Oxford Cambridge and RSA

GCE

Geography

H481/03: Geographical debates

A Level

Mark Scheme for June 2022

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It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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.

MARKING INSTRUCTIONS

PREPARATION FOR MARKING
RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Assessor Online Training*; *OCR Essential Guide to Marking*.

2. 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

3. Log-in to RM Assessor and mark the **required number** of practice responses ("scripts") and the **number of required** standardisation responses.

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

MARKING

1. Mark strictly to the mark scheme.

2. Marks awarded must relate directly to the marking criteria.

3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 40% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.

4. 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.

5. **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.

6. 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.

7. 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.

8. 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.

9. A*ssistant 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.*

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

a. **To determine the level** – start at the highest level and work down until you reach the level that matches the answer

b. **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

11. **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

12. **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:

- the specification, especially the assessment objectives
- the question paper and its rubrics
- 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 predicted global surface temperatures.** The diagram shows the global surface temperatures. Possible limitations include: • Sources not given – bias/reliability. • Categories are inconsistent in their ranges. • Highest temp. category very open ended – current temps regularly >35ºC. • Temperature ranges are quite large so spatial patterns generalised. • Temperature range -9 - +6, covers both negative and positive numbers. • July – S.Hemisphere = winter so not comparing like with like regarding seasons; some locations influenced more by dry / wet seasons e.g. monsoons. • Doesn't show internal variations for some countries e.g. mountain ranges. • No information to compare these predicted average July temperatures with previous years - no evidence of global warming. • Covers a long time period for the prediction to stand, during which there might be further change. • Covers only land surfaces / not marine. • No indication of lines of latitude. • Choropleth maps have 'cliff edges' between one category and another on the map – reality likely to be a gradual change.	**3** **AO3 x3**	**AO3 – 3 marks** 3x1 for three limitations of the data identified through critical questioning of the resource. Annotate as SEEN on script, one for each limitation.

1	(b)		**Explain the vulnerability of <u>one</u> type of natural environment to the impacts of climate change.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of the vulnerability of <u>one</u> type of natural environment to the impacts of climate change (AO1). Explanation shown by including **well-developed** ideas about the vulnerability of <u>one</u> type of natural environment to the impacts of climate change. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of the vulnerability of <u>one</u> type of natural environment to the impacts of climate change (AO1). Explanation shown by including **developed** ideas about the vulnerability of <u>one</u> type of natural environment to the impacts of climate change. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the vulnerability of <u>one</u> type of natural environment to the impacts of climate change (AO1). There may be **simple** descriptive ideas about the vulnerability of <u>one</u> type of natural environment to the impacts of climate change. **0 marks** No response or no response worthy of credit.	**6** **AO1 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of the vulnerability of <u>one</u> type of natural environment to the impacts of climate change could potentially include: • Tundra – rising temperatures melt the permafrost, disrupting the ecosystem, creating large thaw lakes and wetlands, increase in mass movement, tree line descends in altitude + moves to higher latitudes • Mountains – Glaciers will retreat with rising temperatures, mass movement as slopes are less stable, snow line moves upslope and winter snowpack will thin, reduction in meltwater affecting rivers, lakes and ecosystems • Hot semi-arid – rainfall more erratic, some locations rainy seasons shorten, more frequent and prolonged droughts, reduction in vegetation cover, increase in wind erosion and dust storms; other locations become more wet with greater emphasis on fluvial processes • Rainforest – warmer & drier, disruption of carbon + water cycles; positive feedback of further forest loss, changing ecosystem, higher temperatures, more drought, more fires and loss of biodiversity • Coasts – higher sea levels, more powerful storms, increase rates of erosion, shorelines retreat inland, disrupted sediment budgets • Oceans - ↑acidification + impact on marine ecosystems; ↑sea water temperatures + impact on marine ecosystems e.g. coral reefs; ↑sea levels + impacts on ocean margins + islands especially low-lying examples; ↑water + air temperatures →↓ sea ice (extent + thickness) •

Question			Answer	Mark	Guidance
2	(a)		**Identify <u>three</u> limitations of <u>Fig. 2</u> as a source of information about reported outbreaks of communicable diseases.** The word cloud shows the reported outbreaks of communicable diseases in 2020. Possible limitations include: • Reported to who? Sources not given – bias/reliability. • Accuracy of the location of the word/outbreak appears confusing. • Location of reports vague / generalised. • Only reported outbreaks included, some locations less rigorous health monitoring e.g. some LIDCs / remote rural areas. • Lack of information about interpretation of size of words and colours. • Some diseases not represented e.g., Covid in the UK. • Frequency of words not related to population. • date of outbreaks not given. • No evidence of duration. • Country borders/labels are not present. • No indication of how many separate outbreaks are shown.	**3** **AO3 x3**	**AO3 – 3 marks** 3x1 for three limitations of the data identified through critical questioning of the resource. Annotate as SEEN on script, one for each limitation.

2	(b)		**Explain the impacts of <u>one</u> named disease on resident populations in a country which has experienced a natural hazard.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of the impacts on resident populations of <u>one</u> disease in a country that has been affected by a natural hazard (AO1). Explanation shown by **well-developed** ideas about the impacts on resident populations. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of the impacts on resident populations of <u>one</u> disease in a country that has been affected by a natural hazard (AO1). Explanation shown by **developed** ideas about the impacts on resident populations. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the impacts on resident populations of <u>one</u> disease in a country that has been affected by a natural hazard (AO1). There may be **simple** descriptive ideas about the impacts on resident populations. **0 marks** No response or no response worthy of credit.	**6** **AO1 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of the impacts on resident populations could potentially include: • Impact on the health of the resident population including fatalities/symptoms suffered. • Differential impacts on different socio-economic groups e.g. mortality, short + long term effects, ability to work. • Hospital admissions ↑ but if medical infrastructure damaged/destroyed disease impacts ↑. • ↑ in breeding habitats of some diseases e.g. malaria. • Introduction of a disease via aid personnel e.g. UN peacekeepers in Haiti 2010. • Impacts may be positive – e.g. longer term improvements in sanitation + health care following reconstruction. Credit explanation of impacts of <u>one</u> disease in a country which has experienced a natural hazard – no named disease/country limited to bottom of L2. Credit impacts if more than one similar linked disease is named (e.g. water-borne disease). Two impacts well explained can reach L3.

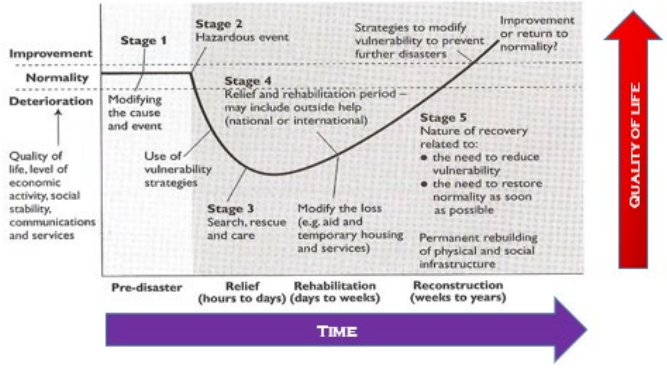
Question			Answer	Mark	Guidance
3	(a)		**Identify <u>three</u> limitations of <u>Fig. 3</u> as a source of information about coral bleaching.** The diagram shows the extent of coral bleaching. Possible limitations include: • Sources not given – bias/reliability. • No data provided for bleaching that is less than 1% can this small a scale be measured? • Circles overlap so data is difficult to read accurately. • The categories overlap. • Lack of information as to length of time loss of coral was measured over. • No absolute data for areas affected, only %. • date of survey not given. • No sea water temperatures? • No information on healthy reefs. • Improved locational information e.g., latitude. • Coral loss is not solely due to coral bleaching e.g., sediment levels in water, human activities, extraction	**3** **AO3 x3**	**AO3 – 3 marks** 3x1 for three limitations of the data identified through critical questioning of the resource. Annotate as SEEN on script, one for each limitation.
3	(b)		**Explain how acidification of oceans contributes to depleting fish stocks.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of how acidification of oceans contributes to depleting fish stocks (AO1). Explanation shown by including **well-developed** ideas about how acidification of oceans contributes to depleting fish stocks. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and	**6** **AO1 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of how acidification of oceans contributes to depleting fish stocks could potentially include: • Acidification of oceans – increasing carbon dioxide absorbed by the oceans, lowering pH • Lower trophic levels e.g., zooplankton, krill, molluscs, crustacea, less able to accumulate $CaCO_3$ as carbonate concentrations diluted →organisms have weaker shells → more predation+ less likely to reach maturity + breed. • Ability to build coral reefs also negatively

			understanding of how acidification of oceans contributes to depleting fish stocks (AO1). Explanation shown by including **developed** ideas about how acidification of oceans contributes to depleting fish stocks. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of how acidification of oceans contributes to depleting fish stocks (AO1). There may be **simple** descriptive ideas about how acidification of oceans contributes to depleting fish stocks **0 marks** No response or no response worthy of credit.		affected → loss of breeding + nursery locations for many fish species. • Oyster larvae experienced widespread mortality as shells did not form properly and reproduction levels have fallen. • Jellyfish numbers may ↑ increasing competition for small fish reducing their numbers and therefore ↓ food for higher trophic levels. • For fish without shells, acidification slows growth.

Question			Answer	Mark	Guidance
4	(a)		**Identify <u>three</u> limitations of <u>Fig. 4</u> as a source of information about food security risks in a dryland area.** The sketch shows wheat farming in the Gobi Desert. Limitations need to focus on food security. Possible limitations include: • Sources not given – bias/reliability. • Informal representation – influenced by perceptions and intentions of artist. • Lack of information about indication of farming methods, transport / accessibility or technology used. • Poor choice of cooler – e.g. dry sand hills are in green. • Annotations not present. • Lack of locational information. • Lack of information about when this sketch was made. • No info on number of crops per year. • Only wheat shown, no info on other crop types / food sources. • No info on population / density. • Shows only one field and not wider area of production. • no info on climate / seasonality. • Lack of scale. • Irrigation – is channel for this?	**3** **AO3 x3**	**AO3 – 3 marks** 3x1 for three limitations of the data identified through critical questioning of the resource. Annotate as SEEN on script, one for each limitation.

4	(b)		**Explain the physical conditions of an extreme environment, where there is indigenous farming.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of the physical conditions of an extreme environment (AO1). Explanation shown by including **well-developed** ideas about the physical conditions of an extreme environment. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of the physical conditions of an extreme environment (AO1). Explanation shown by including **developed** ideas about the physical conditions of an extreme environment. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the physical conditions of an extreme environment (AO1). There may be **simple** descriptive ideas about the physical conditions of an extreme environment. **0 marks** No response or no response worthy of credit.	**6** **AO1 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of the **physical conditions** of an extreme environment, where there is indigenous farming, could potentially include: • Any extreme environment is valid e.g., Sahel, Tropical Rainforest, Arctic Tundra, Gobi Desert. • Temperature (extremes) – length of growing season, annual range, diurnal range. • Light (Intensity and daylight hours). • Water availability. • Soil – type/fertility. • Wind speed.

Question			Answer	Mark	Guidance
5	(a)		**Identify <u>three</u> limitations of <u>Fig. 5</u> as a source of information about volcanic eruptions.** The map shows the proportion of volcanic eruptions between 2000 – 2017. Possible limitations include: • Sources not given – bias/reliability. • Original size of each country/continent is distorted so very difficult to accurately appreciate proportion of eruptions i.e. numerical data. • Accurate and reliable data unavailable in some areas of the world. • Distorted shapes make it difficult to recognise individual countries. • Does not show exact location of specific eruptions. Countries with overseas dependencies increase distortion. • Does not show frequency of eruptions at any one site. • Does not show exact dates of specific eruptions. • Represents only a limited time period, 2000-17. • Does not show magnitude of eruption. • Does not show type of eruption. • Country borders/labels are not present. • No key to identify regions from their colour. • Assumption that eruptions shown are land based. • Does not show relationship to plate boundaries.	**3** **AO3 x3**	**AO3 – 3 marks** 3x1 or three limitations of the data identified through critical questioning of the resource. Annotate as SEEN on script, one for each limitation.

5	(b)		**Explain the Park model of disaster-response.** **Level 3 (5-6 marks)** Demonstrates **thorough** knowledge and understanding of the Park model of disaster-response (AO1). Explanation shown by including **well-developed** ideas about the Park model of disaster-response. **Level 2 (3-4 marks)** Demonstrates **reasonable** knowledge and understanding of the Park model of disaster-response (AO1). Explanation shown by including **developed** ideas about the Park model of disaster-response. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the Park model of disaster-response (AO1). There may be **simple descriptive** ideas about the Park model of disaster-response. **0 marks** No response or no response worthy of credit.	**6** **AO1 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of the Park model of disaster-response could potentially include: • Different versions of the Park model are available. • Shows the relationship between disaster and response. • Measures disaster commonly; normality, deterioration, improvement which is measuring quality of life, level of economic activity, social stability, communications and services. • Response over time can be described as; pre-disaster, relief (hours to days), rehabilitation (days to weeks), reconstruction (weeks to years) • Stages commonly identified; ○ 1 – modifying cause and event. ○ 2 – hazardous event occurs. ○ 3 – search, rescue and care. ○ 4 – relief and rehabilitation. ○ 5 – nature of recovery which can be determined the need to reduce vulnerability, and the need to restore normality as soon as possible. Credit content presented as an annotated diagram. 

SECTION B – SYNOPTIC QUESTIONS

Question	Answer	Mark	Guidance

Question			Answer	Mark	Guidance
6			**Examine how the balance of anthropogenic emissions around the world has been changed by <u>EITHER</u> international trade <u>OR</u> global migration.** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of anthropogenic emissions and 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 balance of anthropogenic emissions has been changed by EITHER international trade OR global migration (AO2). This will be shown by including **well-developed** ideas about how the balance of anthropogenic emissions has been changed by 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 anthropogenic emissions and 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 balance of anthropogenic emissions has been changed by EITHER international trade OR global migration (AO2).	**12** **AO1 x6** **AO2 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of anthropogenic emissions and EITHER international trade OR global migration could potentially include: Anthropogenic emissions • Sources - Greenhouse gases e.g. CO_2, CH_4. • Balance of anthropogenic emissions around the world i.e. where the emissions occur across the continents. International trade • Movement of goods and services between countries. • Current spatial patterns in the direction and components of international trade – global shift in economic activity. Global migration • Movement of people between countries. • Current spatial patterns in the direction and components of global migration. **AO2 – 6 marks** Application of knowledge and understanding to analyse how the balance of anthropogenic emissions around the world has been changed by EITHER international trade OR global migration could potentially include: • Increased economic activity globally due to increased demand for goods and services, increasing emissions • International trade o Changing pattern of emissions from increased use of fossil fuels and manufacturing in some areas, but decline in others o Demand for traded goods e.g. manufactured goods, fuels, mining

Question			Answer	Mark	Guidance
			This will be shown by including **well-developed** ideas for **either** anthropogenic emissions **or** 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 anthropogenic emissions and 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 balance of anthropogenic emissions has been changed by EITHER international trade OR global migration (AO2). This will be shown by including **developed** ideas about **either** anthropogenic emissions **or** 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 anthropogenic emissions and 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 balance of anthropogenic emissions has been changed by EITHER international		products or agricultural products will increase anthropogenic emissions as countries increase production e.g. Europe + Asia high volume of merchandise exports, S+C America + Africa have relatively low volumes; MNCs with factories in 'host' countries may increase emissions there rather than where headquartered o Global trade system dominated by a few powerful economies which leads to imbalance of anthropogenic emissions e.g. port development in ACs would lead to higher emissions, whereas LIDCs and some EDCs would not be developing ports on a large scale because the volume of trade is much smaller; services also generate emissions and again ACs dominate global distribution o Transport linked to trade increases anthropogenic emissions – air and oceans o ACs have cleaner technology in general. • Global migration o Increased movement of people to cities, increasing urbanisation, leading to increased emissions as transport within cities is in higher demand. o Examples of transport of contemporary migrants that could contribute to anthropogenic emissions include air travel (e.g. Poland to UK and other inter EU travel). Travel by boat – most well-known = across Mediterranean and cross channel migration of refugees o Many economic migrants are moving to ACs or EDCs for employment contributing with skilled and unskilled labour = the growth of industry and farming e.g., migrants from Pakistan moving to Kuwait to

Question			Answer	Mark	Guidance
			trade OR global migration (AO2). This will be shown by including **simple** ideas about anthropogenic emissions and 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.		work in the oil trade shifting the balance of emissions as industry grows. o One third of global migrants are now South – South i.e. amongst LIDCs and some EDCs. Much movement for economic reasons which contributes to ↑ emissions in some locations e.g. Burkina Faso – Ivory Coast. o Historical perspective valid e.g. flows of Europeans to the rest of the World.

Question			Answer	Mark	Guidance
7			**Examine how disease diffusion is affected by physical factors in any <u>one</u> landscape system.** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of disease diffusion and physical factors in any **one** landscape system (AO1). Demonstrates **comprehensive** application of knowledge and understanding to provide clear, developed and convincing analysis that is fully accurate of how disease diffusion is affected by physical factors in any **one** landscape system (AO2). This will be shown by including **well-developed** ideas about the relationship between disease diffusion and physical factors in any **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 disease diffusion and physical factors in any **one** landscape system (AO1). Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy of how disease diffusion is affected by physical factors in any **one** landscape system (AO2). This will be shown by including **well-developed** ideas about **either** disease diffusion **or** physical factors in any **one** landscape system and **developed** ideas for the other focus.	**12** **AO1 x6** **AO2 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of disease diffusion and physical factors in any **one** landscape system could potentially include: • Disease diffusion ⊖ expansion, relocation, contagious, hierarchical diffusion ⊖ Hägerstrand model of diffusion ⊖ Barriers to diffusion • physical factors – coastal landscape systems ⊖ Sea level rise, ocean currents ⊖ Landform formations ⊖ Climate, geology, relief • physical factors – glaciated landscape systems, including tundra. ⊖ climate, geology, latitude, altitude, relief, aspect ⊖ glacial advance and retreat ⊖ Landform formations • physical factors – dryland landscape systems ⊖ climate, changes in aridity, latitude, altitude, relief, aspect ⊖ Landform formations **AO2 – 6 marks** Application of knowledge and understanding to analyse how disease diffusion is affected by physical factors in any **one** landscape system could potentially include: ○ Generic points for any landscape system • Relief - high altitude / steep slopes such as a mountain range can cause abrupt change in climate and vector habitats, acting as a barrier to vector-borne disease diffusion. Contrast

			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 disease diffusion and physical factors in any **one** landscape system (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide sound analysis that shows some accuracy of how disease diffusion is affected by physical factors in any **one** landscape system (AO2). This will be shown by including **developed** ideas about **either** disease diffusion **or** physical factors in any **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 disease diffusion and physical factors in any **one** landscape system (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how disease diffusion is affected by physical factors in any **one** landscape system (AO2). This will be shown by including **simple** ideas about disease diffusion and physical factors in any **one** landscape system. There are limited attempts to make synoptic links between content from different parts of the course of		lowland plains that may provide conditions favouring transmission / spread • Climate - temperature, rainfall and humidity can affect timing and rate of progress of disease diffusion, especially if regimes are markedly seasonal; this is because vector habitats, time available to complete vector life cycles, and rates of viral replication are affected • Distance - distance is an important physical factor; the probability of a contagious disease spreading to an area is inversely proportional to distance from its source. Scale is a factor that might influence / halt diffusion, such as extent of a desert or ocean o Physical factors can have either a positive (spread) or negative (barrier) effect on disease diffusion - often in combination o Coastal landscape systems • Sea level rise leads to increased flooding which would create expansion diffusion as new areas open up to flooding allowing the spread of diseases such as cholera • Changes in ocean currents, which are rare, but would change the climatic conditions at the coast, e.g. conditions which could stop the spread of malaria but encourage the relocation diffusion of influenza • The coastline itself is a physical barrier which halts diffusion as an abrupt boundary of sea or ocean o Glaciated landscape systems • Advance or retreat of valley glaciers due to changes in climate, would alter physical barriers to disease • Permafrost damage causing transport

			study. **0 marks** No response or no response worthy of credit.		problems would create a physical barrier, which reduces access to medical facilities and lead to a higher contagious diffusion within a community • Reduction in river flows due to ablation would limit the spread of disease o Dryland landscape systems • Increase in aridity increases the physical barrier stopping the diffusion of disease, and lack of moisture in deserts e.g. Namib would decrease the risk of hierarchical diffusion as trade routes may cease through the desert • Pluvial conditions in the Sahara, along with tropical temperatures would increase breeding grounds for mosquitoes increasing relocation diffusion for malaria and dengue fever • Recent warming of the Great Plains leads to a reduction in a physical barrier, and more contagious diffusion especially as areas open up for tourism • the aridity of a desert area is a barrier halting the diffusion of many diseases endemic to the tropics and sub-tropics; e.g. fewer aquatic habitats such as ponds and stagnant pools.

Question			Answer	Mark	Guidance
8			**Examine how the accumulation of plastic in oceans influences representations of place.** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of the accumulation of plastic and representations of place. (AO1). Demonstrates **comprehensive** application of knowledge and understanding to provide clear, developed and convincing analysis that is fully accurate of how the accumulation of plastic in oceans influences representations of place (AO2). This will be shown by including **well-developed** ideas about the relationship between the accumulation of plastic and representations of place. 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 accumulation of plastic and representations of place (AO1). Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy of how the accumulation of plastic in oceans influences representations of place (AO2). This will be shown by including **well-developed** ideas about **either** the accumulation of plastic **or** representations of place and **developed** ideas for the other focus. There are clear attempts to make synoptic links	**12** **AO1 x6** **AO2 x6**	**AO1 – 6 marks** Knowledge and understanding of the accumulation of plastic in oceans and representations of place could potentially include: • Accumulation of plastic in oceans; o Accumulation of plastic in one ocean gyre such as in the North Pacific o Causes of the accumulation • Representations of place; o Informal representations e.g. TV, film, media, art, photography, literature, graffiti and blogs o Formal and statistical representations e.g., geospatial data **AO2 – 6 marks** Application of knowledge and understanding to analyse how the accumulation of plastic in oceans influences representations of place could potentially include: • Photographs of serene waters, or stormy seas are now replaced by photographs focused on plastic pollution – either floating near the surface or wide-angle shots of the masses of plastic accumulating • TV documentaries now focusing on the research, methods, clean up and impact on ecosystems of the open seas e.g., Planet Earth 1 focused on the marine ecosystem in the open seas, whereas Planet Earth 2 included the human impact of plastic accumulation • Films are now being released to shock the general public into action and educate them on the impact of the accumulation of plastic in the ocean • Geospatial data focusing on the amount of plastic, how much plastic can be removed by different methods, rather than the ecosystem itself as it has been in the past

			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 accumulation of plastic and representations of place (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide sound analysis that shows some accuracy of how the accumulation of plastic in oceans influences representations of place (AO2). This will be shown by including **developed** ideas about **either** the accumulation of plastic **or** representations of place 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 plastic and representations of place (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how the accumulation of plastic in oceans influences representations of place (AO2). This will be shown by including **simple** ideas about the relationship between the accumulation of plastic and representations of place. There are limited attempts to make synoptic links between content from different parts of the course of study.		• Examples may be given of representation of rubbish dumps on beaches. • Positive representations of places without plastic accumulations; beach cleaning schemes.

			0 marks No response or no response worthy of credit.		

9			**Examine how strategies to increase food security can be affected by issues of <u>either</u> human rights <u>or</u> territorial integrity.** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of strategies to increase food security and issues of <u>either</u> human rights <u>or</u> territorial integrity. (AO1). Demonstrates **comprehensive** application of knowledge and understanding to provide clear, developed and convincing analysis that is fully accurate of how strategies to increase food security can be affected by issues of <u>either</u> human rights <u>or</u> territorial integrity (AO2). This will be shown by including **well-developed** ideas about how strategies to increase food security could be affected by issues of <u>either</u> human rights <u>or</u> territorial integrity. 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 strategies to increase food security and issues of <u>either</u> human rights <u>or</u> territorial integrity (AO1). Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy of how strategies to increase food security can be affected by issues of <u>either</u> human rights <u>or</u> territorial integrity (AO2). This will be shown by including **well-developed** ideas about **either** strategies to increase food security **or**	**12** **AO1 x6** **AO2 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of strategies to increase food security and issues of <u>either</u> human rights <u>or</u> territorial integrity could potentially include: • Strategies to increase food security: o Short term relief to capacity building to long term redesign. o Large-scale technological techniques to small-scale bottom up and appropriate technological approaches. • Issues of human rights and issues of territorial integrity: o have consequences for citizens and place, including short term effects and long-term effects o Can impact opportunities for stability, growth, development and challenges of inequality and injustice **AO2 – 6 marks** Application of knowledge and understanding to examine how strategies to increase food security can be affected by issues of <u>either</u> human rights <u>or</u> territorial integrity could potentially include: • Human rights (e.g., issues linked to women's rights, forced labour, maternal and child mortality, corruption, access to health and education) o High crime rates + corruption by police and other officials, short term relief e.g., food packages less likely to alleviate the food shortage as officials bribed to distribute this unevenly. o Capacity building is not possible when health and nutritional education is not possible. o Small-scale bottom-up projects are likely to be much more effective as the community

			issues of either human rights or territorial integrity 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 strategies to increase food security and issues of either human rights or territorial integrity (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide sound analysis that shows some accuracy of how strategies to increase food security can be affected by issues of either human rights or territorial integrity (AO2). This will be shown by including **developed** ideas about **either** strategies to increase food security **or** issues of either human rights or territorial integrity 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 strategies to increase food security and issues of either human rights or territorial integrity (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how strategies to increase food security can be affected by issues of either human rights or territorial integrity (AO2).		will be directly benefitting however in a society so used to corruption, this will still be a limitation. ○ Conflict within a society limiting access of NGOs and government ↑ food security. e.g. Afghanistan or DRC. • Territorial integrity ○ Threats to territorial integrity often occur in a context of political turmoil (e.g. military invasion/annexation, civil war/ethnic conflict, partition/independence claims). ○ Military activity can threaten local, regional and global food security e.g. Russian invasion of Ukraine e.g. regions where fighting exists, national disruption + threats to flows of grain affecting global supplies. ○ Many interventions work with NGOs who distribute short term aid on the ground. This can be hampered by violence, harassment and persecution forcing areas to be abandoned by aid workers and food distribution ceases. ○ Some NGOs will administer training to local people in livestock health and use of fishing equipment to ensure longer term food security e.g. in South Sudan. ○ Small-scale bottom-up projects improves food security such as treating malnutrition in vulnerable children which has also occurred from the MSF in South Sudan.

			This will be shown by including **simple** ideas about strategies to increase food security could be affected by issues of <u>either</u> human rights <u>or</u> territorial integrity. 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.		

10			**Examine how volcanic eruptions influence the carbon cycle.** **Level 4 (10-12 marks)** Demonstrates **comprehensive** knowledge and understanding of volcanic eruptions and the carbon cycle (AO1). Demonstrates **comprehensive** application of knowledge and understanding to provide clear, developed and convincing analysis that is fully accurate of how volcanic eruptions influence the carbon cycle (AO2). This will be shown by including **well-developed** ideas about how volcanic eruptions influence the carbon 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 volcanic eruptions and the carbon cycle (AO1). Demonstrates **thorough** application of knowledge and understanding to provide clear and developed analysis that shows accuracy of how volcanic eruptions influence the carbon cycle (AO2). This will be shown by including **well-developed** ideas about **either** volcanic eruptions **or** the carbon 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 study but these are not always appropriate.	**12** **AO1 x6** **AO2 x6**	**Indicative content** **AO1 – 6 marks** Knowledge and understanding of volcanic eruptions and the carbon cycle could potentially include: • Volcanic eruptions – variety of volcanic activity e.g. eruptions (explosive, effusive, hot spots) and types of ejected material e.g. lava, ash, gas. • Volcanic ash – impacts on climate and decomposition. • carbon cycle – carbon cycles in both open and closed systems, inputs, outputs and stores in the carbon cycle, processes and pathways within the carbon cycle. • Fast and slow carbon cycles. **AO2 – 6 marks** Application of knowledge and understanding to analyse how volcanic eruptions influence the carbon cycle could potentially include: • Eruptions release carbon dioxide into the atmosphere which has been stored dissolved in the mantle. Atmospheric carbon store ↑. • Eruptions release lava which cools → bare rock vulnerable to weathering and further breakdown into the soil + atmospheric carbon stores. • Explosive eruptions are less frequent so may have less influence on the carbon cycle but can emit more material than effusive eruptions • Submarine volcanoes release dissolved carbon dioxide into the ocean • Eruptions can damage / destroy biomass on volcano slopes →loss of accumulation of carbon in biomass + release of carbon into atmosphere upon burning. • Eruptions can deposit carbon rich ash → weathers = ↑ biomass growth. • Eruptions can block sunlight due to ash leads to reduction in biomass.

			Level 2 (4-6 marks) Demonstrates **reasonable** knowledge and understanding of volcanic eruptions and the carbon cycle (AO1). Demonstrates **reasonable** application of knowledge and understanding to provide sound analysis that shows some accuracy of how volcanic eruptions influence the carbon cycle (AO2). This will be shown by including **developed** ideas about **either** volcanic eruptions **or** the carbon 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 volcanic eruptions and the carbon cycle (AO1). Demonstrates **basic** application of knowledge and understanding to provide simple analysis that shows limited accuracy of how volcanic eruptions influence the carbon cycle (AO2). This will be shown by including **simple** ideas about volcanic eruptions and the carbon 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		• Acid rain (SO_2) causes increased weathering of carbonate rocks releasing carbon into atmosphere.

SECTION C

Question	Answer	Mark	Guidance

11*			**'International responses to climate change will never work.' Discuss.** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of international responses to climate change. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of international responses to climate change. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of international responses to climate change. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of international responses 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 international responses to climate change will never work. 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 international responses to climate change will never work. 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 international responses to climate change could potentially include: • Geopolitics associated with human response to climate change e.g. island states (Maldives), some EDCs (India). • Role of IPCC in shaping policy making. • Success of international directives + conferences e.g. Kyoto protocol, European Climate change programme; COP26. • Significance of carbon trading and carbon credits – regional responses, e.g. EU. • Other responses – national and sub-national policies. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the extent to which international responses to climate change will never work could potentially include: International responses such as: • IPCC reports are not legally binding reducing effectiveness but important in giving authoritative data. • Not all countries have signed up to Kyoto Protocol; even some of those that were bound in the first instance have not signed up to the voluntary second commitment reducing its effectiveness. • EUETS has made a difference, but it is only within the EU and is making a small difference. However, there is much criticism of scheme as it has not been strict enough and could be more effective. • Some global protocols relatively successful e.g., Montreal, CFCs. Responses reducing

			Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how international responses to climate change will never work. 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 international responses to climate change will never work 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 international responses to climate change will never work. 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 international responses to climate change will never work. 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 international responses to climate change will never work. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which international responses to climate change will never work.		acid rain decreases weathering of carbonate rocks. • Countries remain independent so develop their own policies which are effective in their context and systems e.g. Denmark has strong mitigation policies and has developed regional and local policies to deal with climate change e.g. 'climate-proof' neighbourhoods in Copenhagen. • Comments about individual and small group responses valid e.g. change in use of car; shift in diets; recycling + reuse schemes.

			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.		

12*			**Assess the success of mitigation strategies to cut global emissions of greenhouse gases.** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of mitigation strategies to cut global emissions of greenhouse gases. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of mitigation strategies to cut global emissions of greenhouse gases. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of mitigation strategies to cut global emissions of greenhouse gases. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of mitigation strategies to cut global emissions of greenhouse gases. **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 success of mitigation strategies to cut global emissions of greenhouse gases. 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 success of mitigation strategies to cut global emissions of greenhouse gases.	**33** **AO1 x9** **AO2 x24**	**Indicative content** **AO1 – 9 marks** Demonstrating knowledge and understanding of mitigation strategies to cut global emissions of greenhouse gases could potentially include: • Energy efficiency and conservation. • Fuel shifts and low-carbon energy sources. • Carbon capture and storage. • Forestry strategies. • Geoengineering – only allow strategies aimed at cutting emissions. • Global/regional/national/sub-national initiatives e.g. COP26, EUETS, California, UK/Denmark, urban emission zones. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the success of mitigation strategies to cut global emissions of greenhouse gases could potentially include: Two or more mitigation strategies: • The larger the scale of involvement, the more countries involved but the lower the targets. The smaller the scale, the fewer countries involved and higher the targets. • Energy efficiency in many countries is not a legal requirement. Involves extra cost so not a priority especially in EDCs and LIDCs. In the UK building regulations enforce minimum requirements but more could be done e.g. electricity generation using renewable sources of energy. • Fuel shifts – significant difference by moving from: ○ dirty to cleaner fossil/non-renewable fuels (e.g. from coal to gas fired power stations enabled the UK to meet EU climate targets) ○ fossil to renewable energy sources; the UK

			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 the success of mitigation strategies to cut global emissions of greenhouse gases. Demonstrates **thorough** application of knowledge and understanding to provide a detailed evaluation that offers generally secure judgements, with some link between rational conclusions as the success of mitigation strategies to cut global emissions of greenhouse gases. 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 success of mitigation strategies to cut global emissions of greenhouse gases. 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 success of mitigation strategies to cut global emissions of greenhouse gases. 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 success of mitigation strategies to cut global emissions of greenhouse gases. Demonstrates **basic** application of knowledge and		is relying more and more on renewable sources • CCS has the potential to make a difference. In the UK and worldwide however, the technology is still developing + expensive and projects due in 2015 for e.g. are still not operational e.g. Gorgon Injection Project, Australia or Alberta Carbon Trunk Line, USA • Forestry strategies - reforestation and forest conservation e.g., UN REDD programme • Geoengineering has different methods but many are still in the R&D stage. Once operational - limited ability to affect greenhouse gas emissions unless relatively cheap.

			understanding to provide an un-supported evaluation that offers simple conclusions as to the success of mitigation strategies to cut global emissions of greenhouse gases. 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.		

13*			**To what extent can LIDCs or EDCs successfully mitigate against and respond to outbreaks of a communicable disease?** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of mitigation against a communicable disease and response to outbreaks in LIDCs or EDCs. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of mitigation against a communicable disease and response to outbreaks in LIDCs or EDCs. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of mitigation against a communicable disease and response to outbreaks in LIDCs or EDCs. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of mitigation against a communicable disease and response to outbreaks in LIDCs or EDCs. **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 success of LIDCs or EDCs in mitigating against and responding to outbreaks of a communicable disease. Demonstrates **comprehensive** application of knowledge and understanding to provide a detailed and substantiated	**33** **AO1 x9** **AO2 x24**	**Indicative content** **AO1 – 9 marks** Demonstrating knowledge and understanding of mitigation against a communicable disease and response to outbreaks in LIDCs or EDCs could potentially include: o Communicable disease = infectious disease spreading from host to host e.g. Ebola, typhoid, influenza, covid, tuberculosis, HIV/Aids, malaria, cholera. o Mitigation strategies e.g., blocking transmission routes, eliminating conditions that favour the disease; consideration of housing conditions, education; public health programmes e.g., vaccination + campaigns. o Response to outbreaks e.g., public health and medical initiatives; quarantine / lock-down; vaccination, emergency aid e.g., NGOs and governments. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the extent to which LIDCs or EDCs can successfully mitigate against and respond to outbreaks of a communicable disease, could potentially include: o Details of mitigation against and response to outbreaks of a communicable disease in LIDCs or EDCs. o The effectiveness of mitigation and response to outbreaks – successes, failures, with reasons. Speed of response, e.g., covid in Cuba (EDC). o By Jan 2020 commission set up to deal with covid. Personnel sent to China to learn about virus and plan made ready to implement. o Well organized civil defense (for impacts of natural disasters) applied to covid.

			evaluation that offers secure judgements leading to rational conclusions that are evidence based as to the extent to which LIDCs or EDCs can successfully mitigate against and respond to outbreaks of a communicable disease. 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 the success of LIDCs or EDCs in mitigating against a communicable disease and responding to outbreaks. 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 LIDCs or EDCs can successfully mitigate against and respond to outbreaks of a communicable 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 the success of LIDCs or EDCs in mitigating against a communicable disease and responding to outbreaks. 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 LIDCs or EDCs can successfully mitigate against and respond to outbreaks of a communicable disease. Concepts are discussed but their use lacks precision. **Level 1 (1–6 marks)**		○ Domestic pharmaceutical industry produces 70% of Cuba's drug demand. Generated supplies quickly e.g. steroids ○ Lockdown from March 2020 – contact tracing, door to door checks, financial help for those hospitalized. March 24 borders closed to non-residents. ○ By mid July 2020 death rates close to expected levels for the time of year – death rate from covid 7.6 / million c.f. UK 649 + USA 391. E.g. malaria in sub-Saharan Africa + parts of Asia (EDCs + LIDCs) Key mitigation + response interventions; ○ Prompt + effective chemo-treatment e.g. artemisinin based therapies ACT – developed as Plasmodium parasites developed resistance to malaria treatments in some areas. ○ Vector control - insecticidal bed nets – very effective when most people in an area have them; need to be long-lasting and affordable. ○ Vector control - indoor spraying with insecticide + burning mosquito coils – affordable but generate a repellent smoke but smoke contains pollutants →health concerns ○ Vector control – reducing / eliminating larval breeding aquatic habitat – only effective where these a few, fixed locations and findable e.g. close to dwellings. ○ Rapid diagnostic testing being developed c.f. lateral flow for covid; also vaccine development e.g. funded by Gates Foundation. ○ Evaluation that 'one size fits all' approach invalid – different mosquito species have different habits e.g. when they're active and biting, different susceptibilities to insecticides, different patterns of human activity e.g.

			Demonstrates **basic** application of knowledge and understanding to provide a simple analysis that shows limited accuracy of the success of LIDCs or EDCs in mitigating against a communicable disease and responding to outbreaks. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which LIDCs or EDCs can successfully mitigate against and respond to outbreaks of a communicable disease. 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.		farmers c.f. urban dwellers – L4 indicators ○ Progress made over past two decades e.g. 1.7 billion cases prevented + 10.6 million deaths China eliminated malaria; but progress slowed – 2020 est. 240 million cases 95% in Africa, est 627,000 deaths mostly children <5 yrs old; malaria can by asymptomatic so humans can spread disease without realizing they have malaria E.g. cholera in Bangladesh after flooding. ○ Mitigation – afforestation, building dams to manage river flow – more expensive. ○ Response to outbreaks – emergency aid; food aid from government, UNICEF provided drugs, saline solution and hundreds of mobile health teams indicating Bangladesh's inability to manage. Clear and developed consideration of both mitigation and response **likely** to be L3 and above indicator. Responses not considering either mitigation nor response are **reasonable**, therefore top of L2 limit.

14*			**There is a link between disease and levels of economic development'. Discuss.** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of disease and levels of economic development. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of disease and levels of economic development. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of disease and levels of economic development. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of disease and 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 the link between disease and economic development. 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 there is a link between disease and levels of economic development. Relevant concepts are authoritatively discussed.	**33** **AO1 x9** **AO2 x24**	**Indicative content** **AO1 – 9 marks** Demonstrating knowledge and understanding of disease and levels of economic development could potentially include: • Where rising standards of living (medical advances, clean water plus sanitation, food security) have yet to occur (LIDCs) main cause of death is communicable diseases. • Demonstrated by the stages 1 and 2 of the epidemiological transition. Followed by stage 3 (EDCs +ACs) where degenerative and other non-communicable diseases become the main cause of death. • Some diseases may be linked to levels of economic development e.g. from impact of air pollution in LIDCs, EDCs + ACs, or diet. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the extent to which there is a link between disease and levels of economic development could potentially include: • Specific diseases and groups of diseases demonstrate the extent to which there is a link between disease and levels of economic development for example: ○ Countries across the development continuum experience degrees of air pollution e.g., EDC Mexico - one of the highest rates of urban air pollution globally, AC UK in 2019 Public Health England stated the biggest environmental threat to health was air pollution especially in some urban centres. ○ Malaria is most prevalent in sub-Saharan Africa where it is a struggle to manage due to lack of resources, whereas some South

			Level 3 (13–18 marks) Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of the link between disease and economic development. 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 there is a link between disease and levels of economic development. 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 link between disease and economic development. 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 there is a link between disease and levels of economic development. 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 link between disease and economic development. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which there is a link		American + Asian countries, while sharing similar climatic conditions manage contributory factors more effectively due to their organisation, development, and investments, → lower prevalence of the disease. ○ Cancer seen as a disease of affluence varies depending on the type e.g. prostate cancer is much more prevalent in LIDCs and EDCs in Africa and South America, whereas lung cancer has very low rates in Africa, high rates in some EDCs e.g. China. ○ Coronavirus (CV19) despite being communicable, showed greater prevalence in many ACs e.g. UK, USA, Italy and Spain than many LIDCs – depends on the disease and the sections of population that are most vulnerable e.g. ageing populations in many ACs. Cuba e.g. (EDC) interesting comparison here. ○ Diabetes – widespread across development continuum especially concentrated in USA, East + South Asia. Types 1 is genetic + most common amongst children, Type 2 develops in adulthood linked with obesity, poor diet and physical inactivity. ○ In some ACs rates in improvement in life expectancy slowing. In UK for e.g. life expectancy actually falling for both males + females – males 13 months since 2015 females 14 months. ○ While environmental conditions are significant, simplistic determinism due to climate not appropriate e.g. Singapore, 1° N of Equator – life expectancy = 83.5 years one of the highest in world.

between disease and levels of economic development.

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.

15*			**'The oceans are vital to globalisation'. To what extent do you agree with this statement?** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of the oceans and globalisation. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of the oceans and globalisation. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of the oceans and globalisation. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the oceans and globalisation **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 oceans are vital to globalisation. 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 oceans are vital to globalisation. 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 oceans and globalisation could potentially include: • Concept of globalisation – multiple interconnections and linkages between nations, groups of people, businesses and individuals, (for the delivery of goods and services) which make up the modern world system. • Oceans – large areas of water between continents with shipping routes that facilitate varied trade in a many directions. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the extent to which the oceans are vital to globalisation could potentially include: • Historical context of globalisation relevant. e.g – colonialization, East India Company. • Landlocked countries are at a great disadvantage. • Oceans are not vital to globalisation o There are other ways to interconnect, (air travel which now links countries, peoples and businesses together quickly; satellites and telecommunications. • Oceans are vital to globalisation o Movement of goods is a critical and significant way in which countries interlink (most freight transport is still shipped – evidence such as containerisation, bulk carriers). o Resources e.g. minerals, fish, tourism. o Improved developments in technology so better tracking, speed and reliability of trade delivery. o Submarine cables carrying vast volumes of data transfer.

			Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of how the oceans are vital to globalisation. 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 oceans are vital to globalisation. 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 oceans are vital to globalisation. 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 oceans are vital to globalisation. 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 oceans are vital to globalisation. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which the oceans are vital to globalisation. Concepts are not discussed or are so inaccurately. **0 marks**		• Oceans and globalisation ○ A neutral position when oceans are used by countries/individuals to exert their influence (eg naval clashes, ownership disputes, piracy) or by migrants as escape routes.

			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		

16*			**'The opportunities arising from the use of ocean resources are greater than the threats'.** **Discuss.** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of opportunities and threats arising from the use of ocean resources. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of opportunities and threats arising from the use of ocean resources. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of opportunities and threats arising from the use of ocean resources. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of opportunities and threats arising from the use of ocean resources. **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 opportunities and the threats arising from the use of ocean resources. 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 the opportunities and the threats arising from the use of ocean resources could potentially include: • Ocean resources - biological, energy or mineral, and associated extraction/use and management. • Opportunities – environmental, economic, political benefits. o Biological resources within oceans used in sustainable ways. o Use of flow resources e.g., wave and tidal energy. o Management and international cooperation of the resources. • Threats – the disadvantages associated with using ocean resources: o Unsustainable use of biological resources. o Use and management of non-renewable resources, seabed minerals. o Pollution – extraction of minerals. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the extent to which the opportunities arising from the use of ocean resources are greater than the threats, could potentially include: • Opportunities and threats exist alongside each other o Opportunities in REE exploitation, however the surrounding ecosystems are vulnerable & disposal tailings is generally threatening sea-bed ecosystems. o International management e.g. IWC is successful in joining countries together in one goal to protect the ocean, however such agreements have had limited success e.g. commercial whaling still

			the opportunities arising from the use of ocean resources are greater than the threats. 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 the opportunities and the threats arising from the use of ocean resources. 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 opportunities arising from the use of ocean resources are greater than the threats. 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 opportunities and the threats arising from the use of ocean resources. 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 opportunities arising from the use of ocean resources are greater than the threats. 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 opportunities and the threats arising from the use of ocean resources.		continues ○ Socio-economic opportunities are huge e.g. in the Gulf of Mexico the multiplier effect from the 40,000km active pipelines across the sea floor provided construction jobs 240,00 jobs directly linked in US Gulf energy industries. However, much oil seeps from seabed pipelines + disasters e.g. Deep water horizon. • Opportunities greater than threats: ○ Tourism opportunities created from individual projects e.g. from the Tidal Lagoon in Swansea Bay created cycle paths, recreational fishing, sailing, rowing. ○ Values, attitudes, socio-economic status and political context of stakeholders can positively influence the use and management of a biological resource e.g. sustainable tourism, World heritage sites, conservation zones e.g., Great Barrier Reef. • Threats greater than opportunities: ○ Exploitation of ocean resources has been a historic issue and one that continues today e.g. bigeye and Blue Fin tuna, halibut, monkfish. ○ Challenges to manage illegal fishing facilitates overfishing. ○ Oil spills from using the oil in the seabed causes huge threats to the ecosystem for both the short and long term.

			Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which the opportunities arising from the use of ocean resources are greater than the threats. 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.		

17*			**'Economic factors are the main cause of spatial variation in global food security'. Discuss.** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of economic factors and global food security. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of economic factors and global food security. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of economic factors and global food security. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of economic factors and global food security. **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 global food security and factors influencing spatial variation. 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 economic factors are the main cause of spatial variation in global food security. Relevant concepts are authoritatively discussed.	**33** **AO1 x9** **AO2 x24**	**Indicative content** **AO1 – 9 marks** Demonstrating knowledge and understanding of economic factors and global food security could potentially include: • Food security = where there is access to sufficient food for individuals to lead a healthy life e.g., quality/quantity of calories, nutrients. Use of Global Hunger Index valid. • Economic factors e.g. land ownership, competition (in markets and for resources), technology, infrastructure, increasing role of TNCs. • Other factors e.g. social, political, environmental/physical. • Food security - varies both between and within countries creating uneven global patterns. • Pattern of food security is dynamic through time. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate whether economic factors are the main cause of spatial variation in global food security could potentially include: There is more than enough food for the world – it is the distribution and access to that food that determine food security • Economic factors e.g. ○ Acquisition of land by other countries to increase their own food security, linked to wealth differentials - land grabbing increases both vulnerability of LIDCs and food insecurity for local farmers and populations. ○ ACs have capital, technological advantage, reliable (energy & educated workforce).

			Level 3 (13–18 marks) Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of global food security and factors influencing spatial variation. 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 economic factors are the main cause of spatial variation in global food security. 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 global food security and factors influencing spatial variation. 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 economic factors are the main cause of spatial variation in global food security. 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 global food security and factors influencing spatial variation. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to whether economic factors are the main cause of spatial variation in global food security.		LIDCs less advanced tech, 'appropriate technology' ○ Local food insecurity - making a local difference but not national. ○ Storage and distribution – problems cause geographical pinch points and shortages of food for those most in need. ○ Dominance of retail chains, TNCs reduces competition, farmers lose income and may be forced to grow high-value crops. ○ Land locked countries restricted in importing and exporting. • Environmental factors e.g. ○ Physical factors (e.g., soil, climate) affect food production and vary globally ○ Climate change affecting food production systems. ○ Hazards + extreme weather events e.g. earthquakes, flooding, drought e.g. India, Australia. • Political and social factors e.g. ○ Growing populations can lead to land ownership issues. ○ Ideas e.g. Malthus + Boserup. ○ Global competition may increase food security in ACs; LIDCs at greater risk of food insecurity. ○ Trading blocs – facilitate flows of food e.g., EU, ASEAN. ○ Extreme shock events e.g., war (Syria), conflict (Yemen).

			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
18*			**To what extent is globalisation changing the food industry?** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of globalisation changing the food industry. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of globalisation changing the food industry. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of globalisation changing the food industry. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of globalisation changing the food industry. **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 globalisation changing the food industry. 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 globalisation is changing the food industry. Relevant concepts are authoritatively discussed.	**33** **AO1 x9** **AO2 x24**	**Indicative content** **AO1 – 9 marks** Demonstrating knowledge and understanding of globalisation changing the food industry could potentially include: • Influence of globalisation – growing integration + interdependence of people's lives in a complex process with economic, social (cultural), political + environmental components. • Innovations e.g. technological innovation, short-term food relief, consumer choice • Food industry – the complex sequence of chains = production, harvest, processing, transport + consumption of food + disposal of waste. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the extent to which globalisation is changing the food industry could potentially include: • Production = local process initially determined by factors e.g. climate, soil, relief. • Globalisation →quantity + quality of inputs e.g. fertilizer ↑ e.g. potash – Canada 29% world production most exported; Brazil imports 90% of its demand. China, India + USA also major importers; seed developments e.g. GM; livestock breeding. e.g. fungicides, herbicides, insecticides – agro-chemical industry globalized e.g. Monsanto based in USA. e.g. machinery – AC manufacturers e.g. John Deere USA, CNH Netherlands, are top two producers in world; four of top ten are based in China – export globally especially EDCs +

			Level 3 (13–18 marks) Demonstrates **thorough** application of knowledge and understanding to provide a clear and developed analysis that shows accuracy of globalisation changing the food industry. 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 globalisation is changing the food industry. 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 globalisation changing the food industry. 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 globalisation is changing the food industry. 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 globalisation changing the food industry. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which globalisation is changing the food industry. Concepts are not discussed or are so inaccurately.		LIDCs. e.g. food processing + handling – Cargill is world's largest by revenue 2019 US$113.5 billion, has 155,000 personnel spread across 70 countries - HQ in US. e.g. food retailing – increasing numbers of TNS - Walmart, Lidl, Aldi, Costco. • Demands and tastes – food tastes changing + consumer choice ↑, some food brands have global appeal. Seasonality no longer as prominent as previously in ACs. • Consequential rise in food miles as supermarkets meet demands, although some customers choosing local farmers markets + indigenous produce to deliberately reduce food miles. However, can be less damaging environmentally as out of season food production can consume large amounts of energy. • ↑ inequality between TNCs (agribusinesses + food retailers) and small-scale suppliers, however, rise of Fairtrade modifies this – but Fairtrade movement relatively small. • Global food prices become volatile + vulnerable to price shocks e.g., threats to territorial integrity – Ukraine, extreme weather, natural hazards. • Provision of food aid facilitated e.g., FAO; national governments + NGOs.

			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*			**'The most effective strategy to manage tectonic hazards is to mitigate against vulnerability.'** **To what extent do you agree with this statement?** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of the strategies to manage tectonic hazards. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of the strategies to manage tectonic hazards. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of the strategies to manage tectonic hazards. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the strategies to manage tectonic hazards. **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 effective strategies to manage tectonic hazards. 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 most effective strategy to manage tectonic hazards is to mitigate against vulnerability.	**33** **AO1 x9** **AO2 x24**	**Indicative content** **AO1 – 9 marks** Demonstrating knowledge and understanding of the strategies to manage tectonic hazards could potentially include: • Different measures of vulnerability – physical e.g. on built environment + people, economic e.g. damage to enterprises (factory, farm, office) + impacts on labour force, social e.g. impacts on different groups e.g. women, children, elderly, environmental e.g. impacts on biosphere • Mitigate against vulnerability e.g. ○ Education, Community preparedness, Prediction and warning, Hazard-resistant building design, Hazard mapping, Land-use zoning • Modify the hazard event e.g. ○ Lava diversion channels, Cooling the lava with water, Slowing / diverting lava flows, (Not possible to modify earthquake event) • Modify people's losses e.g. ○ Emergency aid, Disaster- response teams and equipment, Search and rescue, Insurance, Resources for rebuilding public services. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the extent to which the most effective strategy to manage tectonic hazards is to mitigate against vulnerability could potentially include: • Managing seismic activity is most effective when mitigating vulnerability and loss, as little can be done to modify the event

			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 effective strategies to manage tectonic hazards. 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 most effective strategy to manage tectonic hazards is to mitigate against vulnerability. 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 effective strategies to manage tectonic hazards. 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 most effective strategy to manage tectonic hazards is to mitigate against vulnerability. 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 effective strategies to manage tectonic hazards. Demonstrates **basic** application of knowledge and understanding to provide an un-supported evaluation that offers simple conclusions as to the extent to which the most effective		*Mitigate against vulnerability* • Comparison of AC and LIDC seismic activity can exemplify the different impacts of mitigating against vulnerability • e.g. Nepal 2015 some communities were not educated nor prepared, many buildings not hazard resistant and no warning - 8800 died and 22,000 injured in Nepal. But given the magnitude, the impacts could have been much worse. The Nepalese do have some measures in place, however, Japanese earthquake 2011 lost very few people in the earthquake itself where citizens are educated, prepared & buildings are hazard resistant. But the resulting tsunami created a very high death toll and major environmental and economic impacts/ • Mt. Merapi, Indonesia, 2010 eruption – forbidding permanent settlement on higher slopes, early warning + evacuation helped reduce death rate. *Modify the hazard event* Actions can be taken to modify volcanic effusive eruption events. e.g. Mt Etna, Italy, slowing and diverting lava flows *Modify people's losses* • Comparison of AC and LIDC volcanic activity can exemplify the impact of modifying losses. Resources and economic strength contribute to effectiveness. • Examples: Mt. Merapi, Indonesia – search and rescue by emergency services, temporary shelters, river channel clearance. Mt Etna, Italy – government compensation of individuals and businesses, rebuilding of infra structure, well trained public services.

			strategy to manage tectonic hazards is to mitigate against vulnerability. 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.		Responses can follow either a breadth or depth approach. The former would have a range of tectonic hazards and strategies. The latter would focus on a limited number of tectonic hazards and strategies. Responses do not have to include both seismic and volcanic examples.

Question			Answer	Mark	Guidance
20*			**'The hazards generated by earthquakes have greater impact on people than those from volcanic eruptions'. Discuss.** **AO1** **Level 4 (7–9 marks)** Demonstrates **comprehensive** knowledge and understanding of the hazards generated by earthquakes and volcanic eruptions. **Level 3 (5–6 marks)** Demonstrates **thorough** knowledge and understanding of the hazards generated by earthquakes and volcanic eruptions. **Level 2 (3–4 marks)** Demonstrates **reasonable** knowledge and understanding of the hazards generated by earthquakes and volcanic eruptions. **Level 1 (1–2 marks)** Demonstrates **basic** knowledge and understanding of the hazards generated by earthquakes and volcanic eruptions. **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 impact on people of the hazards generated by earthquakes and those 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 the hazards generated by earthquakes and volcanic eruptions could potentially include: • Earthquakes o Ground shaking and ground displacement, liquefaction, landslides and avalanches, tsunamis with sea-bed uplift and underwater landslides, flooding. • Volcanic eruptions o lava flows, pyroclastic flows, gas emissions, tephra and ash, lahars and flooding associated with the melting of ice, tsunamis associated with explosive eruptions, acid rain. **AO2 – 24 marks** Application of knowledge and understanding to analyse and evaluate the extent to which the hazards generated by earthquakes have greater impact on people than those from volcanic eruptions could potentially include: • Difficult to compare magnitudes of tectonic events e.g. volcanic eruption v seismic event. • High magnitudes events whether seismic or volcanic eruption have the potential to affect globally / continentally e.g. Krakatoa, Pinatubo affected global atmospheric conditions/ Great East Japan 'quake impacted across the Pacific. • Comparisons between the hazards that impact people from earthquakes and those from volcanic eruptions will illustrate their relative severity and significance. o impacts of volcanic eruptions less severe

			the hazards generated by earthquakes have greater impact on people than those 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 the impact on people of the hazards generated by earthquakes and those 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 the hazards generated by earthquakes have greater impact on people than those 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 the impact on people of the hazards generated by earthquakes and those 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 the hazards generated by earthquakes have greater impact on people than those 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		because there are often warning signs e.g. increase of earthquake activity before Mount Ontake erupted in 2014-only 63 died, however large areas were affected by ash fall, pyroclastic flows, volcanic bombs and lahars. The Great East Japan earthquake of 2011 came without warning and led to a large tsunami killing 16,000 lives. o Pyroclastic flows cannot be stopped and can travel uphill so locals cannot escape. If residents flee to higher ground they can escape tsunamis (e.g. Japan 2011). When Merapi erupted in Indonesia in 2010, pyroclastic flows extended in every direction e.g. north 4km, west 11.5km, east 7km and south 15km. o No super volcano has erupted for several thousand years, one of these events would surpass the impact of the Great East Japan Earthquake. o Volcanic eruptions occur at the surface, whereas some earthquakes can occur deep in the crust limiting their effect as energy is lost as the shock waves travel towards the surface e.g. they can occur as deep as 300km. o Contrast in impacts depending on if AC, EDC or LIDC. o Impacts can be spatial, temporal, or related to people e.g. accept social, economic, political or environmental impacts.

			accuracy of the impact on people of the hazards generated by earthquakes and those 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 the hazards generated by earthquakes have greater impact on people than those 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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