

INTERNATIONAL GCSE GEOGRAPHY

9230/1

Paper 1 Living with the Physical Environment

Mark scheme

June 2024

Version: 1.0 Final



2 4 6 Y 9 2 3 0 / 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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Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each 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.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

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 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

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 help. There will 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.

Section A – The challenge of natural hazards

Question 1

Qu	Part	Marking guidance	Total marks						
01	1	Complete Table 1 by selecting a natural hazard for each category from the examples given below.	2 marks AO1=2						
		<table><tr><th>Natural hazard category</th><th>Example</th></tr><tr><td>Atmospheric</td><td>Tropical storm</td></tr><tr><td>Tectonic</td><td>Earthquake</td></tr></table>		Natural hazard category	Example	Atmospheric	Tropical storm	Tectonic	Earthquake
		Natural hazard category		Example					
		Atmospheric		Tropical storm					
Tectonic	Earthquake								

Qu	Part	Marking guidance	Total marks
01	2	What is the temperature difference between 1880 average and 1960 average at location A on Figure 1a? C –3 (°C) to –4 (°C)	1 mark AO4=1

Qu	Part	Marking guidance	Total marks
01	3	Using Figure 1b identify the continent where there is an area of decrease in the average temperature in 2020 compared to 1960. Antarctica	1 mark AO4=1

Qu	Part	Marking guidance	Total marks
01	4	Calculate the difference in average temperature (°C) between 1880 and 2020 for location B on Figures 1a and 1b. 4°C Allow +4	1 mark AO4=1

Qu	Part	Marking guidance	Total marks									
01	5	Describe changes in average global temperatures (°C) between 1880 and 2020 as shown in Figure 1a and Figure 1b. <table><tr><td>Level 2 (Clear)</td><td>3–4 marks</td><td>Changes in global temperatures are described with a clear overview. Evidence is quoted from the maps to illustrate key changes. Answer is organised.</td></tr><tr><td>Level 1 (Basic)</td><td>1–2 marks</td><td>Changes in global temperatures are partly described, with a focus on some areas. Evidence may be quoted from the maps to illustrate changes. Order is likely to be random.</td></tr><tr><td></td><td>0</td><td>No relevant content.</td></tr></table> Indicative content Almost all areas of the world have experienced an increase in temperatures. The only exception to this is a part of western Antarctica. The highest increases have been in the most northerly parts of the Northern Hemisphere – in areas which had some of the highest negative differences in 1880. Oceans have generally warmed less than the land – with the Atlantic showing greatest increase of 2 degrees C and the Pacific and Indian Oceans less. There have been greater differences in some land areas than others – such as northern parts of North America and eastern Asia in comparison to lower increases across much of Africa and South America.	Level 2 (Clear)	3–4 marks	Changes in global temperatures are described with a clear overview. Evidence is quoted from the maps to illustrate key changes. Answer is organised.	Level 1 (Basic)	1–2 marks	Changes in global temperatures are partly described, with a focus on some areas. Evidence may be quoted from the maps to illustrate changes. Order is likely to be random.		0	No relevant content.	4 marks AO2=2 AO3=2
Level 2 (Clear)	3–4 marks	Changes in global temperatures are described with a clear overview. Evidence is quoted from the maps to illustrate key changes. Answer is organised.										
Level 1 (Basic)	1–2 marks	Changes in global temperatures are partly described, with a focus on some areas. Evidence may be quoted from the maps to illustrate changes. Order is likely to be random.										
	0	No relevant content.										

Qu	Part	Marking guidance			Total marks
01	6	Suggest how natural factors can cause climate change.			
		Use Figure 2 and your own understanding.			
		Level 3 (Detailed)	5–6 marks	Specific, detailed understanding of the natural causes of climate change. The impact of orbital change and volcanic eruptions are explained in statements that are developed and logically ordered, linking the cause to temperature change.	
		Level 2 (Clear)	3–4 marks	Some specific understanding of the natural causes of climate change. The impact of orbital change and/or volcanic eruptions is/are explained in statements that are partly developed and logically ordered, with some linking of at least one cause to temperature change.	
		Level 1 (Basic)	1–2 marks	Simple, separate statements with reference to natural causes of climate change. The process of orbital change and/or volcanic activity will be partly explained. Separate statements regarding cause and climate change. Order may be random.	
			0	No relevant content.	
Indicative content					
Orbital change is shown in the first diagram where the Earth orbits the Sun. As the orbit is elliptical rather than circular, there are many years when the Earth is both nearer and further away from the Sun. This leads to different levels of energy and therefore contrasting degrees of warmth which will lead to temperatures increasing and decreasing. The shape of the ellipse changes every 100 000 years, so over a long-time scale, greater proximity to the Sun will lead to higher temperatures and a longer distance away will reduce the temperature.					
Volcanic activity This leads to two potential effects. Some eruptions release huge clouds of gas which block out the sunlight reducing temperatures as the Sun’s rays are reflected back into the atmosphere. The eruption also releases sulphur dioxide – this then mixes with water vapour to form a volcanic sulphate/sulphuric acid. This acts like the presence of mirrors to reflect the radiation from the Sun and therefore cool temperatures – over a longer time scale than the ash.					

Qu	Part	Marking guidance	Total marks
01	7	Explain how climate change may affect the distribution of tropical storms. The distribution of tropical storms may become more widespread (1) occurring at greater distances from the Equator/more than 15 degrees north and south (1) in areas not previously affected (1) such as the South Atlantic possibly (1). This is due to the increased temperatures warming larger areas of ocean (1) beyond those that reach 27 degrees C now (1).	2 marks AO1=2

Qu	Part	Marking guidance	Total marks
01	8	Outline one primary effect of Hurricane Dorian. Recognition of a primary effect – high winds/heavy rain and storm surge are mentioned – one of these should be identified (1) and this direct/immediate impact should be described. This is likely to include buildings/houses being destroyed/infrastructure destroyed (1); people becoming trapped/fleeing the area (1) flooding occurring in coastal areas (1) leading to deaths (1). 1 mark for a basic point. 1 + 1 for a developed point.	2 marks AO3=2

Qu	Part	Marking guidance	Total marks
01	9	Outline one secondary effect of Hurricane Dorian. Recognition of a secondary effect – loss of power and limited access to clean water are mentioned (1) and this subsequent effect should be described. This is likely to include no means of cooking/heating/air conditioning (1) communication links lost (1) no street lighting (1) so increased crime (1); risk of disease if no clean water to drink (1) possibly outbreaks of cholera (1) due to water contaminated by sewage or systems not working/due to storm surge/flooding (1). 1 mark for a basic point. 1 + 1 for a developed point.	2 marks AO3=2

Qu	Part	Marking guidance			Total marks
01	10	Immediate and long-term responses to earthquakes or volcanoes vary between areas of contrasting wealth.			
		Use named examples to discuss this statement.			
		Level 3 (Detailed)	7–9 marks	Specific, detailed understanding of immediate and long-term responses to earthquakes or volcanoes and how these vary between areas of contrasting wealth. There is specific reference to named examples throughout. Statements are developed and linked with purposeful discussion.	
		Level 2 (Clear)	4–6 marks	Some specific understanding of immediate and/or long-term responses to earthquakes or volcanoes and how these vary between areas of contrasting wealth. There is some specific reference to one or more named examples. Some statements are developed and linked with some discussion.	
		Level 1 (Basic)	1–3 marks	Simple, separate statements describing immediate or long-term responses to earthquakes and/or volcanoes and how these vary between areas of contrasting wealth. Answer likely to be generic even if example named. Any discussion is limited and simple. Statements possibly in a random order.	
			0	No relevant content.	
Indicative content					
The question command is ‘discuss’ so candidates need to reflect on the immediate and long-term responses and how these vary between areas of contrasting wealth in a reflective way – considering whether richer country fares better on one aspect of response or both and there may be discussion as to why this is the case. The nature of the discussion and the points made will depend on the examples used.					
Immediate responses These include search and rescue of people trapped or injured; providing shelter in the form of tents possibly, clean water and food, medical aid and hospitals being set up; emergency repairs to infrastructure. They may also include evacuation, trying to divert lava, clean up ash if a volcanic eruption is used.					
Long term responses These include rebuilding and repairing homes, schools and other buildings damaged or destroyed as well as infrastructure – such as roads, railways, bridges and restoring power, water supplies etc. There may be reference to improved buildings or restrictions on where buildings might be constructed.					

9 marks
AO1=3
AO2=3
AO3=3

		There should be reference to any two areas of contrasting wealth such as Chile and Nepal, Iceland and the Philippines but credit should be given for any clear contrast in wealth such as Japan and Chile.	
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Section B – The living world

Question 2

Qu	Part	Marking guidance	Total marks
02	1	Which of the following is an input in an ecosystem as shown in Figure 4? B Energy from the Sun	1 mark AO4=1

Qu	Part	Marking guidance	Total marks
02	2	Suggest the impact of a reduction of secondary consumers on the ecosystem. If there was a reduction in secondary consumers, there would be more primary consumers (1) as they will be eaten less (1) which will result in producers being eaten more/so a reduction in producers(1). There will be less food for tertiary consumers (1) and so these will reduce in number (1). 2 × 1 per basic point. 1 + 1 for a developed point.	2 marks AO3=2

Qu	Part	Marking guidance	Total marks
02	3	Identify two characteristics of rainfall in a hot desert. At times, there can be torrential rain (1). It is often for only a short time (1). As a result, water cannot be absorbed/stays on the surface leading to flooding (1). Happens rarely/infrequently (1) Minimal amount (1) May be part of a thunderstorm (1) 2 × 1 per basic point. 1 + 1 for a developed point.	2 marks AO2=2

Qu	Part	Marking guidance	Total marks									
02	4	Explain how water and soil management can reduce the risk of desertification in hot deserts. <table><tr><td>Level 2 (Clear)</td><td>3–4 marks</td><td>Explanation is sequential linking strategies of soil and water management to reducing the risk of desertification in hot deserts. Information is specific with linked statements.</td></tr><tr><td>Level 1 (Basic)</td><td>1–2 marks</td><td>Explanation is partial with some understanding of how soil and/or water management can reduce the risk of desertification in hot deserts. Information uses simple, separate statements.</td></tr><tr><td></td><td>0</td><td>No relevant content.</td></tr></table> Indicative content Water management may involve building small dams to try and save rain when it does fall and improve water supply; collecting rainwater on rooves and channelling it to where it is needed; irrigation can provide water and so alleviate water shortage and ensure there is ground cover. The soil can be held in place and not eroded by planting trees or other ground cover such as Atriplex shrubs or building stone lines/bunds to prevent the soil from being washed away downslope as it is trapped and these slow down surface runoff giving water a chance to infiltrate and so ensure the soil is not dry and reduce the chance of desertification. Terraces for farming where flat sections are created have a similar effect. There may be reference to examples such as the Sahel or the Badia.	Level 2 (Clear)	3–4 marks	Explanation is sequential linking strategies of soil and water management to reducing the risk of desertification in hot deserts. Information is specific with linked statements.	Level 1 (Basic)	1–2 marks	Explanation is partial with some understanding of how soil and/or water management can reduce the risk of desertification in hot deserts. Information uses simple, separate statements.		0	No relevant content.	4 marks AO1=2 AO2=2
Level 2 (Clear)	3–4 marks	Explanation is sequential linking strategies of soil and water management to reducing the risk of desertification in hot deserts. Information is specific with linked statements.										
Level 1 (Basic)	1–2 marks	Explanation is partial with some understanding of how soil and/or water management can reduce the risk of desertification in hot deserts. Information uses simple, separate statements.										
	0	No relevant content.										

Qu	Part	Marking guidance	Total marks
02	5	State two facts about the location of areas of deforestation in the Amazon rainforest of Brazil shown in Figure 5. Any valid point from Figure 5. Deforestation is concentrated in the south of the Brazilian Amazon (1). The largest continuous area is adjacent to the Atlantic Ocean (1). Locations are more isolated/spread out in the south west (1). There are lines that follow the rivers in the centre of the Brazilian Amazon (1), especially along the Amazon but also along other rivers/tributaries (1). Answer must relate to locations where deforestation has occurred; not where it hasn't. 1 mark for a basic point. 1 + 1 for a developed point.	2 marks AO4=2

Qu	Part	Marking guidance			Total marks
02	6	Selective logging and replanting are the most effective strategies used to manage the tropical rainforest sustainably.			
		To what extent do you agree with this statement?			
		Level 3 (Detailed)	7–9 marks	Statements are developed and linked, logically ordered with specific reference to selective logging and replanting. There will be reference to alternative strategies such as conservation and education, ecotourism, international agreements and debt reduction. There is specific, detailed reference to information to illustrate strategies. There is explicit assessment of the extent to which selective logging and replanting are the most effective strategies, with comments likely to be present throughout the answer.	
		Level 2 (Clear)	4–6 marks	Some statements are developed and linked, with specific reference to selective logging and/or replanting. There may be reference to alternative strategies such as conservation and education, ecotourism, international agreements and debt reduction. There is some reference to information to illustrate strategies. There is some, possibly implicit, assessment of the extent to which selective logging and replanting are the most effective strategies.	
		Level 1 (Basic)	1–3 marks	Simple, separate statements, possibly in a random order with reference to either selective logging or replanting. There may be basic and descriptive reference to other strategies. There may be brief reference to information to illustrate strategy/(ies). There may be a basic assessment of the extent to which selective logging and replanting are the most effective strategies.	
		0	No relevant content.		
Indicative content					
The specification refers to conservation and education, ecotourism, international agreements and debt reduction, as well as selective logging and replanting so there may be reference to any of these in the answer.					
The response should consider selective logging where certain trees are removed regarding age, quality, position and only some rather than all trees are removed and replanting where trees that are chopped down are replaced by one or two new saplings being planted. In the case of					

		selective logging, the forest is more able to regenerate as trees remain and they can seed and new trees can grow unlike when clear felling occurs. Replanting ensures there will be new trees to replace those cut down – both are therefore effective in managing the forest sustainably – and can be carried out in all areas as part of a management programme. In this way, forest can be used but without any long-term damage. Other strategies such as conservation and education ensure forest dwellers and international businesses can ensure the sustainability of rainforests by being aware of how the forest works and companies such as Givaudin have helped in the planting of tonka beans whilst protecting an area of rainforest in Venezuela. Ecotourism is green tourism where the impact on the environment is minimal using sustainable local resources at a small scale ensuring no damage to the areas occur. International agreements seek to protect the rainforest and ensure limited amounts are removed and those that are under the eye of the Forestry Stewardship Council are sustainable. Writing off debts in return for lowering rates of deforestation is another way of managing the rainforest. These strategies should be evaluated in comparison to selective logging and replanting and advantages and disadvantages may be considered in this context. Do not accept reference to climate change.	
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Section C – Physical landscapes
Coastal landscapes

Question 3

Qu	Part	Marking guidance	Total marks
03	1	Describe the evidence of mass movement shown in Figure 6. Any valid point from Figure 6. Mass movement has taken a large section/slice out of the coast in the centre (1). This area looks very different as it is treeless in contrast to the surrounding area (1). Much of this material has ended up on the beach (1), being higher on the right/forming a bank (1) and lower on the left/almost like a fan (1). It is different/redder in colour compared to the paler sand on the beach next to the sea (1).	2 marks AO4=2

Qu	Part	Marking guidance	Total marks
03	2	Complete the scattergraph (Figure 7) using the information below. 1 mark for plotting information accurately.	1 mark AO4=1 (M)

Qu	Part	Marking guidance	Total marks
03	3	Describe the relationship shown in Figure 7. Generally, as wind speed increases, wave height increases/there is a positive correlation (1) plus evidence from Figure 7 to illustrate this (1). Or there may be reference to some anomalies such as a wind speed of 13.5 ms and height of 4.4 m – more than expected (1) or a wind speed of 16 ms and height of 2.4 m – lower than expected (1) indicating that relationship is not perfect (1). 1 mark for a basic point. 1 + 1 for a developed point.	2 marks AO4=2

Qu	Part	Marking guidance			Total marks
03	4	Explain the formation of spits and bars.			4 marks AO1=2 AO2=2
		Level 2 (Clear)	3–4 marks	More complete explanation that addresses aspects of sequence and process in the formation of spits and bars – with longshore drift and deposition clearly addressed. Developed and linked statements, logically ordered.	
		Level 1 (Basic)	1–2 marks	Partial explanation focusing on either sequence or process in the formation of spits and/or bars with some possible reference to longshore drift and/or deposition. Simple, separate statements possibly in a random order.	
			0	No relevant content.	
		Indicative content			
Spits form due to longshore drift transporting sediment along the coastline and across an opening/indent on the coastline such as an estuary or a bay. The material is subsequently deposited and this continues across the estuary or bay as land is built out as the coast/land extends. If the spit is built across an estuary, it may curve due to winds coming from a different direction. If conditions are calm and there is limited current such as at a bay, the spit may continue to build and extend over time and eventually link up to the other side of the bay forming a bar. Diagrams may be used to help in the explanation of the formation.					

Qu	Part	Marking guidance			Total marks
03	5	Explain how the coastal management strategy shown in Figure 8 protects the coastline from physical processes.			6 marks AO2=3 AO3=3
		Level 3 (Detailed)	5–6 marks	Complete, well-ordered explanation of how gabions protect the coastline from physical processes – erosion. Detailed, developed and linked statements that are logically ordered. There is full understanding of what gabions are.	
		Level 2 (Clear)	3–4 marks	There is some explanation of how gabions protect the coastline from physical processes – erosion. Some developed and linked statements that are usually logically ordered. There is some understanding of what gabions are.	
		Level 1 (Basic)	1–2 marks	Simple, separate statements, possibly in a random order. Partial explanation of how gabions protect the coastline.	
			0	No relevant content.	
Indicative content					
Gabions are rows of rocks which are placed in metal cages at the back of the beach in front of the base of cliffs. They form a barrier between the waves and the land behind and so they take the force of the waves rather than the cliffs. This protects the land and buildings behind as they take the energy out of the waves and the cliff base remains intact rather than being undercut. This would lead to instability and the houses/buildings being threatened by the sea. Allow L2 if rock armour, not gabions, are indicates as the coastal management strategy, either by name or description.					

Section D – Physical landscapes

Hot desert landscapes or River landscapes

Question 4 – Hot desert landscapes

Qu	Part	Marking guidance	Total marks
04	1	What is deposition? Deposition occurs when material that has been carried is left behind (1).	1 mark AO1=1

Qu	Part	Marking guidance	Total marks
04	2	Draw a line to join the correct definition to the erosion process. Abrasion – Sandpaper effect of loose rocks being moved over the surface by wind or water. Deflation – Removal of fine particles from the surface by the wind. Hydraulic power – The force of running water. 1 correct – 1 mark; all 3 correct – 2 marks	2 marks AO1=2

Qu	Part	Marking guidance			Total marks
04	3	Explain the role of the wind in the formation and development of the characteristics of the landform shown in Figure 9.			
		Use Figure 9 and your own understanding.			
		Level 3 (Detailed)	5–6 marks	Complete, well-ordered explanation of characteristics of sand dunes as shown in Figure 9 and formation. Sequence and processes of sand dune formation are addressed with some description of processes. The role of the wind is explicitly addressed, linked to formation and the development of characteristics. Detailed, developed and linked statements that are logically ordered.	
		Level 2 (Clear)	3–4 marks	More complete explanation that addresses characteristics of sand dunes as shown in Figure 9 and formation. Sequence and processes of sand dune formation are addressed. The role of the wind is addressed – this may be implicit and may refer to either formation and/or the development of characteristics. Statements are linked and usually logically ordered.	
		Level 1 (Basic)	1–2 marks	Simple, separate statements, possibly in a random order. Partial explanation focusing on either sequence or process of sand dune formation – or the development of characteristics.	
		0	No relevant content.		
Indicative content					
The sand dunes in Figure 9 have a clear crest which is visible in the foreground and centre. This winds rather than being straight and has a steeper slope facing to the right. Ripples are clearly visible on the sand dunes especially in the foreground and to the left.					
Sand dunes are formed where there is a plentiful supply of sand with winds strong enough to transport the sand – and the winds occurring mainly in one direction to create the shape. It is likely that the wind will be from left to right in Figure 9 where the slope is gentler as the sand is shifted by saltation and surface creep of larger particles. The effect of the wind sculpts the surface layers of sand forming the ripples. The slope facing the right is steeper due to sand avalanches that occur as the sand is unstable and also due to the eddying (circular movement) of the wind on the leeward side. It is this that gives the uneven, broken					

6 marks
AO2=3
AO3=3

		appearance of the ridge of sand dunes – may refer to these as seif dunes and could relate the formation of crescent shaped barchans and how these transform into seif dunes following changes in wind direction and the elongation of one of the horns of the barchan.	
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Qu	Part	Marking guidance	Total marks
04	4	State two features of the location of the Sonoran Solar Energy Project shown in Figure 10. Any valid feature visible from Figure 10. The Sonoran Solar Energy Project Area is located north of the Sonoran Desert National Monument/south of Estrella Mountain Park/south east of Buckeye Hills Regional Park/in the middle of a variety of tourist attractions (1). It is about 1km south of Buckeye or alternative place (1). The Gila River flows both to the west and north (1). It is very accessible with major roads north, west and south/with a number of junctions (1). 2 × 1 mark for a basic point.	2 marks AO4=2

Qu	Part	Marking guidance			Total marks
04	5	Explain how energy projects provide opportunities for development in hot desert areas.			4 marks AO1=2 AO2=2
		Level 2 (Clear)	3–4 marks	Clear statements which show some awareness of the opportunities for development resulting from energy projects in hot desert areas. There is an awareness of opportunities or reasons why deserts offer such opportunities related to energy projects. There are some developed and linked statements, usually logically ordered.	
		Level 1 (Basic)	1–2 marks	Simple, separate and random points relating to the opportunities for development resulting from energy projects in hot desert areas. There may be some simple understanding of opportunities or reasons why deserts offer such opportunities related to energy projects.	
			0	No relevant content.	
		Indicative content			
The command is ‘explain’ so there should be an understanding of the ways in which energy development provides opportunities and/or the reasons why energy can be developed in hot desert areas. There may be reference to a named desert and specific opportunities present there. Some hot desert areas have non-renewable energy sources such as coal (and oil which has been discovered but not yet extracted) in the Thar. The extraction of the coal and potentially oil leads to jobs directly and income but also the thermal power plant that has been built at Gira provides electricity and offers opportunities for better living standards and quality of life as well as the potential for further growth and investment creating a multiplier effect. Similar opportunities are offered by wind farms such as at Jaisalmer and solar power. Windy conditions present in the desert and often cloudless skies mean the hot desert area is ideal for these. The presence of energy resources often encourages workers to go and live in inhospitable conditions as well as development of infrastructure offering further opportunities.					

Question 5 – River landscapes

Qu	Part	Marking guidance	Total marks
05	1	What is deposition? Deposition occurs when material that has been carried is left behind (1).	1 mark AO1=1

Qu	Part	Marking guidance	Total marks
05	2	Draw a line to join the correct definition to the erosion process. Attrition – Rock particles hit each other as they move in the water. Hydraulic action – The force of running water. Solution – Certain rock types slowly dissolve in the water. 1 correct – 1 mark; all 3 correct – 2 marks	2 marks AO1=2

Qu	Part	Marking guidance			Total marks
05	3	Explain the role of erosion in the formation and development of the characteristics of the landforms shown in Figure 11.			
		Use Figure 11 and your own understanding.			
		Level 3 (Detailed)	5–6 marks	Complete, well-ordered explanation of characteristics of the waterfall/gorge as shown in Figure 11 and formation. Sequence and processes of waterfall/gorge formation are addressed with some description of processes. The role of erosion is explicitly addressed, linked to formation and the development of characteristics. Detailed, developed and linked statements that are logically ordered.	
		Level 2 (Clear)	3–4 marks	More complete explanation that addresses characteristics of the waterfall/gorge as shown in Figure 11 and formation. Sequence and processes of waterfall/gorge formation are addressed. The role of the erosion is addressed – this may be implicit and may refer to either formation and/or the development of characteristics. Statements are linked and usually logically ordered.	
		Level 1 (Basic)	1–2 marks	Simple, separate statements, possibly in a random order. Partial explanation focusing on either sequence or process of waterfall/gorge formation – or the description of the development of characteristics.	
		0	No relevant content.		
Indicative content					
The waterfall in Figure 11 has a near vertical descent in a number of sections – the main one on the right where the water is funnelled down. There appear to be two different rock types – with horizontal cracks visible in the upper rock layer. The water enters a plunge pool at its base before continuing on a narrow valley floor surrounded by steep sides – the gorge. Waterfalls often form where there are horizontal bands of rock with the top/cap rock – the one with the horizontal cracks in being harder and more resistant to erosion than the underlying rock. Thus, this erodes faster due to hydraulic action and abrasion – especially in and around the plunge pool where the water is moving very fast. Vertical erosion is dominant in this part of the valley near the source. This steepening of					

		the slope creates the waterfall. Over time, undercutting of the softer rock will lead to an overhang which will eventually collapse and the waterfall will retreat – leaving a gorge in the front of it marking earlier positions of the waterfall.	
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Qu	Part	Marking guidance	Total marks
05	4	State two features of the rainfall in 2023 compared to the average as shown in Table 2. Any valid feature apparent from Table 2. The actual rainfall was never the same as the average/it was always above or below (1). On two occasions the differences were within 30mm of the average or alternative to convey relative proximity (1). However, in June there was an increase of over 200mm from the average/almost 4 times the average rain fell (1). 2 × 1 mark for a basic point.	2 marks AO4=2

Qu	Part	Marking guidance			Total marks
05	5	Explain how physical factors affect the risk of flooding.			4 marks AO1=2 AO2=2
		Level 2 (Clear)	3–4 marks	Clear statements which show an understanding of how physical factors affect flood risk. There is an awareness of the sequence and processes that lead to an increase/decrease in flood risk linked to physical factors. There are some developed statements, usually logically ordered.	
		Level 1 (Basic)	1–2 marks	Simple, separate and random points relating to one or more physical factors or flood risk. There may be some simple understanding of the links.	
			0	No relevant content.	
		Indicative content			
		The command is ‘explain’ so there should be reference to how precipitation and/or geology and/or relief – physical factors – affect the flood risk. High amounts of precipitation/heavy, intense rain/prolonged rain can lead to flooding as water is falling faster than it can be absorbed/or land may already be saturated giving rise to rapid overland flow which reaches river channels faster than underground transfers. Impermeable rocks will not allow water to soak in and therefore results in much water on the surface and a rapid transfer to rivers resulting in a flashy hydrograph. Steep slopes encourage water to flow quickly downhill due to gravity and therefore limited time for water to be absorbed again resulting in rapid surface runoff to the streams increasing flood risk. Candidates may refer to how these factors can reduce flood risk – such as low rainfall, permeable geology and gentle relief.			