provide temporary supplies of water, food, electricity, gas and communications systems if regular supplies have been damaged. • Application to **Figure 7**. Long-term responses involve rebuilding programmes, constructing new houses using strong, long-lasting materials, replacing those that were destroyed. This allows people to plan for the future, and may also provide work for local builders, electricians, carpenters etc. Longer-term plans to improve forecasting and early warning aim to use data from radar, satellites and aircraft to monitor storms. Computer models are then used to calculate a predicted path for the storm to give people more warning in the future. • In future buildings can be designed to withstand tropical storms, eg by using reinforced concrete. Building regulations are improved so more buildings withstand tropical storms, or change planning rules so homes can't be built in the most risky areas. Buildings can also be put on stilts so they're safe from floodwater. • Credit references to examples eg Typhoon Haiyan. Immediate responses included international government and aid agencies responding quickly with food aid, water and temporary shelters. US aircraft carriers and helicopters assisted with search and rescue and delivery of aid. Evacuation centres were set up to help the homeless. Shelter kits were provided. Field hospitals were set up to help the injured. The Red Cross delivered basic food aid. Credit local Philippines responses. Long-term responses include rebuilding of roads, bridges and airport facilities. Local people were paid to help clear debris and rebuild the city. Rice farming and fishing were quickly re-established. Aid agencies such as Oxfam supported the replacement of fishing boats. Thousands of homes were built away from areas at risk from flooding. More cyclone shelters were built to accommodate people evacuated from coastal areas. • Discussion of the importance of immediate and long-term responses. Both may be considered essential, although longer term responses are sometimes given lower priority after initial publicity ceases. Immediate relief is essential to save lives, provide shelter and food. Short-term aid from other countries may be crucial as the government is not able to meet the needs of the victims. Long-term responses may be considered equally/more important as they ensure the survivors are able to integrate back into their normal life. Length of recovery period may depend on availability of money for longer-term reconstruction, available technology, efficiency of distribution systems, communications and infrastructure, level of preparation and planning, and how well emergency services cope. AO1 – 3 marks AO2 – 3 marks AO3 – 3 marks	

		Spelling, punctuation and grammar (SPaG) **Responses with SPaG marks that gain a mark of 0 for the content/skills of the question can still be awarded SPaG marks if the response is judged to be a genuine attempt to answer the question.** **High performance** • Learners spell and punctuate with consistent accuracy. • Learners use rules of grammar with effective control of meaning overall. • Learners use a wide range of specialist terms as appropriate. **Intermediate performance** • Learners spell and punctuate with considerable accuracy. • Learners use rules of grammar with general control of meaning overall. • Learners use a good range of specialist terms as appropriate. **Threshold performance** • Learners spell and punctuate with reasonable accuracy. • Learners use rules of grammar with some control of meaning and any errors do not significantly hinder meaning overall. • Learners use a limited range of specialist terms as appropriate. **No marks awarded** • The learner writes nothing. • The learner's response does not relate to the question. • The learner's achievement in SPaG does not reach the threshold performance level, for example errors in spelling, punctuation and grammar severely hinder meaning.	3 2 1 0

Section B

Qu	Pt	Marking guidance	Total marks
02	1	**Outline one reason why there are high levels of biodiversity in the tropical rainforest.** 1 mark for single reason or 2 marks for developed explanation. Eg Temperatures/humidity are high (1) so (many) plants grow quickly (d) (1) There is much sunlight/rain (1), so plants grow well /so there are many plants (d) (1) Because rainforests are located in tropical regions, they receive a lot of sunlight (1) so photosynthesis is rapid/there are many different plants. (d) (1) There are many habitats (1) for different plants and animals to grow or live.(d) (1) The rainforest has a canopy structure(1), which means that there are sources of food (and shelter) for different animals (d) (1) The hot, damp conditions (on the forest floor) (1), mean that nutrient cycling is rapid (d) (1) /means rapid decay of dead plant material /plentiful nutrients easily absorbed by plant roots. (d) (1) Large areas of rainforest are untouched by humans (1), allowing a variety of nature to thrive. (d) (1) Accept explicit answers about biodiversity alongside answers about high levels of growth (with biodiversity only implied) No credit for description of plants or plant adaptations to climate. AO2 – 2 marks	2
02	2	**State one threat to biodiversity in the tropical rainforest.** People chop/burn/remove trees (1) Habitat loss. (1) Deforestation or any valid factor leading to deforestation. (1) Climate change (less rain, too hot) (1) Invasive species. (1) Accept other valid answer AO1 – 1 mark	1
02	3	**Complete the following paragraph by choosing the correct words from the list below**. Figure 8 is an example of a food **web**. Orchid plants are an example of a **producer**. An increase in the number of jaguars is likely to **reduce** the number of monkeys. 1 mark for each correct word. Allow “decrease” instead of “reduce” AO4 – 3 marks	3

02	4	**Use the following data to complete Figure 9.** Bar graph to be drawn accurately to 13 000 km^2 Allow any reasonable width of bar. Shading not required. Top of bar needs to touch 13000 line. AO4 – 1 mark	1

02	5	**Using Figure 9, which one of the following statements is true?** **C** Annual rate of deforestation was lowest in 2012. No credit if two or more statements are circled. AO4 – 1 mark	1

02	6	**Suggest how deforestation in the tropical rainforest can be caused by a range of different activities. Use a case study.** **Level 3 (detailed)** responses will be developed with accurate use of geographical terms. Reasoned examination of the range of different causes of rainforest deforestation in the context of a clear case study. **Level 2 (clear)** responses will have linked or elaborated statements and some accurate use of geographical terms. Likely to outline the different causes of tropical rainforest deforestation. **Level 1 (basic)** responses are likely to consist of simple statements, with limited use of subject vocabulary. Might be limited to generic statements and basic causes. Might be a list of relevant activities Max Level 2 if a case study is not stated. Allow L3 marks if at least two activities are explained thoroughly or a larger range explained in less detail (in the context of a case study)	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of the different causes of deforestation in the rainforest they have studied. AO3 Demonstrates thorough application of knowledge and understanding in assessing how deforestation can be caused by a range of different activities.
2 (Clear)	3–4	AO2 Shows reasonable geographical understanding of the different causes of deforestation and likely to refer to the rainforest they have studied. AO3 Demonstrates reasonable application of knowledge and understanding in assessing how deforestation can be caused by a range of different activities.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of the different causes of deforestation. Likely to be general causes. AO3 Demonstrates limited application of knowledge and understanding in assessing how deforestation can be caused by one or more activities.
	0	No relevant content.

		Indicative content • Students are likely to consider a range of different causes of rainforest deforestation such as cattle ranching, mining, farming, logging, mineral extraction, energy development, dam building, road building, settlement and population growth. They could also refer to smaller scale activities such as shifting cultivation and ecotourism. • Answers may focus on the fact that cattle ranching has been the main cause of deforestation followed by other types of commercial farming, whilst smaller scale activities such as shifting cultivation are much less significant. The building of roads often leads to further and more rapid destruction. Allow reference to political causes of deforestation-national or government policies • Credit discussion of how the causes vary in different parts of the world but since the students are only required to look at one case study of a tropical rainforest, this is not necessary. Focus should be on the range of activities in the rainforest they have studied. AO2 – 3 marks AO3 – 3 marks	

02	7	**Outline one way selective logging can be used to manage the rainforest sustainably.** • Selective logging reduces the overall extent of deforestation (1) • It allows other trees to carry on growing (1) • the selected trees are often older/more highly valued and the selective logging allows the forest to recover(1) • Selective logging allows the other trees to gain more space and sunlight to grow (1) • Removing just a few trees means that the forest recovers more quickly (1) • Only a few trees are cut down (1) AO2 –1 mark	1

02	8	**Using either Figure 10 or Figure 11, suggest one way the soil can be affected by the climate in either a hot desert or cold environment.** **Hot desert**: The soil shown is loose in structure. (1) Largely comprised of sand/rock/stone. (1) It is dry. (1) It has limited organic matter. (1) Lacks nutrients/infertile (1) It starts to crack (1) Degradation/soil erosion (1) Desertification (1) Salty/saline (1) **Cold environment**: Infertile soil. (1) Permafrost/ice in the upper layer. (1) Ice can thaw for several months. (1) Limited organic matter. (1) It is frozen (1) Degradation /soil erosion (1) Weathering (1)	1

		It is not necessary to specify hot desert or cold environment-can be inferred from answer AO3 –1 mark	

02	9	**'Plants and animals need to have special adaptations to cope with extreme environments.'** **Discuss this statement.** **Use either Figure 12 or Figure 13 and your own understanding**.	9

Level	Marks	Description
3 (Detailed)	7–9	AO1 Demonstrates detailed knowledge of how plants and animals adapt to cope with extreme environments. AO2 Shows thorough geographical understanding of the adaptations of plants and animals in extreme environments. AO3 Demonstrates thorough application of knowledge and understanding in assessing the importance of the adaptations of plants and animals in extreme environments.
2 (Clear)	4–6	AO1 Demonstrates clear knowledge of how plants and/or animals adapt to cope with extreme environments. AO2 Shows clear geographical understanding of the adaptations of plants and/or animals in extreme environments. AO3 Demonstrates reasonable application of knowledge and understanding in assessing the importance of the adaptations of plants and/or animals in extreme environments.
1 (Basic)	1–3	AO1 Demonstrates limited knowledge of how plants and/or animals adapt to cope with extreme environments. AO2 Shows limited geographical understanding of the adaptations of plants and/or animals in extreme environments. AO3 Demonstrates basic or no application of knowledge and understanding in assessing the importance of the adaptations of plants and /or animals in extreme environments.
	0	No relevant content.

Level 3 (detailed) responses will be well developed with accurate use of geographical terms. Reasoned discussion of how plants and animals adapt to cope with extreme environments with reference to **Figure 12** or **13** and own understanding.

Level 2 (clear) responses will have linked or elaborated statements and some use of geographical terms. Will outline some ways in which plants and/or animals adapt to cope with extreme environments with reference to **Figure 12** or **13** and/or own understanding.

Level 1 (basic) responses are likely to consist of simple statements, with limited use of subject vocabulary. Might be limited to generic statements. May only refer to plants **or** animals in extreme environments. Likely to rely on figures provided.

Developed answers may attain Level 3 referring to Figure 12 /13 only.

Indicative content

- The question requires students to make a judgment about the need for special adaptations. In order for plants and animals to survive in cold environments or hot deserts they have had to adapt to the extreme conditions found there.

Hot desert environment (based on **Figure 12** which shows a succulent plant and desert fox, though identification of species is not needed).

- Understanding of hot desert as a hostile environment. Rainfall less than 250 mm per year, high daytime temperatures (up to 50 ^{o}C) but cool at night. Plants and animals have developed adaptations which allow them to survive in hot and dry conditions. Very little biodiversity in hot deserts because of the harsh climate.

Understanding of plant adaptations

These include:

- No leaves or small seasonal leaves that only grow after it rains – this helps reduce water loss during photosynthesis.
- Many plants have long root systems – these spread out wide or go deep into the ground to absorb water.
- Short life cycles – some plants germinate in response to rain, grow, flower, produce new seeds and die over a short period.
- Leaves with hair – these help shade the plant, reducing water loss.
- Other plants have leaves that turn throughout the day to expose a minimum surface area to the heat.
- Waxy coating on stems and leaves – this helps to reduce water loss.
- Many plants are slower growing – this requires less energy. The plants don't have to make as much food and therefore do not lose as much water.
- General density of vegetation is low. Plants are spread out across the landscape so they can draw in water without competition from other plants.
- Application to **Figure 12**. Succulent plants are well adapted for survival in the desert. They have stems that can store water and thick waxy skin to reduce water loss through pores.

Understanding of animal adaptations

- Students likely to refer to other species like camels which have thick fur on the top of the body for shade, and thin fur elsewhere to allow easy heat loss. They also have large surface area which maximises heat loss, large, flat feet to spread their weight on the sand and the ability to go for a long time without water – they lose very little through urination and sweating. Camels also store fat in their hump which provides energy in times of food shortages and they are able to tolerate body temperatures up to 42 °C. Their slit-like nostrils and two rows of eyelashes help keep the sand out of their eyes.
- Application to **Figure 12**. Animals like the desert fox may have large ears to give off heat, have thick fur on the soles of their feet to protect them from the hot ground and have light coloured fur to reflect the sunlight and keep them cool. They are only active at night to avoid heat.

Cold environments (based on **Figure 13** which shows a bearberry plant and an Arctic fox, though identification of species is not needed)

		• Understanding of cold, hostile environments. Credit reference to polar and/or tundra landscapes. These ecosystems have long cold winters and short, cool summers. The tundra has low precipitation (less than 200 mm per year) and dry winds. These conditions make the Arctic tundra a desert-like climate. Ground consists of permafrost, with a thin active layer in summer. Very short growing season. **Understanding of plant adaptations** Plants in the tundra have adapted in a variety of ways: • plants grow close together, low to the ground and they remain small to be able to withstand the cold temperatures and high winds • soils are often waterlogged because of the permafrost underneath, so only hardy plants like moss can cope with seasonal drought and waterlogging • some plants have a waxy, hairy coating which helps to shield them from the cold and the wind, and protects plant seeds. They have small leaves, which helps the plants to retain moisture. Only the top layer of soil thaws out, therefore plants have very shallow root systems. • plants like lichens and moss can survive on bare rock with a bit of moisture • most plants don't die off in the winter; they have long life cycles to help with the short growing season. This means photosynthesis can begin immediately once the sunlight is strong enough as plants don't need to regrow leaves • harsh environment means that very little vegetation grows. Some plants like the arctic poppy flower quickly, even whilst the snow is still melting. They also have cup shaped flowers that face the sun to capture as much sunlight as possible. They appear to grow in clumps in stony soil that absorbs the sun's heat and provide shelter for the roots • application to **Figure 13**. This is a bearberry plant which grows low to the ground to avoid harsh winds. It has fine silk hairs that grow on the stem/bark to retain warmth and leathery leaves that reduce evaporation. It thrives in non-nutrient soils such as sand, soils on rock outcrops and shallow soils. **Understanding of animal adaptations** • Animals need shelter and insulation in tundra and polar regions. They tend to have thicker and warmer feathers and fur. Many of them have larger bodies and shorter arms, legs and tails which helps them retain their heat better and prevent heat loss. • Many birds have two coats of feathers to help keep them warm. Animals often have feet lined with fur to help keep them warm. • Many also migrate to warmer climates during the harsh winter months. • Some animals (bears, marmot, arctic squirrels) hibernate for the winter and others will burrow (lemmings, ermine). • Many insects spend their entire life buried in the soil, rocks or plants which act as a shelter. • Application to **Figure 13**. Arctic foxes have thick fur to keep them warm, even on their footpads to stop them freezing, they have proportionally shorter legs, shorter necks and smaller ears. This means that there is less surface area to lose heat from. Their white fur allows them to blend in with their snowy surroundings, keeping them from being seen by	

		predators. They count on their hearing to listen for prey that burrow in the snow where they cannot be seen. • Credit idea of adaptation to climate change – forcing some animals to migrate longer distances, to forage more widely eg polar bears and Arctic foxes. Because of climate change the special adaptations might in the future be less useful eg As the snow melts due to climate change the white rabbits will now get hunted more easily. • Animals may need to adapt with the seasons eg in cold environments, the fur changes from white to brown. • All organisms need to adapt to their habitat to be able to survive the climatic conditions of the ecosystem, predators, and other species that compete for the same food and space. AO1 – 3 marks AO2 – 3 marks AO3 – 3 marks	

Section C

Qu	Pt	Marking guidance	Total marks
03	1	**What does 'managed retreat' mean?** **A.** Allowing the sea to flood or erode an area of low-value land. No credit if two or more statements are shaded. AO1 – 1 mark	1
03	2	**Using Figure 14, which one of the following grid squares shows a shingle beach?** **C.** 9777 No credit if two or more statements are shaded. AO4 – 1 mark	1
03	3	**Using Figure 14, identify one method of hard engineering shown in grid square 9879.** Groyne AO1 – 1 mark	1
03	4	**The area labelled X shows a coastal spit.** **Using Figure 14, describe the size and shape of the spit.** Size. It is 2.5 km long (allow 1.7–3.0 km). (1) It varies in width. (1) It is long/narrow (1) The width is up to 400 m (allow 50–500m). (1) It covers an area of 0.8 km^2 (allow 0.5–1.10 km2). (1) Nearly stretches across the river (1) Don't credit "large" or "wide" on its own Shape. It is long/narrow/thin. (1) It is straight (on one side) (1) It is curved (on one side)(1) It is finger shaped. (1) It has a hooked shape. (1) It starts wider, becomes narrower, (then is wider at the end). (1) Don't double credit if the same answer is given for both parts of the question. AO4 – 2 marks	2

03	5	**You have studied a coastal management scheme in the UK.** **Explain the effects of the scheme.**	4

Level	Marks	Description
2 (Clear)	3–4	AO1 Demonstrates accurate knowledge of a coastal management scheme in the UK. AO2 Shows a clear geographical understanding of the effect(s) of a coastal management scheme in the UK. Explanations are developed.
1 (Basic)	1–2	AO1 Demonstrates limited knowledge of a coastal management scheme in the UK. AO2 Shows a limited geographical understanding of the effect(s) of a coastal management scheme in the UK. Explanations are partial.
	0	No relevant content.

- **Level 2 (clear)** responses are likely to contain linked statements showing understanding of one or more effects of a coastal management scheme. Appropriate geographical terminology.

- **Level 1 (basic)** responses will comprise simple ideas with limited or partial understanding of one or more effects of a coastal management scheme. Limited geographical terminology.

Max Level 1 for generic explanation of the effects of a coastal management scheme or hard/soft engineering strategies. Allow Level 2 for a place-specific scheme, although it may not be named

Note it is possible to gain top Level 2 for a well-developed single effect of a coastal management scheme.

Indicative content

- The command is 'explain', so responses should provide a reasoned account of the effects of a coastal management scheme.
- Effects can be positive and/or negative. Positive impacts (hard engineering) might include the fact that new defences have stood up to recent stormy winters. Harbours may be better protected, benefitting boat owners and fishermen. Tourism may have benefitted, with increased visitor numbers.
- Negative effects may include the fact that the new defences have spoilt the natural coastal landscape or that hard engineering may interfere with coastal processes and affect neighbouring stretches of coastline, causing conflicts elsewhere.
- Examples may include hard and soft engineering schemes, or managed retreat/coastal realignment. Effects may cover conflicts between different interest groups as well as environmental, social and economic effects.
- Expect a named example eg Mappleton on the Holderness coast where the scheme included building of rock groynes and rock armour.
  Positive effects: the village of Mappleton and the B1242 road are no longer at risk from erosion. Cliffs are stabilised, and a wide sandy beach has formed, protecting the settlement.
  Negative effects. Rock groynes prevented sediment moving south along the coast by longshore drift. This has caused increased erosion south of Mappleton. Loss of land, including farms and caravan park. Property

		prices along the coast have fallen sharply for those houses at risk from erosion. Loss of homes leaves home owners with negative equity. Difficult to get insurance or a mortgage for housing. Further down the coast, coastguard and lifeboat services from Spurn Head under threat due to erosion, in part linked to Mappleton. Loss of habitat for wildlife on Spurn Head, because less material is coming down the coast to collect there, so is at risk of being washed away. AO1 – 2 marks AO2 – 2 marks	

03	6	**Explain how coastal landscapes are formed by different processes. Use Figure 15 and your own understanding.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of the formation and development of landforms associated with a changing coastline. AO3 Demonstrates thorough application of knowledge and understanding in analysing the changing coastline shown in **Figure 15**.
2 (Clear)	3–4	AO2 Shows clear geographical understanding of the formation and development of landform(s) associated with a changing coastline. AO3 Demonstrates reasonable application of knowledge and understanding in analysing the changing coastline shown in **Figure 15**.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of the formation and development of landform(s) associated with a changing coastline. AO3 Demonstrates limited application of knowledge and understanding in analysing the changing coastline shown in **Figure 15**.
	0	No relevant content.

- **Level 3 (detailed)** will be developed responses with understanding of the processes involved and the sequence of formation. Appropriate geographical terminology will be used. Appropriate reference to **Figure 15**.

- **Level 2 (clear)** responses are likely to contain linked statements showing some understanding or identification of the processes involved and the sequence of formation. Some geographical terminology will be used. Some use of **Figure 15**.

- **Level 1 (basic)** responses will comprise simple ideas or random statements with limited or partial sequence and little reference to the processes involved. May consider one landform or focus on sequence only. Geographical terminology will be limited. Answer may be largely reliant on **Figure 15**.
- The formation and development of at least two landforms should be explained to access Level 3.

Credit labelled diagrams.
Credit valid annotations on the Figure
Credit correct explanation of processes even if they are not named.

Max Level 2 for answers that refer to a single landform.

Max Level 2 if there is no reference to **Figure 15**.

Indicative content

- The question implies knowledge of the processes of erosion as well as landforms of coastal erosion. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation and changes in a coastline over time.

- Understanding of specific processes relevant to the formation of landforms shown – weathering, mass movement, erosion, hydraulic action, corrasion/abrasion, attrition, longshore drift, folding/faulting

- Application to **Figure 15**. The photograph includes an arch, stacks/ stumps, cliffs, headlands and bays, and a beach. The sequence of arch and stack can be seen in **Figure 15** representing different stages in the sequence of erosional landforms. In **Figure 15** the headland and arch appear to be composed of hard sedimentary rocks tilting steeply.

- Understanding of landform development. Firstly, the sea attacks the foot of the cliff and begins to erode areas of weakness such as joints and cracks, through processes of erosion such as hydraulic action, wave pounding, abrasion and solution.

- Gradually these cracks get larger, developing into small caves. Further erosion widens the cave and where the fault lines run through the headland, two caves will eventually erode into the back of each other forming an arch, passing right through the headland.

- A combination of wave attack at the base of the arch, and weathering of the roof of the arch (by frost, wind and rain), weakens the structure until eventually the roof of the arch collapses inwards leaving a stack, a column of rock which stands separate from the rest of the headland.

- The stack continues to erode, eventually collapsing to form a stump which may be covered by water at high tide. Credit wave refraction processes eg concentrating energy on headlands.

- Understanding of formation of **headlands and bays** and changes over time. Because of differences in resistance of rocks to erosion, some parts of the coast may retreat faster than others. This will happen where the rocks are at right angles to the coastline (a discordant coast), although in Figure 15 the coastline is concordant. Over thousands of years the softer less resistant rock will be eroded more quickly than the harder, more resistant rock and differences become more pronounced. Eventually there will be headlands that stick out into the sea and bays where the land has been worn back. The headlands are more exposed to wave attack and erosional landforms develop. Due to wave refraction the energy of the waves is then focused on the headlands and spread out in the bays.

- **Beaches** develop at the head, or innermost part, of a bay. In this area wave action is usually not very strong and deposition occurs. The beach will not extend to the headlands because erosion from waves increases strongly towards the headlands and deeper water. Longshore drift may cause material to be moved along the bay.

		• Credit other landforms which show how the coastline is changing, for example **wave cut platforms.** The sea attacks the base of the cliff between the high and low water mark along a headland. A wave-cut notch is formed by erosional processes such as abrasion and hydraulic action. As the notch increases in size, the cliff becomes unstable and collapses, leading to the retreat of the cliff face. The backwash carries away the eroded material, leaving a wave-cut platform. The process repeats. The cliff continues to retreat. Some may recognise the concordant coastline shown in the photograph. • Analysis of Figure 15 demonstrates that the coastline is constantly changing due to a combination of processes. Credit idea that continued wave action/refraction may eventually cause the coastline to become more straightened as headlands are worn back and bays receive more sediment. AO2 – 3 marks AO3 – 3 marks	

Qu	Pt	Marking guidance	Total marks
04	1	**Which one of the following factors is most likely to cause river levels to rise quickly after heavy rainfall?** **D.** Steep slopes No credit if two or more answers are circled. AO1 – 1 mark	1
04	2	**Using Figure 16, measure the distance along the Old River Witham between point X and point Y.** 2.3 km (allow 2.0–2.6 km) AO4 – 1 mark	1
04	3	**Using Figure 16, identify one method of hard engineering shown in grid square 0970.** Embankment/levee (1) Straightened river/channeling (1) AO4 – 1 mark	1
04	4	**Using Figure 16, describe the relief and drainage shown in grid square 0870.** Relief: (The land is) flat. (1) It is low-lying. (1) Gentle gradient (1) It is approximately 2 metres above sea level. (1) Drainage: There are several (drainage) channels. (1) The channels are straight. (1) There is a larger channel/ Branston Delph). (1) There are rivers/streams (1) There are 5 streams/channels going into a river (1) Allow canal (1) Drainage system (1) Allow 1 mark for each. AO4 – 2 marks	2

04	5	**You have studied a flood management scheme in the UK.** **Explain why the scheme was needed and how it works.**	4

Level	Marks	Description
2 (Clear)	3–4	AO1 Demonstrates accurate knowledge about a flood management scheme in the UK. AO2 Shows a clear geographical understanding of the features of a flood management scheme in the UK, and why the scheme was needed. Explanations are developed.
1 (Basic)	1–2	AO1 Demonstrates limited knowledge about a flood management scheme in the UK. AO2 Shows a limited geographical understanding of the features of a flood management scheme in the UK, and/or why the scheme was needed. Explanations are partial
	0	No relevant content.

- **Level 2 (clear)** responses are likely to contain linked statements showing understanding of the features of the flood management scheme and why it was needed. Appropriate geographical terminology.

- **Level 1 (basic)** responses will comprise simple ideas about general features of a flood management scheme. Geographical terminology will be limited.

Max Low Level 2 if one aspect is covered clearly, but the other is omitted.

A place specific scheme is required to access Level 2 marks, although it may not be named.

Max Level 1 for generic explanation of the features of a flood management scheme.
No credit for impacts of a flood event or responses to flooding.

<u>Indicative content</u>

- The command is 'explain', so responses should provide a reasoned account of the features of named flood management scheme and why it was implemented.
- Hard engineering schemes such as dams and reservoirs, straightening, embankments, flood relief channels and soft engineering schemes such as flood warnings, preparation, flood plain zoning, planting trees and river restoration are listed in the specification.
- Students should refer to an example of a specific flood management scheme they have studied. Examples include the Jubilee river flood-relief channel, Banbury flood storage, Kielder dam, Quaggy river restoration.
- Dams and reservoirs can provide HEP, water supply and tourism and recreational opportunities. River straightening reduces flood risk and can improve navigation. Embankments can reduce flood risk and provide habitats for riverbank animals as well as walking routes for people.
- Flood plain zoning creates green spaces. Planting trees has numerous environmental benefits and can be relatively inexpensive. River restoration creates new wetland habitats and recreational areas and increases biodiversity.

		• Expect a named example. Features of the scheme. The Jubilee river flood relief channel, built in 2002, is 12 km long, 50 m wide and cost £110 million to build, funded by the Environmental Agency. It was created to look and act like a natural river. It has shallow reed beds and a nature reserve with bird hides. One year after completion weirs were damaged by flooding. Projected total cost expected to reach £330 million. • Why the scheme was needed. It was built to protect areas like Maidenhead, Windsor and Eton during a flood, which are very high value areas. When discharge is high, the Jubilee River diverts from the River Thames, preventing the river from overflowing its banks. Thames flood plain is low-lying and prone to flooding. Impermeable surfaces of the built-up areas have historically resulted in flooding. AO1 – 2 marks AO2 – 2 marks	

04	6	**Explain how river features are created by erosion and deposition. Use Figure 17 and your own understanding.** **Level 3 (Detailed)** – 5–6 marks: AO2 Shows thorough geographical understanding of the formation and development of landforms associated with river erosion and deposition. AO3 Demonstrates thorough application of knowledge and understanding in analysing the formation of river landforms shown in **Figure 17**. **Level 2 (Clear)** – 3–4 marks: AO2 Shows clear geographical understanding of the formation and development of landform(s) associated with river erosion and/or deposition. AO3 Demonstrates reasonable application of knowledge and understanding in analysing the formation of river landform(s) shown in **Figure 17**. **Level 1 (Basic)** – 1–2 marks: AO2 Shows limited geographical understanding of the formation and development of landform(s) associated with river erosion and/or deposition. AO3 Demonstrates limited application of knowledge and understanding in analysing the formation of river landform (s) shown in **Figure 17**. 0 marks: No relevant content. • **Level 3 (detailed)** will be developed responses with understanding of erosional and depositional processes involved and the sequence of formation. Appropriate geographical terminology will be used. Appropriate reference to **Figure 17**. • **Level 2 (clear)** responses are likely to contain linked statements showing some understanding or identification of the processes involved and the sequence of formation. Some geographical terminology will be used. Some use of **Figure 17**. • **Level 1 (basic)** responses will comprise simple ideas or random statements with limited or partial sequence and little reference to the processes involved. May consider one landform or focus on sequence only.	6

		Geographical terminology will be limited. Answer may be largely reliant on **Figure 17**. • The formation and development of at least two landforms should be explained to access Level 3. Credit labelled diagrams. Credit valid annotations on the Figure Credit correct explanation of processes even if they are not named. Max Level 2 for answers that refer to a single landform. Max Level 2 if there is no reference to **Figure 17**. <u>Indicative content</u> • The question implies knowledge of the processes of erosion and deposition as well as the associated landforms. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation and changes in the features of a river floodplain over time. • Application to **Figure 17**, which illustrates several floodplain features, including meanders and oxbow lakes. It shows evidence of lateral erosion and deposition of material on the inner bends of meanders. **Figure 17** shows a meandering river with 3 cutoffs or oxbow lakes where the river has short circuited its original route. There is much evidence of deposition in the channel especially on the inner bends of meanders. The river is braided in several places with a small island in the centre of the channel. Outer bends are being eroded laterally. • The development of **meanders** is due to both deposition and erosion. A meander is a winding curve or bend in a river. Water flows fastest on the outer bend of the river where the channel is deeper and there is less friction. Lateral erosion results in undercutting of the river bank and the formation of a steep sided river cliff. On the inside of the bend, where the river flow is slower and water is shallower, material is deposited on a slip off slope, as there is more friction. Over time, because of erosion and deposition, meanders gradually change shape and move across the floodplain and migrate downstream. • Accept reference to initial formation (riffles and pools). In low flow conditions bends in a river are initially formed by the deposit of sediment on the river bed, resulting in the variations in the river's flow. Shallower areas with deposits are known as riffles, while deeper areas are called pools. The flow of the river naturally increases in pools, where there is less friction and more erosion, causing the river to bend. • **Oxbow lakes**. The neck of a meander narrows due to lateral erosion on opposite sides of the meander bend. During high flow (flood) conditions, the meander neck is broken through. The river now adopts the shorter (steeper) route, by-passing the old meander. Deposition occurs at the edges of the new straight section, effectively cutting off the old meander. The old meander now forms an ox-bow lake, separated from the main river. Gradually the oxbow lake silts up to form marshland. • **Floodplains** form due to erosion and deposition. Erosion removes any interlocking spurs, creating a wide, flat area on either side of the river. During a flood, the material being carried by the river is deposited (as the river loses its speed and energy to transport material). Over time, the height	

		of the floodplain increases as the material is deposited on either side of the river. The floodplain is often a wide, flat area caused by meanders shifting along the valley. • Accept reference to other relevant landforms not shown in **Figure 17** eg l**evees** are long narrow ridges or raised embankments alongside the river, composed of gravel, stones and alluvium. Steeper on channel side than land side. Levees occur in the lower course of a river when there is an increase in the volume of water flowing downstream and flooding occurs. Sediment that has been eroded further upstream is transported downstream. When the river floods, the sediment spreads out across the floodplain. Friction with the land reduces velocity and causes deposition. When a flood occurs, the river loses energy. The largest material (sand and gravel) is deposited first on the sides of the river banks and smaller material (finer silt and mud) further away. After many floods, the sediment builds up to increase the height of the river banks, so the levees become higher than the surrounding floodplain. • Accept explanations of landforms that are formed largely by erosion, for instance waterfalls, and those that form as a result of deposition, for instance estuaries. • Analysis of the source demonstrates that river features are constantly changing due to a mix of processes. Several landforms are created by a combination of erosion and deposition. Very few, if any, are formed by erosion (or deposition) alone. Labelled and annotated diagram(s) can substitute for written text, showing the sequence of changes and processes involved (either cross section or plan view). Credit valid annotations on the Figure AO2 – 3 marks AO3 – 3 marks	

Qu	Pt	Marking guidance	Total marks
05	1	**What does abrasion mean?** **C.** Rocks trapped beneath the glacier scratch and smooth the bedrock underneath. No credit if two or more answers are circled. AO1 – 1 mark	1
05	2	**Using Figure 18, which grid square shows part of a ribbon lake?** **C.** 7109 No credit if two or more answers are circled. AO4 – 1 mark	1
05	3	**Using Figure 18, name one landform of glacial erosion shown in grid square 7112.** Corrie/cwm/cirque (1), arete (1), corrie lip (1), corrie backwall (1), corrie lake/tarn (1), pyramidal peak (1) AO1 – 1 mark	1
05	4	**Using Figure 18, describe the shape of the valley and measure the width of the valley floor between points X and Y.** Shape of valley. The valley is U shaped/It is steep/It has a flat floor (1) Width of valley floor. Allow 400–700 metres. (1). Also allow answers in range 1300-1500 metres (1) AO4 – 2 marks	2

05	5	**You have studied a glaciated upland area in the UK.** **Explain why this area attracts tourists.**	4

Level	Marks	Description
2 (Clear)	3–4	AO1 Shows accurate geographical knowledge of a glaciated upland area in the UK used for tourism. AO2 Demonstrates reasonable understanding of the attractions for tourists in a glaciated upland area in the UK.
1 (Basic)	1–2	AO1 Shows limited geographical knowledge of a glaciated upland area in the UK used for tourism. AO2 Demonstrates limited understanding of the attractions for tourists in a glaciated upland area in the UK .
	0	No relevant content.

- **Level 2 (clear)** responses will show clear understanding of attractions to tourists in a glaciated area. May refer to both physical and human attractions. Some geographical terminology evident.

- **Level 1 (basic)** responses will be simple statements about the attraction(s) to tourists in a glaciated area. May consist of listed points or random generic statements about one or more attractions of a glaciated area for tourists. May not give a named example.

- Maximum Level 1 if named or place-specific area not indicated

- Max Level 1 if glaciated area is outside the UK

<u>Indicative content</u>

- The command is 'explain', so responses should provide a reasoned account of why a glaciated upland area is attractive to tourists.
- Examples are likely to include the Lake District, Snowdonia, The Cairngorms, The Isle of Arran etc but the example(s) need(s) to be in the United Kingdom.
- Physical attractions of glaciated areas include mountainous areas and glacial features which provide opportunities for walking, climbing, mountain biking, camping, skiing etc as well as striking views and physical challenges for people who like to spend their leisure time outdoors.
- Glacial lakes have scenic value but can also be used for water sports and other water-related leisure activities.
- The climate of glaciated areas tends to be colder and therefore might provide opportunities for winter activities such as skiing.
- Human attractions of glaciated areas include the human settlements which are found in glaciated areas and the tourist-specific businesses and activities which have developed in these areas. This includes a huge range of different examples including hotels, shops and cafes, campsites, tourist attractions, historical houses and monuments.
- Expect a named example. The Lake District National Park is England's largest National Park and includes Scafell Pike - its highest mountain, Wastwater - its deepest lake, and towns like Keswick and Bowness-on-Windermere. There are a huge number of activities for visitors on offer, including walking, climbing, cycling, boat cruises and various museums. The spectacular glaciated scenery is a major attraction. 16 million visitors

		come to the Lake District each year spending over £1000 million. They come to enjoy the scenery, peace and quiet and walking but also to visit specific attractions or take part in an outdoor activity. Mountains like Helvellyn and Scafell Pike provide opportunities for walking and climbing with spectacular views at the top. AO1 – 2 marks AO2 – 2 marks	

05	6	**Explain the different ways that glacial material is transported and deposited.** **Use Figure 19 and your own understanding.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of the ways that glacial material is transported and deposited. AO3 Demonstrates thorough application of knowledge and understanding in analysing the depositional features shown in **Figure 19**.
2 (Clear)	3–4	AO2 Shows clear geographical understanding of the ways that glacial material is transported and /or deposited. AO3 Demonstrates reasonable application of knowledge and understanding in analysing the depositional feature(s) shown in **Figure 19**.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of the ways that glacial material is transported and/or deposited. AO3 Demonstrates limited application of knowledge and understanding in analysing the depositional feature(s) shown in **Figure 19**.
	0	No relevant content.

- **Level 3 (detailed)** will be developed responses with understanding of transport and depositional processes involved and the sequence of formation. Appropriate geographical terminology will be used. Appropriate reference to **Figure 19**.

- **Level 2 (clear)** responses are likely to contain linked statements showing some understanding or identification of the transport and/or depositional processes involved and/or the sequence of formation. Some geographical terminology will be used. Some use of **Figure 19**.

- **Level 1 (basic)** responses will comprise simple ideas or random statement with limited or partial sequence and little reference to the processes involved. May consider one landform or focus on sequence only. Geographical terminology will be limited. Answer may be largely reliant on **Figure 19**.

Credit labelled diagrams
Credit valid annotations on the Figure
Credit correct explanation of processes even if they are not named.

		Max Level 2 if there is no reference to **Figure 19**. <u>Indicative content</u> • The question implies knowledge of the processes of transport and deposition as well as the associated landforms. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation and changes in the features of a glaciated upland landscape over time. • Application to **Figure 19**. **Figure 19** shows a variety of moraines, formed in different places in a glaciated upland area. Terminal moraine marks the maximum advance of the glacier. Medial moraines form in the middle of valley glaciers as they are joined by tributaries. Lateral moraines can be seen along the edge of glaciers. On the right of the diagram the outwash plain is shown, criss-crossed by streams formed in the meltwater zone. **Figure 19** also shows several lateral and medial moraines formed from several tributary glaciers, becoming much wider in the foreground. All indicate material transported by the ice from upland areas. • Glacial transport processes. As freeze-thaw weathering occurs along the edge of the glacier, pieces of rock, which break off larger rocks, fall onto the glacier and are transported. Rocks plucked from the bottom and sides of the glacier are moved downhill with the ice. Bulldozing is when rocks and debris, found in front of the glacier, are pushed downhill by the sheer force of the moving ice. • Types of glacial deposit debris in the glacial environment may be deposited directly by the ice (till or boulder clay) or, after reworking, by meltwater streams (outwash). • Moraines are composed of rocky debris that has been removed from the valley sides and floor by weathering and erosion and carried downhill by glaciers. • **Terminal moraine** –Terminal moraines mark the maximum extent of the glacier. Huge amounts of material build up at the snout to form a high ridge across the valley. The longer the snout stays in one place, the greater the amount of material that is deposited. • **Lateral moraine** – moraine running along the edge of the glacier where it meets the valley side. These develop from the collection of frost-shattered rock debris falling from valley sides and accumulating at the base of the rock face on the surface of the glacier. When the ice melts the material forms a line of unsorted rock debris slumped against the valley sides. • **Medial moraine** – when two glaciers meet the lateral moraines of two glaciers merge and extend down the middle of the enlarged glacier. When the ice melts the unsorted rock debris is left as a ridge down the middle of the valley. • **Recessional moraines** are small ridges of debris which tend to be deposited at a temporary pause when the glacier is retreating. • **Ground moraine** – material that was at the bottom of the glacier. It is found on the valley floor when ice melts. • **Outwash plains** are formed in front of a glacier where material is deposited over a wide area, carried out from the glacier by meltwater. The finest sediments are carried further away from the glacier.	

		Coarser materials are deposited nearer to the snout of the glacier as the meltwater drops these first as its energy declines. • Credit reference to other landforms produced by glacial transport and deposition. Eg Drumlins are made up of glacial material eroded by the glacier further up-valley. They are smooth egg shaped hills around 10–20 metres high, often found in clusters. Drumlins are formed underneath the glacier so are found behind the terminal moraine. Melting ice at the base of the glacier causes material to be deposited as ground moraine, as there is too much to be carried. This ground moraine is then sculpted to form drumlin shapes by further ice movements. They build up over time, comprising layers of glacial till and rock. The long axis of drumlins aligns with the flow of glacial ice. They usually have a blunt end that faces up the valley and a more pointed end facing down-valley. • Analysis of Figure 19 shows that glacial debris is transported and deposited in a variety of different ways, creating distinctive landforms. Transport can occur below, within and on top of the ice. Material is deposited directly by ice or indirectly by meltwater. Glacial deposits are angular and mixed up (unsorted) whereas meltwater deposits are sorted into different sizes. Credit valid annotations on the Figure AO2 – 3 marks AO3 – 3 marks	