GCE

Geography

H481/03: Geographical debates

A Level

Mark Scheme for June 2023

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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MARKING INSTRUCTIONS

- Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM assessor Online Training*; *OCR Essential Guide to Marking*.
- Make sure that you have read and understood the mark scheme and the question paper for this unit. These are posted on the RM Cambridge Assessment Support Portal http://www.rm.com/support/ca
- Log-in to RM assessor and mark the **required number** of practice responses ("scripts") and the **number of required** standardisation responses.

  YOU MUST MARK 5 PRACTICE AND 10 STANDARDISATION RESPONSES BEFORE YOU CAN BE APPROVED TO MARK LIVE SCRIPTS.

MARKING

- Mark strictly to the mark scheme.
- Marks awarded must relate directly to the marking criteria.
- The schedule of dates is very important. It is essential that you meet the RM assessor 50% and 100% deadlines. If you experience problems, you must contact your Team Leader without delay.
- If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone or the RM assessor messaging system, or by email.
- **Crossed Out Responses**
  Where a candidate has crossed out a response and provided a clear alternative then the crossed out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed out response where legible.

  Rubric Error Responses – Optional Questions
  Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

  Multiple Choice Question Responses
  When a multiple choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).
  When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses
When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only **one mark per response**)
Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth **two or more marks**)
If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space.)

Longer Answer Questions (requiring a developed response)
Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

- Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there then add a tick to confirm that the work has been seen.

- Award No Response (NR) if:
  - there is nothing written in the answer

  space Award Zero '0' if:

  - anything is written in the answer space and is not worthy of credit (this includes text and symbols).

  Team Leaders must confirm the correct use of the NR button with their markers before live marking commences and should check this when reviewing scripts.

- The RM assessor **comments box** is used by your team leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**
  If you have any questions or comments for your team leader, use the phone, the RM assessor messaging system, or e-mail.

- Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

- For answers marked by levels of response: Not applicable in F501

1. **To determine the level** – start at the highest level and work down until you reach the level that matches the answer
2. **To determine the mark within the level**, consider the following:

Descriptor	**Award mark**
On the borderline of this level and the one below	At bottom of level
Just enough achievement on balance for this level	Above bottom and either below middle or at middle of level (depending on number of marks available)
Meets the criteria but with some slight inconsistency	Above middle and either below top of level or at middle of level (depending on number of marks available)
Consistently meets the criteria for this level	At top of level

- **Annotations**

Annotation	Meaning
	Highlight
	Off page comment
^	Omission mark
?	Unclear or Indicates material for which there is no credit
R	Rubric error placed at start of response not being counted
L1	Level 1
L2	Level 2
L3	Level 3
L4	Level 4
S	Synoptic link
DEV	Development of a point
IRRL	Significant amount of material which doesn't answer the question
SEEN	Used to denote that points had been seen and noted but mostly where credit was given
NE	No place specific detail
	Highlighting an issue e.g. irrelevant paragraph. Use in conjunction with another stamp e.g. IRRL or EVAL
BP	Blank page
EVAL	Evaluation

- **Subject Specific Marking Instructions**

INTRODUCTION
Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

1. the specification, especially the assessment objectives
2. the question paper and its rubrics
3. the mark scheme.

You should ensure that you have copies of these materials.

You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet **Instructions for Examiners**. If you are examining for the first time, please read carefully **Appendix 5 Introduction to Script Marking: Notes for New Examiners**.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

USING THE MARK SCHEME

Please study this Mark Scheme carefully. The Mark Scheme is an integral part of the process that begins with the setting of the question paper and ends with the awarding of grades. Question papers and Mark Schemes are developed in association with each other so that issues of differentiation and positive achievement can be addressed from the very start.

This Mark Scheme is a working document; it is not exhaustive; it does not provide 'correct' answers. The Mark Scheme can only provide 'best guesses' about how the question will work out, and it is subject to revision after we have looked at a wide range of scripts.

Please read carefully all the scripts in your allocation and make every effort to look positively for achievement throughout the ability range. Always be prepared to use the full range of marks.

LEVELS OF RESPONSE QUESTIONS:

The indicative content indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance.

Using 'best-fit', decide first which set of level descriptors best describes the overall quality of the answer. Once the level is located, adjust the mark concentrating on features of the answer which make it stronger or weaker following the guidelines for refinement.

Highest mark: If clear evidence of all the qualities in the level descriptors is shown, the HIGHEST Mark should be awarded.

Lowest mark: If the answer shows the candidate to be borderline (i.e. they have achieved all the qualities of the levels below and show limited evidence of meeting the criteria of the level in question) the LOWEST mark should be awarded.

Middle mark: This mark should be used for candidates who are secure in the level. They are not 'borderline' but they have only achieved some of the qualities in the level descriptors.

Be prepared to use the full range of marks. Do not reserve (e.g.) highest level marks 'in case' something turns up of a quality you have not yet seen. If an answer gives clear evidence of the qualities described in the level descriptors, reward appropriately.

Quality of extended response will be assessed in questions marked with an (*). Quality of extended response is not attributed to any single assessment objective but instead is assessed against the entire response for the question.

	AO1	**AO2**	**AO3**	**Quality of extended response**
Comprehensive	A wide range of detailed and accurate knowledge that demonstrates fully developed understanding that shows full relevance to the demands of the question. Precision in the use of question terminology.	Knowledge and understanding shown is consistently applied to the context of the question, in order to form a: Clear, developed and convincing analysis that is fully accurate. Clear, developed and convincing interpretation that is fully accurate. Detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based.	Quantitative, qualitative and/or fieldwork skills are used in a consistently appropriate and effective way and with a high degree of competence and precision.	There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.

Thorough	A range of detailed and accurate knowledge that demonstrates well developed understanding that is relevant to the demands of the question. Generally precise in the use of question terminology.	Knowledge and understanding shown is mainly applied to the context of the question, in order to form a: Clear and developed analysis that shows accuracy. Clear and developed interpretation that shows accuracy. Detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence.	Quantitative, qualitative and/or fieldwork skills are used in a suitable way and with a good level of competence and precision.	There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence.
	AO1	**AO2**	**AO3**	**Quality of extended response**
Reasonable	Some sound knowledge that demonstrates partially developed understanding that is relevant to the demands to the question. Awareness of the meaning of the terms in the question.	Knowledge and understanding shown is partially applied to the context of the question, in order to form a: Sound analysis that shows some accuracy. Sound interpretation that shows some accuracy. Sound evaluation that offers generalised judgments and conclusions, with limited use of evidence.	Quantitative, qualitative and/or fieldwork skills are used in a mostly suitable way with a sound level of competence but may lack precision.	There information has some relevance and is presented with limited structure. The information is supported by limited evidence.

Basic	Limited knowledge that is relevant to the topic or question with little or no development. Confusion and inability to deconstruct terminology as used in the question.	Knowledge and understanding shows limited application to the context of the question in order to form a: Simple analysis that shows limited accuracy. Simple interpretation that shows limited accuracy. Un-supported evaluation that offers simple conclusions.	Quantitative, qualitative and/or fieldwork skills are used inappropriately with limited competence and precision.	The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.

Question			Answer	Mark	Guidance
1	(a)		**Identify <u>three</u> limitations of <u>Fig. 1</u> as a source of information about the global energy balance.** The text describes changes in the global energy balance. Possible limitations include: • Validity of data/source uncertain as no information on qualifications of researchers • Lack of information on how data collected e.g. satellites / ground stations • Lack of information on the location of data collection • Time scale issues. • No raw data/absolute values. • The type of excess heat going into the ocean is not specified e.g., radiation, conduction. • No reference to effects of other factors on global heat distribution such as ocean depth, latitude, oceanic circulation, earth's albedo, seasonal variation – spatial variations. • No reference to causes of imbalance such as anthropogenic pollution of the atmosphere – increasing GHGs; • Ambiguous/ill-defined phrases and sentences, e.g., excess heat, industrial revolution. • No reference to rates of change or distributional change during the 47-year period.	**3** **AO3** **x3**	**AO3 – 3 marks** 3x1 (SEEN) for three limitations of the data identified through critical questioning of the resource. If 0 marks are recorded, ^ needs to be annotated at the end of the answer.

1	(b)		**Explain how increasing atmospheric water vapour influences the climate system.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of how increasing atmospheric water vapour influences the climate system (AO1). This will be shown by including **well-developed** ideas about how increasing atmospheric water vapour influences the climate system. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of how increasing atmospheric water vapour influences the climate system (AO1). This will be shown by including **developed** ideas about how increasing atmospheric water vapour influences the climate system. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of how increasing atmospheric water vapour influences the climate system (AO1). There may be **simple** ideas about how increasing atmospheric water vapour influences the climate system. **0 marks** No response or no response worthy of credit	**6** **AO1** **x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of how increasing atmospheric water vapour influences the climate system could potentially include: • Water vapour is a significant greenhouse gas • Traps energy radiated from the earth's surface contributing towards natural greenhouse effect • As the world warms, there is more evaporation increasing the amount of water vapour • Positive feedback occurs – warmer temperatures increases evaporation → increasing atmospheric water vapour → increased warming → increasing evaporation • Estimated that for every 1°C ↑ in temperature, water vapour levels double contributing a significant warming influence on the climate system • Water vapour transfers vast quantities of latent heat energy into atmosphere • More energy in atmosphere – when water vapour condenses, energy released • Some locations experience warmer, wetter conditions, some locations become drier. Some evidence of increasing frequency and severity of tropical storms / hurricanes / mid-latitude depressions. • Also, a possibility that ↑ water vapour to the atmosphere could → negative feedback. • ↑ water vapour → ↑ cloud formation. Clouds reflect sunlight so ↓ in amount of energy reaching Earth's surface. If solar warming ↓, then temperature of the Earth ↓ But cloud cover does mean more condensed water in the atmosphere, making for a stronger greenhouse effect than non-condensed water vapour alone – it is warmer on a cloudy winter day than on a clear one.

Question			Answer	Mark	Guidance
2	(a)		**Identify <u>three</u> limitations of <u>Fig. 2</u> as a source of information about the percentage of deaths caused by air pollution in South and East Asia, 2017.** Map shows % of deaths caused by air pollution in 2017 for the countries in South + East Asia. Possible limitations include: • Basic generic disadvantages of choropleth maps - relies on average for whole country - no abrupt change in figures at each national boundary; cliff edges - larger countries likely to conceal significant internal variation than smaller countries - high number of categories - absolute numbers not known. - difficult to distinguish shading - highest values should have densest shading. • No data source→ possible bias • Lack of information about regional differences e.g., urban v. rural contrasts within a country • Are %s of the deaths caused by air pollution in each country or of all of South + East Asia? • What deaths/disease count as 'caused by air pollution'? Reliability of data. • Lack of information of exact % of deaths/disease for each country • No information on distribution of deaths by age/gender (demographics). • Lack of information about levels + types of air pollution • Now six years out of date • Countries not named/some islands are missing e.g., Maldives. Hard to distinguish borders. • No information on economic status- AC/EDC/LIDC	**3** **AO3** **x3**	**AO3 – 3 marks** 3x1 (SEEN) for three limitations of the data identified through critical questioning of the resource. NOTE: Do not accept the resource should be in colour. Do not accept suggestions of other data presentation techniques. Focus should be on this resource. If 0 marks are recorded, ^ needs to be annotated at the end of the answer.

2	(b)		**Explain the socio-economic impacts of a non-communicable disease.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of the socio-economic impacts of a non-communicable disease (AO1). This will be shown by including **well-developed** ideas about the socio-economic impacts of a non-communicable disease. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of the socio-economic impacts of a non-communicable disease (AO1). This will be shown by including **developed** ideas about the socio-economic impacts of a non-communicable disease. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the socio-economic impacts of a non-communicable disease (AO1). There may be **simple** ideas about the socio-economic impacts of a non-communicable disease. **0 marks** No response or no response worthy of credit.	**6** **AO1 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of the socio-economic impacts of a non-communicable disease could potentially include: • **<u>Must be impacts</u>** of a disease on people + society. **Not** the causes of non-communicable disease. • Identification of non-communicable disease e.g. CVD + cancers • Healthcare, cost of NHS treatment, extra demand for staffing, equipment both for treatment, prevention and early diagnosis • Economy e.g. time off work, loss of income + tax. Possible benefit claims, costs of unpaid care. • Social position in society e.g. psychological impacts (social isolation, anxiety, mental health problems), early deaths. • Spatial impacts vary e.g. urban – rural; regional inequalities usually based on contrasts in wealth

Question			Answer	Mark	Guidance
3	(a)		**Identify <u>three</u> limitations of <u>Fig. 3</u> as a source of information about the relief of the Indian Ocean Basin.** The diagram shows the relief of the Indian Ocean Basin. Possible limitations include: • Locational information unclear/lacking. • Whole of Indian ocean is not represented. • No quantitative indication of depth; lack of information of relief scale • No horizontal scale to indicate size / dimensions of features. • No north arrow. • Key not clear; shades of blue / white give only generalised indication of relief – could easily be misinterpreted • Guyots/sea mounts, rifts, abyssal plains, island chains not identified • No plate boundaries are shown. • Lack of source.	3 AO3 x3	**AO3 – 3 marks** 3x1(SEEN) for three limitations of the data identified through critical questioning of the resource. If 0 marks are recorded, ^ needs to be annotated at the end of the answer.

3	(b)		**Explain the pattern of circulation in the North Atlantic Ocean.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of the pattern of circulation in the North Atlantic Ocean (AO1). This will be shown by including **well-developed** ideas about the pattern of circulation in the North Atlantic Ocean. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of the pattern of circulation in the North Atlantic Ocean (AO1). This will be shown by including **developed** ideas about the pattern of circulation in the North Atlantic Ocean. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the pattern of circulation in the North Atlantic Ocean (AO1). There may be **simple** ideas the pattern of circulation in the North Atlantic Ocean. **0 marks** No response or no response worthy of credit.	**6** **AO1 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of the pattern of circulation in the North Atlantic Ocean could potentially include: • Relatively warm saline water flows from Florida to NE Atlantic as the Gulf Stream/North Atlantic Drift. • As water cools in the Arctic, density ↑ and sinks. Flows back towards Equator as a deep-water current. Resurfaces c. 150 – 250 years later. • The cold Labrador current flows south from NW Atlantic. • North Atlantic gyre (circular ocean current) has the Gulf Steam as its western edge. Some water flows southwards past the Canary Islands as the Canary current. It then returns to the Caribbean as the North Atlantic Equatorial current. • There is an inflow of warm (13°C) salty (37.3ppm) water from the Mediterranean moving through the Straits of Gibraltar that is around 1000m deep, which eventually mixes both in terms of temperature and density • Potential disruption to N Atlantic circulation if vast quantities of fresh water released from land based ice on Greenland. Salinity decreases, sea water density decreases, flows disrupted.

Question			Answer	Mark	Guidance
4	(a)		**Identify <u>three</u> limitations of <u>Fig. 4</u> as a source of information about types of soil.** The table shows information about different types of soil. Possible limitations include: • Only info on texture and drainage • No data on other characteristics such as mineral content, water content, organic matter, pH, structure, depth • Lack of information for each soil type on ○ method of measuring texture ○ drainage descriptors including numerical data • Simplistic - percentages of each grain size should be a range for each soil type • No source – location information (where collected, time of day, year). • Drainage not defined. • Data better represented on a triangulation graph.	3 AO3 x3	**AO3 – 3 marks** 3x1 (SEEN) for three limitations of the data identified through critical questioning of the resource. If 0 marks are recorded, ^ needs to be annotated at the end of the answer.
4	(b)		**Explain why geographical pinch points exist in the food supply chain.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of why geographical pinch points exist in the food supply chain (AO1). This will be shown by including **well-developed** ideas about why geographical pinch points exist in the food supply chain. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of why geographical pinch points exist in the food supply chain (AO1).	6 AO1 x6	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of why geographical pinch points exist in the food supply chain could potentially include: • What the global supply chain is, i.e., how food gets from the farm to the table (production, processing, distribution and consumption. • Pinch points = places in supply chain where disruption often occurs. Found in every stage of the chain. • Food supply increasingly global, so chains subject to problems creating pinch points: • Political (Suez Canal closure, Brexit,

			This will be shown by including **developed** ideas about why geographical pinch points exist in the food supply chain. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of why geographical pinch points exist in the food supply chain (AO1). There may be **simple** ideas about why geographical pinch points exist in the food supply chain. **0 marks** No response or no response worthy of credit.		invasion of Ukraine), • Environmental (Iceland ash cloud, Australian drought, southern European supply of salad 2023), • Social (pandemic, panic buying) • Technological - The JIT (just-in-time) delivery system lowers resilience to pinch points - fuel protests in UK 2012 = transport disruption. Combined with reliance on third party logistics firms and low food stocks pinch points formed e.g., at farms where raw food was produced, regional distribution centres and retailers. Result = storage issues and increased waste. • Variety of scales can be discussed.

Question			Answer	Mark	Guidance

5	(a)		**Identify <u>three</u> limitations of <u>Fig. 5</u> as a source of information about the global economic cost of natural disasters.**
			
			The graph shows the cost of natural disasters as a % share of global GDP.
			
			Possible limitations include:
			• No source given.
			• Lack of information about;
			  • Definition of 'natural disaster'.
			  • What natural disasters are shown – may or may not include tectonic / climatic etc as well as distribution of natural disasters.
			  • Regions or specific countries that might be disproportionately affected → AC, EDC, LIDC
			  • Social, political or environmental costs ignored
			• Absolute financial costs not shown, only % of global GDP.
			• Covers only a relatively short 27-year period.
			• No specific figures placed at top of bars → difficult to read.
			• No recent data given – latest entry 2017.
			• Labelling has been changed/missed/intervals altered between 2014 and 2017.
			• On the y axis there is a large interval between the figures → difficult to read.
				3
				AO3 x3
					AO3 – 3 marks
					
					3x1 (SEEN) for three limitations of the data identified through critical questioning of the resource.
					
					If 0 marks are recorded, ^ needs to be annotated at the end of the answer.

5	(b)		**Explain how fossil record evidence supports the theory of continental drift.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of how fossil record evidence supports the theory of continental drift (AO1). This will be shown by including **well-developed** ideas about how fossil record evidence supports the theory of continental drift. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of how fossil record evidence supports the theory of continental drift (AO1). This will be shown by including **developed** ideas about how fossil record evidence supports the theory of continental drift. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of how fossil record evidence supports the theory of continental drift (AO1). There may be **simple** ideas about how fossil record evidence supports the theory of continental drift. **0 marks** No response or no response worthy of credit.	**6** **AO1 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of the evidence of fossil records in the theory of continental drift could potentially include: • Fossils are preserved traces of plants and animals found in the rock – show evidence of past conditions. • Theory of continental drift – that continents are mobile and have moved through time. Pangea/Gondwanaland/Laurasia have all broken up. • Similarity in fossil records across continents that are now widely spaced but once were adjacent e.g. similar fossil reptiles found in South America and South Africa + similar fossil brachiopods (marine shellfish) found in Australia and Indian limestone. • Examples could include: • Fossils from rocks younger than the Carboniferous period, in Australia and India, show fewer similarities – indicating different evolution pathways • Fossil remains of *Lystrosaurus,* a hippo-like reptile 200m years ago, the key index fossil of the Triassic in Africa, has been found 640km from the South Pole in Antarctica – evidence of previous land connection.

SECTION B – SYNOPTIC QUESTIONS

Question			Answer	Mark	Guidance

6			**Examine how climate change may influence human activity in <u>ONE</u> landscape system.**
			
			Level 4 (10-12 marks)
			Demonstrates **comprehensive** knowledge and understanding of climate change and human activity in ONE landscape system (AO1).
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide clear, developed and convincing analysis that is fully accurate of how climate change may influence human activity in ONE landscape system (AO2).
			
			This will be shown by including **well-developed** ideas about how climate change may influence human activity in ONE landscape system.
			
			There are clear and explicit attempts to make appropriate synoptic links between content from different parts of the course of study.
			
			Level 3 (7-9 marks)
			Demonstrates **thorough** knowledge and understanding of climate change and human activity in ONE landscape system (AO1).
			
			Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy of how climate change may influence human activity in ONE landscape system (AO2).
			
			This will be shown by including **well-developed** ideas **either** climate change **or** human activity in ONE landscape system and **developed** ideas for the other focus.
			
			There are clear attempts to make synoptic links between
				12
				AO1 x6
				AO2 x6
					Indicative content AO1 – 6 marks
					Knowledge and understanding of climate change and human activity in **<u>ONE</u>** landscape system could potentially include:
					• Climate change – majority of students likely to focus on warming climate, credit discussions on influences of colder climate.
					• Both negative + positive influences relevant.
					• Increase in surface, atmospheric and oceanic temperatures leading to:
					  ○ Shrinking of valley glaciers and ice sheets
					  ○ Rising sea level – eustatic change
					  ○ Increasing atmospheric water vapour and subsequent effect on rainfall patterns
					  ○ Extreme weather
					
					• Coastal or Glaciated or Dryland landscapes
					  For each landscape system, human activity is influenced by and responds to climate change in a variety of ways e.g.
					  ○ Coastal: economic developments such as ports / tourist resorts; management strategies
					  ○ Glaciated: resource extraction / buildings; energy production; tourism such as ski resorts
					  ○ Dryland: water storage; tourist activity; farming practices
					
					AO2 – 6 marks
					Application of knowledge and understanding to analyse how climate change may influence human activity in ONE landscape system could potentially include:
					• Coastal landscapes
					  ○ Increased temperatures, higher rates of evapotranspiration, more storms, more erosion and more tourism in some areas
					  ○ As sea levels rise so erosion rates increase requiring more frequent maintenance, or more engineering e.g., groynes at Sandbank may now

			the content from different parts of the course of study but these are not always appropriate. **Level 2 (4-6 marks)** Demonstrates **reasonable** knowledge and understanding of climate change and human activity in ONE landscape system (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide sound analysis that shows some accuracy of how climate change may influence human activity in ONE landscape system (AO2). This will be shown by including **developed** ideas about **either** climate change **or** human activity in ONE landscape system and **simple** ideas for the other focus. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of climate change and human activity in ONE landscape system (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how climate change may influence human activity in ONE landscape system (AO2). This will be shown by including **simple** ideas about climate change and human activity in ONE landscape system. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit.		have a reduced life span. ○ Isostatic uplift in some areas due to longer term + accelerated melting of land-based ice offers opportunities e.g. settlement sites, raised beaches for agriculture. ○ With ↑ surface + ocean temperatures, tourism may ↑ in coastal areas causing ↑ in economic activity and development. ○ Change in Arctic Sea ice, ice-free ports, new trade routes and port growth. ○ Impact of rising sea levels on socio-economic activity in low lying islands such as Maldives. • Glaciated landscapes ○ ↑ temperatures, ↑ rates of evapotranspiration, ↓ permafrost, reduction snow melt impact on buildings and HEP e.g. Alps + Himalayas. ○ ↑ temperatures ↓ snow cover and permafrost damaging building foundations and pipelines in Alaska where oil extraction takes place. ○ threats to indigenous groups food security / way of life in extreme environments such as the Arctic. • Dryland landscapes ○ Already areas of significant water stress. ○ ↑ temperatures, ↑ rates of evapotranspiration, ↑ frequency of droughts as ↓ snowfall, and ↓ river levels ○ Water shortages / rationing e.g., Colorado flow drops 9-30% so impassable for white water rafting. ○ Irrigation / domestic supplies stressed e.g., 40 million residents in Colorado catchment. ○ Wildlife impacted e.g. ↓ in Blue Heron numbers and ↓ in wildlife tourism ○ Impact on way of life in Sahel e.g., obtaining water supplies / food security. ○ Long distance human migration caused by environmental change e.g., Sahel If the response does not have one of the spec landscape systems, MAX top L1. Credit is for AO1, climate change.

Question			Answer	Mark	Guidance

7			**Examine how patterns of disease may be influenced by placemaking.**
			
			Level 4 (10-12 marks)
			Demonstrates **comprehensive** knowledge and understanding of patterns of disease and placemaking (AO1).
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide clear, developed and convincing analysis that is fully accurate of how patterns of disease may be influenced by placemaking (AO2).
			
			This will be shown by including **well-developed** ideas about the relationship between patterns of disease and placemaking.
			
			There are clear and explicit attempts to make appropriate synoptic links between content from different parts of the course of study.
			
			Level 3 (7-9 marks)
			Demonstrates **thorough** knowledge and understanding of patterns of disease and placemaking (AO1).
			
			Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy of how patterns of disease may be influenced by placemaking (AO2).
			
			This will be shown by including **well-developed** ideas about **either** patterns of disease **or** placemaking and **developed** ideas for the other focus.
			
			There are clear attempts to make synoptic links between the content from different parts of the course of study but these are not always appropriate.
				12
				AO1 x6
				AO2 x6
					Indicative content
					AO1 – 6 marks
					Knowledge and understanding of patterns of disease and placemaking could potentially include:
					• Patterns of disease
					  ○ Distributions of diseases
					  ○ Disease diffusion
					  ○ Physical and mental health
					• Placemaking - A process that aims to raise the quality/attractiveness of a place by:
					  ○ attracting inward investment and regeneration
					  ○ involving stakeholders such as design specialists, government (local and national) and community groups
					  ○ improving socio-economic factors that influence patterns of disease (housing, infrastructure)
					
					AO2 – 6 marks
					Application of knowledge and understanding to analyse how patterns of disease may be influenced by placemaking could potentially include:
					• Green space – promotes increased health
					• Influence of placemaking on patterns of disease is varied (positive and negative) and occurs at all scales (global to local, urban and rural) including
					  ○ Better health (physical and mental) of some so reduced incidence of diseases.
					  ○ Wealth polarisation – incidence of disease and life expectancy seen in different areas e.g. urban areas
					  ○ Manufacturing industry attracted to LIDCs/EDCs – increases health issues through increase in pollution.
					• Placemaking – often a process to improve infrastructure + environment and thus influencing patterns of disease e.g.
					  ○ Community placemaking

			Level 2 (4-6 marks) Demonstrates **reasonable** knowledge and understanding of patterns of disease and placemaking (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide sound analysis that shows some accuracy of how patterns of disease may be influenced by placemaking (AO2). This will be shown by including **developed** ideas about **either** patterns of disease **or** placemaking and **simple** ideas for the other focus. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of patterns of disease and placemaking (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how patterns of disease may be influenced by placemaking (AO2). This will be shown by including **simple** ideas about patterns of disease and placemaking. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit.		- health benefits of gyms, as well as cultural and social activities. - self-help schemes in urban squatter settlements or rural communities - improvements in housing quality, sanitation, water quality ○ Development – improved transport, more cars = more pollution.

Question			Answer	Mark	Guidance

8			**Examine how alterations to the oceans caused by climate change affect the water cycle.**
			
			Level 4 (10-12 marks)
			Demonstrates **comprehensive** knowledge and understanding of alterations to the oceans caused by climate change and the water cycle. (AO1).
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide clear, developed and convincing analysis that is fully accurate of how alterations to the oceans caused by climate change affect the water cycle (AO2).
			
			This will be shown by including **well-developed** ideas about the relationship between to the oceans caused by climate change and the water cycle.
			
			There are clear and explicit attempts to make appropriate synoptic links between content from different parts of the course of study.
			
			Level 3 (7-9 marks)
			Demonstrates **thorough** knowledge and understanding of alterations to the oceans caused by climate change and the water cycle (AO1).
			
			Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy of how alterations to the oceans caused by climate change affect the water cycle (AO2).
			
			This will be shown by including **well-developed** ideas about **either** alteration to the oceans caused by climate change **or** the water cycle and **developed** ideas for the other focus.
			
			There are clear attempts to make synoptic links between the content from different parts of the course of
				12
				AO1 x6
				AO2 x6
					AO1 – 6 marks
					Knowledge and understanding of alterations to the oceans caused by climate change and the water cycle could potentially include:
					• Alterations in the ocean system caused by climate change.
					  ○ ↑ temperature of oceans
					  ○ Sea level change (eustatic) - thermal expansion of water and the transfer of water from the land to the oceans
					  ○ Changes in extent of sea ice → reduction in albedo
					  ○ Changes to ocean circulation.
					• Water cycle – Earth's life support systems.
					  ○ Inputs, outputs and stores of the water cycle
					  ○ Processes and pathways of the water cycle
					
					AO2 – 6 marks
					Application of knowledge and understanding to analyse how alterations to the oceans caused by climate change affect the water cycle could potentially include:
					• Impact on flows between oceans, land and atmosphere.
					  ○ E.g., ↑ in water vapour transfer from ocean to atmosphere, precipitation from atmosphere to land and river flows from land to ocean
					• Stores, inputs and outputs.
					  ○ Sea level rise is partly due to the thermal expansion of water, the melting of glaciers and of ice sheets and depletion of sea ice – this will affect the global store of water in oceans, and correlating reduction in stores of glacial ice, ice sheets e.g., Antarctica, and sea ice e.g., Arctic
					• Processes and pathways/feedback loops
					  ○ Warming oceans → more evaporation, more condensation and potentially more precipitation.

			study but these are not always appropriate. **Level 2 (4-6 marks)** Demonstrates **reasonable** knowledge and understanding of alterations to the oceans caused by climate change and the water cycle (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide sound analysis that shows some accuracy of how alterations to the oceans caused by climate change affect the water cycle (AO2). This will be shown by including **developed** ideas about **either** alterations to the oceans caused by climate change **or** the water cycle and **simple** ideas for the other focus. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of the accumulation of alterations to the oceans caused by climate change and the water cycle (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how alterations to the oceans caused by climate change affect the water cycle (AO2). This will be shown by including **simple** ideas about the relationship between alterations to the oceans caused by climate change and the water cycle. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit.		○ Potential disruption of oceanic circulation – must be related to impacts on water cycle e.g., change in evaporation if surface currents become colder • Effects on the water cycle can be described at a range of scales.

Question			Answer	Mark	Guidance

9			**Examine how risks to food security may influence patterns of social inequality in places.**
			
			Level 4 (10-12 marks)
			Demonstrates **comprehensive** knowledge and understanding of risks to food security and patterns of social inequality in places. (AO1).
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide clear, developed and convincing analysis that is fully accurate of how risks to food security may influence patterns of social inequality in places (AO2).
			
			This will be shown by including **well-developed** ideas about risks to food security and patterns of social inequality in places.
			
			There are clear and explicit attempts to make appropriate synoptic links between content from different parts of the course of study.
			
			Level 3 (7-9 marks)
			Demonstrates **thorough** knowledge and understanding of risks to food security and patterns of social inequality in places (AO1).
			
			Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy of how risks to food security may influence patterns of social inequality in places (AO2).
			
			This will be shown by including **well-developed** ideas about **either** risks to food security **or** patterns of social inequality in places and **developed** ideas for the other focus.
			
			There are clear attempts to make synoptic links between the content from different parts of the course
				12
				AO1 x6
				AO2 x6
					Indicative content
					AO1 – 6 marks
					Knowledge and understanding of risks to food security and patterns of social inequality in places could potentially include:
					• Food security
					  ○ Food security = when / where there is physical and economic access to safe and sufficient food for individuals to lead healthy lives. Availability, access and utilisation (stability of supply).
					  ○ Risk to food security can be identified at a range of scales
					  ○ Regions, countries, people whose food security is most at risk across the development continuum
					  ○ Worsening factors linked to physical conditions, social and political changes
					• Patterns of social inequality in places
					  ○ Distribution of resources, wealth and opportunities are not evenly spread within and between places
					  ○ Processes of economic change creates social inequality (opportunities and challenges)
					  ○ Social inequality impacts people and places in different ways e.g., housing, healthcare, education, employment, access to services
					
					AO2 – 6 marks
					Application of knowledge and understanding to examine how risks to food security may influence patterns of social inequality in places could potentially include:
					• Increasing risk to food security can worsen patterns of social inequality
					• Environmental e.g., drought/flood/insect pests →

			of study but these are not always appropriate. **Level 2 (4-6 marks)** Demonstrates **reasonable** knowledge and understanding of risks to food security and patterns of social inequality in places (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide sound analysis that shows some accuracy of how risks to food security may influence patterns of social inequality in places (AO2). This will be shown by including **developed** ideas about **either** risks to food security **or** patterns of social inequality in places and **simple** ideas for the other focus. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of risks to food security and patterns of social inequality in places (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how risks to food security may influence patterns of social inequality in places (AO2). This will be shown by including **simple** ideas about risks to food security and patterns of social inequality in places. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit.		↑ food insecurity → ↑ social inequality especially in rural areas in LIDCs + some EDCs where the least well-off have little or no reserves to fall back on • Social - in many LIDCs women have lower food security than men → higher infant mortality rates. • Political - e.g., Syria (conflict 2011 and continuing), food insecurity added to the social deprivation as food price ↑ made food inaccessible → many ate less frequently • Political / Economic – impacts of land grabbing reducing availability of land for some → reduced food security → increasing inequalities e.g., in Indonesia + Argentina • Globalisation of the food system e.g., dominance of TNCs – seed fertilizer, processing and retailing. • Hazard event - Nepal earthquake (2015) 80% of households lost their entire food stock ↑ social deprivation and affected it for the next season as seed stocks were also lost. • In some ACs healthy food can be relatively expensive and availability less in some areas e.g., some inner urban locations. Lower quartiles in economic terms have difficulty in accessing healthy food at affordable prices. Food banks are a symptom of food insecurity.

Question			Answer	Mark	Guidance

10			**Examine how the risks from tectonic hazards can alter patterns of EITHER international trade OR global migration.**
			
			Level 4 (10-12 marks)
			Demonstrates **comprehensive** knowledge and understanding of the risks from tectonic hazards and patterns of EITHER international trade OR global migration (AO1).
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide clear, developed and convincing analysis that is fully accurate of how the risks from tectonic hazards can alter patterns of EITHER international trade OR global migration (AO2).
			
			This will be shown by including **well-developed** ideas about the risks from tectonic hazards and patterns of EITHER international trade OR global migration.
			
			There are clear and explicit attempts to make appropriate synoptic links between content from different parts of the course of study.
			
			Level 3 (7-9 marks)
			Demonstrates **thorough** knowledge and understanding of the risks from tectonic hazards and patterns of EITHER international trade OR global migration (AO1).
			
			Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy of how the risks from tectonic hazards can alter patterns of EITHER international trade OR global migration (AO2).
			
			This will be shown by including **well-developed** ideas
				12
				AO1 x6
				AO2 x6
					Indicative content
					AO1 – 6 marks
					Knowledge and understanding of the risks from tectonic hazards and patterns of EITHER international trade OR global migration could potentially include:
					• Risks from tectonic hazards
					  • Probability of volcanic and/or earthquake hazards and the risks they pose.
					  • How risk varies over time e.g. changes in frequency / impact
					  • Disaster risk equation.
					  • Risk varies with level of development and ability to mitigate.
					• International trade
					  ○ Current patterns of flows of merchandise, services and capital between countries
					  ○ Patterns of international trade relate to socio-economic development and are dominated by ACs and faster growing EDCs; LIDCs have limited access.
					• Global migration
					  ○ Current patterns of flows of migrants between countries
					  ○ Patterns of global migration relate to socio-economic development
					  ○ New source areas and host destinations for environmental refugees and economic migrants
					
					AO2 – 6 marks
					Application of knowledge and understanding to analyse how the risks from tectonic hazards can alter patterns of EITHER international trade OR global migration could potentially include:
					• International trade
					  ○ In a country with high risk of hazards that can cause socio-economic damage, trade

			about **either** the risks from tectonic hazards **or** patterns of EITHER international trade OR global migration and **developed** ideas for the other focus. There are clear attempts to make synoptic links between the content from different parts of the course of study but these are not always appropriate. **Level 2 (4-6 marks)** Demonstrates **reasonable** knowledge and understanding of the risks from tectonic hazards and patterns of EITHER international trade OR global migration (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide sound analysis that shows some accuracy of how the risks from tectonic hazards can alter patterns of EITHER international trade OR global migration (AO2). This will be shown by including **developed** ideas about **either** the risks from tectonic hazards **or** patterns of EITHER international trade OR global migration and **simple** ideas for the other focus. There are some attempts to make synoptic links between content from different parts of the course of study but these are not always relevant. **Level 1 (1-3 marks)** Demonstrates **basic** knowledge and understanding of the risks from tectonic hazards and patterns of EITHER international trade OR global migration (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how the risks from tectonic hazards can alter patterns of EITHER international trade OR global migration (AO2).		is reduced as means of production limited and there is lack of funds to buy imports. ○ Disruption to trade e.g. Icelandic ash cloud; closure of airports / sea ports / land links due to hazards e.g. Kobe 1995 port seriously damaged ○ Alteration of trade in e.g. in Japan after Tōhoku earthquake – imports of oil increased to replace nuclear power and exports fell ○ Perceived risk has bigger impact on smaller organisations with slim margins • Global migration ○ Risk of tectonic hazard can affect global migration patterns through perception of place as hazardous. ○ Destination attracting migrants e.g. Nepal/Haiti unlikely as development reduced by tectonic activity ○ Destination may attract temporary migration in the form of aid workers. ○ Emigration of migrant workers, wages sent home/remittances to high risk homeland and related boost to its GDP ○ If economically strong, countries with high tectonic risk may still be well equipped to host migrants e.g. California; Japan receives more than 10,000 refugee applications per annum.

			This will be shown by including **simple** ideas about the risks from tectonic hazards and patterns of EITHER international trade OR global migration. There are limited attempts to make synoptic links between content from different parts of the course of study. **0 marks** No response or no response worthy of credit		

SECTION C

Question			Answer	Mark	Guidance

11*			**'Adaptation is the most effective way humans can respond to climate change.' Discuss.**
			
			AO1
			Level 4 (7–9 marks)
			Demonstrates **comprehensive** knowledge and understanding of adaption and other ways humans can respond to climate change.
			
			Level 3 (5–6 marks)
			Demonstrates **thorough** knowledge and understanding of adaption and other ways humans can respond to climate change.
			
			Level 2 (3–4 marks)
			Demonstrates **reasonable** knowledge and understanding of adaption and other ways humans can respond to climate change
			
			Level 1 (1–2 marks)
			Demonstrates **basic** knowledge and understanding of adaption and other ways humans can respond to climate change.
			
			0 marks
			No response or no response worthy of credit.
			
			AO2
			Level 4 (19–24 marks)
			Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of how adaptation is the most effective way humans can respond to climate change.
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which
				33
				AO1 x9
				AO2 x24
					Indicative content AO1
					– 9 marks
					Demonstrating knowledge and understanding of adaption and other ways humans can respond to climate change could potentially include:
					• Adaptation
					  ○ IPCC 'Adaption is process of adjustment to actual or expected climate + its effects.'
					  ○ Framework of adaption:
					  retreat, such as coastal managed realignment or land-use zoning along river valleys.
					  accommodate, such as more drought resistant crops; more efficient irrigation; water supply strategies e.g. leakage repair, reservoir construction; improved education + public awareness of hazards e.g. storms + heatwaves
					  protect, such as hard / soft engineering techniques
					  ○ What future homes, offices, farms, cities, transport and economies will look like following adaptation throughout the 21st century
					• Other ways humans can respond to climate change
					  ○ **Mitigation** to cut greenhouse gas emissions (energy efficiency and conservation; fuel shifts and low-carbon energy sources; carbon capture + storage; geoengineering such as stimulating phytoplankton growth in oceans; forestry)
					  ○ **Modelling** to know what the future will hold
					
					Adaptation strategies only = top L2 AO1 max.

			adaptation is the most effective way humans can respond to climate change.
			
			Relevant concepts are authoritatively discussed.
			
			Level 3 (13–18 marks)
			Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how adaptation is the most effective way humans can respond to climate change.
			
			Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to the extent to which adaptation is the most effective way humans can respond to climate change.
			
			Relevant concepts are discussed but this may lack some authority.
			
			Level 2 (7–12 marks)
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how adaptation is the most effective way humans can respond to climate change.
			
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the extent to which adaptation is the most effective way humans can respond to climate change.
			
			Concepts are discussed but their use lacks precision.
			
			Level 1 (1–6 marks)
			Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how adaptation is the most effective way humans can respond to climate change.
					AO2 – 24 marks
					Application of knowledge and understanding to analyse and evaluate the extent to which adaptation is the most effective way humans can respond to climate change could potentially include:
					• Expect wide range of effective evaluation e.g. cost, duration, ease of implementation, geographic scale, environmental impact, ability to implement across development continuum or other appropriate perspective e.g., urban – rural + regional inequalities. Most ACs likely to adapt to worst effects. Variable situation across EDCs. Most LIDCs likely to be seriously affected.
					• Mitigation and adaptation are complementary - both cause and effect are being managed i.e., a much stronger response and more effective management strategy, adaptation alone limits effectiveness. Examples could include:
					  ○ Australia ratified Kyoto Protocol (2007) and Copenhagen climate summit of 2013 (mitigation); simultaneously used adaptation methods (building new sea walls, flood gates and dams which protected current developments).
					  ○ Bangladesh and other LIDCs, focused exclusively on adaptation, however, as Bangladesh continues to develop, so too will carbon emissions and this will need to be addressed with mitigation strategies.
					• Areas where adaptation and mitigation can be combined e.g. Project Drawdown.
					
					Adaptation strategies only = top L2 AO2 max.
					
					There does not have to be an equal balance of adaptation and mitigation to go into L4.

			Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which adaptation is the most effective way humans can respond to climate change. Concepts are not discussed or are so inaccurately. **0 marks** No response or no response worthy of credit. **Quality of extended response Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Question			Answer	Mark	Guidance

12*			**'Political organisations have the most influence in shaping the climate change debate.' Discuss.**
			
			AO1
			Level 4 (7–9 marks)
			Demonstrates **comprehensive** knowledge and understanding of political organisations and the climate change debate.
			
			Level 3 (5–6 marks)
			Demonstrates **thorough** knowledge and understanding of political organisations and the climate change debate.
			
			Level 2 (3–4 marks)
			Demonstrates **reasonable** knowledge and understanding of political organisations and the climate change debate.
			
			Level 1 (1–2 marks)
			Demonstrates **basic** knowledge and understanding of political organisations and the climate change debate.
			
			0 marks
			No response or no response worthy of credit.
			
			AO2
			Level 4 (19–24 marks)
			Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of how political organisations shape the climate change debate.
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to whether political organisations have the most influence in shaping the climate change debate.
			
			Relevant concepts are authoritatively discussed.
				33
				AO1 x9
				AO2 x24
					Indicative content
					AO1 – 9 marks
					Demonstrating knowledge and understanding of political organisations and the climate change debate could potentially include:
					• Historic background of the global warming debate and how it has evolved over time.
					• Understanding of political and other organisations that shape the climate change debate
					  ○ Role and possible bias of governments and international organisations, such as the EU or UN.
					  ○ Role and possible bias of the media and different interest groups.
					
					AO2 – 24 marks
					Application of knowledge and understanding to analyse and evaluate whether political organisations have the most influence in shaping the climate change debate could potentially include:
					• Expect wide range of evaluation of 'most influence', measured temporally, spatially, within political body or by results or actions.
					• Scientists
					  ○ Discussion over global warming ongoing since 1957
					  ○ Role of scientists in discovery and developing understanding of climate change, some scientists challenge widely accepted view of anthropogenic global warming.
					  ○ Developments in measuring change e.g. GHGs levels, extent + thickness of sea ice, use of satellites, computer modelling offer increasingly secure data to shape debate.
					  ○ International Panel on Climate Change

			Level 3 (13–18 marks)
			Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how political organisations shape the climate change debate.
			
			Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to whether political organisations have the most influence in shaping the climate change debate.
			
			Relevant concepts are discussed but this may lack some authority.
			
			Level 2 (7–12 marks)
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how political organisations shape the climate change debate.
			
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether political organisations have the most influence in shaping the climate change debate.
			
			Concepts are discussed but their use lacks precision.
			
			Level 1 (1–6 marks)
			Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how political organisations shape the climate change debate.
			
			Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to whether political organisations have the most influence in shaping the climate change debate.
					(IPCC) – the key group for establishing the science of climate change.
					• Political organisations
					  ○ The UN - actions against global warming from 1997 (Kyoto Protocol); some international impact, but key political powers failed to engage with the binding targets e.g. USA and China.
					  ○ EU initiatives
					  ○ National + regional governmental policies
					• Popular media
					  ○ Newspapers, social media (blogs), TV. Bias occurs depending on political leanings.
					  ○ Some films have influenced the debate, but this rarely lasts longer than a news cycle e.g. Inconvenient Truth, Before the Flood, Day after Tomorrow
					• Activist groups + individuals – those campaigning to reduce global warming as well as those not accepting science
					  ○ Just Stop Oil; Extinction Rebellion; David Attenborough, Greta Thunberg.

			Concepts are not discussed or are so inaccurately. **0 marks** No response or no response worthy of credit. **Quality of extended response Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Question			Answer	Mark	Guidance

13*			**'Human factors are most influential in affecting the spread of disease.' To what extent do you agree?**
			
			AO1
			Level 4 (7–9 marks)
			Demonstrates **comprehensive** knowledge and understanding of human and other factors affecting the spread of disease.
			
			Level 3 (5–6 marks)
			Demonstrates **thorough** knowledge and understanding of human and other factors affecting the spread of disease.
			
			Level 2 (3–4 marks)
			Demonstrates **reasonable** knowledge and understanding of human and other factors affecting the spread of disease.
			
			Level 1 (1–2 marks)
			Demonstrates **basic** knowledge and understanding of human and other factors affecting the spread of disease.
			
			0 marks No response or no response worthy of credit.
			
			AO2
			Level 4 (19–24 marks)
			Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of factors affecting the spread of disease.
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which human factors are most influential in affecting the spread of disease.
			
			Relevant concepts are authoritatively discussed.
				33
				AO1 x9
				AO2 x24
					Indicative content
					AO1 – 9 marks
					Demonstrating knowledge and understanding of human and other factors affecting the spread of disease could potentially include:
					• Disease diffusion and spread (Hägerstrand model)
					• Human factors include the influence of:
					  ○ *social and economic* factors e.g. population density, housing quality, sanitation, overcrowding; access to health services, food, and clean water; cultural and religious practices, physical contact, sexual health; farming practices; poverty; disease of affluence
					  ○ *political factors* e.g. mitigation strategies of governments and international agencies; screening availability; funding of treatment / immunisation; education programmes; border controls; attitudes towards sexual health; civil unrest and conflict.
					• Physical / environmental factors include the influence of: temperature, humidity, rainfall, and their seasonality; climate change; atmospheric pollution; and the influence of barriers such as relief, natural hazards, excess water, remoteness of communities
					
					AO2 – 24 marks
					Application of knowledge and understanding to analyse and evaluate the extent to which human and other factors are most influential in affecting the spread of disease, could potentially include:
					• Human factors could receive a wide interpretation; they affect the spread of disease directly or indirectly
					  ○ *Directly* e.g. Cholera outbreak in Haiti

			Level 3 (13–18 marks) Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of factors affecting the spread of disease. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to the extent to which human factors are most influential in affecting the spread of disease. Relevant concepts are discussed but this may lack some authority. **Level 2 (7–12 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of factors affecting the spread of disease. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the extent to which human factors are most influential in affecting the spread of disease. Concepts are discussed but their use lacks precision. **Level 1 (1–6 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of factors affecting the spread of disease. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which human factors are most influential in affecting the spread of disease. Concepts are not discussed or are so inaccurately. **0 marks** No response or no response worthy of credit.		following the 2010 earthquake – variety of cholera from South Asia introduced from Nepal; overcrowded living conditions with poor sanitation. Cancer increased through air pollution (burning of fossil fuels), or lifestyle choices (tanning beds) ○ *Indirectly* e.g. climate change (rising temperatures, increased humidity) - malaria, yellow fever, dengue extend their range, plus EIDs. Outbreaks of zoonotic diseases involve humans e.g. handling animals infected with Ebola; civil conflicts e.g. Haiti, Syria, Sudan • Physical / environmental factors also influence the spread of disease: ○ habitats of disease vectors are affected e.g. prevalence of mosquitoes in warm, humid areas close to water sources ○ seasonal variations that cause disease outbreaks e.g. the seasonal (winter) influenza outbreak continues despite human activity and attempts to prevent spread through the annual flu vaccination programme, ○ evaluation might include some indication of the strength of physical factors relative to human factors e.g. physical barriers (mountain ranges, large water bodies, areas of aridity) may limit spread of disease by restricting population movement or possibly reduce the risk of infection in isolated communities Other evaluative points, possibly indicative of higher levels, could include: • spread of disease results from the *interaction* of a number of variables - often a *combination* of human activity and physical conditions • scale and / or level of development (e.g.

			Quality of extended response **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		national, regional, local, urban / rural) may be significant in considering the effects of factors that influence the spread of disease • the relative influence of human / physical factors might differ in the short-term and long-term There does not have to be an equal balance of human and physical factors to go into L4.

Question			Answer	Mark	Guidance
14*			**'Strategies that deal with disease risk and eradication at a local scale are more effective than at any other scale.' To what extent do you agree?** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of strategies that deal with disease risk and eradication at local and other scales. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of strategies that deal with disease risk and eradication at local and other scales. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of strategies that deal with disease risk and eradication at local and other scales. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of strategies that deal with disease risk and eradication at local and other scales. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (19–24 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of strategies that deal with disease risk and eradication at local and other scales. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational	**33** **AO1 x9** **AO2 x24**	**Indicative content** **AO1 – 9 marks** Demonstrating knowledge and understanding of strategies that deal with disease risk and eradication at local and other scales could potentially include: • Top-down/larger scale - Trans-national / international e.g. UN – WHO, UNICEF, UNESCO; EU's 'Global Health Strategy' Examples such as eradication of smallpox (1980) + ongoing targeting poliomyelitis + dracunculiasis (Guinea worm) • Top-down/larger scale - national, regional governments e.g. Mauritius malaria; UK immunisation of babies + children e.g. measles, diphtheria • Bottom-up/local scale - Grass-root strategies e.g. Guinea worm eradication in Ghana • Role of NGOs e.g. Oxfam, Christian Aid, Cafod, Sightsavers • Could include direct strategies e.g. cancer screening, vaccination programmes + indirect strategies e.g. female education which tends to ↓ infant mortality and ↑ child health; government campaigns regarding healthy diet, exercise and avoidance of smoking + alcohol **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate whether strategies that deal with disease risk and eradication at a local scale are more effective than at any other scale could potentially include: • Expect range of evaluation of 'effectiveness' e.g. measured temporally, spatially, by eradication of disease. • Strategies can be implemented at a range of scales.

			conclusions that are evidence based as to whether strategies that deal with disease risk and eradication at a local scale are more effective than at any other scale.
			
			Relevant concepts are authoritatively discussed.
			
			Level 3 (13–18 marks)
			Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of strategies that deal with disease risk and eradication at local and other scales.
			
			Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to whether strategies that deal with disease risk and eradication at a local scale are more effective than at any other scale.
			
			Relevant concepts are discussed but this may lack some authority.
			
			Level 2 (7–12 marks)
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of strategies that deal with disease risk and eradication at local and other scales.
			
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to whether strategies that deal with disease risk and eradication at a local scale are more effective than at any other scale.
			
			Concepts are discussed but their use lacks precision.
			
			Level 1 (1–6 marks)
			Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited
					• Local level
					  ○ can be adapted to needs, character of locality to ensure success
					  ○ can be more successful for communicable diseases rather than non-communicable diseases, e.g. short term outbreak of cholera (vaccination) whereas longer term changes needed for non-communicable e.g. education, lifestyle.
					• National level
					  ○ Examples of successful campaigns, e.g., Malaria in Mauritius.
					  ○ Vaccination against COVID-19 in UK; government vaccination programme.
					• Global level
					  ○ Examples of successful campaigns – smallpox, polio.
					  ○ International collaboration e.g., covid vaccine development.
					  ○ Inequality in success of implementing some programmes e.g., AC/EDC/LIDC contrasts.
					  ○ Role of TNCs e.g., GSK, Astra Zeneca.
					
					• However, all campaigns can fail at times, e.g., national UK measles, Mauritius malaria,

			accuracy of strategies that deal with disease risk and eradication at local and other scales. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to whether strategies that deal with disease risk and eradication at a local scale are more effective than at any other scale. Concepts are not discussed or are so inaccurately. **0 marks** No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Question			Answer	Mark	Guidance

15*			**'It is only possible to use ocean resources successfully with political involvement.' Discuss**
			
			AO1
			Level 4 (7–9 marks)
			
			Demonstrates **comprehensive** knowledge and understanding of the use of ocean resources and political involvement.
			
			Level 3 (5–6 marks)
			Demonstrates **thorough** knowledge and understanding of the use of ocean resources and political involvement.
			
			Level 2 (3–4 marks)
			Demonstrates **reasonable** knowledge and understanding of the use of ocean resources and political involvement.
			
			Level 1 (1–2 marks)
			Demonstrates **basic** knowledge and understanding of the use of ocean resources and political involvement.
			
			0 marks
			No response or no response worthy of credit.
			
			AO2
			Level 4 (19–24 marks)
			Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of the use of ocean resources and political involvement.
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which it is it is only possible to use ocean resources successfully with political involvement
			
			Relevant concepts are authoritatively discussed.
				33
				AO1 x9
				AO2 x24
					Indicative content AO1 – 9 marks
					Demonstrating knowledge and understanding of the use of ocean resources and political involvement could potentially include:
					• What are resources; renewable, non-renewable.
					• What is success? Is it talking about a financial or sustainable gain?
					• Use of ocean resources
					  ○ The use of biotic, energy and mineral resources
					  ○ Globalisation – tourism, shipping routes and trade
					  ○ Escape routes for migrants
					• Political factors
					  ○ Zones extending out to sea
					  ○ Resource management frameworks
					  ○ Oceans are important spaces where countries challenge each other
					
					AO2 – 24 marks
					Application of knowledge and understanding to analyse and evaluate the extent to which it is only possible to use ocean resources successfully with political involvement could potentially include:
					• Political:
					  ○ The establishment of marine reserves is political, as habitats and ecosystem services are being preserved for future generations.
					  ○ Countries who use the oceans, to exert power and authority across the world e.g., China and the South China Sea.
					  ○ Treaties e.g., Antarctic Treaty
					• Non-political:
					  ○ Inuit people hunting whales -part of their culture and heritage.
					  ○ Gulf of Mexico - oil and gas production has been determined more by economic factors than either social or political.

			Level 3 (13–18 marks) Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of the use of ocean resources and political involvement. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to the extent to which it is it is only possible to use ocean resources successfully with political involvement. Relevant concepts are discussed but this may lack some authority. **Level 2 (7–12 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of the use of ocean resources and political involvement. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the extent to which it is it is only possible to use ocean resources successfully with political involvement. Concepts are discussed but their use lacks precision. **Level 1 (1–6 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of the use of ocean resources and political involvement. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which it is it is only possible to use ocean resources successfully with political		○ The ocean as routes for refugees and migrants seeking an improvement in quality of life is more economic than political. • Conservation for protection of future ocean resources. Consider discussion about the use of the ocean being a historical thing and how it has been used successfully and sustainably for years.

			involvement. Concepts are not discussed or are so inaccurately. **0 marks** No response or no response worthy of credit. **Quality of extended response Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear		

Question	Answer	Mark	Guidance

16*	**'It is more important to prevent ocean pollution than to protect human economic activities. Discuss.**
	
	AO1
	Level 4 (7–9 marks)
	Demonstrates **comprehensive** knowledge and understanding of ocean pollution and human economic activities.
	
	Level 3 (5–6 marks)
	Demonstrates **thorough** knowledge and understanding of ocean pollution and human economic activities.
	
	Level 2 (3–4 marks)
	Demonstrates **reasonable** knowledge and understanding of ocean pollution and human economic activities.
	
	Level 1 (1–2 marks)
	Demonstrates **basic** knowledge and understanding of ocean pollution and human economic activities.
	
	0 marks
	No response or no response worthy of credit.
	
	AO2
	Level 4 (19–24 marks)
	Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of preventing ocean pollution and protecting human economic activity.
	
	Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which it is more important to prevent ocean pollution than to protect human activities.
	
	Relevant concepts are authoritatively discussed.
			Indicative content
			
			AO1 – 9 marks
			Demonstrating knowledge and understanding of ocean pollution and human economic activities could potentially include:
			• Oceans are a vast resource depository e.g., water, biological life, minerals – ecosystem services
			• Pollution = humans add a substance to the environment (oceans) that affects organisms adversely + at a rate.
			• Different types of pollution
			  ○ Point source e.g., sea-bed pipeline; oil rig
			  ○ Non-point source e.g., exhaust fumes from ships
			• Human (economic + social + political) activities that use oceans + along coasts e.g., oil production and transport, fishing, tourism
			
			AO2 – 24 marks
			Application of knowledge and understanding to analyse and evaluate the extent to which it is more important to prevent ocean pollution than to protect human activities could potentially include:
			• Expect range of analysis defining 'importance' – could be environmental, social, economic, over time or space
			• Importance of preventing pollution.
			  ○ Some activities more 'polluting' e.g., non-point source pollution can be more devastating over a geographic area than point source e.g., an oil spill v. the micro-plastic pollution
			  ○ CO_2 levels in oceans ↑ → acidification of oceans – potential devastating impacts on marine ecosystems.
			  ○ Pollution spread globally with global effects e.g., ocean-going cargo vessels which are linked to industry produce 9% of SO_2 emissions

	Level 3 (13–18 marks) Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of preventing ocean pollution and protecting human economic activity. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to the extent to which it is more important to prevent ocean pollution than to protect human activities Relevant concepts are discussed but this may lack some authority. **Level 2 (7–12 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of preventing ocean pollution and protecting human economic activity. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the extent to which it is more important to prevent ocean pollution than to protect human activities Concepts are discussed but their use lacks precision. **Level 1 (1–6 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of preventing ocean pollution and protecting human economic activity. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which it is more important to prevent ocean pollution than to protect human activities.		and account for 3.5-4% of greenhouse emissions = global warming, threat to coral reefs ○ Some pollution threat e.g., radioactivity something of an unknown as radio-active waste disposed of in oceans including scuttled submarines ○ Cost of prevention cheaper than cost of pollution (clean up). • Important to protect human activity. ○ Pollution a by-product of human activity so manage pollution ○ Provision of jobs e.g., fishing, tourism. ○ Importance of fish stocks for food. ○ Coral reef health – provide all types of ecosystem services – provisioning, regulating, cultural + supporting. ○ Humans have capacity to reduce pollution whilst still maintaining economic activity e.g., slow steaming, better ship design, reduce / recycle plastic waste, renewable energy sources, reduction in energy consumption. ○ Global warming impacts - e.g., ocean acidification, melting of sea ice (impacts on indigenous communities) ○ Some pollution threat e.g., radioactivity something of an unknown as radio-active waste disposed of in oceans including scuttled submarines • Wealth creation using ocean resources allows higher levels of conservation and protection.

	Concepts are not discussed or are so inaccurately. **0 marks** No response or no response worthy of credit. **Quality of extended response Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Question			Answer	Mark	Guidance

17*			**'The future of food depends upon key players and strategies.' To what extent do you agree?**
			
			AO1
			Level 4 (7–9 marks)
			Demonstrates **comprehensive** knowledge and understanding of the future of food, key players and strategies.
			
			Level 3 (5–6 marks)
			Demonstrates **thorough** knowledge and understanding of the future of food, key players and strategies.
			
			Level 2 (3–4 marks)
			Demonstrates **reasonable** knowledge and understanding of the future of food, key players and strategies.
			
			Level 1 (1–2 marks)
			Demonstrates **basic** knowledge and understanding of the future of food, key players and strategies.
			
			0 marks
			No response or no response worthy of credit.
			
			AO2
			Level 4 (19–24 marks)
			Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of how the future of food depends on key players and strategies.
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which the future of food depends upon key players and strategies.
			
			Relevant concepts are authoritatively discussed.
			
			Level 3 (13–18 marks)
				33
				AO1 x9
				AO2 x24
					Indicative content
					AO1 – 9 marks
					Demonstrating knowledge and understanding of the future of food, key players and strategies could potentially include:
					• Population is increasing and expected to reach 9 billion by 2050. Important to manage the future of food.
					• Future of food includes the global food system (food supply and distribution), and global food security
					• Key players
					  ○ Countries creating opportunities between each other e.g., trade, agreements
					  ○ Organisations e.g., WTO, NGOs delivering food aid
					  ○ Countries - geopolitics of food supply.
					  ○ Government health campaigns involving food
					  ○ TNCs involved in production, transport + storage, processing + retailing of food.
					  ○ Fair Trade organisations
					  ○ Customers
					  ○ Celebrities who campaign
					• Strategies
					  ○ Short-term relief, long-term capacity building
					  ○ Large-scale technological techniques, small-scale bottom-up and appropriate strategies
					
					AO2 – 24 marks
					Application of knowledge and understanding to analyse and evaluate the extent to which the future of food depends upon key players and strategies could potentially include:
					• Expect variety of evaluation measures e.g., sustainability, temporal or spatial measures

			Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how the future of food depends on key players and strategies.
			
			Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to the extent to which the future of food depends upon key players and strategies
			
			Relevant concepts are discussed but this may lack some authority.
			
			Level 2 (7–12 marks)
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how the future of food depends on key players and strategies.
			
			Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the extent to which the future of food depends upon key players and strategies.
			
			Concepts are discussed but their use lacks precision.
			
			Level 1 (1–6 marks)
			Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how the future of food depends on key players and strategies.
			
			Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which the future of food depends upon key players and strategies.
			
			Concepts are not discussed or are so inaccurately.
					• The global food system and food security need to be improved to prevent malnutrition and starvation in some areas and waste in others. These priorities not always met, or other priorities compete e.g.
					  ○ food aid - historically unhelpful to recipient countries ('dumping' of surplus food from ACs; creating a cycle of food dependency; reducing income for indigenous farmers) creating little long term sustainable hope for the future
					  ○ TNCs - Unilever committed to the UN 'Sustainable Development Goal 2' of zero hunger, however it is also an economic opportunity creating more than 80 million jobs.
					• In other cases, improving food security has occurred e.g.
					  ○ The Acacia project in Senegal - sustainable - rural villages where food security has increased, market opportunities, education and status of women improved = better food security across the genders and generations
					  ○ Cuban permaculture – sustainable food production particularly from urban farms
					• Geopolitical issues impacting food system e.g., Ukraine wheat
					• Conflict between local food supply and export e.g., Mexico – maize vs avocados
					• Local scale examples valid e.g., issues of food availability in relatively small localities e.g., inner urban areas (Bronx)
					• Impacts of climate change

			0 marks No response or no response worthy of credit. **Quality of extended response Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Question			Answer	Mark	Guidance

18*			**To what extent is the global food system vulnerable to shocks?**
			
			AO1
			Level 4 (7–9 marks)
			Demonstrates **comprehensive** knowledge and understanding of the global food system and shocks.
			
			Level 3 (5–6 marks)
			Demonstrates **thorough** knowledge and understanding of the global food system and shocks.
			
			Level 2 (3–4 marks)
			Demonstrates **reasonable** knowledge and understanding of the global food system and shocks.
			
			Level 1 (1–2 marks)
			Demonstrates **basic** knowledge and understanding of the global food system and shocks.
			
			0 marks
			No response or no response worthy of credit.
			
			AO2
			Level 4 (19–24 marks)
			Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of the global food system and its vulnerability to shocks.
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which the global food system is vulnerable to shocks.
			
			Relevant concepts are authoritatively discussed.
			
			Level 3 (13–18 marks)
				33
				AO1 x9
				AO2 x24
					Indicative content
					
					AO1 – 9 marks
					Demonstrating knowledge and understanding of the global food system and shocks could potentially include:
					• Global food system – a broad term covering production, processing, storage, distribution, access, consumption and waste.
					• Shocks that can impact the global food system can be natural or human and include:
					  ○ climate change
					  ○ water scarcity
					  ○ tectonic hazards
					  ○ price crises / inflation
					  ○ transport/distribution issues e.g., driver shortages
					  ○ civil tensions / unrest e.g., war
					
					AO2 – 24 marks
					Application of knowledge and understanding to analyse and evaluate the extent to which the global food system is vulnerable to shocks could potentially include:
					• Shock events can upset the balance of the global food system even with the most stable of systems e.g., El Nino events which vary in their severity and duration e.g., wheat price and availability
					• Climate change is unpredictable e.g., changing rainfall patterns, more droughts and heatwaves, tropical storms and flood events, affecting transportation, or crops fail
					• Tectonic hazards, perhaps most 'shocking' in their unpredictability and widespread

			Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of the global food system and its vulnerability to shocks. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to the extent to which the global food system is vulnerable to shocks. Relevant concepts are discussed but this may lack some authority. **Level 2 (7–12 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of the global food system and its vulnerability to shocks. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the extent to which the global food system is vulnerable to shocks Concepts are discussed but their use lacks precision. **Level 1 (1–6 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of the global food system and its vulnerability to shocks. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which the global food system is vulnerable to shocks. Concepts are not discussed or are so inaccurately.		devastation e.g., Nepal earthquake destroying crops, livestock and transport routes • Role of economic development – ACs + some EDCs relatively resilient to shocks, LIDCs much less so. • Contrast in resilience within a society – top quartile resilient, bottom quartile much less so. • Globalisation decreased resilience as lengthy supply chains more susceptible to shocks. • Scale contrasts e.g. temporal + spatial e.g. local/regional shock from flooding. Expect evaluative comparisons between vulnerability to shocks and parts of the global food system that are more resistant to shocks such as countries in tectonically stable areas; ACs e.g. Netherlands - intensive horticulture under glass so climate resilience and good flood protection.

			0 marks No response or no response worthy of credit. **Quality of extended response Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Question			Answer	Mark	Guidance

19*			**'Earthquake activity has a greater impact on landscapes than volcanic activity.' Discuss.**
			
			AO1
			Level 4 (7–9 marks)
			Demonstrates **comprehensive** knowledge and understanding of the impact on landscapes by earthquake and volcanic activity.
			
			Level 3 (5–6 marks)
			Demonstrates **thorough** knowledge and understanding of the impact on landscapes by earthquake and volcanic activity.
			
			Level 2 (3–4 marks)
			Demonstrates **reasonable** knowledge and understanding of the impact on landscapes by earthquake and volcanic activity.
			
			Level 1 (1–2 marks)
			Demonstrates **basic** knowledge and understanding of the impact on landscapes by earthquake and volcanic activity.
			
			0 marks
			No response or no response worthy of credit.
			
			AO2
			Level 4 (19–24 marks)
			Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of how earthquake activity has a greater impact on landscapes than volcanic activity.
			
			Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which earthquake activity has a greater impact on landscapes than volcanic activity.
				33
				AO1 x9
				AO2 x24
					Indicative content
					AO1 – 9 marks
					Demonstrating knowledge and understanding of the impact on landscapes by earthquake and volcanic activity could potentially include:
					• Landscape features associated with earthquakes e.g., escarpments and rift valleys, horizontal and vertical ground displacement, landslides
					• Landscape features associated with volcanic activity e.g., size and shape of volcanoes, lava and pyroclastic flows, lahars, island chains, caldera, flood basalts, volcanic soils
					
					AO2 – 24 marks
					Application of knowledge and understanding to analyse and evaluate the extent to which earthquake activity has a greater impact on landscapes than volcanic activity could potentially include:
					Expect range of evaluation of impact
					• temporal, spatial, size, height or other; it could also be the creation of the landscape itself
					• depends on factors such as:
					  ○ contrasts between volcanic + seismic activity depending on type of plate boundary – see points below
					  ○ scale of landforms produced
					  ○ magnitude of the event
					  ○ frequency of seismic activity / eruptions
					  ○ nature / type of earthquake / type of eruption (explosive, effusive - viscosity of magma)
					  ○ depth of earthquake focus / land or submarine eruption
					• Volcanic landscapes are more common globally and in places iconic e.g., Arthur's Seat, Edinburgh, Deccan Plateau, India, Cascade Range, NW USA.
					• Rift valleys associated with earthquakes create large scale escarpments e.g. East Africa +

			Relevant concepts are authoritatively discussed. **Level 3 (13–18 marks)** Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how earthquake activity has a greater impact on landscapes than volcanic activity. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to the extent to which earthquake activity has a greater impact on landscapes than volcanic activity. Relevant concepts are discussed but this may lack some authority. **Level 2 (7–12 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how earthquake activity has a greater impact on landscapes than volcanic activity. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the extent to which earthquake activity has a greater impact on landscapes than volcanic activity. Concepts are discussed but their use lacks precision. **Level 1 (1–6 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how earthquake activity has a greater impact on landscapes than volcanic activity. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which earthquake activity has a greater impact on landscapes than volcanic activity.		Iceland, whereas volcanic eruptions create craters which can be just as dramatic e.g. Ngorongoro or Mazama • Impact on landscape - Fault scarps associated with earthquakes often weathered and vegetated indicating lower impact over time; , volcanoes - despite weathering and vegetation they can be more significant in terms of relief and durability and grow in size with every eruption • Landslides can significantly change the landscape, creating large scars and debris slopes • Lahars + volcanic tephra flows can travel significant distances changing landscape over a large distance or area e.g., Monserrat, Mt St Helens, Washington State USA. • Liquefaction causes landscape change – impacts on human landscapes/buildings e.g. Mexico City, Christchurch. • Tsunamis – rearrange the coastal zone. • Reality is that volcanic + earthquake activity often coincides spatially. Accept human activity, if **explicitly** linked to a landscape feature and process e.g., the link between farming and lava flow (volcanic soil), geothermal power.

			Concepts are not discussed or are so inaccurately. **0 marks** No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Question			Answer	Mark	Guidance
20*			**'Levels of economic development determine the impacts people experience from volcanic eruptions.' Discuss.** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of the impacts people experience from volcanic eruptions, at differing levels of economic development. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of the impacts people experience from volcanic eruptions, at differing levels of economic development. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of the impacts people experience from volcanic eruptions, at differing levels of economic development. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the impacts people experience from volcanic eruptions, at differing levels of economic development. **0 marks** No response or no response worthy of credit. **AO2** **Level 4 (19–24 marks)** Demonstrates **comprehensive** application of knowledge and understanding to provide a clear, developed and convincing analysis that is fully accurate of how levels of economic development determine the impacts people experience from volcanic eruptions. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which	**33** **AO1 x9** **AO2 x24**	**Indicative content** **AO1 – 9 marks** Demonstrating knowledge and understanding of levels of economic development and the impacts people experience from volcanic eruptions, could potentially include: • Physical hazards – effusive vs explosive. • Levels of economic development – ACs, EDCs + LIDCs. Also different levels within a country relevant e.g. rural – urban; rich + poor within a locality • Impacts can be both positive + negative. • Economic impacts e.g. farming on fertile soils, tourism, geothermal power, mining, destruction of productive assets e.g. farms, infrastructure • Social impacts e.g. risks to housing, health and life; availability of means of production e.g. building materials • Environmental impacts e.g. ash/gas clouds, pyroclastic flows, tephra, lava flows, gas, flooding e.g. jökulhlaup, tsunami • Political impacts e.g. disaster planning, search and rescue, coping with refugees, investment in recovery and repair **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the extent to which levels of economic development determine the impacts people experience from volcanic eruptions could potentially include: • Measures of 'impacts' could be spatial, temporal, or related directly to people e.g. social, economic, political or environmental. • Economic development enables monitoring, prediction, safe evacuation, as well as effective hazard mapping which would

			levels of economic development determine the impacts people experience from volcanic eruptions. Relevant concepts are authoritatively discussed. **Level 3 (13–18 marks)** Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how levels of economic development determine the impacts people experience from volcanic eruptions Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as to the extent to which levels of economic development determine the impacts people experience from volcanic eruptions. Relevant concepts are discussed but this may lack some authority. **Level 2 (7–12 marks)** Demonstrates **reasonable** application of knowledge and understanding to provide a sound analysis that shows some accuracy of how levels of economic development determine the impacts people experience from volcanic eruptions. Demonstrates **reasonable** application of knowledge and understanding to provide a sound evaluation that offers generalised judgements and conclusions, with limited use of evidence as to the extent to which levels of economic development determine the impacts people experience from volcanic eruptions. Concepts are discussed but their use lacks precision. **Level 1 (1–6 marks)** Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of how levels of economic development determine the		theoretically reduce the impacts people experience. ○ E.g. more people die in countries with lower economic development - In the last 20 years more people have died as a result of volcanic eruptions in LIDCs and EDCs than in ACs. ○ Resilience to volcanic hazards closely linked to level of preparedness which in turn linked to level of economic development. Japan + USA high levels of monitoring. ○ VEI, types of magma and unpredicted type of eruption may be more significant than economic development e.g. Ontake eruption 2014 was VEI 3 (killing 63), the Anak Krakatoa eruption 2018 was VEI 4 (killing 245). White island, NZ (2019) killed 8 tourists. ○ ACs more able to capitalise on volcanic eruptions e.g. Iceland building world's first volcanic museum and offering tours after Eyjafjallajökull. But EDCs e.g. Indonesia also capable – Sarulla geo-thermal power plant operational. ○ Economic development has no impact on environmental impacts, as it cannot stop the hazards, but monitoring will be more advanced which could lead to more effective evacuations

			impacts people experience from volcanic eruptions. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which levels of economic development determine the impacts people experience from volcanic eruptions. Concepts are not discussed or are so inaccurately. **0 marks** No response or no response worthy of credit. **Quality of extended response** **Level 4** There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated. **Level 3** There is a line of reasoning presented with some structure. The information presented is in the most-part relevant and supported by some evidence. **Level 2** The information has some relevance and is presented with limited structure. The information is supported by limited evidence. **Level 1** The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.		

Assessment Objectives (AO) grid

Candidates answer **two** of questions 1 to 5, **two** of questions 6 to 10 and **two** of questions 11 to 15. This has been considered in the totals indicated below.

Question	AO1	AO2	AO3	Marks
1a	0	0	3	3
1b	6	0	0	6
2a	0	0	3	3
2b	6	0	0	6
3a	0	0	3	3
3b	6	0	0	6
4a	0	0	3	3
4b	6	0	0	6
5a	0	0	3	3
5b	6	0	0	6
6	6	6	0	12
7	6	6	0	12
8	6	6	0	12
9	6	6	0	12
10	6	6	0	12
11*	9	24	0	33
12*	9	24	0	33
13*	9	24	0	33
14*	9	24	0	33
15*	9	24	0	33
16*	9	24	0	33
17*	9	24	0	33
18*	9	24	0	33
19*	9	24	0	33
20*	9	24	0	33
Total	42	60	6	108

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