

INTERNATIONAL A-LEVEL GEOGRAPHY GG03

Paper 3 Physical Geography 2

Mark scheme

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Version: 1.0 Final



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

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

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International A-level 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 – Water, Carbon and Life on Earth

Total for this section: 40 marks

Question	Part	Marking guidance	Total marks
01	1	<p>‘Water travels down tree trunks or plants towards the soil.’</p> <p>This is a definition of which of the following?</p> <p>Key – D: Stemflow</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
01	2	<p>Which of the following are <u>all</u> human factors driving change in the carbon cycle over time?</p> <p>Key – A: Car exhaust emissions; deforestation; farming practices</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
01	3	<p>In which of the following is most of the Earth’s fresh water stored?</p> <p>Key – B: Cryosphere</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
01	4	<p>Which of the following describes respiration?</p> <p>Key – B: Carbon from living plants and animals is transferred to the atmosphere.</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
01	5	<p>Which of the following increases overland flow within a drainage basin system?</p> <p>Key – C: Heavy rain exceeding infiltration capacity of the soil</p>	<p>1</p> <p>AO1=1</p>

Question	Part	Marking guidance	Total marks
02		Analyse the information in Figure 1.	6 AO3=6

Level	Marks	Descriptor
2	4–6	AO3 – Clear selection and analysis of the evidence that has been provided which makes appropriate use of data to support. Clear patterns and/or connections made between different aspects of the data.
1	1–3	AO3 – Some basic selection and analysis of the evidence that has been provided which makes limited use of data to support. Basic or limited patterns and/or connections made between different aspects of the data.
0	0	No creditable content.

Indicative Content

This question requires the candidate to analyse the figure and compare the size and/or the proportions of carbon stored in soil, plant and animal life across biomes. This may include manipulation of the data to directly compare rather than just provide descriptive analysis.

AO3

- Wetlands biomes are by far the biggest stores of carbon, with over 60% more carbon per hectare than the next largest biome Boreal forests.
- Wetlands biomes carbon stores are significantly larger still than the 5 biomes with the lowest store values by 128 tonnes of carbon per hectare.
- Cropland has the smallest proportion of carbon stored per hectare in the soil at 2%, or conversely has the largest proportion of carbon stored per hectare in plants and animals at 98%.
- An overall trend exists in that plant and animal life proportionally stores more carbon than the soil across biomes, with the notable exception of Tropical forests where the proportions are similar.
- A trend could also be identified that forest biomes generally have higher proportions of soil carbon storage per hectare.

Question	Part	Marking guidance	Total marks
03		<p>Explain how land use change can affect the water cycle.</p> <p>AO1 – Knowledge and understanding of changes that can occur to the water cycle through land use change.</p> <p>AO2 – Application of knowledge and understanding to explain how land use change can affect water cycles. This may be at one or a variety of scales and over a variety of timescales. Application of knowledge and understanding to consider changes to transfers and/or stores.</p>	<p>9</p> <p>AO1=4 AO2=5</p>

Level	Marks	Descriptor
3	7–9	<p>AO1 – Demonstrates detailed knowledge and understanding of land use change and the resultant effects on the water cycle.</p> <p>AO2 – Applies knowledge and understanding to the novel situation, offering detailed explanation, 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 land use change and the resultant effects on the water cycle.</p> <p>AO2 – Applies knowledge and understanding to the novel situation, offering clear explanation, 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 land use change and the resultant effects on the water cycle.</p> <p>AO2 – Applies limited knowledge and understanding to the novel situation, offering some basic explanation. Connections and relationships between different aspects of study are basic with limited relevance.</p>
0	0	No creditable content.

Indicative Content

This question requires links to specifically human practices that can result in water cycle change. This may be through direct land use change or indirect links such as human activity that continues after land use change. Candidates may use a diagram to reference these changes including size of transfer or store changes.

AO1

- Knowledge and understanding of the water cycle on a variety of scales.
- Knowledge and understanding of stores within the water cycle.
- Knowledge and understanding of transfers within the water cycle.
- Understanding of the changes in magnitude of water cycle stores.
- Knowledge and understanding from other areas of the specification if accurate and relevant to the question.

AO2

- Explained changes to the water cycle may be at a variety of scales, including global changes or local changes.
- Urbanisation may feature as a main driving factor that reduces infiltration, increases overland flow and makes flooding more likely. Reference to reduced soil water and groundwater stores may also feature. This could be approached from a global context of increased urban areas across the world or from a local perspective where smaller scale water cycle systems are affected.
- Deforestation may feature as the removal of trees leads to increased surface runoff and soil erosion which may in turn reduce soil water stores. Conversely afforestation projects would see the opposite occur and should be creditworthy.
- Indirect consequences of land use change are creditworthy; greater water abstraction as a result of land use change to urban areas for example.

Question	Part	Marking guidance	Total marks
04		<p>‘Human activity in tropical rainforests can cause environmental change, affecting the carbon cycle.’</p> <p>Evaluate the extent to which you agree with this statement.</p> <p>Use one or more examples you have studied to support your answer.</p> <p>AO1 – Knowledge and understanding of environmental change and of the carbon cycle and how it functions within tropical rainforests. Knowledge and understanding of how human activity alters the carbon cycle and understanding of the impact of these changes.</p> <p>AO2 – Application of knowledge and understanding to evaluate the extent to which human activity causes environmental change and may alter the carbon cycle within tropical rainforest regions. Application of knowledge and understanding as to what the further ramifications are to these changes on a variety of scales and timeframes supporting with an example. Application of knowledge and understanding to draw conclusions on this issue.</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

The question requires links to be made between specific human activity within tropical rainforests and stores and flows within the carbon cycle. Application of knowledge and understanding needs to be evident to evaluate the role of each human activity referred to and the resultant changes they make at a variety of scales where applicable. This may include where human activity has a minimal impact on environmental change and the carbon cycle. The candidate should be referring to an example to support their knowledge and understanding of human activity and apply their knowledge and understanding by evaluating the extent to which this activity is causing both changes to the carbon cycle, but also environmental changes. Some candidates may use multiple examples and these will be credited. Max Level 2 if responses only cover either environmental change or effects on the carbon cycle.

AO1

- Knowledge and understanding of environmental change, including habitat loss or ecosystem disruption, soil erosion, changes in rainfall patterns or waterway pollution.
- Knowledge and understanding of the carbon cycle, including key processes such as respiration and decomposition.
- Knowledge and understanding of human activities that exist within tropical rainforests.
- Knowledge and understanding of resultant environmental changes such as climate change.
- Knowledge and understanding of one or more examples to support their response.
- Knowledge and understanding from other areas of the specification if accurate and relevant to the question.

AO2

- Evaluation of environmental change, including habitat loss or ecosystem disruption, soil erosion, changes in rainfall patterns or waterway pollution.
- Evaluation of habitat loss or ecosystem disruption is creditable – lack of ecosystem resilience in terms of plant or animal diseases and how this might affect indigenous cultures.
- Evaluation of soil erosion including landslides, tree loss, and leaching that is at an increased rate due to greater runoff or overland flow from exposed ground that receives more rainfall.
- Evaluation of soil erosion as soil becomes compacted due to a lack of interception from trees that would regulate the water reaching the ground more slowly.
- Evaluation of waterway pollution and the effects on river organisms.
- Evaluation of changes in rainfall patterns due to tree loss that creates less predictable rainfall in areas of deforestation as temperature and humidity levels are changed.
- Evaluation of the importance of the carbon cycle in a healthy tropical rainforest; the role of trees in carbon fixing through photosynthesis, leaf litter and root cell respiration in returning carbon to the Earth as carbon storage.
- Evaluation of deforestation as a key driver of carbon cycle change in tropical rainforest regions. The candidate may focus on common clearing and its resultant effects of increased carbon emissions through burning, lack of photosynthesis, reduction in respiration, carbon washing into the ground/streams, the absence of decomposers or increased risk of wildfires.
- Evaluation of the activity that replaces tropical rainforest, be it agriculture, mining, transportation links or settlement. Each activity may affect the carbon cycle at a different magnitude, with agriculture reintroducing stores and flows but at a much more reduced capacity/magnitude.
- Evaluation of activities that minimise impacts on the carbon cycle, such as selective logging and replanting.
- Evaluation of mitigation attempts such as carbon farming and regional carbon offsetting.

- A conclusion will be based on an example or examples referred to and may evaluate impacts on a variety of scales (local to global) and may also recognise the rate of human activity and how this may be increasing over time.

Section B – Ecosystems Under Stress

Total for this section: 40 marks

Question	Part	Marking guidance	Total marks
05	1	Which of the following defines biomass? Key – D: The total weight of living organisms per unit area	1 AO1=1

Question	Part	Marking guidance	Total marks
05	2	Which of the following are <u>both</u> potential impacts of declining biodiversity on human life? Key – C: Fewer opportunities for medical advances and increased food insecurity	1 AO1=1

Question	Part	Marking guidance	Total marks
05	3	Which of these would <u>both</u> provide ideal conditions for coral reef development? Key – C: Alkaline water and unpolluted water	1 AO1=1

Question	Part	Marking guidance	Total marks
05	4	When does a sub-climax community exist? Key – A: When vegetation succession is paused from reaching climatic climax	1 AO1=1

Question	Part	Marking guidance	Total marks
05	5	Which of the following is a definition of a trophic level? Key – D: The position of animals or plants within the structure of an ecosystem	1 AO1=1

Question	Part	Marking guidance	Total marks
06		Analyse the information shown in Figure 2a and Figure 2b.	6 AO3=6

Level	Marks	Descriptor
2	4–6	AO3 – Clear selection and analysis of the evidence that has been provided which makes appropriate use of data to support. Clear connections between different aspects of the data.
1	1–3	AO3 – Some basic selection and analysis of the evidence that has been provided which makes limited use of data to support. Basic or limited connections between different aspects of the data.
0	0	No creditable content.

Indicative Content

This question requires analysis of a bar graph of habitat change for all species by region and a map broken down by country. Some countries are labelled onto the map. Answers should refer to the overall pattern and key trends, including any specific anomalies or areas where there is habitat gain. Credit references that use both figures to determine an overall pattern.

AO3

- The overall pattern is of general worldwide decline, as is apparent in the World statistic of -5.79%.
- The most affected region is Sub-Saharan Africa with the majority of countries in the -10% – -15% category, with Ethiopia, Tanzania and Ivory Coast in the -15% – -20% category. The same category is also evident for Haiti.
- The entirety of Africa is suffering habitat loss of varying extent.
- Parts of South America exist within the -5% – -10% category which represents the majority of the continent's land mass. The most common category is that of 0% – -5%, including most of Europe, Asia and North America.
- Possible habitat increase could also be noted in Russia, Kazakhstan, Mongolia and Australia.
- South and East Asia's land mass is also predominantly in the 0% – -5% category however Russia and several other nations are showing gain.
- The rate of habitat loss is significantly higher in North and Latin America than in South and East Asia or North Africa.
- Candidates should use both figures – they might note, for example, that the sheer size of loss on a global scale can be mostly attributed to Africa but comment on the fact that areas of gain affect the figures for different regions.

Question	Part	Marking guidance	Total marks
07		<p>Assess the challenges and opportunities presented by the sustainable development of an ecosystem at a local scale.</p> <p>Use a case study to support your answer.</p> <p>AO1 – Knowledge and understanding of the nature and properties of the ecosystem and human impacts that are evident on that ecosystem.</p> <p>AO2 – Application of knowledge and understanding to assess how human activity in the named local ecosystem is attempting sustainable development. At least one case study is required to exemplify points made with responses specific to the named case study.</p>	<p>9</p> <p>AO1=4 AO2=5</p>

Level	Marks	Descriptor
3	7–9	<p>AO1 – Demonstrates detailed knowledge and understanding of the nature and properties of the ecosystem at a local scale and human impacts that are evident on that ecosystem.</p> <p>AO2 – Applies knowledge and understanding to the ecosystem at a local scale, offering detailed examination drawn appropriately from the context provided. Challenges and opportunities both examined in detail but with no requirement for balance.</p>
2	4–6	<p>AO1 – Demonstrates clear knowledge and understanding of the nature and properties of the ecosystem at a local scale and human impacts that are evident on that ecosystem.</p> <p>AO2 – Applies knowledge and understanding to the ecosystem at a local scale, offering clear examination drawn appropriately from the context provided. Challenges and/or opportunities examined clearly.</p>
1	1–3	<p>AO1 – Demonstrates basic knowledge and understanding of the nature and properties of the ecosystem at a local scale and human impacts that are evident on that ecosystem.</p> <p>AO2 – Applies limited knowledge and understanding to the ecosystem at a local scale, offering some basic examination drawn appropriately from the context provided. Challenges and/or opportunities examined in a limited manner.</p>
0	0	No creditable content.

Indicative Content

The response to this question largely depends upon the ecosystem at a local scale the candidate has used to explore sustainable development in ecosystems. Knowledge and understanding will be evident through information about the ecosystem, where the emphasis must be on attempts made at development in a sustainable manner. Application of knowledge and understanding will be evident through examination of challenges and opportunities that relate to that ecosystem and the human activity therein. Max Level 2 if example chosen is not at a local scale.

AO1

- Knowledge and understanding of the nature and properties of the ecosystem at a local scale.
- Knowledge and understanding of challenges the ecosystem at a local scale might present in context with efforts being made to sustainably develop it.
- Knowledge and understanding of opportunities the ecosystem at a local scale might present in context with efforts being made to sustainably develop it.
- Knowledge and understanding of the human activity in terms of sustainable development and its impacts on the ecosystem at a local scale.

AO2

- Application of knowledge and understanding will depend greatly on the ecosystem at a local scale in terms of both the nature and properties of the ecosystem and how sustainable development might create challenges and opportunities.
- Application of knowledge and understanding related to tourism may factor heavily in responses and the challenges and opportunities presented through sustainable tourism. Human permanence in terms of inhabiting a local ecosystem may factor, such as sustainable agriculture/farming practices or planning controls that ban harmful development.
- Focus may be on moorland, where the upland/lowland peat areas may see rewetting through drainage channel blocking or restoration work to increase bird nesting. Responses may include a sustainable tourism focus, such as reviewing path quality and monitoring visitor access. Heather management such as swaling and natural grazing, gorse/shrub/bracken management and mire restoration are aspects that candidates may refer to in their examination of the ecosystem.
- Focus may be on coral reefs, largely to include reef protection and the conditions required for further growth but may include artificial reef strategies. This may include local agreements to protect fishing rights on a limited scale, reserves to replenish species such as crabs or limitations on tourist activity. Tourist activity may refer to diving, anchoring or deeper-hulled boats but equally economic activity in terms of mining, fishing and marine discard are equally creditworthy if examination is made as to how these challenges manifest.
- Focus may be on the savanna, largely to examine the implications of agriculture and tourism. Strategies including removal of dual-grazing rights, bans on burning practices and community-based fallow initiatives to keep grasslands intact or even restriction on domestic cattle grazing. Eco-tourism in terms of reduced use of vehicles to reduce soil erosion, safe rubbish disposal to avoid wild animal scavenging which can introduce toxins into the ecosystem or reduced times of activity to encourage hunting and mating behaviours amongst animals are creditworthy.
- Focus may be on tropical rainforests, largely to examine the implications of agriculture and settlement. Strategies including selective logging of mature trees or those of less ecological value to encourage growth of others, replanting to replenish stocks, conservation or eco-tourism are creditworthy.

Question	Part	Marking guidance	Total marks
08		<p>‘Human exploitation has a greater impact on the savanna grassland biome than climate change does.’</p> <p>To what extent do you agree with this statement?</p> <p>Use one or more examples you have studied to support your answer.</p> <p>AO1 – Knowledge and understanding of the impact that climate change has on the savanna grassland biome. Knowledge and understanding of the impact that human exploitation has on the savanna grassland biome. Knowledge and understanding of changes to the savanna grassland biome caused by both climate change and human exploitation. Global warming may feature here but a range of scales and different savanna biomes may be used to exemplify points made.</p> <p>AO2 – Application of knowledge and understanding to assess the relative impact of climate change compared to human exploitation in a savanna grassland biome context. Application of knowledge and understanding to show an appreciation of the complex interaction of climate change and human exploitation and how other factors have a role to play too such as wildfires or large-scale natural disease outbreaks.</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

The scale could be global, although local examples are applicable too so candidates could look at a range of impacts over one savanna biome or use a number of savanna biomes. They must clearly show the impact of climate change and human exploitation such as deforestation, mining or settlement and make a reasoned judgement in response to the question.

AO1

- Knowledge and understanding of the impact of human exploitation through population growth and the spread of ranching.
- Awareness of the impact of human exploitation through overgrazing.
- Knowledge and understanding of positive feedback loops.
- Knowledge and understanding of the impact of human exploitation through attempts to create better land for grazing.
- Awareness of the impact of human exploitation through domestic cattle grazing as opposed to commercial grazing.
- Awareness of poaching as a threat to the biome.
- Knowledge and understanding of the impact of climate through changes in rainfall patterns or variability.
- Knowledge and understanding of the impact of climate change through increased tree cover.
- Knowledge and understanding of the impact of climate change through increased temperatures. This can increase the frequency and severity of droughts and therefore increase desertification rates, as well as increasing the likelihood of natural wildfires. Temperature change can also alter migration routes for birds and animals alike.

AO2

- Application of knowledge and understanding of the impact of human exploitation through population growth and the spread of ranching resulting in habitat loss and reduced wildlife populations.
- Evaluation of the effects of overgrazing, and the distinction between commercial, domestic or nomadic grazing in increasing soil erosion and reducing biodiversity.
- Application of knowledge and understanding of positive feedback loops with the regard to vegetation reduction increasing soil erosion.
- Application of knowledge and understanding in use of fire to clear areas of dead vegetation and its resultant effects.
- Evaluation of tourism on the savannah biome including building of infrastructure, change in animal behaviour and use of vehicles.
- Evaluation of poaching as a threat to biodiversity and long-term sustainability of the biome.
- Analysis of rainfall patterns or variability that may include increased storm events, reduced grazing lands for wildlife or drier conditions.
- Evaluation of how increased tree cover could exacerbate global warming and worsen the biome's condition.
- Application of knowledge and understanding of the impact of climate change through increased temperatures that may include drought severity/duration, wildfire increase or changes in animal and bird migratory routes.
- Critical assessment of the fact that climate change has been enhanced by human exploitation through the increasing production of greenhouse gases. Consequently, climate change and human exploitation are linked and this should be acknowledged in the response.

- Critical assessment of the differences in the rate and scale of the impacts from climate change and human exploitation. Climate change is a slower process, but at a global scale and so its effects are more difficult to control as ablation rates accelerate. The changes in the seasons and the advance of invasive species.
- Consideration that human exploitation tends to be a much faster process, but usually on a smaller scale, however the cumulative effect of many types of human exploitation, such as cattle ranching and logging require much larger areas of land and are also rapid. This is not just going on in one country, but many countries simultaneously so there is a cumulative and often increasing rate of effect.
- Critical assessment of the future changes that may occur. Global warming is likely to be the biggest threat to the savanna biome, with many areas seeing a reduction in wildlife, more unpredictable rainfall and increased soil erosion. Climate change is therefore a greater impact than human exploitation.
- A justified and supported conclusion based on their written evidence that either climate change or human exploitation has a greater impact on the savanna biome, or indeed both equally. There should be recognition, however, that climate change has been accelerated by human exploitation creating positive feedback loops through deforestation and urbanisation. The overall conclusion that the savanna biome is naturally in a state of dynamic equilibrium but that human exploitation interferes with this process is key to a successful response.
- Some students may also make cross-topic links, which should also be credited.

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