GCSE
GEOGRAPHY
8035/1

Paper 1 Living With The Physical Environment

Mark scheme

June 2019

Version: 1.0 Final

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.

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

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, i.e. 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

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, i.e. 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.

Description of annotations

Annotation	Meaning/Use
?	Unclear
[	Left square bracket
]	Right square bracket
^	Omission mark
AO1	Assessment Objective 1
AO2	Assessment Objective 2
AO3	Assessment Objective 3
L1	Level 1
L2	Level 2
L3	Level 3
DP	Developed point
DEV	Development
EG	Example / reference
EVAL	Evaluation
(H LINE)	Horizontal Line
JUST	Level or point just awarded
MAX	Max
Vertical Wavy Line	Not relevant
NC	Nothing Creditworthy
NAQ	Not answered the question
REP	Repeat
SEEN	Reviewed but no marks awarded
Tick	Correct point
TV	Too vague
Highlight	Highlight Box
Text box	On Page Comment
Speech bubble	Off page Comment

Section A

Qu	Pt	Marking guidance	Total marks
01	1	**State what is meant by extreme weather.** One mark for an appropriate definition. Weather that is unexpected (1), unusual (1), severe (1), unseasonal (1), significantly different from the normal pattern (1)/not normal to a particular area (1) Weather (event) that can cause a threat to life(1) Weather (event) that can cause damage (to property)(1) No credit for rearranging the wording of the question or for quoting examples of extreme weather. No credit for "different weather". AO1 – 1 mark	1
01	2	**Which one of the following statements does not describe an extreme weather event in the UK?** D. A wet winter in western Scotland No credit if two or more answers are circled. AO2 – 1 mark	1
01	3	**Using Figure 1, which one of the following statements is true?** C. Cardiff has a red snow warning. No credit if two or more answers are circled. AO4 – 1 mark	1

01	4	**Suggest how extreme weather in the UK can have economic and social impacts.** **Use Figure 2 and your own understanding.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of the economic and social impacts of extreme weather event(s). AO3 Demonstrates coherent application of knowledge and understanding in analysing the social and economic impacts of extreme weather in the UK.
2 (Clear)	3–4	AO2 Shows some geographical understanding of the economic and/or social impacts of extreme weather event(s). AO3 Demonstrates reasonable application of knowledge and understanding in analysing the social and/or economic impacts of extreme weather in the UK.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of the economic and/or social impacts of extreme weather event(s). AO3 Demonstrates limited application of knowledge and understanding in analysing the social and/or economic impacts of extreme weather in the UK.
	0	No relevant content.

- Level 3 (detailed) responses will be developed. Some geographical terms will be applied. All aspects of the question are answered - social and economic impacts, use of Figure and own understanding.

- Level 2 (clear) responses are likely to have linked or elaborated statements and some use of geographical terms. Uses Figure and/or own understanding.

- Level 1 (basic) responses may comprise simple/partially inaccurate statements with very limited subject vocabulary. Partial sequence or random points made. Answers may depend largely on lifting material from the source.

- Max L2 for explanation of social or economic impacts only.
- Max L2 for general explanation of impacts without reference to **Figure 2**.
- There should be some (implied) reference to **Figure 2** to access Level 3.
- No credit for environmental impacts in isolation but allow if linked to social/economic effects eg River water contaminated with sewage brought health risks.

		Indicative content • The command word is "suggest" so responses should set out the likely impacts of extreme weather, making use of **Figure 2**. • Extreme weather hazards may take place over one day or a period of time. In the UK these include storm events, flooding, severe thunderstorms and hailstorms, strong winds and tornadoes, droughts, extreme heat, extremes of cold weather including blizzards. • Understanding of types of impact. Social - effects on people and communities. Economic - impacts on jobs, transport infrastructure, businesses and local and national economies. • Social and economic impacts may overlap. Transport disruption can affect people's daily lives but may have severe effect on transport of supplies and cause delays to employees. • Credit understanding of social and economic impacts of specific weather events such as Cumbria floods (2009), St Jude storm (2013), Somerset Level floods (2014), drought/heatwave in 2003 and 2018, snow and ice in 2010 and March 2018. However reference to specific example is not needed for access to Level 3. • Impacts depend on the nature of the event. Heatwaves may lead to pressures on water supplies (hosepipe bans, water shortages), risk to lives of frail and elderly people, danger of wildfires disrupting traffic and destroying farmland, increased food costs, buckling of railway lines and melting of roads. Credit positive social and economic effects including boost to tourism industry, sales of ice cream and cold drinks. • Application of knowledge and understanding to **Figure 2**. Snow warnings indicate travel delays, road and rail closures (social and economic), power cuts (social and economic) potential risk to life and property (mainly social). • The red warning in the photograph suggests major travel disruption which affects supplies of goods to shops and businesses (economic), possible closures of schools, increased chance of accidents and risk to life (social). Vehicles are stuck in traffic jams in both directions, including lorries carrying supplies. • The caption suggests a cost of £1 billion per day. Credit broader implications of extreme cold including train, ferry and airline cancellations and delays (social and economic), damage to crops and losses of livestock in rural areas (economic), stoppages to certain industries such as construction (economic), loss of electricity supplies if power lines damaged (social and economic). AO2 – 3 marks AO3 – 3 marks	

01	5	**Using Figure 3, complete the following paragraph.** Most tropical storms happen between latitudes 5 degrees and 30 degrees north and south of the **Equator**. On average, three or more tropical storms per year take place in East Pacific and **East Asia**. In the Caribbean the main months for tropical storms are between **August-October**. AO4 – 3 marks	3

01	6	**Give two reasons why tropical storms form in the areas shown in Figure 3.** Eg High sea temperatures/sea temperatures above 26/27 degrees C (1) They form over the oceans, where water provides moisture/gives energy (1) Water vapour is evaporated from the ocean surface, which provides "fuel" for the storm (1) Because at the Equator there isn't enough spin from the earth's rotation (Coriolis effect). (1) Heat makes air unstable/makes the air rise rapidly. (1) Low wind shear (1) 2 separate reasons are required. AO1 – 2 marks	2

01	7	**'As maximum wind speeds increase, so does the number of deaths linked to tropical storms.'** **Do you agree?** **Use evidence from Figure 4 to support your answer.** Eg There is no (clear) relationship/there is not a direct link (1) Some of the storms causing most deaths had lower max wind speeds / some storms causing more deaths had very high wind speeds (1) (Avoid double crediting). Credit qualified use of data from the table e.g. the 3 storms causing the highest number of deaths all had lower wind speeds than the 4 with the least deaths (1)/The Bhola cyclone had the lowest max wind speed yet recorded the greatest number of deaths. (1) Credit data manipulation No credit for explanations of the data. No credit for just disagreeing with the statement AO4 – 2 marks	2

01	8	**Suggest one way the distribution of tropical storms could change if global ocean temperatures continue to rise.** They may affect areas further from the Equator. (1) They could affect parts of the sub tropics/the South Atlantic/NE USA. (1) They could have a broader distribution/affect larger parts of the world. (1)	1

		Credit alternative idea (As the science is uncertain) regions where tropical storms take place are not expected to change much as a result of climate change. (1) AO1 – 1 mark	

01	9	**Explain how alternative energy production and planting trees may help to reduce the rate of climate change.** **Level 2 (Clear) – Marks 3–4** AO1 Demonstrates accurate knowledge about the mitigation strategy(ies) of alternative energy production and planting trees. AO2 Shows a clear understanding of the way(s) that mitigation strategy(ies) can help to reduce the effects of climate change. Explanations are developed. **Level 1 (Basic) – Marks 1–2** AO1 Demonstrates limited knowledge about the mitigation strategy(ies) of alternative energy production and planting trees. AO2 Demonstrates limited understanding of the way(s) that mitigation strategy(ies) can help to reduce the effects of climate change. Explanations are partial. **0 – No relevant content.** • Level 2 (clear) responses will be clear explanation(s) or linked statements. Some accurate use of geographical terms. • Level 1 (basic) responses are likely to be simple random statements. Limited subject vocabulary used. • One factor with a developed explanation can reach bottom of Level 2, but both factors should be considered for top of Level 2. • No credit for adaptation strategies or for other mitigation strategies. <u>Indicative content</u> • The command word is “explain” which requires an account of how and why mitigation strategies of alternative energy production and planting trees are helpful in reducing the rate of climate change. • Knowledge and understanding of how these strategies work. Both attempt to deal with the source of the problem i.e. to prevent or reduce the release of greenhouse gases which cause climate change. • Alternative energy production. Renewable energy sources such as HEP, solar, wind and tides do not emit large amounts of CO2. Some are renewable and last into the future. Nuclear is another source with little or no release of CO2. • Planting trees. Trees act as carbon sinks, removing CO2 from the atmosphere during photosynthesis. They also release moisture into the air, producing more cloud and reducing incoming solar radiation.	4

		AO1 – 2 marks AO2 – 2 marks	

01	10	**'Long-term responses to a tectonic hazard are more important than immediate responses.'** **Do you agree?** **Using Figure 5 and one or more examples, explain your answer.**	9

Level	Marks	Description
3 (Detailed)	7–9	AO1 Demonstrates detailed knowledge of the responses to a tectonic hazard with good use of exemplification. AO2 Shows thorough geographical understanding of places, environments and processes. AO3 Demonstrates thorough application of knowledge and understanding in judging the importance of immediate and long term responses to a tectonic hazard using source and example.
2 (Clear)	4–6	AO1 Demonstrates clear knowledge of the responses to a tectonic hazard. AO2 Shows some geographical understanding of places, environments and processes. AO3 Demonstrates reasonable application of knowledge and understanding in judging the importance of immediate and long term responses to a tectonic hazard, using source and/or example.
1 (Basic)	1–3	AO1 Demonstrates limited knowledge of responses to a tectonic hazard. AO2 Shows slight geographical understanding of places, environments and processes. AO3 Demonstrates limited application of knowledge and understanding in judging the importance of immediate and/or long term responses to a tectonic hazard, using source and/or example.
	0	No relevant content.

- Level 3 (detailed) responses will be developed and include both immediate and long term responses to a tectonic hazard (some may be interlinked). Responses are related to a named example and Figure 5, with some assessment.

- Level 2 (clear) responses are likely to have linked statements, with some accurate use of geographical terms. May refer to named example. May start to evaluate responses. Uses source and/or example

- Level 1 (basic) responses are likely to consist of simple statements, with

		very limited use of subject vocabulary. May be limited to generic statements. May be limited to a single type of response. Uses source and/or example • Reject discussion of impacts unless directly related to responses. • A purely generic answer without clear exemplification is limited to Level 2. • An answer that lacks consideration of the relative importance of immediate and longer term responses is limited to Level 2. • An answer that refers only to responses to tropical storms or other non-tectonic disaster is limited to L1, but answer can access L2 if knowledge and understanding is applied appropriately to the source <u>Indicative content</u> • The command is "do you agree" and to "explain your answer", so the focus of the question is an evaluation of the degree to which long term responses are more or less important than responses in the short term. e.g. Fully agree, disagree, partially agree. Many may feel that short term responses are more significant. Answers should consider their relative importance, supported by evidence. • 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. Examples can include named volcanic events, earthquakes, tsunamis and other hazards. 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, i.e. the first/emergency actions taken by people after an event. These include the need to search for and rescue people, getting them to safety or to hospital, possibly moving inland or to higher ground if a tsunami; 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. • 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. • Evaluation of Figure 5. Allow any reasonable inference from the photographs. Immediate responses include providing water supplies, medicines, first aid and essential supplies for survival. 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. • Knowledge and understanding of specific example(s) of a tectonic event (s). e.g. Haiti 2010 Many countries responded to appeals for aid, dispatching rescue and medical teams, engineers and support personnel. Communication systems, air, land, and sea transport facilities, hospitals, and electrical networks had been damaged by the earthquake, which slowed rescue and aid efforts. As rescues tailed off, supplies, medical care and sanitation became priorities. There were delays in aid distribution. Looting and sporadic violence occurred. Medicines San Frontiers tried to help casualties whilst the USA took charge of trying to coordinate aid distribution. • Longer term responses. The EU and World Bank provided longer term assistance but response was slow. Huge increase in number of people in relief camps of tents, most with no electricity, running water, or sewage disposal. The Dominican Republic offered support and accepted some refugees. Most debris has now been removed, new building codes have been established, port is being rebuilt, part of the country's debt has been written off and most agencies are resolved to make sure that the recovery is sustainable. • Evaluation of the relative 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 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 to 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)** **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	**3** **2** **1** **0**

		• 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.	

Section B

Qu	Pt	Marking guidance	Total marks
02	1	**Using Figure 6, which one of the following statements is true?** One mark for the correct answer: C. Moles eat beetles No credit if two or more statements are shaded. AO4 – 1 mark	1
02	2	**Suggest what would happen in the food web shown in Figure 6 if foxes became extinct.** One mark for each basic point or two marks for developed suggestion. Possible increase in the number of some primary and secondary consumers (1), particularly moles/rabbits (d) (1) There would be fewer predators (1) Increase in number of moles/ rabbits (1) However the number of beetles might eventually decrease (1) Possible fewer plants as numbers of primary consumers / rabbits increase (1) Fewer beetles means fewer mice / tawny owls (1). AO3 – 2 marks	2
02	3	**State one role of decomposers in an ecosystem.** Decomposers help to return nutrients/energy to the soil (1) They break down dead plants and animals/organic waste or excreted material (1) They release energy from a plant or animal so that it can be recycled. (1) AO1 – 1 mark	1

02	4	**Calculate the percentage loss in biomass between the primary consumer and secondary consumer levels.** B. 97.5% No credit if two or more statements are shaded. A04 – 1 mark	1

02	5	**Give two reasons why the biomass changes between each level in the food chain.** E.g. (Loss of energy through) respiration (1) (Loss of energy through) movement (1) (Loss of energy through) excretion (1) (Loss of energy through) digestion (1) Energy loss through heat (1) Energy is used for life processes (1) Faeces and remains are passed to decomposers (1) The entire organism is not consumed or digested / Parts such as roots, woody stems, bones, scales, feathers aren't eaten. (1) AO1 – 2 marks	2

02	6	**Using Figure 8, which part of the rainforest matches the following description?** **An almost continuous layer of branches and leaves between 15 and 30 metres high.** B. Upper canopy No credit if two or more statements are shaded. AO4 – 1 mark	1

02	7	**Using Figure 8, describe one characteristic of the base of the taller trees.** Buttressed roots (1) The base is wider than the rest of the trunk (as roots extend into the ground) (1) Wide base (1) AO4 – 1 mark	1

02	8	**Give one effect of deforestation on the soils of the rainforest.** They become less fertile (1) They become drier (as there is less protection) (1) They are eroded/washed away (as roots no longer hold them in place) (1) They lose their nutrients/rainwater may cause leaching (1) They turn red/they may have a reddish colour due to presence of iron oxide (1) AO1 – 1 mark	1

02	9	**'Plants and animals adapt in order to survive in a hostile environment.'** **Explain this statement.** **Use either Figure 9 or Figure 10 and your own understanding.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of the ways that plants and animals survive in a hostile environment. AO4 Demonstrates relevant and effective use of photographic evidence of plant and animal adaptations.
2 (Clear)	3–4	AO2 Shows some geographical understanding of the ways that plants and/or animals survive in a hostile environment. AO4 Demonstrates reasonable use of photographic evidence of plant and/or animal adaptations.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of the ways that plants and/or animals survive in a hostile environment. AO4 Demonstrates limited use of photographic evidence of plant and/or animal adaptations.
	0	No relevant content

- Level 3 (detailed) responses will be developed. Appropriate use of **Figure 9** or 10 (direct or inferred) and specific own understanding.
- Level 2 (clear) responses are likely to be linked statements with some elaboration. Some use of **Figure 9** or **10** (direct or inferred) and/or own understanding.
- Level 1 (basic) responses are likely to consist of simple statements, with limited use of subject vocabulary. May only use information derived from **Figure 9** or **10**.

- Responses should refer to one or both photographs in **Figure 9** or **Figure 10** (directly or inferred) to access Level 3.

- Both plant and animal adaptation(s) are required to access Level 3

Indicative content

- The command word "explain" is used, which means to provide a reasoned account of the ways that animals and plants adapt to either a hot desert or cold environment.

Hot desert environment (based on **Figure 9**)

- Understanding of hot desert as a hostile environment. Rainfall less than 250mm 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.

- Use of **Figure 9**.
  Cacti are well adapted for survival in the desert. They have:
  - Stems that can store water.
  - Spines instead of leaves. These minimise the surface area and so reduce water loss. The spines may also protect the cacti from animals that might eat them.
  - Thick waxy skin to reduce water loss through pores.
- General density of vegetation is low. Plants are spread out across the landscape so they can draw in water without competition from other plants. Photo shows thorny shrubs with few leaves. Prickly pear cactus in background, storing water in its pads.

- Understanding of animal adaptations. Animals may have large ears to give off heat (e.g. Fennec fox), produce little urine to save water, are active only at night to avoid heat (e.g. cottontail rabbit).

- Use of **Figure 9**
  Camels are well adapted and can cope with wind-blown sand and cold at night. They have:
  - o Thick fur on the top of the body for shade, and thin fur elsewhere to allow easy heat loss.
  - o Large surface area which maximises heat loss.
  - o Large, flat feet to spread their weight on the sand.
  - o Ability to go for a long time without water – they lose very little through urination and sweating.
  - o A fatty hump which provides energy in times of food shortages.
  - o Ability to tolerate body temperatures up to 42°C.
  - o Slit-like nostrils and two rows of eyelashes to help keep the sand out of their eyes.

Cold environments (based on **Figure 10**)

- 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 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.
  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.

- **Use of Figure 10**
  Harsh environment means that very little vegetation grows. Some plants like 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.

		• 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 entire life buried in the soil, rocks or plants which acts as a shelter. • Use of **Figure 10** Polar bears have thick fur, an insulating layer of fat, with a black nose and footpads to absorb sunshine. Front feet are large, flat and oar-like, making them excellent swimmers. Sharp claws and teeth are ideal for catching and eating prey, and small ears reduce heat losses. • Credit idea of adaptation to climate change – forcing some animals to migrate longer distances, to forage more widely eg polar bears and arctic foxes. AO2 – 3 marks AO4 – 3 marks	

<table>
<tr>
<td>02</td>
<td>10</td>
<td>
Either
To what extent is human activity the cause of desertification in areas on the fringes of hot deserts?
or
To what extent are cold environments at risk from economic development and therefore in need of protection?

<u>Hot deserts</u>
<table>
<tr><th>Level</th><th>Marks</th><th>Description</th></tr>
<tr><td>3 (Detailed)</td><td>7–9</td><td>AO1 Demonstrates detailed knowledge of threats from human activities in environments on the fringe of hot deserts.
AO2 Shows thorough geographical understanding of the interrelationships between places, environments and processes in the context of environments on the fringe of hot deserts.
AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating the extent to which human activity poses a risk to environments on the fringe of hot deserts.</td></tr>
<tr><td>2 (Clear)</td><td>4–6</td><td>AO1 Demonstrates clear knowledge of threats from human activities in environments on the fringe of hot deserts.
AO2 Shows some geographical understanding of the interrelationships between places, environments and processes in the context of environments on the fringe of hot deserts.
AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the extent to which human activity poses a risk to environments on the fringe of hot deserts.</td></tr>
<tr><td>1 (Basic)</td><td>1–3</td><td>AO1 Demonstrates limited knowledge of threats from human activities in environments on the fringe of hot deserts.
AO2 Shows slight geographical understanding of the interrelationships between places, environments and processes in the context of environments on the fringe of hot deserts.
AO3 Demonstrates limited application of knowledge and understanding in evaluating the extent to which human activity poses a risk to environments on the fringe of hot deserts.</td></tr>
<tr><td></td><td>0</td><td>No relevant content.</td></tr>
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</td>
<td>9</td>
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</table>

- Level 3 (detailed) responses will be well developed. Reasoned examination of a range of causes of desertification with some evaluation of extent to which human activity is responsible.

- Level 2 (clear) responses will have linked or elaborated statements and some accurate use of geographical terms. May outline several causes of desertification. May start to make an evaluation of the extent to which human activity is responsible.

- Level 1 (basic) responses are likely to consist of simple statements, with limited use of subject vocabulary. Might be limited to generic statements, or a list of risks to the environment without development. May be limited to a single cause of desertification. May make a limited evaluation.

<u>Indicative content for hot deserts</u>

- The command "to what extent" means that responses may state the degree to which human activity causes desertification, with some support for the view expressed. E.g. The statement may be completely untrue, true to some extent (partly but not completely true), to a great extent, or completely true.

- Knowledge of areas affected by the process. 20% of the world's population, in over 60 countries, have to cope with the threat of desertification. For instance, the Sahara has advanced over 250km southwards in the past 100 years.

- Understanding of how desertification occurs – the process of fertile land changing into desert typically as a result of deforestation, drought, or improper/inappropriate agriculture.

Causes which link to human activity include:

- Population growth – more people needing more food which puts pressure on the land.
- Migration- leads to greater population pressure. Drought and desertification in one region will displace people to another fragile environment.
- Overgrazing – too many goats, sheep, cattle can destroy the vegetation. Nomadic groups are now restricted in movement and this places more pressure on land resources. The soil may turn to dust and become infertile.
- Overcultivation – growing too much without allowing the soil to recover means it becomes exhausted.
- Deforestation – trees are cut down for fuel and building. The loss of roots makes the soils more fragile. They are exposed to wind and the rain, leading to gully erosion.
- War – many sub-Saharan countries have suffered for years from civil war, where crops and animals have been destroyed, leading to famine. Millions of people have been forced to move into desert fringe areas by armed conflicts. Some become refugees. The resources in and around the cities and camps where these people settle come under severe

pressure.

- Enhanced greenhouse effect, partially caused by human activity globally, may contribute to increased risks of drought and higher temperatures in areas on fringe of hot deserts.

- Other threats include extraction of mineral resources and fossil fuels and high impact tourism in vulnerable areas such as the edge of the Thar desert and in East Africa.

- Understanding of natural factors leading to desertification. Less rainfall, higher temperatures which lead to increased evaporation/drought, or rainfall becoming more irregular, which means that vegetation dies and soils dry out and are removed by soil erosion. Climate is changing; this is part of a natural cycle of climate change as ocean currents and patterns of winds change. Human and physical factors may be linked.

- Credit examples of desertification e.g. In Kenya, nomadic Masai farmers have been forced onto marginal land. Traditional migration patterns have been affected and they have been forced to use smaller areas of land for their cattle. Overgrazing has resulted from this, leading to soil erosion by wind and water.

- Evaluation of extent to which human activities pose a risk. E.g. although climate change, as part of a natural cycle, may contribute to desertification, there is little doubt that human misuse of the land poses a major threat. Desertification is a huge environmental problem affecting many countries on the edge of hot deserts, which to a great extent is driven by human factors.

<u>Cold environments</u>

Level	Marks	Description
3 (Detailed)	7–9	AO1 Demonstrates detailed knowledge of threats from human activities in cold environments. AO2 Shows thorough geographical understanding of the interrelationships between places, environments and processes in the context of cold environments. AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating the extent to which human activity poses a risk to cold environments and the consequent need for protection.
2 (Clear)	4-6	AO1 Demonstrates clear knowledge of threats from human activities in cold environments. AO2 Shows some geographical understanding of the interrelationships between places, environments and processes in the context of cold environments. AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the extent to which human activity poses a risk to

		cold environments and the consequent need for protection.
1 (Basic)	1-3	AO1 Demonstrates limited knowledge of threats from human activities in cold environments. AO2 Shows slight geographical understanding of the interrelationships between places, environments and processes in the context of cold environments. AO3 Demonstrates limited application of knowledge and understanding in evaluating the extent to which human activity poses a risk to cold environments and the consequent need for protection.
	0	No relevant content.

- Level 3 (detailed) responses will be well developed. Reasoned examination of a risk(s) to cold environments with some evaluation of extent to which protection is needed.

- Level 2 (clear) responses will have linked or elaborated statements and some accurate use of geographical terms. May outline several risks to cold environments. May start to make an evaluation of the extent to which environmental protection is needed.

- Level 1 (basic) responses are likely to consist of simple statements, with limited use of subject vocabulary. Might be limited to generic statements, or a list of risks to the environment without development. May be limited to a single risk caused by human activity. May make a limited evaluation.

- Max L2 if answer does not refer to the need for protection of cold environments

<u>Indicative content for cold environments.</u>

- The command "to what extent" means that responses may state the degree to which human activity poses a risk to cold environments. E.g. the statement may be completely untrue, true to some extent (partly but not completely true), to a great extent, or completely true.

- Cold environments are fragile and they can be easily damaged by human activities. Tundra vegetation takes a very long time to grow. Relatively minor developments such as constructing a footpath can have serious long-term effects. Tyre tracks can be seen for many years after they were made. When the Sun hits the ruts it causes the permafrost to melt; this causes erosion and the ruts get bigger, and eventually the ruts turn into gullies.

- Mining - mines have opened up resources, such as gold and diamonds, under the land in tundra regions, e.g. Arctic Canada. Roads, housing and supply bases are built. This increases the number of vehicles in the

		tundra creating noise and air pollution. • Pollution from mining and oil drilling has contaminated the air, lakes and rivers. Burst pipes have spilt hundreds of thousands of gallons of crude oil in Alaska and Siberia. Oil spills have caused serious water pollution. Some animals' movements to traditional feeding and nesting grounds have been disrupted by oil pipelines. E.g. Alaska- Prudhoe Bay to Valdez raised pipeline. • Natural gas is extracted from gas fields e.g. in western Siberia. Natural gas is pumped from beneath the permafrost and piped across the tundra. Risk of rupture to pipelines and pollution. • Pesticides have been used to control the masses of insects. Migrating birds feed on the insects and are poisoned or die due to their food source being removed. • Problems with melting of permafrost where buildings and roads not constructed properly. • Illegal hunting and fishing is threatening the numbers of certain species, e.g. whales. Species of animals such as polar bears are highly specialised so find it difficult to adapt to change. • Tourism impacts are increasing – the rise in visitor numbers threatens animal breeding patterns and passenger boats affect the marine environment. • Threats to environment resulting from human induced climate change. Polar ice caps are melting because of an increase in global warming. As the tundra melts, the plant matter decomposes and returns carbon dioxide to the atmosphere, causing further warming. Rising sea levels, increased risks of flooding in some low-lying coastal areas. • Understanding the need for protection of fragile cold environments. Reasons for protection: indigenous people live traditional lives, depending on wildlife; many species of birds and animals are threatened; areas are important for scientific research; snow reflects sunlight and helps regulate temperatures; permafrost contains methane, which if released could worsen global warming. Role of sustainable management, appropriate technology, international agreements, conservation strategies to protect cold environments. • Evaluation of risk to environment from human activity. The tundra environment is among the least disturbed ecosystems in the world. However, that is changing with the discovery of large reserves of raw materials. Any damage to the tundra landscape is slow to recover. The greatest threat may be the impact of human-induced climate change. AO1 – 3 marks AO2 – 3 marks AO3 – 3 marks	

Section C

Qu	Pt	Marking guidance	Total marks
03	1	**Using Figure 11, compare two features of destructive and constructive waves.** Answers should state similarities or differences. Credit 1 mark for two separate statements on the same feature. E.g. Constructive waves are spilling whereas destructive waves are plunging (1) Destructive wave crests are close together but constructive crests are far apart/destructive waves have a shorter wavelength/Destructive waves are closer together (1) Constructive waves have strong swash whereas destructive waves have strong backwash (1) Destructive waves are steeper (1) Destructive waves are higher (1) Constructive waves have a lower height (than destructive waves)(1) Destructive waves have high energy whereas constructive waves have lower energy (1) Constructive waves help to build up the beach whereas destructive waves remove material (1) AO4 – 2 marks	2
03	2	**Complete the table in Figure 12 by calculating the mean sediment size, in cm, for location Y.** One mark for the correct answer: 4.3 (cm) (allow 4.33) AO4 – 1 mark	1

03	3	**Suggest one reason for the difference in sediment size between Location X and Location Y.** Longshore drift carries the lighter material much further along the spit (1). Heaviest material is only carried a short distance (1) Greater erosion/attrition as sediment is carried further along the coast (1) AO2 – 1 mark	1

03	4	**Which of these is a process of mass movement in coastal environments?** B. Slumping One mark for the correct answer. No credit if more than one circle shaded. AO1 – 1 mark	1

03	5	**Explain how the sea defences shown in Figure 13 help to protect the coastline from erosion.**	4

Level	Marks	Description
2 (Clear)	3–4	AO2 Demonstrates clear understanding of how coastal defence(s) work in defending the coast. AO3 Demonstrates clear interpretation of coastal management strategies shown in the photograph.
1 (Basic)	1–2	AO2 Shows limited understanding of how the coastal defence(s) work. AO3. Demonstrates limited interpretation of coastal management strategies shown in the photograph.
	0	No relevant content.

- Level 2 (clear) responses are likely to contain linked statements showing understanding of the coastal management strategies shown. Uses appropriate geographical terminology.
- Level 1 (basic) responses will comprise simple ideas with limited or partial understanding of the coastal management strategies shown. Geographical terminology will be limited.
- No credit for explaining how other hard (or soft) engineering strategies work.
- Expect two or more defences to be explained for top of Level 2, but a clear explanation of one strategy gains access to low Level 2.

		Indicative content • Understanding of hard engineering schemes, which involve using artificial structures to control natural processes. These are designed to reduce wave energy or create a barrier between the land and sea, so storm waves can't reach the cliffs. • The command is "explain", so responses should provide a reasoned account of how the hard engineering methods depicted work to prevent or slow down rates of erosion. • The photograph shows groynes, rip rap or rock armour and a sea wall. • Rip rap / rock armour consists of massive blocks of natural rock piled up at the base of a cliff. If resistant rocks like granite are used they are eroded very slowly. The rocks are dumped on top of each other leaving gaps between them that allow water through. This disperses the energy of the waves and reduces their erosional power. • Groynes look like wooden "fences" that are built down the beach at right angles to the coastline. They are designed to stop material being moved along the beach by longshore drift. They work by building up the amount of sand on the updrift side, acting as a buffer against wave attack, helping to protect the cliffs. • Sea walls aim to protect the coast using concrete, steel and/or stone. They are effective in protecting cliffs from erosion and also act as a barrier to prevent flooding. They absorb and deflect wave energy back to sea. AO2 – 2 marks AO3 – 2 marks	

03	6	**Explain how different coastal landforms are created by erosion.** **Use Figure 14 and your own understanding.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of processes and landforms associated with coastal erosion. AO3 Demonstrates thorough application of knowledge and understanding in analysing the landforms shown in **Figure 14**.
2 (Clear)	3–4	AO2 Shows some geographical understanding of processes and landforms associated with coastal erosion. AO3 Demonstrates reasonable application of knowledge and understanding in analysing the landforms shown in **Figure 14**.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of processes and landforms associated with coastal erosion. AO3 May include limited application of knowledge and understanding in analysing one or more landforms shown in **Figure 14**.
	0	No relevant content.

- Level 3 (detailed) will be developed responses with supporting detail of the processes involved and the sequence of formation. Appropriate terminology will be used.
- Level 2 (clear) responses are likely to contain linked statements showing understanding of the processes involved and the sequence of formation. Some geographical terminology will be used.
- 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.
- The formation of at least two landforms should be explained to access Level 3.
- Allow labelled diagrams as long as they don't duplicate the text.

		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. • Understanding of specific processes relevant to the formation of landforms shown-erosion, hydraulic action, corrasion/abrasion, attrition, differential erosion, wave refraction. • Landforms shown in the photograph include caves (left foreground), arch, stacks, stumps, cliffs, headland (and bays) in background. The sequence of cave arch stack and stump can be seen in the photograph representing different stages in the sequence of erosional landforms. The cliff appears to be composed of hard sedimentary rocks tilting slightly towards the land with some vertical cracks or joints. • 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 runs 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. • Credit other landforms of erosion such as headlands and bays, cliffs and wave cut platforms. AO2 – 3 marks AO3 – 3 marks	

Qu	Pt	Marking guidance	Total marks
04	1	**Describe how the cross profile of the river valley changes downstream.** Answer can be two separate points or one developed idea. Valley slopes decrease in angle (1) The valley widens/broadens (1) Valley sides decrease in height (1) The valley floor becomes wider (1) The valley widens (1), a narrow floodplain develops (d) (1), eventually becoming a wide floodplain with levees/embankments (d) (1) Near the source the valley is steep-sided but by the middle stage the valley floor is wider (1) with gentler sides/bluffs (d)(1) No credit for changes in the river or channel. AO4 – 2 marks	2
04	2	**Complete the table in Figure 16 by calculating the median velocity, in metres per second, at point Y.** 1.3 (metres per second) AO4 – 1 mark	1
04	3	**Suggest one reason for the difference in river velocity between point X and point Y.** E.g. The fastest flow of water naturally swings towards the outer bend (1) Water flow has most energy due to decreased friction on the outer bend (1) On the inside of the bend the river flow is slower, as there is more friction (1) As the water flows round the bend the flow is fastest on the outside of the bend where the river is deeper (1). AO2 – 1 mark	1
04	4	**Which of these is a process by which a river transports sediment?** B. Traction One mark for the correct answer: AO1 – 1 mark	1

04	5	**Explain how soft engineering strategies can help to reduce the impact of river flooding.** **Use Figure 17 and your own understanding.**	4

Level	Marks	Description
2 (Clear)	3–4	AO2 Demonstrates clear understanding of soft engineering strategies and how they reduce the impact of flooding. AO3 Demonstrates a clear interpretation of the soft engineering strategy shown in the diagram. Explanations are developed.
1 (Basic)	1–2	AO2 Demonstrates limited understanding of soft engineering strategy(ies) and how they reduce the impact of flooding. AO3 Demonstrates a limited interpretation of the soft engineering strategy shown in the diagram. Explanations are partial.
	0	No relevant content.

- Level 2 (clear) responses are likely to contain linked statements showing understanding of soft engineering. Uses appropriate geographical terminology.
- Level 1 (basic) responses will comprise simple ideas with limited or partial understanding of soft engineering. Geographical terminology will be limited.
- No credit for explaining how hard engineering strategies work.
- A clear explanation of floodplain zoning can access top Level 2.
- Max L1 if diagram not used.

<u>Indicative content</u>

- The command is “explain”, so responses should provide a reasoned account of how and why soft engineering strategies help to protect against river flooding.
- Understanding of soft engineering. These are schemes set up to work with the natural processes along the river to reduce the effects of flooding. They aim to slow down the movement of water into the river channel and do not involve building artificial structures.

		• The diagram depicts floodplain zoning, a type of soft engineering. Soft engineering aims to work with the environment and is more ecologically sensitive. With floodplain zoning closeness to river determines land use. Land use close to river may be used for animal grazing. Land furthest from the river used for 'expensive' land use, such as housing and industry. The strategy is relatively cheap and does not interfere with natural flows and river processes. Less damage is caused, leading to fewer insurance claims. • Credit other soft engineering strategies. Planting of trees in a drainage basin increases interception and storage and reduces surface run off. This reduces a river's discharge and so makes it less likely to flood. It creates new habitats for animals and improves water quality by filtering pollutants out of rainwater. • River restoration involves restoring a river that has undergone hard engineering back to its original course. If the land is no longer valuable, river restoration can help reduce the risk of flooding downstream by using the natural processes of the river. • Flood warnings help people to take action in advance of flooding. 3 levels of warning are used: flood watch, flood warning and severe flood warning. AO2 – 2 marks AO3 – 2 marks	

04	6	**Explain how the landforms shown in Figure 18 are created by physical processes.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of processes and landforms created by river erosion. AO3 Demonstrates thorough application of knowledge and understanding in analysing the landforms shown in **Figure 18**.
2 (Clear)	3–4	AO2 Shows some geographical understanding of processes and landforms associated with river erosion. AO3 Demonstrates reasonable application of knowledge and understanding in analysing the landforms shown in **Figure 18**.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of processes and landforms associated with river erosion. AO3 May include limited application of knowledge and understanding in analysing one or more landforms shown in **Figure 18**.
	0	No relevant content.

- Level 3 (detailed) will be developed responses with supporting detail of the processes involved and the sequence of formation. Appropriate terminology will be used.
- Level 2 (clear) responses are likely to contain linked statements showing understanding of the processes involved and the sequence of formation. Some geographical terminology will be used.
- 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.
- The formation of at least two landforms should be explained to access Level 3.
- Allow labelled diagrams as long as they don't duplicate the text.

<u>Indicative content</u>

- The question implies knowledge of the processes of erosion as well as landforms associated with river erosion. Emphasis is on explanation, so processes should be outlined as well as the sequence of formation.

		• Understanding of specific processes relevant to the formation of landforms shown. These include the erosional processes of hydraulic action and abrasion or corrasion. Erosion is most rapid during powerful flood events. Credit transportation processes such as traction and saltation. Mass movement processes may be relevant in the context of valley formation. • Landforms shown in the photograph include waterfall, gorge of recession, plunge pool, rapids. The link between waterfall retreat and gorge formation may be recognised • Understanding of landform development. The formation of the waterfall should be explained in sequence, with some indication of the processes involved. The river may flow over an area of hard rock with softer more easily eroded rock underneath. Over time the softer rock is worn way more rapidly by processes of hydraulic action and abrasion, creating a waterfall. The water hits the bottom of the falls with great force. This erodes a deep hole called a plunge pool. The softer underlying rock is eroded and weakened. The softer layer collapses into the plunge pool, undercutting the hard cap rock. The cap rock cracks and then collapses. • Gradually the waterfall retreats upstream, leaving behind a steep sided gorge. Every time the overhanging cap rock breaks off the gorge retreats further and grows longer. There is turbulent fast flowing water in the gorge. • Allow other explanations such as knick points along the river caused by changing sea levels. Waterfalls are also found where hanging valleys form in glacial landscapes (as in this case). AO2 – 3 marks AO3 – 3 marks	

Qu	Pt	Marking guidance	Total marks
05	1	**Using Figure 19, describe the extent of ice cover across the British Isles during the last ice age.** Two separate points or one developed idea Much/Most (60–75%) of the UK and Ireland were covered by ice (1) The whole of Scotland, Ireland and much of Wales were covered by ice (1) The ice sheet covered most of northern England (1) Only the Midlands and south of England were not covered (1) The ice sheet extended over most of the British Isles (1), including the whole of Scotland and Ireland and all but the extreme south of Wales (d)(1) Northern England, including the Lake District, was covered by ice(1) but the boundary was uneven, dipping southwards along the east coast (d)(1) AO4 – 2 marks	2
05	2	**Complete the table in Figure 20 by calculating the range of sediment size, in cm, at location B.** 6.6 (cm) AO4 – 1 mark	1
05	3	**Suggest one reason for the difference in the range of sediment size between location A and location B.** E.g. Till has a wider range as it consists of materials moved by solid ice so everything is picked up (1) Outwash has a smaller range because it has been moved by water (1) Water sorts out the materials moved, leaving behind the largest (1) Glaciers shift everything in their path including large boulders and small debris whereas water can only pick up some materials (1) Till consists of unsorted materials (of all sizes) whereas outwash comprises sorted materials (with a smaller range) (1) AO2 – 1 mark	1

05	4	**Which of these is a process of glacial erosion?** B. Plucking No credit if two or more answers shaded. AO1 – 1 mark	1

05	5	**Explain why there may be land use conflicts in glaciated upland areas. Use Figure 21 and your own understanding.** **Level / Marks / Description** 2 (Clear) / 3–4 / AO2 Shows clear geographical understanding of land use conflicts in glaciated areas. AO3 Demonstrates reasonable application of knowledge and understanding in interpreting issues of conflict in glaciated areas. 1 (Basic) / 1–2 / AO2 Shows limited geographical understanding of land use conflicts in glaciated areas. AO3 May include limited application of knowledge and understanding in interpreting issue(s) of conflict in glaciated areas. 0 / No relevant content. • Level 2 will have linked statements showing understanding of land use conflict(s). Some geographical terminology evident. • Level 1 will be simple statements with limited understanding or development. May consist of listed points or random statements about conflicts. • Maximum Level 1, one mark, for describing footpath erosion without reference to conflict <u>Indicative content</u> • Responses should show understanding of land use conflicts in glaciated areas in the UK, applying understanding to the photograph. • Economic activities listed in the specification are tourism, farming, forestry and quarrying. Others might include hydro-electric power/wind/renewable energy, water supply, military training. • The photograph depicts walkers on wide footpaths where erosion is extensive, with forestry and lake (water supply) in background. There are possible conflicts between tourists and farmers or conservationists, between forestry and tourism/faming etc.	4

		• Conflicts between tourism and other activities. Some people fear interference with their livelihoods (e.g. farmers), or congestion and pollution from cars and litter. Too much recreational activity may damage fragile environments (e.g. soil erosion). Tourists could leave gates open whilst walking and exploring the area. This can lead to animals escaping and potentially being injured or lost. This would affect profits for the farmer. Purchase of second homes reduces chances of property availability for locals and limits use of local services. • Conflicts between forestry and other land uses. Heavy trucks used to transport the logs can cause traffic congestion on roads. Logging can cause noise pollution which disrupts the peace and quiet of the area and can scare away wildlife. It can scar the landscape and make it look unsightly. Growing trees in rows or lines looks out of place and destroys the natural beauty of the area. After the forest has been cut down, there is no vegetation left to intercept rainfall. Machinery used by the loggers compacts the soil so water cannot soak in. This can result in flooding. • Conflicts between quarrying and other land uses. Quarrying may lead to pollution of land and rivers and spoil the landscape. • Wind farms may spoil landscape, which affects number of tourists staying in hotels/visiting area. House prices may fall if views spoilt. Much local opposition. • Credit named examples of land use conflicts e.g. Glenridding zip wire proposal (dropped after opposition). • Economic development in upland glaciated areas can lead to many land use conflicts, particularly between tourism and other land users, and forestry and other land users. Many locals may be prepared to accept developments, and overlook disadvantages, if they bring employment and money to the area. AO2 – 2 marks AO3 – 2 marks	

05	6	**Explain the formation of different landforms of glacial deposition. Use Figure 22 and your own understanding.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of processes and landforms created by glacial deposition. AO3 Demonstrates thorough application of knowledge and understanding in analysing the landforms shown in **Figure 22**.
2 (Clear)	3–4	AO2 Shows some geographical understanding of processes and landforms associated with glacial deposition. AO3 Demonstrates reasonable application of knowledge and understanding in analysing one or more of the landforms shown in **Figure 22**.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of processes and landforms associated with glacial deposition. AO3 May include limited application of knowledge and understanding in analysing one or more landforms shown in **Figure 22**.
	0	No relevant content.

- Level 3 (detailed) will be developed responses with supporting detail of the processes involved and the sequence of formation. Appropriate terminology will be used.
- Level 2 (clear) responses are likely to contain linked statements showing understanding of the processes involved and the sequence of formation. Some geographical terminology will be used.
- 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.
- The formation of at least two landforms should be explained to access Level 3.
- Credit labelled diagrams as long as they don't duplicate the text

<u>Indicative content</u>

- The question implies knowledge of the processes of transport and deposition as well as landforms associated with glacial deposition.
- Landforms of glacial deposition shown in the diagram include terminal

		moraine, recessional moraine, drumlins, till plain, outwash plain. Allow reference to other depositional landforms. • Understanding of relevant processes. As ice descends into lowland areas the snout bulldozes soil, rocks and boulders. Ice stagnates and melts. Processes include freeze-thaw on mountain slopes, various forms of mass movement, and erosional processes of plucking and abrasion, all of which contribute to the creation of morainic debris and glacial till. Transport processes are relevant as are processes of deposition under the ice (subglacial), on top of the ice (supraglacial), and ahead of the glacier snout (proglacial). • Moraine refers to rocks carried on top, within and beneath the ice. Till consists of all the eroded and weathered material deposited by the ice. • 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. Accept other theories of drumlin formation eg core of rock with boulder clay deposited in layers as ice advanced. • 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. • Ground moraines consist of material dragged underneath the glacier and left behind when the ice melts. It often forms an uneven hilly surface. • Recessional moraines are small ridges of debris which tend to be deposited at a temporary pause when the glacier is retreating. AO2 – 3 marks AO3 – 3 marks	