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INTERNATIONAL AS GEOGRAPHY GG01A

Paper 1A Physical Geography 1 Hot Desert Systems and Landscapes

Mark scheme

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2 3 1 X G G 0 1 A / 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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International AS Geography mark scheme

How to mark

Aims

When you are marking your allocation of scripts your main aims should be to:

- recognise and identify the achievements of students
- place students in the appropriate mark band and in the appropriate part of that mark band (high, low, middle) for **each** Assessment Objective
- record your judgements with brief notes, annotations and comments that are relevant to the mark scheme and make it clear to other examiners how you have arrived at the numerical mark awarded for each Assessment Objective
- ensure comparability of assessment for all students, regardless of question or examiner.

Approach

It is important to be **open-minded** and **positive** when marking scripts.

The specification recognises the variety of experiences and knowledge that students will have. It encourages them to study geography in a way that is relevant to them. The questions have been designed to give them opportunities to discuss what they have found out about geography. It is important to assess the quality of **what the student offers**.

Do not mark scripts based on the answer **you** would have written. The mark schemes have been composed to assess **quality of response** and not to identify expected items of knowledge.

Assessment Objectives

This component requires students to:

AO1	Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change, at a variety of scales.
AO2	Apply knowledge and understanding in different contexts to interpret, analyse and evaluate geographical information and issues.
AO3	Use a variety of relevant quantitative, qualitative and fieldwork skills to: <ul style="list-style-type: none"> • investigate geographical questions and issues • interpret, analyse and evaluate data and evidence • construct arguments and draw conclusions.

The marking grids

Do not think of levels equaling grade boundaries.

Depending on the part of the examination, the levels will have different mark ranges assigned to them. This will reflect the different weighting of Assessment Objectives in particular tasks and across the examination as a whole.

Using the grids

Having familiarised yourself with the descriptors and indicative content, read through the answer and annotate it (as instructed below) to identify the qualities that are being looked for and that it shows. You can now check the levels and award a mark.

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 descriptors for that level. The descriptors for the level indicate the different qualities that might be seen in the student's answer for that level. If it meets all the descriptors for 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 descriptors and the answer. With practice and familiarity you will find that for better answers you will be able to skip through the lower levels of the mark scheme quickly.

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.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark.

It is often best to start in the middle of the level's mark range and then check and adjust. If there is a lot of indicative content fully identifiable in the work you need to give the highest mark in the level. If only some is identifiable or it is only partially fulfilled, then give the lower mark.

The exemplar materials used during standardisation will also help. There will be an answer in the standardising materials that 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 of 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.

In addition to the levels descriptors, question specific indicative content is provided as a guide for examiners. This is not intended to be exhaustive and you must credit other valid points.

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

Annotating scripts

You should write a summative comment at the end for each Assessment Objective and indicate the marks for each Assessment Objective being tested at the end of the answer in the margin in sequence. It is vital that the way you arrive at a mark should be recorded on the script. This will help you with making accurate judgements and it will help any subsequent markers to identify how you are thinking. Please do not write negative comments about students' work or their alleged aptitudes.

Section A – Living with Hazards

Total for this section: 40 marks

Question	Part	Marking guidance	Total marks
01	1	<p>Which of the following describes how seismic hazards can trigger landslides?</p> <p>Key – B: Seismic waves disrupt the friction that holds sediments together and this loosens the materials.</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
01	2	<p>‘A combination of increased convectional rainfall and storm surges inundate areas with water.’</p> <p>This statement explains the cause of which of these events associated with storm hazards?</p> <p>Key – B: Coastal flooding</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
01	3	<p>Age, social status and religious beliefs can all be determining factors of which characteristic of hazards?</p> <p>Key – D: Perception</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
01	4	<p>Which of the following describes the process of slab pull?</p> <p>Key – A: Following subduction the lithosphere sinks further into the mantle under its own weight.</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
01	5	<ul style="list-style-type: none"> • They are found at destructive plate margins. • They are formed when oceanic lithosphere is subducted. • They have volcanic activity. <p>The three statements above describe which of the following?</p> <p>Key – A: Island arcs</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
02		<p>Figure 1 shows natural disasters in the Asia-Pacific region from January to June 2014.</p> <p>Analyse the data shown in Figure 1.</p>	<p>6</p> <p>AO3=6</p>

Level	Marks	Descriptor
2	4–6	AO3 – Clear selection and analysis of the evidence that has been provided linked to the relationship between the number and type of disasters and number of deaths.
1	1–3	AO3 – Some basic selection and analysis of the evidence that has been provided linked to the relationship between the number and type of disasters and number of deaths.
0	0	No creditable content.

Indicative Content

There is a variety of ways of approaching this unseen material. Students must select the relevant data from the map and look at patterns and relationships between number and types of disasters. Students should look at the figure and see anomalies and links between the data.

AO3

- China is the only country to have over 13 disasters in the time period – China is impacted by major seismic events and a cyclone off the coast.
- A positive correlation between number of disasters and number of deaths in general – China has the most disasters and the most deaths, whilst Vietnam is in the lowest number of between 1 and 4 disasters and has 27 deaths.
- Deaths in China (220) are significantly more than in any other country and account for almost one quarter of the deaths on the map – the country has the most disasters and the most deaths.
- The distribution of seismic events and cyclones outweigh the number of volcanic eruptions causing damage – which only are found on the islands of Indonesia.
- Seismic hazards are more sporadic in distribution and there are fewer volcanic hazards – located only in Indonesia. Tropical storm hazards affect east coasts of areas on the map such as NE Australia and SE Japan.
- Volcanic eruptions in Indonesia (2) and a seismic event led to a significant number of disasters (between 5–12) and caused 128 deaths within the time frame.
- In general seismic hazards are the most frequent, but when there are few disasters in a country such as in the Solomon Islands (1 death).
- When seismic hazards cause multiple disasters, such as in India there is a higher number of deaths (84).

Question	Part	Marking guidance	Total marks
03		<p>‘Preparation for tropical storm hazards reduces their impacts.’</p> <p>Discuss the extent to which you agree with this statement. Use examples you have studied to support your answer.</p> <p>AO1 – Knowledge and understanding of impacts and human responses to tropical storm hazards.</p> <p>AO2 – Application of knowledge and understanding to analyse whether preparation for tropical storm hazards reduces their impacts.</p>	<p>9</p> <p>AO1=4 AO2=5</p>

Level	Marks	Descriptor
3	7–9	<p>AO1 – Demonstrates detailed knowledge and understanding of concepts, processes, interactions and change associated with impacts of tropical storm hazards and their responses.</p> <p>AO2 – Applies knowledge and understanding to the novel situation, offering detailed analysis and evaluation, drawn appropriately from the context provided. Connections and relationships between different aspects of study are thorough and relevant.</p>
2	4–6	<p>AO1 – Demonstrates clear knowledge and understanding of concepts, processes, interactions and change associated with impacts of tropical storm hazards and their responses.</p> <p>AO2 – Applies knowledge and understanding to the novel situation, offering clear analysis and evaluation, drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident and relevant.</p>
1	1–3	<p>AO1 – Demonstrates basic knowledge and understanding of concepts, processes, interactions and change associated with impacts of tropical storm hazards and their responses.</p> <p>AO2 – Applies limited knowledge and understanding to the novel situation, offering some basic analysis and evaluation, drawn from the context provided. Connections and relationships between different aspects of study are basic and of limited relevance.</p>
0	0	No creditable content.

Indicative Content

AO1

- The characteristics of tropical storms.
- Hazards associated with tropical storms including strong and high winds; storm surges; coastal and river flooding; landslides.
- Primary and secondary impacts of tropical storms.
- Primary impacts of tropical storms are the initial impacts including strong winds and heavy rainfall – these can have consequences as secondary impacts such as flooding and landslides.
- Social impacts of tropical storms are impacts on people such as injuries and deaths from debris within a storm surge and objects within the high winds.
- It is not possible to stop the tropical storm from hitting areas but preparation is aimed to reduce the impacts when tropical storms make landfall.
- Preparation measures can include changes in behaviour such as small scale and community preparation such as determining evacuation routes and increasing of provisions.
- Locations such as The Philippines and low-lying areas of Bangladesh are prone to tropical storms affecting densely populated areas. Some preparations have been large scale such as cyclone shelters.
- Other methods of reducing impacts from tropical storms may include mitigation through structural responses including flood walls to protect from storm surge events; disaster aid to support impacted communities especially those displaced.

AO2

- Linking preparation to the impacts of tropical storm hazards.
 - Structural preparations such as building flood walls by the coast reduces the risk of flooding and the social and economic costs of flooding caused by tropical storm hazards.
 - Large scale preparations such as education on evacuation procedures as seen in Mindanao due to Tropical Storm Odette which helped prepare residents for the threat of flooding and landslides.
 - Tropical storm watch and warnings issued in the Bahamas encouraged people to board up windows and evacuate early reducing deaths and injuries during Hurricane Dorian.
- Analysis of how different preparations influence the impacts of tropical storm hazards.
- Analysis of how other factors may influence impacts despite preparations.
- The relative importance of preparation in reducing the impacts of tropical storm hazards.
- Case studies of recent tropical storms to discuss the success of preparation in reducing the impacts.
 - Eg Cyclone Idai affected Mozambique. The preparation for tropical storms relied heavily on external agencies in small communities. Evacuation was not well co-ordinated and involved people living in tents for long periods, so many locals stayed put and therefore were affected by the 4-metre-high storm surge increasing deaths and injuries.
 - Evacuation as a preparation helps reduce deaths and injuries but doesn't help reduce economic cost of repairing, replacing and rebuilding when homes are impacted by high winds and flooded.
- Discussion and evidence provided to evaluate whether preparation or other factors such as mitigation help more to reduce the impacts of tropical storm hazards.

Question	Part	Marking guidance	Total marks
04		<p>‘The nature and underlying causes of volcanic hazards makes them easier to respond to and manage than wildfires.’</p> <p>Evaluate this statement with reference to examples you have studied.</p> <p>AO1 – Knowledge of nature and underlying causes of volcanic and wild fire hazards. Knowledge of the concept of hazard response and management.</p> <p>AO2 – Application of knowledge and understanding to evaluate whether the nature and causes of volcanic hazards makes the response and management of them easier than fires in nature.</p>	<p>20</p> <p>AO1=10 AO2=10</p>

Level	Marks	Descriptor
4	16–20	<p>AO2 – Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question.</p> <p>AO2 – Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout.</p> <p>AO2 – Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts.</p> <p>AO1 – Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout.</p> <p>AO1 – Full and accurate knowledge and understanding of key concepts and processes throughout.</p> <p>AO1 – Detailed awareness of scale and temporal change which is well integrated where appropriate.</p>
3	11–15	<p>AO2 – Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question.</p> <p>AO2 – Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding.</p> <p>AO2 – Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts.</p> <p>AO1 – Generally clear and relevant knowledge and understanding of place(s) and environments.</p> <p>AO1 – Generally clear and accurate knowledge and understanding of key concepts and processes.</p>

		AO1 – Generally clear awareness of scale and temporal change which is integrated where appropriate.
2	6–10	<p>AO2 – Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question.</p> <p>AO2 – Some partially relevant analysis and evaluation in the application of knowledge and understanding.</p> <p>AO2 – Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts.</p> <p>AO1 – Some relevant knowledge and understanding of place(s) and environments which is partially relevant.</p> <p>AO1 – Some knowledge and understanding of key concepts, processes and interactions and change.</p> <p>AO1 – Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies.</p>
1	1–5	<p>AO2 – Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question.</p> <p>AO2 – Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence.</p> <p>AO2 – Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts.</p> <p>AO1 – Very limited relevant knowledge and understanding of place(s) and environments.</p> <p>AO1 – Isolated knowledge and understanding of key concepts and processes.</p> <p>AO1 – Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies.</p>
0	0	No creditable content.

Indicative Content

Content will depend on the volcanic and wild fire events chosen. If student does not refer to examples of hazard events the response will be limited to level 2.

AO1

- Volcanic events whilst difficult to predict to any degree of accuracy are relatively rare.
- Volcanic eruptions tend to follow periods of seismic activity and other warning signs such as land deformation and a release of volcanic gases.
- Volcanic monitoring warns of imminent danger from eruptions and gives governments and populations time to take action and make preparation.
- The nature of volcanic hazards is determined by their location, plate margins and lava types.
- Volcanic hazards can be classes as explosive or effusive, previous events will help shape the predictability and management of volcanic hazards.
- Wild fires occur with certain conditions – fuel characteristics, ignition sources and climatic conditions (eg heatwaves and droughts).
- Whilst the conditions make wild fires predictable the behaviour of wild fires can make them difficult to manage – this is influenced by winds as well as human populations.
- Preparedness, adaptation and mitigation are common responses to both hazards.
- There is no one set response to a natural hazard and these are determined by governments and individuals.
- Other factors such as the level of development of an area will influence how well hazards can be prepared for and managed to (eg may lack wealth and technology).
- The causes and factors increasing the risk and impact of fires in nature and volcanic eruptions and their link/relationship to risk management.
- Some comparison of use of management strategies.
- Primary and secondary impacts of volcanic hazards and wild fire events and their link/relationship to risk management.
- Short and long-term responses to volcanic hazards and wild fire events and their link/relationship to risk management.
- Place knowledge of the impacts of human response evidenced by a recent wild fire event and a recent volcanic event.

AO2

- Analysis and explanation of the interactions between nature and underlying causes of volcanic hazards and their response and management.
- Analysis and explanation of the interactions between nature and underlying causes of fires in nature and their response and management.
- Evaluation of how knowledge of the nature and underlying causes of both volcanic hazards and fires in nature shape their responses and management.
- Relative comparison between the two hazards, their nature and underlying causes and their response and management.
- Analysis of whether nature and underlying causes of the hazards makes one hazard easier to manage and respond to.
 - Eg Indonesia contains the most active volcanoes of anywhere in the world. Knowledge of the destructive plate margin and movement makes the area well researched. The government, along with support from the USGS have set up monitoring of volcanoes.

- The eruption of Mount Merapi in 2010 was preceded by 500 earthquakes. This led to the evacuation of over 20 000 people on the flanks of the volcano. Prior experience of the volcano identified that the volcano would have an explosive eruption.
- Eg The Paradise Wild Fire in California was incredibly difficult to manage and fight. Even though the authorities were aware of the causes and conditions the nature of the vegetation and weather conditions made the fire a continuous wall of fire. The sheer size of the blaze ensured that despite helicopters dropping water and trees being removed the spread was rapid.
- An evaluation of factors influencing response and management – whether or not this is shaped by knowledge of the underlying causes and nature of the two hazards.
 - Populations generally are sparsely populated in areas of volcanic risk.
 - All populated continents have a risk of fires in nature.
 - Volcanic hazard response is determined by the risk posed by particular volcanoes – different volcanoes have different levels of risk based upon their location and plate margin. Grassland fires produce less of a threat than forest fires. In this light both seem equally predictable and therefore equal to manage, however the influence of wind has the potential to increase the spread of a wildfire and reduce the success of management.

Section B – Hot Desert Systems and Landscapes

Total for this section: 40 marks

Question	Part	Marking guidance	Total marks
05	1	<p>Which of the following are ALL processes of wind action?</p> <p>Key – C: Deflation, saltation and surface creep.</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
05	2	<p>Which of the following describes the typical water balance in hot deserts?</p> <p>Key – B: Mean monthly potential evapotranspiration exceeds mean monthly precipitation.</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
05	3	<p>Which areas are examples of sinks within a desert sediment budget?</p> <p>Key – A: Bahadas, areas within wadi floors, deposition within sand dune systems.</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
05	4	<ul style="list-style-type: none"> • Small scale features found on desert pavements. • Clearly eroded sides facing the direction of the prevailing wind. • Abraded by sand particles carried within the wind. <p>The three statements above describe the characteristics and formation of which desert landform?</p> <p>Key – C: Ventifacts</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
05	5	<p>Which of the following describes the link between episodic rainfall and sheet flooding?</p> <p>Key – C: Infrequent rainfall releases large volumes of water in short time periods. The baked soil means that the majority of this rainfall moves as overland flow across large flat areas.</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
06		<p>Figure 2 shows the latitude, relief and distribution of sand dunes in a study area of the Namib Desert in southern Africa.</p> <p>Analyse the data shown in Figure 2.</p>	<p>6</p> <p>AO3=6</p>

Level	Marks	Descriptor
2	4–6	AO3 – Clear selection of evidence from the map provided and appropriate comparison between areas and sand dune types. Making appropriate use of specific latitudes, sand dune types and relief measurements.
1	1–3	AO3 – Some basic selection of evidence from the map images provided. Isolated or basic ideas.
0	0	No creditable content.

Indicative Content

There is a variety of ways of approaching this unseen material. Students should analyse the distribution patterns of sand dunes with the latitude and relief.

AO3

- Large proportion of the study area is made up of seif dunes from 23.2°S to 26.4°S over 200km in length and just over 100 km at their widest point 100 km south of Walvis Bay.
- Seif dunes tend to occur in areas over 100 m in relief, however there are some lower lying examples from 25°S to 26.5°S which are found on contours of between 25 m and 50 m.
- Barchans, network and transverse dunes are more often by the Atlantic coast in areas below 50 m in relief.
- Close transverse are only found in two narrow bands of 25 km and 100 km stretch further south along the Atlantic coast. Those found further south occur within relief of 25 m or less, however those further north occur with higher relief of up to 100 m.
- Areas below 50 and 25 m in relief away from the coast tend to have network dunes – like by the coast, but also star dunes such as those found 25°S and 15.7°S.
- Sand dunes group in distinct bands, especially grouped by longitude – majority of linear dunes between 15°E and 16°S.
- Highest dunes (over 100 m) are found in a band between 24°S and ~25 °S although some small pockets around ~23.5 °S. the highest dunes are often seif dunes.
- Network dunes are found further south on the map and dendritic tend to be found further north.

Question	Part	Marking guidance	Total marks
07		<p>Assess the extent to which desertification threatens sustainable development in an area you have studied.</p> <p>AO1 – Knowledge and understanding of desertification. Knowledge and understanding of a case study at a local scale where desertification has occurred.</p> <p>AO2 – Application of knowledge and understanding of how desertification processes threaten sustainable development. Students may apply their ideas to areas they have studied.</p>	<p>9</p> <p>AO1=4 AO2=5</p>

Level	Marks	Descriptor
3	7–9	<p>AO1 – Demonstrates detailed knowledge and understanding of desertification. Detailed ideas on the links between desertification and threats to sustainable development.</p> <p>AO2 – Applies knowledge and understanding to the novel situation, offering detailed analysis and evaluation, drawn appropriately from the context provided. Connections and relationships between different aspects of study are thorough and relevant.</p>
2	4–6	<p>AO1 – Demonstrates knowledge and understanding of desertification. Clear ideas on the links between desertification and threats to sustainable development.</p> <p>AO2 – Applies knowledge and understanding to the novel situation, offering clear analysis and evaluation, drawn appropriately from the context provided. Connections and relationships between different aspects of study are evident and relevant.</p>
1	1–3	<p>AO1 – Demonstrates basic knowledge and understanding of desertification. Basic ideas on the links between desertification and threats to sustainable development.</p> <p>AO2 – Applies limited knowledge and understanding to the novel situation, offering some basic analysis and evaluation, drawn from the context provided. Connections and relationships between different aspects of study are basic and of limited relevance.</p>
0	0	No creditable content.

Indicative Content

AO1

- Desertification is the degradation of land and the destruction of its biological potential.
- Desertification turns marginal land, often on the edges of existing deserts into wasteland.
- Desertification changes the extent and distribution of hot deserts.
- Climate change and population growth are some of the major causes of desertification leading to over farming and unsustainable land use techniques.
 - Eg increased sheep farming in the Baida region of Jordan has reduced land and soil quality.
- Knowledge of a case study at a local scale where desertification has occurred.
- Knowledge and understanding of the interaction of processes threatening areas subject to desertification.
 - Eg soil erosion reducing the ability of farm land to maintain water, increased irrigation makes the land more saline, this reduces the soil's ability to bind together, which makes the soil looser and more prone to erosion.
- Knowledge and understanding of the threats to human populations from desertification and alternative futures for local populations.
 - Eg Less productive soils increase migration and put pressure on other areas – such as the rural depopulation of the Baida region in Jordan.
 - Eg less productive soils encourage some to implement conservation strategies such as drip irrigation and zero tillage farming.
- Knowledge of implication of desertification for sustainable development.

AO2

- A clear explanation of the influence that desertification has on the case study.
 - Eg Reduced soil quality has led to over farming techniques movement in Zinder, Niger whereby populations have increased irrigation of land and made it more saline.
- A clear explanation of the links between the causes and impacts of desertification.
- Sustainable development and desertification should be linked clearly within the case study.
 - Eg In the Baida region of Jordan the Tal Rimah Rangeland Restoration Project was initiated to ask herders to reduce sheep grazing; bunds were built to reduce water loss; drought tolerant vegetation was planted. The aim of the project was to support populations to survive and thrive in this region and reduce population loss. The project ensured farmers were able to make a living from their land and increased the biodiversity of the region.
 - Eg Collection of fuelwood was a major cause of desertification in Zinder, Niger. The introduction of solar ovens has reduced the need for fuelwood collection for these populations. This has maintained greater land cover and forest and reduced the erosion of the fragile soil underneath.
- Critical assessment of whether desertification does threaten sustainable development in the case study chosen.
- Other factors could be discussed (such as resilience, mitigation and adaptation).
- An assessment of whether desertification does threaten sustainable development using examples to justify this.

Question	Part	Marking guidance	Total marks
08		<p>For a hot desert environment you have studied, assess the extent to which the climatic characteristics influence the landforms found there.</p> <p>AO1 – Knowledge and understanding of arid landscape development and a case study of a hot desert environment. Knowledge and understanding of deserts as natural systems; arid geomorphological processes and the roles of wind and water.</p> <p>AO2 – Application of knowledge and understanding to analyse the influence of climatic characteristics in shaping hot desert environments.</p>	<p>20</p> <p>AO1=10 AO2=10</p>

Level	Marks	Descriptor
4	16–20	<p>AO2 – Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question.</p> <p>AO2 – Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout.</p> <p>AO2 – Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts.</p> <p>AO1 – Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout.</p> <p>AO1 – Full and accurate knowledge and understanding of key concepts and processes throughout.</p> <p>AO1 – Detailed awareness of scale and temporal change which is well integrated where appropriate.</p>
3	11–15	<p>AO2 – Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question.</p> <p>AO2 – Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding.</p> <p>AO2 – Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts.</p> <p>AO1 – Generally clear and relevant knowledge and understanding of place(s) and environments.</p> <p>AO1 – Generally clear and accurate knowledge and understanding of key concepts and processes.</p> <p>AO1 – Generally clear awareness of scale and temporal change which is integrated where appropriate.</p>

2	6–10	<p>AO2 – Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question.</p> <p>AO2 – Some partially-relevant analysis and evaluation in the application of knowledge and understanding.</p> <p>AO2 – Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts.</p> <p>AO1 – Some relevant knowledge and understanding of place(s) and environments which is partially relevant.</p> <p>AO1 – Some knowledge and understanding of key concepts, processes and interactions and change.</p> <p>AO1 – Some awareness of scale and temporal change which is sometimes integrated where appropriate. There may be a few inaccuracies.</p>
1	1–5	<p>AO2 – Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question.</p> <p>AO2 – Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence.</p> <p>AO2 – Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts.</p> <p>AO1 – Very limited relevant knowledge and understanding of place(s) and environments.</p> <p>AO1 – Isolated knowledge and understanding of key concepts and processes.</p> <p>AO1 – Very limited awareness of scale and temporal change which is rarely integrated where appropriate. There may be a number of inaccuracies.</p>
0	0	No creditable content.

Indicative Content

AO1

- Knowledge of current distributions of hot desert environments and their margins – found close to the tropics, margins are around the edges of deserts, in continental interiors and/or on the leeward side of mountain ranges.
- Knowledge of the climatic characteristics of hot desert environments: high diurnal temperature range, low levels of precipitation, high insolation, macro, meso and micro scale winds.
- Knowledge of the climatic characteristics of a hot desert environment to illustrate climatic characteristics.
 - Eg Thar desert.
 - Precipitation ranges from 100 mm or less in the west to 500 mm in the East: the Eastern Thar desert is semi-arid and becomes increasingly arid until the Western Thar which is classed as hyper arid.
 - Between 75–90% of the annual rainfall occurs during the Indian monsoon from July to September.
 - The prevailing wind in the northeast monsoon – a dry wind.
 - Temperatures are hottest between May and June and extreme highs of 45 °C can occur, a range of 40 °C from the coolest temperatures of 5 °C in the months of December and January.
 - The Thar desert experiences frequent sand and dust storms of up to 140 km/h.
- Knowledge of distinctively arid geomorphological processes.
- Knowledge of the role of wind and water in causing erosion, transportation and deposition.
- Knowledge of arid landscape development, including the development of sand dunes, deflation hollows, wadis and playas.
- The interactions between climate and geomorphic and aridity processes.
- The interactions between arid landscape development, processes and climate.
- Understanding of the relationship between time, processes, landforms and landscape within mid and low latitude settings.

AO2

- Analysis of the role that the climate has on geomorphological processes operating in an arid area.
- Analysis of how climate characteristics influence both geomorphological processes and the role of water and wind.
- An assessment of the influence of climate characteristics in creating the hot desert environment setting.
- Analysis of how climate shapes processes and influences the landforms and landscapes found in the hot desert environment setting.
- Assessment of the specific aridity causing processes and the scale of their influence in shaping the hot desert landforms and landscapes.
- Comparison and analysis of the different factors shaping the landforms and landscapes within the hot desert environment.
 - Eg Thar desert.
 - Sand dunes in the central Thar are created by the arid climate. The lack of precipitation leads to hyper arid and arid conditions. This creates a loose soil substrate and limited vegetation. Aeolian erosion and transportation cause sand to be blown into smaller sheltered areas in the central Thar and create sand seas and parabolic sand dunes.
 - The Aravalli Range in the south-eastern Thar desert region consists of large mountains. Other non-climatic processes have shaped these and these are relict features from previous tectonic activity. Whilst transported sand creates striations and intermittent rainfall in the seasonal streams

such as the Luni erode minor wadis into the surface, the major factor shaping these is not the climate characteristics.

- The Rann of Kutch in the Thar desert experiences periods of rainfall. Here exists a salt marsh formed by the episodic rainfall and high levels of evaporation and insolation. This landscape is very much determined by the Thar desert's climatic characteristics.
- Examples used to analyse the influence of climatic characteristics on hot desert environment landforms.
- Case study of a hot desert environment setting to illustrate and analyse key themes: desert climatic characteristics, geomorphological processes, the roles of wind and water, origin and development of landforms of mid and low latitude deserts.
- A conclusion of the influence of climatic characteristics as a factor shaping landscapes and landforms of a hot desert environment.

Assessment Objective grid

	AO1	AO2	AO3	Total
Section A				
01.1	1			1
01.2	1			1
01.3	1			1
01.4	1			1
01.5	1			1
02			6	6
03	4	5		9
04	10	10		20
Section B				
05.1	1			1
05.2	1			1
05.3	1			1
05.4	1			1
05.5	1			1
06			6	6
07	4	5		9
08	10	10		20
Unit total	38	30	12	80