Oxford Cambridge and RSA

A Level Geography

H481/03 Geographical debates

Sample Question Paper

Date – Morning/Afternoon

Time allowed: 2 hours 30 minutes

You must have:
- the Resource Booklet
- the OCR 12-page Answer Booklet
  (OCR 12 sent with general stationary)

You may use:
- a ruler (cm/mm)
- a piece of string
- a calculator

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INSTRUCTIONS
- Use black ink. You may use an HB pencil for graphs and diagrams
- Section A: Choose **two topics** and answer **one** question from **each** topic.
- Section B: Choose **two topics** and answer **one** question from **each** topic.
- Write your answer to each question in the Answer Booklet.
- Additional paper may be used if required but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.
- The separate Resource Booklet will be found inside this document.

INFORMATION
- The total mark for this paper is **96**.
- The marks for each question are shown in brackets **[ ]**.
- Quality of extended response will be assessed in questions marked with an (*).
- This document consists of **4** pages.

Section A

Choose **two topics** and answer **one** question from **each** topic.

Topic 3.1 – Climate Change

1. Analyse **Fig. 1** in the separate Resource Booklet, global temperature variations between 1850 and 2010.

Outline **one** geographical issue and justify **two** strategies for its management.

[10]

Topic 3.2 – Disease Dilemmas

2. Analyse **Fig. 2** in the separate Resource Booklet, two treatment centres – one in a LIDC and one in an AC.

Outline **one** geographical issue and justify **two** strategies for its management.

[10]

Topic 3.3 – Exploring Oceans

3. Analyse **Fig. 3** in the separate Resource Booklet, an extract adapted from a text on oceans.

Outline **one** geographical issue and justify **two** strategies for its management.

[10]

Topic 3.4 – Future of Food

4. Analyse **Fig. 4** in the separate Resource Booklet, the global distribution of working tractors per 1000 people by country, 2014.

Outline **one** geographical issue and justify **two** strategies for its management.

[10]

Topic 3.5 – Hazardous Earth

5. Analyse **Fig. 5** in the separate Resource Booklet, a scatter graph showing the relationship between earthquake magnitude and deaths for selected events since 2001.

Outline **one** geographical issue and justify **two** strategies for its management.

[10]

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Section B

Choose **two topics** and answer **one** question from **each** topic.

Topic 3.1 – Climate Change

6*. 'The vulnerability of people to the impacts of climate change is the result of economic factors.' Discuss.

[38]

OR

7*. 'Climate change is nothing new and is simply part of natural cycles.' How far do you agree with this view?

[38]

Topic 3.2 – Disease Dilemmas

8*. Evaluate the relative importance of social factors influencing the spread of disease.

[38]

OR

9*. To what extent can technology reduce threats from disease?

[38]

Topic 3.3 – Exploring Oceans

10*. To what extent can ocean energy and mineral resources be managed sustainably?

[38]

OR

11*. How far do you agree that changes in Arctic sea ice bring more opportunities than threats?

[38]

Topic 3.4 – Future of Food

12*. Assess the extent to which the challenges facing food supply are essentially physical.

[38]

OR

13*. Evaluate the impacts on people of imbalances in the global food system.

[38]

Topic 3.5 – Hazardous Earth

14*. To what extent are impacts of tectonic hazards influenced by the level of development?

[38]

OR

15*. 'Earthquakes generate only local hazards.' Discuss.

[38]

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OCR
Oxford Cambridge and RSA

…day June 20XX – Morning/Afternoon

A Level Geography

H481/03 Geographical debates

SAMPLE MARK SCHEME

Duration: 2 hour 30 minutes

MAXIMUM MARK 96

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This document consists of 36 pages

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MARKING INSTRUCTIONS

PREPARATION FOR MARKING

SCORIS

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *scoris 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 scoris and mark the **required number** of practice responses ("scripts") and the **required number** of standardisation responses.

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

TRADITIONAL

Before the Standardisation meeting you must mark at least 10 scripts from several centres. For this preliminary marking you should use **pencil** and follow the **mark scheme**. Bring these **marked scripts** to the meeting.

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 scoris 50% and 100% (traditional 50% 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, email or via the scoris messaging system.

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5. Work crossed out:
   a. where a candidate crosses out an answer and provides an alternative response, the crossed out response is not marked and gains no marks
   b. if a candidate crosses out an answer to a whole question and makes no second attempt, and if the inclusion of the answer does not cause a rubric infringement, the assessor should attempt to mark the crossed out answer and award marks appropriately.

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. There is a NR (No Response) option. Award NR (No Response)
   - if there is nothing written at all in the answer space
   - OR if there is a comment which does not in any way relate to the question (e.g. 'can't do', 'don't know')
   - OR if there is a mark (e.g. a dash, a question mark) which isn't an attempt at the question.

   Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

8. The scoris **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 telephone, email or the scoris messaging system.

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

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10. **Annotations**

Annotation	Meaning

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11. 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.

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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.

The Examiners’ Standardisation Meeting will ensure that the Mark Scheme covers the range of candidates’ responses to the questions, and that all Examiners understand and apply the Mark Scheme in the same way. The Mark Scheme will be discussed and amended at the meeting, and administrative procedures will be confirmed. Co-ordination scripts will be issued at the meeting to exemplify aspects of candidates’ responses and achievements; the co-ordination scripts then become part of this Mark Scheme.

Before the Standardisation Meeting, you should read and mark in pencil a number of scripts, in order to gain an impression of the range of responses and achievement that may be expected.

In your marking, you will encounter valid responses which are not covered by the Mark Scheme: these responses must be credited. You will encounter answers which fall outside the ‘target range’ of Bands for the paper which you are marking. Please mark these answers according to the marking criteria.

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.

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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.

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	AO1	AO2	AO3
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.
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.	Quantitative, qualitative and/or fieldwork skills are used in a suitable way and with a good level of competence and precision.

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		detailed evaluation that offers generally secure judgements, with some link between rational conclusions and evidence.	
Reasonable	Some sound knowledge that demonstrates partially developed understanding that is relevant to the demands of 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 judgements 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.
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 or no application to the context of the question in order to form a: simple analysis that shows limited accuracy.	Quantitative, qualitative and/or fieldwork skills are used inappropriately with limited competence and precision.

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		simple interpretation that shows limited accuracy. Un-supported evaluation that offers simple conclusions.	

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Generic Mark Scheme for Section A

Answer	Marks	Levels of Response
Level 3	**8–10**	A response at this Level is characterised by **thorough** knowledge and understanding of an appropriate geographical issue (AO1) interpreted directly from the resource (AO3). **Thorough** analysis and interpretation to justify two strategies for its management (AO2).
Level 2	**4–7**	A response at this Level is characterised by **reasonable** knowledge and understanding of an appropriate geographical issue (AO1) interpreted directly from the resource (AO3). There are some gaps in knowledge and understanding. **Reasonable** analysis and interpretation to justify one **or** two strategies for its management (AO2).
Level 1	**1–3**	A response at this Level is characterised by **basic** knowledge and understanding of a geographical issue (AO1) which may be only loosely linked to the resource (AO3). There are gaps in knowledge and understanding. **Basic** analysis and interpretation to attempt to justify one **or** two strategies for its management (AO2).
	0	No evidence submitted or the response does not address the question.

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Question			Answer	Marks	Guidance
1			See generic Levels mark scheme.	10	**Indicative content** The graph shows deviations in global average temperature from the long-term average and the range in uncertainty about the data. Possible geographical issues can include: • impacts on sea ice, either or both of extent and thickness • impacts on land-based ice • impacts on permafrost • impacts on ecosystems / biomes e.g. Arctic; savannah; tropical rainforest • impacts on sea level • impacts on intensity and or frequency of storms e.g. hurricanes; depressions • any of the above can be linked with impacts on people e.g. threats to low-lying islands and coastal margins; increased flood risk; agricultural changes due to increase / decrease in water availability • opportunities are valid e.g. opening up of sea lanes due to reduced sea ice cover; different crops able to be cultivated • causes of the temperature changes such as anthropogenic GHG (e.g. CO_2; CH_4). Possible strategies can include: • global actions e.g. Kyoto, Bali etc • regional government actions e.g. EU Emission Trading System; EU directives regarding CO_2 emissions • national government actions e.g. UK Climate Change Act (2008) including targets for CO_2 reduction and renewable electricity targets • local and individual responses e.g. promotion of public transport; recycling programmes; increased levels of building insulation • evacuation and abandonment of low-lying islands and coastal areas.

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Question			Answer	Marks	Guidance
2			See generic mark scheme	10	**Indicative content** The two photographs highlight a contrast in the quality of health care available in countries at different points along the development continuum. However, the health care in the LIDC is not without a degree of capability. Responses can either compare and contrast the two images or can chose one and focus on that: both routes can access Level 3. Possible geographical issues can include: • the inequality in health care provision at the global scale but could also be at the national or regional scales • lack of investment in LIDCs in health care • the sophisticated technology used in ACs which has implications for funding • the need for increasing levels of training in both ACs and LIDCs (and EDCs) as medical technology advances • the growing demand for health care from an ageing population in ACs • the growing demand for health care from increasing populations in LIDCs and EDCs which are also ageing. Possible strategies can include: • transfer of medical technology from ACs to countries lacking in medical services • Aid in the form of training for medical staff from LIDCs and EDCs. • change in spending priorities in LIDCs to focus more on health care • various strategies in ACs to fund increasing health care demands e.g. government taxes or private insurance.

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Question			Answer	Marks	Guidance
3			See generic levels mark scheme	10	**Indicative content** The resource suggests that both increasing population and rising expectations of increasing standards of living have effects on ocean resources. The text is not specific as to resource type and so candidates can either deal with ocean resources in general or focus on one resource such as fish (or even a single species such as herring / cod) or oil. Possible geographical issues can include: • the over-exploitation of a biological resource such as fish / krill / whale which can extend beyond the threshold for recovery • the exploitation of difficult to reach mineral resources can lead to exhaustion of that resource • the exploitation of some resources leads to side-effects such as pollution e.g. oil spills • there tends to be a contrast in technology used in resource exploitation between ACs, EDCs and LIDCs and therefore impact on resource exploitation • however, LIDCs and EDCs can also over-exploit ocean resources e.g. coral destruction. Possible strategies can include: • zonal management of oceans to help in the sustainable management of resources e.g. territorial waters; exclusive economic zones (EEZs); United Nations Convention on the Law of the Sea (UNCLOS) • role of trans-national government policies e.g. EU's Common Fisheries Policy • education of consumers to change buying habits to conserve threatened species e.g. move away from cod to other species • fish farming to conserve wild stocks • establish marine reserves to protect and conserve the resources e.g. the Pitcairn Island Marine Reserve • more advanced technology to reduce risks from mineral / energy exploitation.

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Question			Answer	Marks	Guidance
4			See generic levels mark scheme	10	**Indicative content** The production of food is the result of the interaction between physical and human factors. This map, one of the worldmapper series, shows the number of working tractors per 1000 people by country. There is no requirement to study tractor ownership in particular, therefore tractors can be taken as a surrogate for food production actual and potential. High levels of tractor ownership are associated with high levels of agricultural production and vice versa. Possible geographical issues can include: • the global divide – inequality food security / production between ACs, EDCs and LIDCs; Europe stands out as a region of high security / production whereas Africa and sub-Saharan Africa stand out as regards very low levels of tractor ownership • mechanisation can exacerbate differences between large- and small-scale farmers in any economic context • some locations are unsuitable for mechanisation due to physical factors e.g. relief in Indonesia and human factors e.g. lack of mechanics to service machinery. Possible strategies can include: • aid of various types and or government schemes can spread mechanisation of agriculture and thereby improve yields. For this to succeed, resources need to be given to training mechanics and to securing spare part availability • difficulties in making tractors (machinery) available and in maintaining it in working condition in some parts of the world mean that appropriate technology can be more effective. • where there is an abundance of labour e.g. China and India, this can raise production.

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Question			Answer	Marks	Guidance
5			See generic levels mark scheme	10	**Indicative content** The variety of hazards generated by earthquakes will have been studied by candidates. In addition they will have considered the range of impacts arising from earthquakes as well as the various strategies used to manage these impacts from across the development continuum. Possible geographical issues can include: • different socio-economic and political contexts offer different degrees of vulnerability and resilience to earthquake hazard • tectonic processes generating the earthquakes graphed are generated from different types of plate boundaries • earthquakes resulting in tsunami can be particularly devastating • significant contrast amongst locations in terms of deaths for earthquakes of similar magnitudes e.g. Chile and Indian Ocean, and New Zealand and Haiti. Possible strategies can include: • short term mitigation – emergency relief including search and rescue; refugee camps; government and NGO aid such as Red Cross / Crescent • longer term planning to increase resilience and reduce vulnerability and loss – mandatory building regulations regarding aseismic design e.g. in Southern California; land-use zoning • disaster planning also increases resilience and reduces vulnerability and loss e.g. earthquake drills for general public as well as emergency services e.g. Japan • predictive techniques – comments about their effectiveness relevant.

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Generic mark scheme for People and Environment Section B essay questions

Total marks available = 38

AO1 Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change at a variety of scales.

Answer	Marks	Levels of Response
Level 3	**8–11 marks**	A response at this level is characterised by **comprehensive** developed knowledge and understanding of the topic. Where appropriate, scale is included to add authority to the discussion.
Level 2	**4–7 marks**	A response at this level is characterised by **thorough** knowledge and understanding of the topic. Scale may be mentioned but lacks authority.
Level 1	**1–3 marks**	A response at this level is characterised by **basic** and or simple knowledge and understanding of the topic. Scale is not mentioned.
	0 marks	No evidence submitted or the response does not address the question.

AO2 Apply knowledge and understanding in different contexts to analyse, interpret and evaluate geographical information and issues

Answer	Marks	Levels of Response
Level 4	**21–27 marks**	A response at this level is characterised by **comprehensive** analysis, interpretation and evaluation of the question set. Analysis of connections between factors and cause and effect are discussed with authority. Relevant concepts are authoritatively discussed. Interpretation of geographical information and issues is clear and convincing. The evaluation of geographical information and issues is explicitly in the context of the question and offers secure judgement leading to rational conclusions that are evidence based. There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.
Level 3	**14–20 marks**	A response at this level is characterised by **thorough** analysis, interpretation and evaluation which is mainly set in the context of the question set. Analysis of connections between factors and cause and effects are discussed but some lack authority. Relevant concepts are discussed but this may lack some authority. Interpretation of geographical information and issues is generally convincing but may be inconsistent in places. The evaluation of geographical information and issues is in the context of

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		the question and offers generally secure judgement but the link between rational conclusion and evidence may be less developed. 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	**7–13 marks**	A response at this level is characterised by **reasonable** analysis, interpretation and evaluation but this may not be focused on the question set. Some analysis of connections between factors and some cause and effect are discussed but tend towards being superficial. Interpretation of geographical information and issues is present but is inaccurate. Some evaluation of geographical information and issues is present but may not relate to the question. Conclusions are generalised. The information has some relevance and is presented with limited structure. The information is supported by limited evidence.
Level 1	**1–6 marks**	A response at this level is characterised by **basic** analysis, interpretation and evaluation of material largely irrelevant to the question. Analysis of connections between factors and cause and effect, if present, are simple. Interpretation of geographical information and issues, if present, is simple and is unlikely to relate to the question. Conclusions are either not present or very simplistic and not evidenced based. 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.
	0 marks	No evidence submitted or the response does not address the question.

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Question			Answer	Marks	Guidance
6*			Knowledge and understanding of the impacts of climate change will be assessed in AO1. Substantial knowledge will be indicated by the quality and quantity of real world exemplification. Authoritative use of concepts such as vulnerability, threshold and resilience in the context of the impacts of climate change, is likely to indicate Level 2+ in AO1. Analysis and evaluation of the factors influencing vulnerability to the impacts of climate change, will be assessed in AO2. A response which fails to pick up on economic factors will not climb out of Level 1 in AO2. Discussion of more than one scale might indicate a Level 3+ response in AO2 such as individuals c.f. country	38	**'The vulnerability of people to the impacts of climate change is the result of economic factors. Discuss.** **Indicative content** The concept of vulnerability can be stated as *'the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from …'* in this case the impacts of climate change. Vulnerability might be seen in any of the following: • rising sea levels e.g. island communities such as Pacific or Indian Ocean islands; barrier beach communities along east coast of USA; delta dwelling communities such as in Bangladesh • change in ecosystems e.g. savannah lands in Africa such as Kenya and its herding peoples experiencing greater variability in rainfall with the consequent effect on pasture growth; tropical rainforest dwellers in Amazon basin experiencing changed rainfall patterns; • impacts on human health e.g. more intense heat waves in western Europe or southern USA; invasion and spread of diseases and viruses such as malaria to areas presently unaffected such as southern Europe • reductions in extent and thickness of sea ice e.g. in Arctic threatening traditional way of life of indigenous peoples such as Inuit • increased intensity of storms such as Typhoon Pam impacting on Vanuatu. Economic status can either increase or decrease vulnerability: • ACs can afford coastal flood defences such as Netherlands Delta Plan and Thames flood barrier. LIDCs such as Bangladesh cannot • ACs can afford water supply management to cope with decreased precipitation and or increased variability such as Australia / S.

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Question			Answer	Marks	Guidance
					California. LIDCs such as Mali cannot • ACs can afford technology to predict storms such as hurricanes or depressions and thereby reduce vulnerability and loss. LIDCs cannot • ACs have the resources to combat health risks. LIDCs do not. However, evaluation and analysis could introduce points such as: • even wealthy communities have a limit to their monetary power to deal with climate change. E.g. not all coastlines can be defended even in the USA or UK. • Political will to reduce vulnerability and loss e.g. Western Europe compared to USA / Australia • there are many low cost schemes around the world which are reducing vulnerability of communities to impacts such as basic cyclone and storm surge warnings in Bangladesh; improved communication of rainfall patterns in East Africa • national programmes e.g. Malawi's National Adaptation Programmes of Action (NAPA) e.g. afforestation of catchments.

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Question			Answer	Marks	Guidance
7*			Knowledge and understanding of the pattern of climate change will be assessed in AO1. Substantial knowledge of climate change, for example mention of long-, medium- and short-term change is likely to indicate Level 3 in AO1. A response dealing only with one scale of change, for example recent short-term changes, is likely to be Level 1 in AO1. A response which is authoritative concerning the range of evidence is likely to be Level 3. Confusion about the term 'greenhouse effect', such as not appreciating that this is a natural phenomenon, likely to indicate a Level 1 response. Analysis and evaluation will come from the discussion of the balance between natural and anthropogenic forcing and is assessed in AO2. More convincing discussions, Levels 3 and 4, will offer a range of evidence across both natural and anthropogenic forcing mechanisms.	38	**'Climate change is nothing new and is simply part of natural cycles.' How far do you agree with this view?** **Indicative content** The candidates will have studied the key idea that the earth's climate is dynamic over several time scales according to a variety of evidence. They will also have studied the causes of changes, again over a variety of time scales. How and when has climate changed: • long term dynamism e.g. gradual cooling over the past 100 million years – fossil records of changing distribution of pants and animals • ice ages and interglacials of the past 2.5 million years – ice core evidence of CO2 and oxygen isotope concentrations • medium-term climate variation i.e. the last 10,000 years – tree rings and pollen sequences; historical records such as diaries, paintings, harvest records • short-term recent changes e.g. last 150 years – instrumental records of air and ocean temperatures • changes in intensity and frequency of weather events such as tropical storms relevant. The causes of climate change: • natural factors influencing climate change e.g. tectonic events such as volcanic eruptions; Milankovitch cycles; sunspot activity; role of El Niño / La Niña relevant in context of extreme events • anthropogenic factors influencing climate change e.g. levels of CO2 directly linked to combustion of fossil fuels; increases in CH4 due to increasing numbers of livestock and increased acreage of rice padi; deforestation.

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Question			Answer	Marks	Guidance
					The debate about climate change: • role of the IPCC and other scientific organisations such as NOAA (National Oceanographic and Aeronautical Administration) in advancing knowledge and understanding of changes • the existence of a sceptical scientific point of view • the role of political factors in the assessment of climate change such as the view from governments relying on fossil fuels to support development e.g. China, USA and Australia • data from ice cores only go back so far in time; tree ring and pollen data is regional not global. recording of data has improved e.g. quality of instruments such as thermometers, so how accurate and reliable are the data from the past; Comments such as the unreliable and subjective nature of surrogate information (paintings and diaries for example) is likely to indicate Level 3+. The political dimension of the debate is likely to indicate top of Level 3+.

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Question			Answer	Marks	Guidance
8*			Knowledge and understanding of disease(s) and of the factors influencing the spread should be assessed in AO1. Substantial knowledge of the factors, physical and human, influencing the spread of disease are likely to indicate Level 3 in AO1. This does not have to be equally weighted across the factors. A range of either physical or human factors in less detail likely to indicate Level 2. Only one factor likely to indicate Level 1. Consideration of spread through space and time, diffusion, might indicate Level 3 in AO1 and Level 3+ in AO2. Analysis and evaluation will come from the discussion of the balance between social and other factors and is assessed in AO2. More convincing discussions, Levels 3 and 4, will offer a range of evidence across both social and other factors. Comments about the epidemiological transition, that is the link between development and health and longevity of a population, might indicate Level 3+ in AO2.	38	**Evaluate the relative importance of social factors influencing the spread of disease.** **Indicative content** Factors influencing the spread of disease: • social factors such as level of education in a country which influences quality and quantity of health care; level of education of individuals which influences their knowledge and understanding about disease and its spread including attitudes towards vaccination; attitudes and life styles such as death rites, sexual relationships; migration patterns • physical / environmental factors such as climate; weather patterns such as monsoon; life cycles of vectors such as insects • economic factors such as financial resources of a country to provide health care; financial resources of individuals to provide their own health care such as access to health care, quality of housing, quality and quantity of diet; financial resources to afford supply of clean water and treatment of polluted water / sewage • political factors such as approaches to spending on health care; attitudes towards vaccination / immunisation programmes such as compulsory or not; measures adopted when an outbreak occurs e.g. border controls; the impact of political tension / war on the spread of disease. Clearly, the human factors, economic, social and political, have a strong degree of inter-action. Consideration of the spread of a disease through space and time, diffusion, relevant.

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Question			Answer	Marks	Guidance
9*			Knowledge and understanding of medical and other technologies linked with disease should be assessed in AO1. Substantial knowledge of a range of technology linked to health care required for Level 3+ in AO1. Analysis and evaluation of the ways technology interacts with disease both to combat and to increase risk will be assessed in AO2. A response that picks up the point that technology can deal with many threats from disease but that some disease continues to be very difficult to deal with is likely to reach top of Level 2 in AO2. Points about technology actually increasing threats are likely to indicate Level 3+ in AO2.	38	**To what extent can technology reduce threats from disease?** **Indicative content** The candidates will have studied a variety of factors that influence patterns of disease at a variety of scales. In addition prediction and mitigation strategies are studied, one key one being the role of technology. Technology should be given a very broad interpretation and should include anything that has a direct bearing on disease. Technology 'wins' over diseases: • immunisation programmes such as smallpox, polio and measles • bio-technology in detection of disease such as scanners and laboratory analysis of samples of biological material • bio-technology in treating disease such as lasers, key-hole surgery; joint replacement; organ transplants; radio- and chemo-therapy • technology used to distribute medicines e.g. refrigeration for some vaccines • technology used to provide clean water and to treat polluted water • technology used to monitor air pollution – link with alerts for asthma sufferers, for example. However, evaluation and analysis could raise the following points: • a clear divide exists across the development continuum regarding ability of countries to provide technology to combat disease; medical technology often requires much capital and human resourcing • comments about differential provision within a country also valid such as urban – rural contrasts as well as regional differences such as core-periphery • some health threats are proving difficult to combat such as some cancers, Alzheimer's, sleeping sickness, dengue fever

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					• the emergence of resistant bacteria due to the over-use of technology in the form of antibiotics • political factors regarding allocation of resources to health care • social factors acting against technology such as attitudes towards sexual relations and intra-venous drug use for example in the spread of HIV/AIDS • technology can make possible the rapid spread of disease through increases in mobility of people across the globe such as H1N1 (swine 'flu) virus.

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Question			Answer	Marks	Guidance
10*			Knowledge and understanding of the management of ocean energy and mineral resources should be assessed in AO1. Substantial knowledge and understanding of a range of energy and mineral resources required for Level 3+ in AO1. This does not have to be equally weighted between the two groups of resources. A range of resources in less detail likely to indicate Level 2. Only one type of resource discussed, such as oil or tidal, likely to indicate Level 1. The inclusion of sea-bed minerals might indicate a Level 2+ response. A basic definition of sustainability is likely to indicate Level 2 knowledge and understanding. Analysis and evaluation of the ways by which sustainable management can or cannot be achieved will be assessed in AO2. Discussion of the contested nature of sustainability and that 'needs' was clearly set in the context of the essential needs of the poor, likely to indicate Level 3+ in AO2. The basic contrast between renewable and non-renewable resources is required for Level 2+ in AO2. The inclusion of impacts of transport and or the socio-economic impacts on coastal communities of energy and or mineral resource use, likely to indicate Level 3+ in AO2. Level 4 in AO2 will	38	**To what extent can ocean energy and mineral resources be managed sustainably?** **Indicative content** The candidates will have studied a range of energy and mineral resources. Types of resources include: • oil and gas as examples of non-renewable • wave and tidal energy as examples of renewable (flow) resources • sea-bed minerals, ferrous and non-ferrous as examples of non-renewable resources. Sustainability: • a contested concept with several definitions • at A level the most common definition is taken from the Brundtland Commission of 1983, 'that sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' Ways in which ocean energy and mineral resources pose management issues are: • exploration for energy and mineral resources e.g. Deepwater Horizon drilling rig disaster 2010 • extraction of energy and mineral resources e.g. Deepwater Horizon drilling rig disaster 2010; the impacts of tidal schemes e.g. La Rance, Brittany • transport of energy and mineral resources e.g. the tanker (Exxon Valdez 1989) • socio-economic impacts of resource use such as on fishing communities and or tourism.

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Question			Answer	Marks	Guidance
			need discussion of one or both of these impacts. The point that large scale incidents involving oil tankers seem to be diminishing and thereby suggesting more sustainable management is a likely Level 4 indicator in AO2. Introduction of the concept of the global commons, the high seas, a likely Level 3+ indicator in AO2.		Strategies include: • to control environmental impacts of for example oil spills and schemes such as tidal barrages, on environments and ecosystems • national scale management of waters close to and further away from the coast such as territorial waters / exclusive economic zones (EEZs) • international scale management such as the United Nations Convention on the law of the Sea (UNCLOS) including the concept of the high seas.

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Question			Answer	Marks	Guidance
11*			Knowledge and understanding of the region and the changes in sea ice cover will be assessed in AO1. Comments about the overall change in sea ice required for Level 2+ in AO1. Substantial knowledge about both extent and thickness of sea ice likely to indicate Level 3 in AO1. Comments about the seasonality of ice cover likely to indicate Level 3 in AO1. One possible approach to the evaluation of these changes is to look at the natural world and then human activities (of course the two do interact) and assess the balance between opportunities and threats. Critically for AO2 is the degree of analysis and evaluation. Threats to ecosystems and traditional ways of life likely to indicate Level 2+ in AO2. Comments about the geo-political threats likely to indicate Top of Level 2+ in AO2. Comments about the possible disruption of the Gulf Steam likely to indicate Level 3+ in AO2. Opportunities for energy / mineral resource exploitation likely to indicate Level 2+ in AO2 as might changes to ocean transport. Inclusion of comments about possible increases in some fish stocks due to warming waters (cod and herring for example) likely to indicate Level 3+ in AO2.	38	**How far do you agree that changes in Arctic sea ice bring more opportunities than threats?** **Indicative content** The candidates will have studied the case study of the Arctic region and the implications of changes in sea ice cover there. Changes in Arctic sea ice: • changes to the extent of sea ice e.g. steadily decreasing for the past thirty to forty years • changes to the thickness of the sea ice e.g. steadily thinning for the past thirty to forty years. Threats include: • to ecosystem such as polar bears, fish such as arctic char • to way of life of indigenous peoples e.g. Inuit – threats to hunting of walrus and seals • threats from ice bergs increase • geo-politically the region becomes more contested as bordering nations jostle for power and influence in the region e.g. Russia, Canada, USA, Norway • reduction in salinity of Arctic Ocean with the potential to disrupt the Arctic Conveyor (Atlantic thermohaline circulation). This threatens the operation of the Gulf Steam with subsequent impacts on the climate of north-west Europe. Opportunities include: • for ecosystem such as increased numbers of cod and herring • transport routes for shipping allowing globalised trade to use northern passages for longer in the year • energy and mineral exploitation is made more possible with less sea ice and improved transport possibilities.

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Question			Answer	Marks	Guidance
12*			Knowledge and understanding of the factors affecting food supply will be assessed in AO1. Mention of the fundamental physical factors likely to indicate Level 2 in AO1. Level 3 in AO1 might be indicated by a discussion that extends this need to the raising of livestock via fodder crops (e.g. grass / maize). The range of factors included likely to influence the Level in AO1, as a wide range suggests a strong understanding of the interaction of factors influencing food supply. Analysis and evaluation of the relative roles that physical and human factors can play will be assessed in AO2. The higher Levels in AO2, 3 and 4, might be indicated when a discussion suggests that human factors can overcome physical obstacles. For example, technology and capital come together in greenhouses and crop breeding to increase food production. A more extreme example is hydroponics. Role of capital is significant and the contrast between agribusinesses of ACs in contrast to the lack of finance in many LIDCs likely to indicate Level 3+ in AO2.	38	**Assess the extent to which the challenges facing food supply are essentially physical.** **Indicative content** The candidates will have studied the factors affecting food supply both physical and human. Factors affecting food supply: • physical include – climate (water; temperature e.g. length of growing season, hours of sunshine); soils; relief (slope and altitude); pests and diseases • human include – labour quantity and quality; capital; land ownership (size of farm and tenure); technology; government; market availability. Challenges include: • increasing food production - intensification – higher yields • increasing food production – extensification – increasing the farmed area • physical obstacles such as water availability; steep relief; pests and diseases • physical obstacles arising from human activities such as damage to ecosystems e.g. soil compaction; salinisation; impacts on species through use of pesticides and insecticides e.g. mortality amongst bees or the development of 'super-pests' resistant to insecticides; pollution of water; GM of plants. human obstacles – farm size and tenure; capital availability linked to credit; impact of food aid reducing demand for local production; issues concerning secure storage of food to prevent loss due to disease and or pest; inaccessibility of markets due to transport issues; role of TNCs.

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			The role of markets, storage and distribution of food offer much potential for evaluation. This would include the replacement of food crops in some locations by bio-fuels as a result of globalised market forces. The inclusion of comments regarding land purchasing by TNCs or foreign governments and the impacts on food supply relevant and likely to indicate level 3+ in AO2.		

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Question			Answer	Marks	Guidance
13*			Knowledge and understanding of physical and human impacts will be assessed in AO1. Substantial knowledge and understanding of a range of physical and human impacts required for Level 3+ in AO1. This does not have to be equally weighted between the two groups of impacts. A range of impacts in less detail likely to indicate Level 2. Only one type of impact discussed, such as water availability or loss of employment likely to indicate Level 1. Analysis and evaluation of the impacts that imbalances in the global food supply can play will be assessed in AO2. The discussion of how and why impacts vary across the development continuum likely to indicate Level 3+ in AO2.	38	**Evaluate the impacts on people of imbalances in the global food system.** **Indicative content** Imbalance in the global food system has physical and human impacts. Physical impacts include: • impacts on water availability and quality e.g. falling ground water levels or a rise in nitrate level • impacts on eco-systems reducing bio-diversity e.g. reduction in song bird populations which in turn reduces quality of life • impacts on landscape reducing amenity value e.g. prairie style landscape of eastern England • level of food miles which in turn impact on greenhouse gas emissions which them impact on human populations. Human impacts include: • decreasing food security for some which can lead to increased chance of under-nutrition, malnutrition, famine and even starvation • impacts on human health through the accumulation of chemicals through food chains • rural to urban migration due to inability to make a living farming • loss of agricultural employment due to increasing scale of capital intensive, mechanised farming (agri-business). Impacts can be identified across the development continuum, from ACs through EDCs to LIDCs.

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Question			Answer	Marks	Guidance
14*			Knowledge and understanding of a range of tectonic hazards will be assessed in AO1. Substantial knowledge and understanding of a range of tectonic hazards required for Level 3 in AO1. This does not have to be equally weighted between the two groups of tectonic hazards. A range of hazards in less detail likely to indicate Level 2. Only one type of tectonic hazard discussed, such as lava flow or liquefaction, likely to indicate Level 1. Understanding that development is more than just economic (wealth) and includes social and political aspects likely to indicate Level 3 in AOs 1 and 2. The analysis and evaluation of three or four of the categories of impacts likely to indicate top of Level 3+ in AO2.Two of them might suggest bottom of level 3 maximum and only one of the categories, bottom of Level 2 maximum. The inclusion of impacts affecting at different scales (region/district/household/individual) likely to indicate Level 4 in AO2. The appropriate use of the Park model (disaster response curve) or the risk equation likely to indicate top of Level 2+ in AO1 and Level 3+ in AO2.	38	**To what extent are impacts of tectonic hazards influenced by the level of development?** **Indicative content** The candidates will have studied a range of tectonic events such as: • volcanoes – lava flows; ashfalls; pyroclastic flows; lahars; poisonous gases • earthquakes - ground shaking; liquefaction; mass movements such as landslides; tsunamis. Impacts can be classified as environmental, social, economic and political and should be evaluated in the context of locations across the development continuum. The concept of vulnerability is very helpful here as it describes how resistant a society is to tectonic hazards: it is strongly influenced by levels of preparedness and the ability to mitigate impacts. The relationship between level of development and impact includes: • ACs have the resources to monitor and predict volcanic eruption such as monitoring seismic activity, sampling of gases, measuring ground deformation • ACs have resources to try to deal with lava flows e.g. diversion of small scale flows on slopes of Etna; spraying of water on flow to halt it e.g Heimaey, Iceland • ACs have the resources to design and build aseismic structures e.g. steel cross-bracing / counter-weights / shock absorbers in foundations / automatic cut-offs for electricity and gas • ACs have the resources for effective disaster planning e.g.

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Question			Answer	Marks	Guidance
					education programmes / search and rescue facilities / medical facilities. Analysis and evaluation might include: • role of magnitude of event e.g. even an AC such as Japan had serious impacts from high energy earthquake events (Kobe 1995 and Tohoku 2011); ash cloud from Eyjafjallajoekull (Iceland 2010) impacted on people and places of high levels of development such as Western Europe • in general, impacts tend to be more severe for locations towards the lower end of the development continuum • in general, whatever the overall development context, AC, EDC or LIDC, difference in economic development (wealth) is significant for a region or district / household or individual • level of social and or political organisation can be significant. A dysfunctional government can exacerbate impacts e.g. Haiti earthquake, 2010. Chile is a helpful example here of how an EDC can with fairly effective organisation, minimise the impacts of tectonic hazards despite its location on the 'Ring of Fire.' • the time of day or the season of the year the event occurs can have significant influence on the impacts.

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Question			Answer	Marks	Guidance
15*			Knowledge and understanding of earthquakes and the hazards they generate will be assessed in AO1. Substantial knowledge and understanding of a range of hazards generated by earthquakes required for Level 3 in AO1. A range of hazards in less detail likely to indicate Level 2. Only one type of hazard discussed, such as ground shaking likely to indicate Level 1. As the question is focused solely on earthquakes, expectations of the quality of knowledge and understanding can be high. Analysis and evaluation of the scale over which earthquake hazards impact will be assessed in AO2. Comments about the key factor being the magnitude of the event likely to indicate tope of Level 2 in AO2. Discussions which discuss factors such as depth of focus and whether or not a tsunami was generated likely to indicate Level 3+ in AO2. Comments about scale in the context of social, economic or political impacts likely to indicate Level 3+ in AO2.	38	**'Earthquakes generate only local hazards.' Discuss.** **Indicative content** The thrust of the question is the scale of hazard earthquakes are capable of generating. Hazards arising from earthquakes include: • ground shaking; liquefaction; mass movements such as landslides; tsunamis. These should be related to impacts on human societies such as building collapse, disruption of infrastructure and coastal flooding. Analysis and evaluation might include: • a relatively simple analysis might suggest that earthquakes do only generate effects which are locally hazardous. For example, liquefaction in the Kobe earthquake of 1995 was largely restricted to the port (reclaimed land) • reference to the magnitude of the earthquake with the assertion that the more energy released, the more wide spread the hazards posed by an earthquake event are likely to be • reference to the depth of focus relevant • earthquakes of not particularly high magnitude in regions such as Himalayas can trigger many landslide hazards across a wide part of the region due to steep relief of the area • tsunami events such as that resulting from the Boxing Day earthquake (2004) had impacts both local (Ache province, Indonesia) and distant to the location of the earthquake. Lives were lost and substantial damage caused right around the Indian Ocean • impacts can be seen as social, economic or political e.g. Kobe earthquake had global economic impacts as the port is a key transit location in the global trading system. The Haiti earthquake had social impacts around the world in terms of the international relief operation.

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Assessment Objectives (AO) grid

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

Question	AO1	AO2	AO3	Marks
1	4	3	3	10
2	4	3	3	10
3	4	3	3	10
4	4	3	3	10
5	4	3	3	10
6*	11	27		38
7*	11	27		38
8*	11	27		38
9*	11	27		38
10*	11	27		38
11*	11	27		38
12*	11	27		38
13*	11	27		38
14*	11	27		38
15*	11	27		38
Total	30	60	6	96

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