GCSE
GEOGRAPHY
8035/1

Paper 1 Living With The Physical Environment

Mark scheme

June 2021

Version: 1.0 Final Mark Scheme

2 1 6 G 8 0 3 5 / 1 / M S

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.

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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 level of 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

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

<table>
<tr><th>Qu</th><th>Pt</th><th>Marking guidance</th><th>Total marks</th></tr>
<tr><td>01</td><td>1</td><td>Using Figure 1, which natural disaster caused the greatest number of deaths?

Earthquake.

AO4 – 1 mark</td><td>1</td></tr>
<tr><td>01</td><td>2</td><td>Using Figure 1, which one of the following statements is true?

One mark for correct answer:

C The two heatwaves in Central Europe and Russia resulted in 126 000 deaths.

No credit if two or more answers are circled.

AO4 – 1 mark</td><td>1</td></tr>
<tr><td>01</td><td>3</td><td>Explain how living in areas that are at risk from tectonic hazard(s) may have both advantages and disadvantages.

<table>
<tr><th>Level</th><th>Marks</th><th>Description</th></tr>
<tr><td>3 (Detailed)</td><td>5–6</td><td>AO1 Demonstrates detailed knowledge of the advantages and disadvantages of living in areas at risk from tectonic hazards.

AO2 Shows thorough geographical understanding of how tectonic hazards create both advantages and disadvantages for people.</td></tr>
<tr><td>2 (Clear)</td><td>3–4</td><td>AO1 Demonstrates reasonable knowledge of the advantages and/or disadvantages of living in areas at risk from tectonic hazards.

AO2 Shows clear geographical understanding of how tectonic hazards create advantages and/or disadvantages for people.</td></tr>
<tr><td>1 (Basic)</td><td>1–2</td><td>AO1 Demonstrates basic knowledge of the advantage(s) and/or disadvantage(s) of living in areas at risk from tectonic hazards.

AO2 Demonstrates limited understanding of how tectonic hazards create advantage(s) and/or disadvantage(s) for people.</td></tr>
<tr><td></td><td>0</td><td>No relevant content.</td></tr>
</table>

• Level 3 (detailed) responses will be developed. Some geographical terms will be applied. All aspects of the question are answered, including both</td><td>6</td></tr>
</table>

		advantages and disadvantages, although the two aspects may not be balanced. • **Level 2 (clear)** responses are likely to have linked or elaborated statements and some use of geographical terms. May cover advantages or disadvantages only. • **Level 1 (basic)** responses may comprise simple/partially inaccurate statements with very limited subject vocabulary. Partial sequence or random points made. May be limited to a single advantage **and/or** disadvantage. • Max Level 1 if referring to a natural hazard that is not tectonic. <u>Indicative content</u> The command word is "explain", so responses should provide a reasoned account of how and why tectonic hazards create advantages and disadvantages for people. Advantages of living in areas at risk from volcanic hazards. • 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. Poor people, especially in LICs 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. Advantages of living in areas at risk from seismic hazards • 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. Disadvantages of living in areas at risk from volcanic hazards. • Volcanic eruptions can kill people and damage property.	

		• Economic activity can suffer as it is hard for businesses to operate after an eruption. • Habitats and landscapes are damaged by lava flows. • Ash disperses in the air, and together with volcanic gases can affect breathing. It may cover the land, including fields, houses, roads, and industrial plants. • Pyroclastic flows can destroy houses and trees. Eruptions may trigger tsunamis, which lead to destructive flooding of the coastline. Disadvantages of living in areas at risk from seismic hazards. • In seismic areas ground shaking causes bridges and buildings to collapse, windows to shatter, power lines to collapse, water/gas mains and sewers to fracture. • Immediate deaths and injuries result from crushing, falling glass, fire and transport accidents. • People become homeless. • Slope failures set off avalanches. • There may be panic, fear and hunger. • Longer term disadvantages include diseases spread from polluted water, civil disorder, looting, power cuts, reduced emergency services, unemployment, disability, loss of farmland and food production. • 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	4	**Using Figure 2, which one of the following statements is true?** One mark for correct answer: **B** Earthquakes are found in long narrow zones along plate margins. No credit if two or more answers are circled. AO4 – 1 mark	1

01	5	**Using Figure 2, name the type of plate margin at X.** Conservative/passive/transform	1

		AO4 – 1 mark	

01	6	**Suggest why earthquakes and volcanic eruptions happen close to the plate margin at Y.** **Use Figure 2 and your own understanding.**	4

Level	Marks	Description
2 (Clear)	3–4	AO2 Shows clear geographical understanding of the processes causing volcanic and earthquake activity. AO3 Demonstrates reasonable application of knowledge and understanding in analysing why tectonic activity occurs along the western side of South America.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of the processes causing volcanic **and/or** earthquake activity. AO3 Demonstrates limited application of knowledge and understanding in analysing why tectonic activity occurs along the western side of South America.
	0	No relevant content.

- **Level 2 (clear)** will have linked or elaborated statements and some accurate use of geographical terms. Clear sequence with processes explained.
- **Level 1 (basic)** may comprise simple statements with limited subject vocabulary. Partial sequence or random points made.
- Max Level 1 for explanation of tectonic activity at constructive or conservative margins.
- Max Level 1 for explanation of one of earthquakes or volcanoes only.
- There should be some (implied) reference to Figure 2 to access Level 2. Understanding processes at a destructive margin is sufficient reference.

<u>Indicative content</u>

- The command word is “suggest” so responses should set out the likely causes of both volcanoes and earthquakes from the source, showing an understanding of the processes involved. The map shows a destructive plate margin.
- Accept explanations that refer to slab pull and gravitational movement of plates: the denser plate sinks into the mantle under the influence of gravity, which pulls the rest of the plate along behind it (slab pull).
- Credit also the more conventional theory of the movement of convection currents in the upper mantle as the mechanism for plate movement and subduction.

		• Understanding of processes causing volcanic activity at destructive margins. Two plates move towards each other. The denser plate sinks below the lighter, less dense plate and melts in the subduction zone. Hot magma rises up through the overlying mantle and lithosphere, and some can eventually erupt out at the surface producing volcanoes. • Credit the idea that magma becomes increasingly viscous or sticky as it rises to the surface, producing composite volcanoes which are steep sided and have violent eruptions. • Understanding of earthquakes at destructive margins. As the two plates converge, pressure builds up. The rocks eventually fracture causing an earthquake. Most happen at shallow depths below the surface where the plates collide. They also occur at greater depth, in the lower part of the subduction zone. • Application of knowledge and understanding to the map. The Nazca Plate is subducted beneath the South American Plate. Expect recognition that this plate boundary is destructive and that the denser ocean crust is subducted. AO2 – 2 marks AO3 – 2 marks	

01	7	**State two ways that planning might help to reduce the damaging effects of an earthquake or a volcanic eruption.** Prepare emergency aid and distribution (1). Practise earthquake/volcano drills. (1) Plan evacuation routes (1). Stockpile blankets, clean water and food (1). Educate people so they know what to do if an earthquake or volcano happens (1). Prepare hazard maps to show areas most at risk of damage (1). 2 separate ways are required. AO1 – 2 marks	2

01	8	**Using Figure 3, which one of the following statements is true?** One mark for correct answer: **C.** High pressure occurs where the air is sinking. No credit if two or more answers are circled. AO4 – 1 mark	1

01	9	**Using Figure 3, describe the link between air pressure and surface winds.** Eg Winds blow from high pressure areas to low pressure areas (1). Eg The trade winds blow from 30 degrees N and S towards the Equator (d) (1). Winds converge in areas of low pressure (1) eg the Polar easterlies meet the westerlies at 60 degrees S (d) (1). Sinking air causes high pressure (1) which leads to winds moving away/diverging (d) (1). AO4 – 2 marks	2

01	10	**Suggest why areas close to the Equator usually have high rainfall.** **Use Figure 3 and your own understanding.** Air is heated by the sun / air rises rapidly along the Equator (1). The air cools and condensation occurs (d) (1). This leads to heavy showers and frequent (convectional) thunderstorms. (d) (1) AO3 – 2 marks	2

01	11	**To what extent is climate change the result of human actions?** **Use Figure 4 and your own understanding.**		9

Level	Marks	Description
3 (Detailed)	7–9	AO1 Demonstrates detailed knowledge of the factors which affect climate change. AO2 Shows thorough geographical understanding of places, environments and processes. AO3 Demonstrates thorough application of knowledge and understanding in evaluating the importance of human and physical factors to climate change.
2 (Clear)	4–6	AO1 Demonstrates clear knowledge of the factors which affect climate change. AO2 Shows some geographical understanding of places, environments and processes. AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the importance of human and physical factors to climate change.
1 (Basic)	1–3	AO1 Demonstrates limited knowledge of the factors which affect climate change. AO2 Shows slight geographical understanding of places, environments and processes. AO3 Demonstrates limited application of knowledge and understanding in evaluating the importance of human factors to climate change.
	0	No relevant content.

- **Level 3 (detailed)** responses will be developed. Appropriate use of Figure 4 (direct or inferred) and specific own understanding, with some evaluation.

- **Level 2 (clear)** responses are likely to be linked statements with some elaboration. Some use of Figure 4 (direct or inferred) and 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 4.

- An answer that lacks consideration of the relative importance of physical and human factors is limited to Level 2.

Indicative content

- The command is "to what extent", so the focus of the question is an evaluation of the degree to which human factors are responsible for climate change. eg Fully agree, disagree, partially agree. Many may feel that human factors are largely to blame for the rapid rise in temperatures (global warming) in recent times. Answers should consider their relative importance, supported by evidence.

- Knowledge of long term changes in climate since start of Quaternary period. Patterns of alternating cold periods (glacials) and warm periods (interglacials). Up to 10 glacial periods in past million years. Ice age continued until 12 000 years before present.

- Knowledge of the enhanced greenhouse effect and the role of greenhouse gases such as CO_2, methane and nitrous oxides. Evidence of recent temperature change, with predictions of rises of up to 5^{o} C by 2100.

- Knowledge of the evidence for climate change eg ice and sediment cores, tree rings, pollen analysis, temperature records, rising sea levels, loss of ice volumes.

- Understanding the contribution of increased use of fossil fuels, inferred in Figure 4. Fossil fuels account for over 50% of global greenhouse gas emissions. Burning these releases carbon dioxide into the atmosphere. Fossil fuels are used in transportation, building, heating homes, manufacturing industry, and generating electricity.

- Understanding of other human factors affecting climate change:
  eg Changes in agriculture. Producing food uses fossil fuels in the production of fertiliser and pesticides, and in transporting. Changing forest cover to farmland also releases greenhouses gases. Increases in meat, dairy and rice production create more methane.
  Deforestation. Plants remove CO_2 from the atmosphere and convert it to organic matter using photosynthesis. When trees are cut down this is reduced. CO_2 is also released when trees are burnt.
  Cement production. Cement is made from limestone, which contains carbon. When cement is manufactured, much CO_2 is released.

		• Understanding of the effects of volcanic activity, inferred from Figure 4. Volcanoes can release large amounts of ash. This can reflect the Sun's rays causing the planet to cool. Over time however, eruptions can release large quantities of greenhouse gases eg. Carbon dioxide. These gases can trap the Sun's rays causing the planet to warm. • Understanding of other natural factors affecting climate change, eg Effects of orbital changes. Changes from a circular to an oval orbit can affect the amount of sunlight the earth receives. It takes 100 000 years for the Earth's orbit to change from being more circular to an ellipse and back again. This eccentricity cycle coincides closely with the alternating cold (glacial) and warm (inter-glacial) periods in the Quaternary period. These changes are called Milankovitch Cycles. The Earth wobbles on its axis leading to changes in its tilt. When the Earth is more upright, it receives a greater amount of energy from the sun and experiences higher temperatures. Solar output. The output is measured by observing sunspots, which are not constant. They increase and decrease over an 11 year cycle, and possible longer cycles of several hundred years. • Evaluation of the importance of human factors in climate change. Much evidence that since the start of the industrial era (about 1750) the overall effect of human activities on climate has been a warming influence. The human impact on climate during this period greatly exceeds that due to changes in natural processes, such as solar changes and volcanic eruptions. However in the longer term scientists have measured and proved that natural causes are fundamentally responsible for climate change. 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 • 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.	**3** **2** **1** **0**

		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	**Which one of the following phrases defines the term biodiversity?** One mark for the correct answer: **B.** The number and types of plants and animals that live in an area. No credit if two or more statements are shaded. AO1 – 1 mark	1
02	2	**Using Figure 5, describe the location of areas with low biodiversity levels.** Low levels are found in (hot and cold) desert areas (1) such as the Sahara/Arabian/Atacama desert (d) (1) Mountainous areas have low levels (1) such as the Himalayas/Andes (d) (1) Tundra/polar areas have low levels (1) such as northern Canada/northern Russia/Greenland/Antarctica (d) (1) Much of northern Africa/northern Canada has low biodiversity levels (1) Areas inside the Arctic Circle have low levels (1) Max 1 mark for list of locations. Credit two separate points or one developed point for 2 marks No credit for explanation of biodiversity levels. AO4 – 2 marks	2
02	3	**Using Figure 5, suggest one reason for the high biodiversity levels in area X.** Area X receives very high rainfall (1) which allows many plants to grow (d) (1). Area X experiences high temperatures and high rainfall (1) which means that plants grow rapidly (d) (1). Area X receives some rain in every month (1) which means that plants grow throughout the year (d) (1). There is a hot wet climate (1) which leads to the growth of many plants in a tropical rainforest (d) (1). AO2 – 2 marks	2

02	4	**Outline one way that plants are adapted to the climate in either hot deserts or cold environments.** Hot deserts Plant roots may be extremely long (1) to reach deep water supplies (d) (1). Roots may be spread out very wide near the surface (1) to catch as much water as possible when it rains (d) (1). Many plants, (eg cacti) are succulents (1). They have large, fleshy stems for storing water (d) (1) and thick waxy skin to reduce water loss (d) (1). Some plants have small leaves (1) reducing water loss (d)(1). The seeds of some plants only germinate when it rains (1) which means they only grow when there's enough water to survive (d)(1). Cold environments Most plants become dormant (1) to survive the cold, dark winters (d) (1). Plants are small/round-shaped (1) to provide protection from the wind (d) (1). Most plants have shallow roots (1) because of the layer of permafrost/ice beneath the soil layer (d) (1). Leaves are generally small (1) to limit the amount of moisture lost (d) (1). Many plants use underground runners or bulbs instead of seeds (1) because the growing season is so short (d) (1). Credit valid points about one environment only. Max 1 mark for two separate points. No credit for reference to animal adaptation. AO1 – 2 marks	2

02	5	**Assess the importance of inaccessibility and extreme temperatures as challenges to development in one of the following environments.** **Hot desert environment** **Cold environment** **Use a case study and your own understanding.**	6

<u>Mark Scheme – Hot desert environment</u>

Level	Marks	Description
3 (Detailed)	5–6	AO2 Demonstrates detailed understanding of challenges to development in hot deserts. AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating the importance of challenges to development in hot deserts.
2 (Clear)	3–4	AO2 Demonstrates clear understanding of challenge(s) to development in hot deserts. AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the importance of challenges to development in hot deserts.
1 (Basic)	1–2	AO2 Demonstrates limited understanding of challenge(s) to development in hot deserts. AO3 Demonstrates limited application of knowledge and understanding in evaluating the importance of challenges to development in hot deserts.
	0	No relevant content

- **Level 3 (detailed)** responses will be well developed and make accurate use of geographical terms. Reasoned evaluation of challenges to development in hot deserts with clear case study support.
- **Level 2 (clear)** responses will have linked or elaborated statements and some accurate use of geographical terms. May start to make an evaluation of the importance of challenge(s) to development. May include some case study support.
- **Level 1 (basic)** responses are likely to consist of simple statements, with limited use of subject vocabulary. Might be limited to generic statements. May make a limited evaluation.
- If candidate writes about both environments, credit the more convincing answer for one environment only.

		Indicative content - Hot desert environment • The command “assess the importance” means that responses may state the degree to which one or more challenges affect economic development, with some support for the view expressed. Eg the statement may be completely untrue, true to some extent (partly but not completely true), to a great extent, or completely true. • Understanding of challenges to development: Extreme temperatures. Due to the lack of cloud cover, daily temperatures can range from over 40 °C during the day to below freezing at night. Exposure to high temperatures can cause illness or death, and healthcare may be a long distance away. Inaccessibility. Some hot deserts are huge – people and materials have to travel long distances, often by air, which is expensive. It’s difficult to provide services, eg medical care, to remote regions, making it hard for them to develop. Expensive pipelines have to be built to transport oil and gas from remote areas. • Case study support eg Thar Desert. Extreme temperatures – temperatures in the Thar Desert can exceed 50°C in the summer months. It is hard for people to farm, work in mines or as tourist guides during these months as it is simply too hot. This makes development difficult. • Inaccessibility – the desert covers a huge area of 200 000 sq km. Most of the desert is inaccessible due to the extreme environmental conditions and poor infrastructure. Beyond the city of Jaisalmer, development is limited. This has created a honeypot site for tourists in Jaisalmer but not beyond. Inaccessibility to many parts of the desert has led to greater differences between rich and poor. • Evaluation should consider the importance of one or more factors in limiting development.	

Mark Scheme – Cold environment

Level	Marks	Description
3 (Detailed)	5–6	AO2 Demonstrates detailed understanding of challenges to development in cold environments. AO3 Demonstrates application of knowledge and understanding in a coherent and reasoned way in evaluating the importance of challenges to development in cold environments.
2 (Clear)	3–4	AO2 Demonstrates clear understanding of challenge(s) to development in cold environments. AO3 Demonstrates reasonable application of knowledge and understanding in evaluating the importance of challenges to development in cold environments.
1 (Basic)	1–2	AO2 Demonstrates limited understanding of challenge(s) to development in cold environments. AO3 Demonstrates limited application of knowledge and understanding in evaluating the importance of challenges to development in cold environments.
	0	No relevant content

- **Level 3 (detailed)** responses will be well developed and accurate use of geographical terms. Reasoned evaluation of challenges to development in cold environments with clear case study support.
- **Level 2 (clear)** responses will have linked or elaborated statements and some accurate use of geographical terms. May start to make an evaluation of the importance of challenge(s) to development. May include some case study support.
- **Level 1 (basic)** responses are likely to consist of simple statements, with limited use of subject vocabulary. Might be limited to generic statements. May make a limited evaluation.
- If candidate writes about both environments, credit the more convincing answer for one environment only.

		Indicative content - Cold environment • The command "assess the importance" means that responses may state the degree to which one or more challenges affect economic development, with some support for the view expressed. Eg the statement may be completely untrue, true to some extent (partly but not completely true), to a great extent, or completely true. • Understanding of challenges to development: Extreme temperatures. Mean annual temps are well below freezing. Extreme weather such as snow and strong winds are common. Exposure to the extreme cold can cause injury or death, and healthcare may be a long distance away. Cold environments are subject to extremes in the amount of daylight – in winter, it can be dark nearly all the time. In the summer, when the active layer thaws, buildings can subside and transport routes become damaged. Inaccessibility. Some areas are extremely remote, and the mountainous land makes access difficult and expensive. In winter, the only way to get to some towns is via air or dangerous ice roads. In summer, there are no roads to some towns because the ground is too soft. People in small towns may be a long way from employment opportunities or services. • Case study support eg Svalbard temperatures can fall below –30 °C. Extreme temperatures make it dangerous to work outside, with a serious risk of frostbite. • Accessibility. Svalbard is located in a remote part of Europe and can only be reached by plane or ship. The islands themselves are inaccessible and almost all transport systems are restricted to the immediate area around Longyearbyen. There is one airport close to Longyearbyen capable of handling international flights. There is 50 km of road in Longyearbyen. No roads serve the other outlying communities. Most people use snowmobiles, particularly in the winter. • Evaluation should consider the importance of one or more factors in limiting development. Expect a range of views. Extreme cold may be considered as the most significant factor. There is virtually no settled population in many cold environments. AO2 – 3 marks AO3 – 3 marks	

02	6	**Using Figure 6, calculate the mean global forest loss from 2011 to 2017. Give your answer to one decimal place.** 23.4 (accept 23.3) million hectares AO4 – 1 mark	1

02	7	**Calculate the percentage change in global forest loss between 2011 and 2017.** One mark for the correct answer: **B.** 68%. No credit if two or more statements are shaded. AO4 – 1 mark	1

02	8	**State one way that debt reduction can help to make tropical rainforests more sustainable.** Countries are relieved of some of their debt in return for protecting their rainforests (1). The USA signed an agreement to convert some of Brazil's debt into a fund to protect large areas of tropical forest (1). Some HICs agree to write off the debts of some poor LICs (1). There are debt for nature/conservation swaps (1). Debt is paid off in exchange for a guarantee that money is spent on conservation (1). AO2 – 1 mark	1

02	9	**'Tropical rainforests should be protected from economic development.'** **Do you agree?** **Explain your answer.** **Use Figure 7 and your own understanding.**	9

Level	Marks	Description
3 (Detailed)	7–9	AO1 Demonstrates detailed knowledge of the advantages and disadvantages of using tropical rainforests for economic purposes. AO2 Shows thorough geographical understanding of the value of tropical rainforests in protecting the natural environment and the economic issues involved. AO3 Demonstrates thorough application of knowledge and understanding in making a supported judgement about the issues.
2 (Clear)	4–6	AO1 Demonstrates reasonable knowledge of the advantages **and/or** disadvantages of using tropical rainforests for economic purposes. AO2 Shows some geographical understanding of the value of tropical rainforests in protecting the natural environment and the economic issues involved. AO3 Demonstrates reasonable application of knowledge and understanding in making a judgement about the issues.
1 (Basic)	1–3	AO1 Demonstrates limited knowledge of the advantages **and/or** disadvantages of using tropical rainforests for economic purposes. AO2 Shows limited geographical understanding of the value of tropical rainforests in protecting the natural environment **and/or** the economic issues involved. AO3 Demonstrates limited application of knowledge and understanding in making a judgement about the issues.
	0	No relevant content.

		• **Level 3 (detailed)** responses will be developed with supporting evidence for answer, which might be balanced or based on definite decision. Appropriate use of Figure 7 (direct or inferred) and specific own understanding. • **Level 2 (clear)** responses are likely to be linked statements with some elaboration. Answers may be balanced or based on definite decision. Some use of Figure 7 (direct or inferred) and own understanding. • **Level 1 (basic)** responses will be simple statements with limited understanding or development. May consist of listed points, using information taken largely from Figure 7. <u>Indicative content</u> • Responses will apply knowledge and understanding of the need to protect rainforests from further deforestation and the arguments in favour of economic development, making a judgment about the issues involved. • The command is 'explain your answer', so responses should support the choice made. Credit responses which highlight one side of the argument, as well as those which take a more balanced or nuanced approach before reaching a conclusion. There is no "correct" view – both sides can be credited, if supported with evidence. • Understanding of the reasons for protecting the rainforests from deforestation. These include: Medicine – around 25% of medicines come from rainforest plants. Resources – rainforest trees provide valuable hardwoods as well as nuts, fruit, and rubber. Water – rainforests are important sources of clean water. Protection against soil erosion. Water and nutrient recycling. • Application of understanding to Figure 7: Climate – protecting the rainforests may help to reduce the greenhouse effect by cutting CO_2 emissions. Over a quarter of the world's oxygen comes from the rainforests. They prevent the climate from becoming too hot and dry. Biodiversity – over half of the world's plants, many of which are at risk of extinction. People – indigenous tribes live in harmony in the world's rainforests. • Understanding of the types and advantages of economic development in rainforest areas. These include: Mining. Minerals such as bauxite, gold and iron ore are mined and sold to make money. Commercial farming. Forest is cleared to make space for cattle grazing or for huge palm oil or soya plantations. Energy developments. Building dams to generate HEP floods large areas of forest. Logging. Trees are felled for timber and paper. Road building for logging requires more tree clearance. • Application of understanding to Figure 7: Employment in mining, logging and farming helps to support local economy. Better transportation means easier access to raw materials	

		like minerals and timber. Rainforest resources can be transported away and sold. Infrastructure, hospitals and education can be improved from the money gained from selling natural resources. Taxes paid by large companies helps to fund essential services. Raw materials, eg tropical hardwoods such as ebony and mahogany, can be sold for a good price abroad. • Credit reference to case study support eg Malaysia – tin mining, palm oil plantations, logging for timber, hydroelectric projects such as Bakun dam. • Sustainable development may allow economic progress whilst preserving the forests. Selective logging, ecotourism, agroforestry, international agreements eg Forestry Stewardship Council. • Evaluation and judgement. A range of views may be taken. Despite economic benefits, clearing rainforest threatens the survival of many plant and animal species and can lead to serious environmental degradation. Widespread deforestation damages the whole biosphere with severe long-term consequences. Credit opposite view that economic development is essential to ensure a rise in living standards, and that some deforestation is needed to enable activities such as mineral extraction, energy development and commercial farming to take place. Some may take a more balanced view, accepting the need for some development but minimising the environmental impacts by using strategies for managing the tropical rainforests sustainably. AO1 – 3 marks AO2 – 3 marks AO3 – 3 marks	

Section C

Qu	Pt	Marking guidance	Total marks
03	1	**Using Figure 8, how long is the coastline between points X and Y?** One mark for the correct answer: **B.** 2.8km No credit if more than one circle shaded. AO4 – 1 mark	1
03	2	**Using Figure 8, what direction would you be facing from the lighthouse at 676421 to the dunes at 690433?** One mark for the correct answer: North east AO4 – 1 mark	1
03	3	**Using Figure 8, describe one piece of evidence which suggests that Hunstanton is a tourist resort.** There is a tourist information centre (1). There is a wide sandy beach (1). A golf course is located to the north east of Hunstanton (1). There are several hotels/camp/caravan sites (1) where tourists can stay when they are on holiday (d) (1). There is a Sea Life centre on the coast (1) which will be popular with families (d) (1). There is a nature reserve nearby/in grid square 6939(1) which would be an attraction for bird watchers (d) (1). Max 1 mark for naming an attraction or list of attractions eg camping/caravan sites, sea life centre, hotel, motel, tourist Information centre. AO4 – 2 marks	2
03	4	**Suggest one type of mass movement that is affecting these cliffs.** Rockfall/slumping/landslip. AO3 – 1 mark	1

03	5	**Explain the formation of a spit.**	4

Level	Marks	Description
2 (Clear)	3–4	AO1 Demonstrates accurate knowledge about coastal erosion processes and spit formation. AO2 Shows a clear geographical understanding of the interrelationships between coastal environments and processes. Explanations are developed.
1 (Basic)	1–2	AO1 Demonstrates some knowledge of coastal erosion processes and spit formation. AO2 Shows limited geographical understanding of the interrelationships between coastal environments and processes. Explanations are partial.
	0	No relevant content.

- **Level 2 (clear)** responses are likely to contain linked statements showing understanding of the processes involved and the sequence of formation. Appropriate geographical terminology.
- **Level 1 (basic)** responses will comprise simple ideas with limited or partial sequence and little reference to the processes involved. Geographical terminology will be limited.
- The sequence of formation and some reference to processes involved are both required to reach the top of level 2.

<u>Indicative content</u>

- The command is “explain”, so responses should provide a reasoned account of how and why spits form.
- A spit is a sand or shingle beach that is joined to the land but projects out (downdrift) into the sea.
- Longshore drift transports sand along the coast. Direction of prevailing wind determines direction of LSD.
- Spits form where the coastline suddenly changes shape or at the mouth of an estuary. Sand or shingle starts to build up in the sheltered lee side of the headland. This will continue to build up.
- Finer material is carried out into the deeper water of the estuary and is deposited as the water loses its capacity to transport it any further.
- A spit will continue to grow until the water becomes too deep or until material is removed faster than it is deposited.

		• The end of the spit may begin to curve round as wave refraction carries material round into the more sheltered water. Wind and waves may also push the spit material back towards the mainland. • The spit will not grow all the way across the estuary as the material is carried seaward by the river. • Credit relevant labelled/annotated diagram. AO1 – 2 marks AO2 – 2 marks	

<table>
<tr>
<td>03</td>
<td>6</td>
<td>
Discuss the costs and benefits of soft engineering strategies in protecting coastlines.

Use Figure 10 and Figure 11 and your own understanding.
<table>
<tr><th>Level</th><th>Marks</th><th>Description</th></tr>
<tr><td>3 (Detailed)</td><td>5–6</td><td>AO2 Shows thorough geographical understanding of the costs and benefits of soft engineering strategies.

AO3 Demonstrates thorough application of knowledge and understanding by making reasoned analysis of soft engineering strategies.</td></tr>
<tr><td>2 (Clear)</td><td>3–4</td><td>AO2 Shows some geographical understanding of the costs and/or benefits of soft engineering strategy(ies).

AO3 Demonstrates reasonable application of knowledge and understanding by making clear analysis of soft engineering strategy(ies).</td></tr>
<tr><td>1 (Basic)</td><td>1–2</td><td>AO2 Shows limited geographical understanding of the costs and/or benefits of soft engineering strategy(ies).

AO3 Demonstrates limited application of knowledge and understanding by making basic analysis of soft engineering strategy(ies).</td></tr>
<tr><td></td><td>0</td><td>No relevant content.</td></tr>
</table>

Level 3 (detailed) will be developed responses clearly discussing both costs and benefits of named soft engineering strategies. Appropriate terminology will be used.
Level 2 (clear) responses are likely to show understanding of soft engineering strategy(ies) and their costs and/or benefits. Some discussion and some geographical terminology may be evident.
Level 1 (basic) responses will be simple statements with limited understanding or development. May consist of listed points or random statements about general coastal management strategy(ies).
Max Level 1 for hard engineering strategy(ies).
Max Level 2 for answer that does not refer to Figure(s).

<u>Indicative content</u>

Credit different soft engineering strategies. Beach nourishment, reprofiling and dune regeneration are listed in the specification.

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		• Figure 10 and Figure 11 show beach nourishment and dune regeneration and so there should be some discussion of the costs and benefits of these approaches. Other types of soft engineering may also be credited. • Beach nourishment replaces beach or cliff material that has been removed by erosion or longshore drift. The main advantage is that beaches are a natural defence against erosion and coastal flooding. It usually looks natural and can improve the attractiveness of a stretch of coast. It creates a useful amenity for tourism, it is a relatively cheap option and easy to maintain. • However, it does require constant maintenance to replace the beach material as it is washed away. This is particularly the case after winter storms. People may be prevented from using the beach for several weeks during maintenance. Costs up to £500 000 per 100 metres (but cost can vary greatly depending on transport costs and quantity). • Beach reprofiling is the artificial re-shaping of a beach using existing beach material. For example, after winter storms, bulldozers may move shingle back up the beach. The costs and benefits are similar to those for beach nourishment. The disruption caused by reprofiling may have negative impacts on beach habitats. • Dune regeneration is the artificial creation of new sand dunes or the restoration of existing dunes using strategies such as marram grass planting or fencing them off from human impact. Sand dunes act as a physical barrier between the sea and the land. They absorb wave energy and water and in doing so protect the land from the sea. This strategy is considered natural by most people and can produce an attractive amenity for tourists. They may also increase biodiversity, providing a greater range of natural habitats for plants, animals and birds. However, they can be easily damaged by storms and it can be time-consuming to plant the grass and maintain the area/it can also deter tourists at this time. Costs £400-£2000 per 100 metres. • Overall assessment - soft engineering works with nature rather than against it, blends in with the environment and can improve it eg adding sand to beaches, doesn't interfere with processes elsewhere and affect other areas; is sustainable. Disadvantages of soft engineering – areas can just be left at the mercy of the sea, more gentle intervention may not be effective, people can lose homes, livelihoods. AO2 – 3 marks AO3 – 3 marks	

Qu	Pt	Marking guidance	Total marks
04	1	**Using Figure 12, identify a feature of the East Dart River at 627811.** One mark for the correct answer: Waterfall AO4 – 1 mark	1
04	2	**Describe the relief (height and shape of the land) in the highlighted grid square 6082.** Credit two separate points or a developed point for 2 marks. The highest point is (over) 590 metres/between 590 and 600 metres (1) The land varies in height between (below) 510 and (above) 590 metres (1) (Allow 530-590 metres) The land is (quite) steep (1) The slope varies a great deal (1) The land rises to over 590 metres in the north west (1) but is lower than 510 metres in the south east (d) (1) There is a river valley in the east (1) with a steep western slope (d) (1). AO4 – 2 marks	2
04	3	**Using Figure 12 and Figure 13, which direction was the photographer facing when the picture was taken?** One mark for the correct answer: **D.** South west No credit if two or more answers are circled AO4 – 1 mark	1
04	4	**Suggest one way that the river valley shown in Figure 13 may change as it goes downstream.** Less steep valley gradient. Wider/more open valley. May develop floodplain. No credit for changes in the river channel. AO3 – 1 mark	1

04	5	**Explain the formation of an ox-bow lake.** **Level / Marks / Description** 2 (Clear) / 3–4 / AO1 Demonstrates accurate knowledge about river erosion processes and ox-bow lake formation. AO2 Shows a clear geographical understanding of the interrelationships between river environments and processes. Explanations are developed. 1 (Basic) / 1–2 / AO1 Demonstrates some knowledge about river erosion processes and ox-bow lake formation. AO2 Shows limited geographical understanding of the interrelationships between river environments and processes. Explanations are partial. 0 / No relevant content. • **Level 2 (clear)** responses are likely to contain linked statements showing some understanding of the processes involved and the sequence of formation. Appropriate geographical terminology. • **Level 1 (basic)** responses will comprise simple ideas with limited or partial sequence and little reference to the processes involved. Geographical terminology will be limited. • The sequence of formation and some reference to processes involved are both required to reach the top of level 2. <u>Indicative content</u> • The command is "explain", so responses should provide a reasoned account of how and why ox-bow lakes form. • Note that it is not essential to include the formation of a meander, although this can be credited. • The question implies knowledge of the processes of erosion and deposition. Emphasis is on explanation, so processes may be outlined as well as the sequence of formation. • 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. The development of meanders is due to both deposition and erosion. On the inside of the bend, where the river flow is slower, material is deposited on a slip off slope, as there is more friction. Over time, because of erosion and deposition, meanders gradually change. • The neck of the meander narrows due to lateral erosion on opposite sides of the meander bend.	4

		• 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 ox-bow lake silts up to form marshland. • Credit relevant labelled/annotated diagrams. AO1 – 2 marks AO2 – 2 marks	

04	6	**Discuss how flood management strategies may have impacts on people and the environment.** **Use Figure 14 and an example you have studied.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of the impacts of flood management strategies in a named location. AO3 Demonstrates thorough application of knowledge and understanding by making reasoned analysis of the impacts of flood management strategies on people and the environment.
2 (Clear)	3–4	AO2 Shows some geographical understanding of the impacts of flood management strategy(ies). AO3 Demonstrates reasonable application of knowledge and understanding by making clear analysis of the impacts of flood management strategy(ies) on people and/or the environment
1 (Basic)	1–2	AO2 Shows limited geographical understanding of the impacts of flood management strategy(ies) AO3 May include limited application of knowledge and understanding in analysing the impacts of flood management strategy(ies) on people and/or the environment.
	0	No relevant content.

- **Level 3 (detailed)** will be developed responses with reference to and understanding of the impacts of flood management strategies on people and the environment. Detailed use of supporting example as well as Figure 14. Appropriate terminology will be used.

- **Level 2 (clear)** responses will show some understanding of flood management strategy(ies) on people and/or the environment. Answers may make reference to both Figure 14 and own example. Some geographical terminology evident.

- **Level 1 (basic)** responses will be simple statements with limited understanding or development. May consist of listed points or random statements about flood management strategy(ies).

- Max L2 for answer that does not refer to Figure 14

- Max L2 for answer that does not include reference to a named example

		• Max Level 2 for answer that covers impacts on people or impacts on environment only. <u>Indicative content</u> • Responses will apply knowledge and understanding of flood management strategies to the question with a focus on people and the environment. • Flood management strategies evident in **Figure 14** include planting trees, flood defence structures including flood walls and embankments, development of wetland areas and water meadows on the floodplain. • Planting trees increases interception of water in the catchment area and reduces the amount of precipitation reaching the river. The EA estimate that planting trees can reduce flooding by as much as 20%. This strategy also has numerous positive environmental impacts because trees absorb CO_2, manage and reduce soil erosion, reduce pollution, improve aesthetics, provide habitats for wildlife and thus increase biodiversity in an area. Loss of potential farmland and the changed appearance of the countryside from grass to woodland may be deemed less aesthetically pleasing by some. • Construction of wetland areas and water meadows on the floodplain also have largely positive environmental impacts such as creating new wetland habitats, and improving biodiversity and providing additional green/recreational spaces for people. • River restoration is when a river that has previously been hard engineered is restored to a natural channel. For example, the River Quaggy in Greenwich had previously been re-routed through underground drains but was brought back to the surface and restored close to its original meandering course in 2007. Wildflower meadows and avenues of trees were planted bringing numerous environmental benefits and improving the look of the area. Local people were also able to use the space for recreational and leisure purposes although there has to be some acceptance that flooding may occur in the area which could create inconvenience at times. • Floodplain zoning comprises a range of potential strategies including construction of wetland areas and water meadows discussed above and land put aside for grazing. It can include restriction of building and economic development on the floodplain which some argue puts greater pressure on other areas. It can reduce insurance costs when properties are flooded. • Flood warnings and preparation helps people to be prepared and act accordingly but recognise that flooding is a natural event and people need to live with floods. People may not always act appropriately, especially if warnings turn out to be false alarms. • Hard engineering schemes such as dams and reservoirs, straightening embankments and flood relief channels are more often associated with negative environmental impacts but are effective at preventing flooding and therefore offer greater reassurance to people and reduce insurance premiums.	

		• Dams and reservoirs can have negative effects on wildlife and habitats but bring benefits for people. For example, a dam often interferes with the path of migrating fish and trapped sediment can disturb fish spawning grounds. Algae can build up behind a dam which deoxygenates the water. Reservoirs often flood areas of outstanding natural beauty. For example, when the Kielder reservoir was built in Northumberland, 1.5 million trees were lost along with 2700 acres of farmland. Both had a negative effect on habitats. However, they can create opportunities for tourism and recreation (sailing, fishing, walking), provide HEP and a source of drinking water. • Channel straightening can endanger animals and destroy habitats. The river's ecosystem is changed. A straightened river may have a concrete lining which is visually unattractive and deprives burrowing river bank animals of their habitat. In straightened sections, there is some evidence of increased pollution on the land from agro-chemicals, as run-off cannot drain into the river so easily. • Flood relief channels, though artificial, can bring environmental advantages such as new aquatic habitats. Earthen embankments can also be positive in terms of providing habitats for riverbank animals such as water voles, kingfishers and otters. Where harder materials such as concrete and gabions are used to stabilise embankments, habitats are more likely to be broken up and the aesthetic appearance of the area declines. • Depending on the river management scheme chosen by the student, the environmental impacts could be either positive or negative or both. Examples might include the Jubilee river flood-relief channel, Banbury flood storage, Kielder dam, Quaggy river restoration. AO2 – 3 marks AO3 – 3 marks	

Qu	Pt	Marking guidance	Total marks
05	1	**Using Figure 15, what is the difference in height between the spot height at 556577 and the spot height at 532577?** 600 metres AO4 – 1 mark	1
05	2	**Using Figure 15, describe the land use shown in the highlighted grid square 5456.** Credit two separate points or a developed point for 2 marks. There are some areas of woodland/forestry(1) especially in the south western part of the square/on the steeper valley sides (d) (1) There are several buildings (1) which are mainly found on the valley floor/located along the main road (d) (1) An A Road and railway cross the area (1) following the flat valley floor/with a railway station at Plasisaf (d)(1) A campsite shows evidence of tourism (1) Part of a small quarry is found here (1) Accept farming as inferred land use Allow max 1 mark for list of (at least 2) land uses, eg tourism, forestry, transport, settlement (1) AO4 – 2 marks	2
05	3	**Using Figure 15 and Figure 16, identify the grid square where point X is located.** One mark for the correct answer: **A.** 5555 No credit if two or more answers are circled AO4 – 1 mark	1
05	4	**Using Figure 16, suggest one piece of evidence that shows this area was glaciated.** Eg A long narrow/ribbon lake (1). Steep sided valley/glacial trough (1). Flat valley floor (1). Glacial debris/moraine/till deposits (1). AO3 – 1 mark	1

05	5	**Explain the formation of a hanging valley.**	4

Level	Marks	Description
2 (Clear)	3–4	AO1 Demonstrates accurate knowledge about glacial erosion processes and hanging valley formation. AO2 Shows a clear geographical understanding of the interrelationships between glacial environments and processes. Explanations are developed.
1 (Basic)	1–2	AO1 Demonstrates some knowledge of glacial erosion processes and hanging valley formation. AO2 Shows limited geographical understanding of the interrelationships between glacial environments and processes. Explanations are partial and limited in scope.
	0	No relevant content.

- **Level 2 (clear)** will have linked statements showing understanding of the processes involved and the sequence of formation. Appropriate geographical terminology.
- **Level 1 (basic)** responses will comprise simple ideas with limited or partial sequence and little reference to the processes involved. Geographical terminology will be limited.
- Sequence of formation and some reference to processes involved are both required to reach top of Level 2.

<u>Indicative content</u>

- The command is "explain", so responses should provide a reasoned account of how and why a hanging valley forms. This could include post-glacial changes through to the present day.
- The question implies knowledge of the processes of erosion as well as a landform of glacial erosion. Processes may be outlined as well as the sequence of formation.
- Processes include abrasion – where moraine within the ice to the sides has a sandpapering effect on both sides and base; and plucking – where the ice following melting under pressure, freezes to the rock and tears part of it away when it moves.
- Ice occupies a former river valley, often V shaped. The glacier is fed by several tributary glaciers that start in corries. These join together and cause the ice to erode powerfully by plucking and abrasion. The main valley is widened by lateral erosion and deepened by vertical erosion forming a glacial trough/u-shaped valley.

		• Small glaciers can erode only shallow valleys while large glaciers can erode much deeper valleys. A hanging valley is a shallow valley carved by a small tributary glacier and so when the ice melts the height of the valley floor is left "hanging" high above the valley floor eroded by the larger trunk glacier. • If a river occupies a hanging valley it plunges as a waterfall to the floor of the main valley and sometimes builds up an alluvial fan of coarse materials. • Credit relevant labelled diagrams as part of the explanation of processes and the sequence of hanging valley formation. • Sequence of formation and some reference to processes involved required to reach top of Level 2. AO1 – 2 marks AO2 – 2 marks	

05	6	**Discuss the success of strategies used to manage the impacts of tourism in glaciated upland areas.** **Use Figure 17 and an example you have studied.**	6

Level	Marks	Description
3 (Detailed)	5–6	AO2 Shows thorough geographical understanding of strategies used to manage the impacts of tourism in a named glaciated upland area. AO3 Demonstrates thorough application of knowledge and understanding in analysing the success of strategies to manage tourism in glaciated upland areas.
2 (Clear)	3–4	AO2 Shows some geographical understanding of one or more strategies used to manage the impacts of tourism in glaciated upland areas. AO3 Demonstrates reasonable application of knowledge and understanding in analysing the success of one or more strategies used to manage tourism in glaciated environments.
1 (Basic)	1–2	AO2 Shows limited geographical understanding of one or more strategies used to manage the impacts of tourism in glaciated upland areas. AO3 May include limited application of knowledge and understanding in analysing the success of one or more strategies used to manage tourism in glaciated upland areas.
	0	No relevant content.

- **Level 3 (detailed)** will be developed responses, with supporting evidence for answer, referring to a named example of a glaciated upland area and use of Figure 17. Answers will discuss the success or otherwise of strategies. Appropriate terminology will be used.
- **Level 2 (clear)** responses are likely to have linked statements showing understanding of strategy(ies) used to manage tourism in glaciated upland areas. Answers may discuss the success of the strategy(ies). Answers may refer to a named example. Answers may make use of Figure 17. Some geographical terminology evident.
- **Level 1 (basic)** responses will be simple statements with limited understanding or development. May consist of listed points or random statements about one or more strategies used to manage tourism. May rely heavily on Figure 17 with little development.
- Reference to an example is required for access to Level 3.
- Max Level 1 if strategies are not pertinent to a glaciated upland area

		• Max Level 2 if there is no assessment of the success of strategies used. <u>Indicative content</u> • Responses should apply knowledge and understanding of the strategies used to manage tourism, making an assessment of the success of these strategies. Some will take a balanced approach before reaching a conclusion. • Understanding of the strategies used to manage tourism. Credit any strategy that can feasibly be used in glaciated upland areas. • Managing footpath erosion includes: resurfacing paths with hard-wearing materials, eg rocks, plastic mesh, slabs, etc.; reseeding vegetation to reduce the visual impact of the erosion; encouraging visitors to use alternative routes by providing signposting or fencing. • Managing traffic congestion includes increasing public transport in the tourist season, improving the road network, eg by providing designated passing places on single-track roads, encouraging people to use bikes, buses, boats and trains, eg by providing discounts. • Protecting wildlife and farmland includes: using signs to remind people to take their litter home and provide covered bins at the most popular sites; encouraging visitors to enjoy the countryside responsibly eg by closing gates and keeping dogs on leads. • Use of example to support answer, eg Lake District. Traffic issues. The Go Lakes Travel scheme aims to reduce car use, eg by introducing pay-as-you-go bikes. Ambleside has Controlled Parking Zones within the town centre where people can only park for 1 hour. High property prices. Permission granted for 270 affordable homes that only local people can buy. Erosion of footpaths. At Tarn Hows, severely eroded paths have been covered with soil and reseeded, and the main route has been gravelled to protect it. Noise, erosion and pollution from water sports. Zoning schemes mean that some water sports are only allowed in certain areas of some lakes. Windermere has a 10 knot speed limit for all boats, • Application of knowledge and understanding to Figure… Public transport is being encouraged, with special bus services serving tourists including cyclists and hikers. By connecting up the main settlements drivers can park their cars, which reduces traffic congestion and delays, reduces carbon emissions and lessens the effects of air pollution. It is convenient for those who wish to rejoin at a different point. The bus service connects local communities, and helps to achieve sustainable use of the area and protect its environment.	

		• Assessing the success of strategies to manage tourism. Answers may indicate that strategies have been completely, partially or not successful, supported by evidence. Eg several projects have successfully repaired footpaths, created steps, re-surfaced paths with local stone and re-planted native species. However, there are still hundreds of kilometres of footpath in need of constant attention, and their maintenance is very difficult. The use of public transport has been generally successful, but the increasing number of vehicles still means huge congestion problems, particularly in the summer. AO2 – 3 marks AO3 – 3 marks	