

GCE A LEVEL

# WJEC Eduqas GCE A LEVEL in GEOGRAPHY

ACCREDITED BY OFQUAL

## SAMPLE ASSESSMENT MATERIALS

Teaching from 2016





For teaching from 2016  
For award from 2018

GCE A LEVEL GEOGRAPHY

SAMPLE ASSESSMENT  
MATERIALS



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**A LEVEL GEOGRAPHY**

**COMPONENT 1**

**CHANGING LANDSCAPES AND  
CHANGING PLACES**

**SAMPLE ASSESSMENT MATERIALS**

**1 hour 45 minutes**



**ADDITIONAL MATERIALS**

In addition to this examination paper, you will need **one** 12 page answer book and a calculator.

**INSTRUCTIONS TO CANDIDATES**

Answer in Section A, **either** 1, 2 and, **either** 3 **or** 4 (Coastal Landscapes) **or** 5, 6 and **either** 7 **or** 8 (Glaciated Landscapes).

Answer 9, 10 and, **either** 11 **or** 12 in Section B (Changing Places).

Use either black ink or black ball-point pen.

Write your answers in the separate answer book provided.

Write your name, centre number and candidate number in the spaces at the top of the answer book.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets [ ] at the end of each question or part-question; you are advised to divide your time accordingly.

**This paper requires that you make as full use as possible of appropriate examples and reference to data to support your answers. Sketch maps and diagrams should be included where relevant.**

## Section A – Changing Landscapes

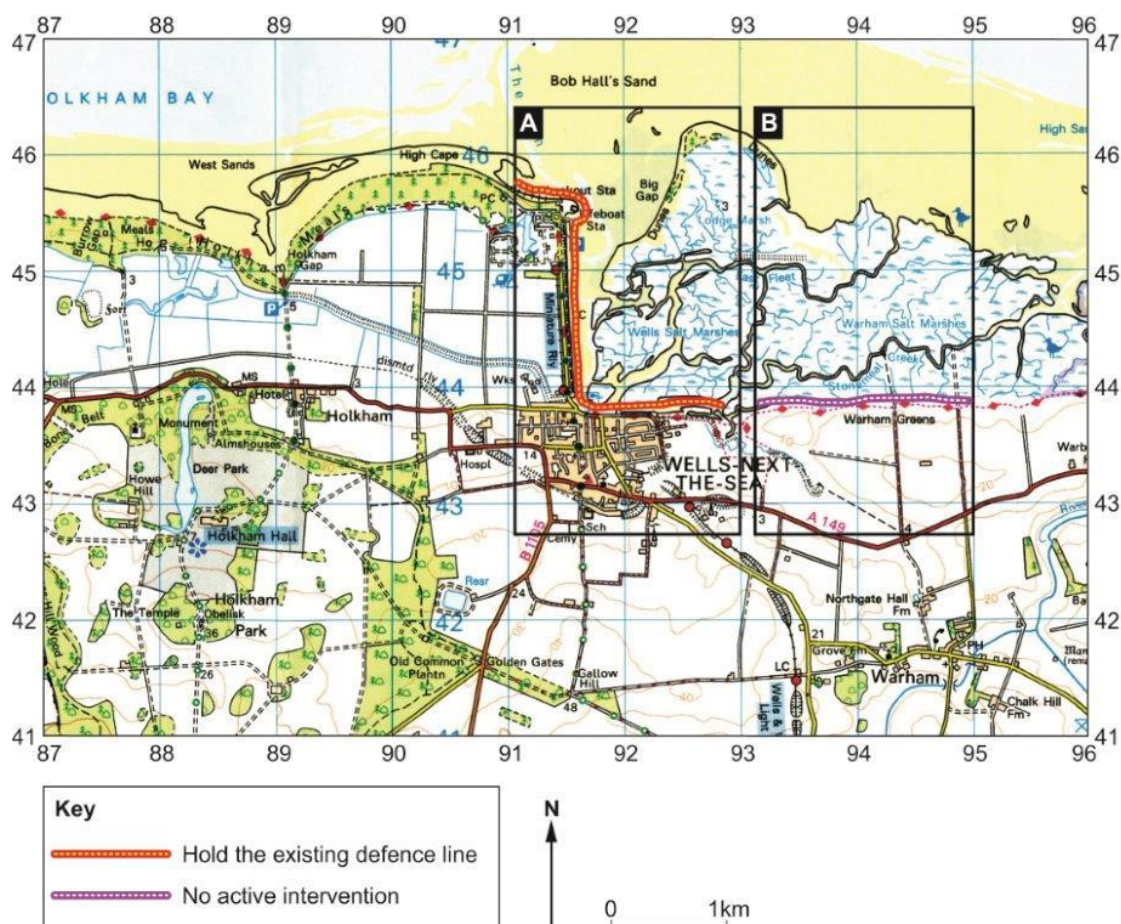
Answer **either** question 1, 2 and, either 3 **or** 4 **or** questions 5, 6 and, either 7 **or** 8 from your chosen landscape.

Where possible, make full use of examples and data to support your answers.

### Coastal Landscapes

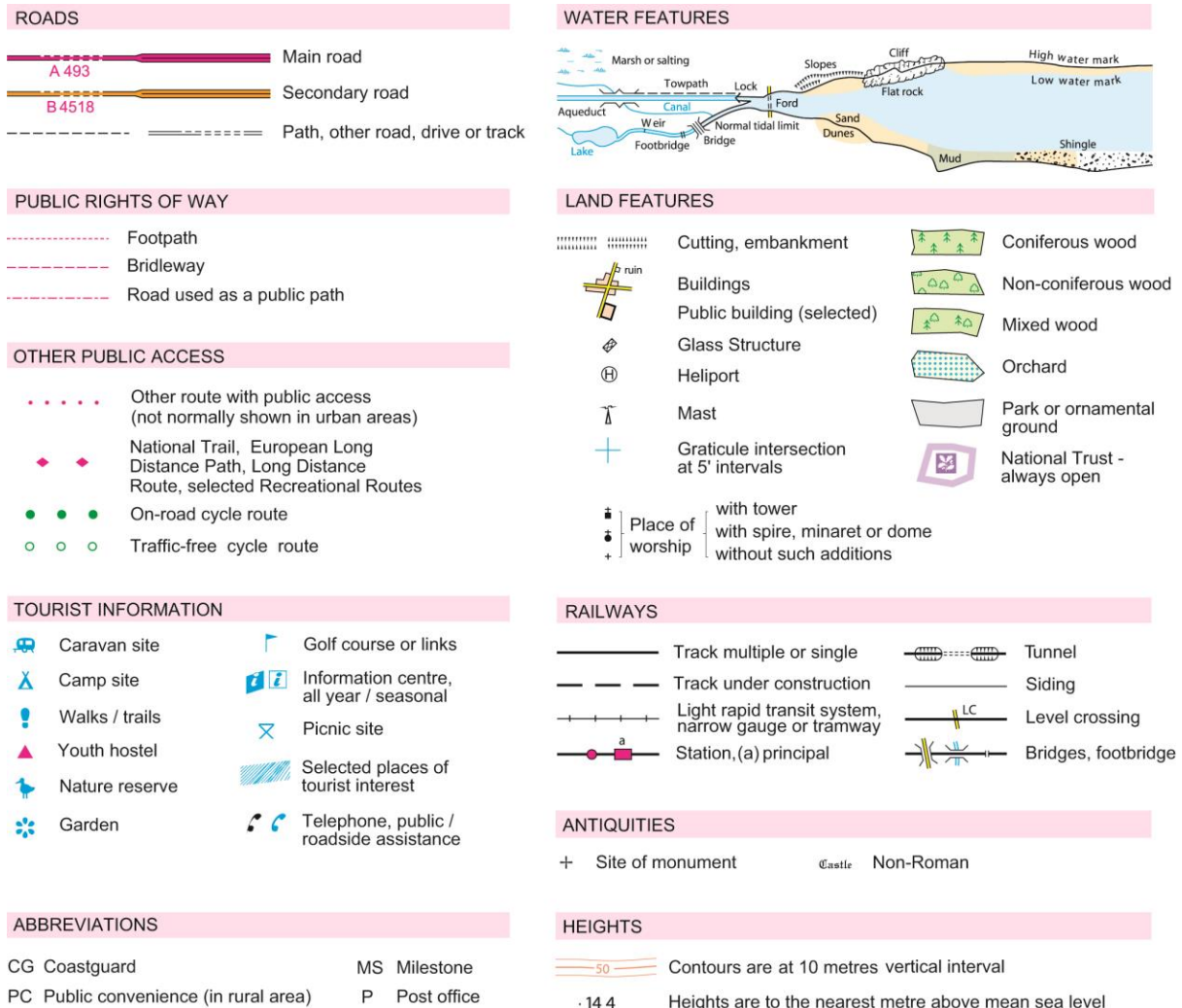
Answer questions 1, 2 and, either 3 **or** 4 if this is your chosen landscape.

Figure 1: Shoreline management in North Norfolk, England



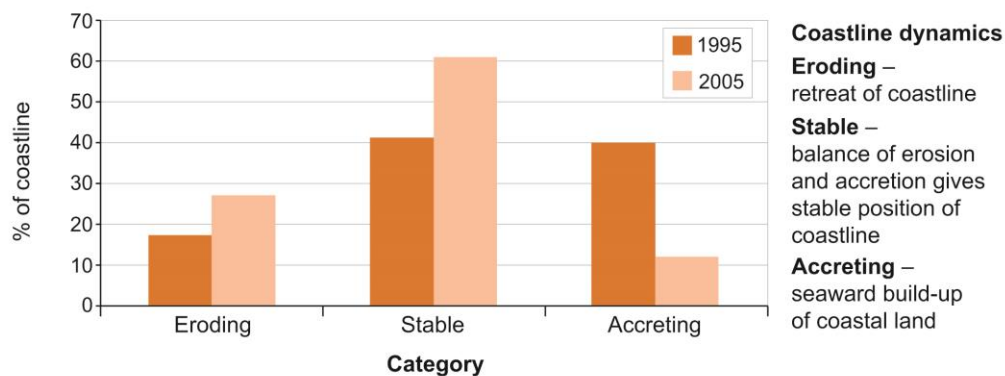
Source: adapted from Ordnance Survey and maps environment-agency





1. (a) (i) Use **Figure 1** to outline how the choice of the shoreline management strategies shown in boxes **A** and **B** suggests that the principles of cost-benefit have been used. [5]
- (ii) With reference to **Figure 1**, suggest why there is likely to be an increasing need for shoreline management. [6]
- (b) State what is meant by the term *isostatic change*. [2]

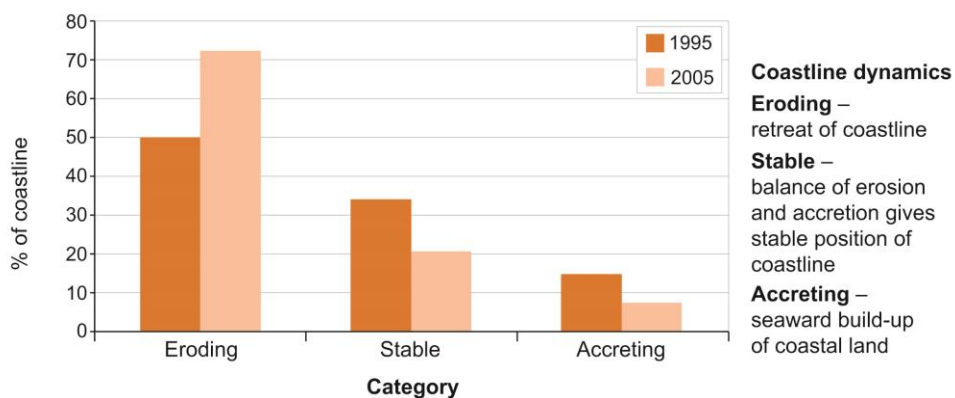
**Figure 2: Contrasting coastline dynamics of the southern Baltic Sea, 1995 and 2005**



**Figure 2a: Coastline for Klaipeda**



**Map locating Klaipeda and Kaliningrad**



**Figure 2b: Coastline for Kaliningrad**

Source: adapted from corpi.ku

2. (a) (i) Use **Figure 2** to examine to what extent the coastal dynamics of Klaipeda and Kaliningrad differ. [5]
- (ii) Suggest **one** reason why rates of coastal erosion vary. [2]
- (b) Describe **two** ways in which coastal sediment is transported. [6]

**Either:**

3. Evaluate the importance of sediment transport in the development of **one** coastal depositional landform. [15]
- Within your answer to question 3, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*

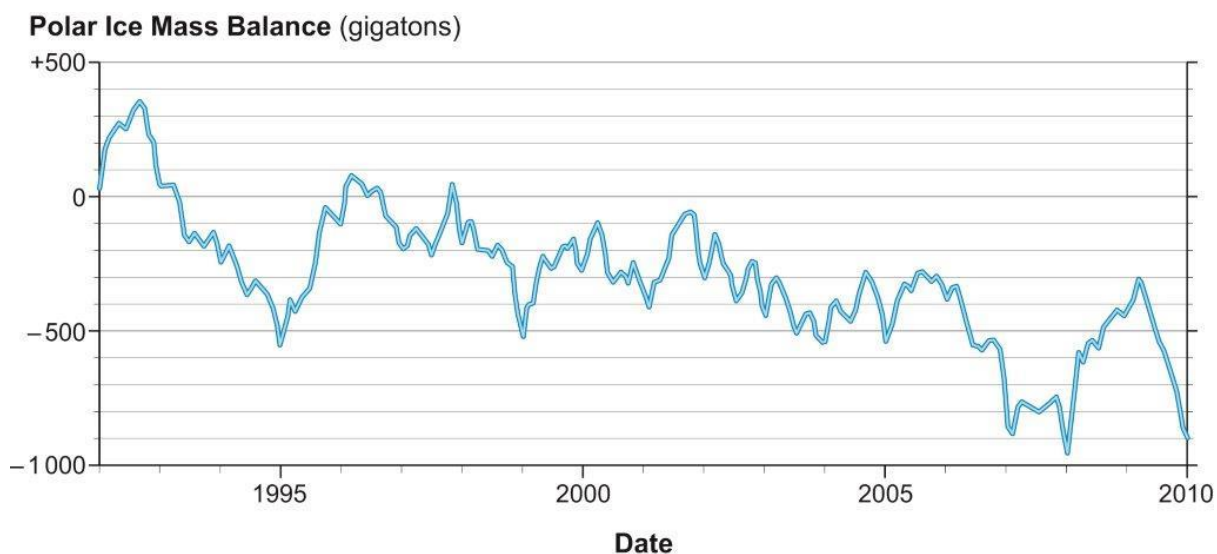
**Or:**

4. To what extent has a fall in sea level modified coastal landscapes? [15]
- Within your answer to question 4, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*

### Glaciated Landscapes

Answer questions 5, 6 and, either 7 or 8 if this is your chosen landscape.

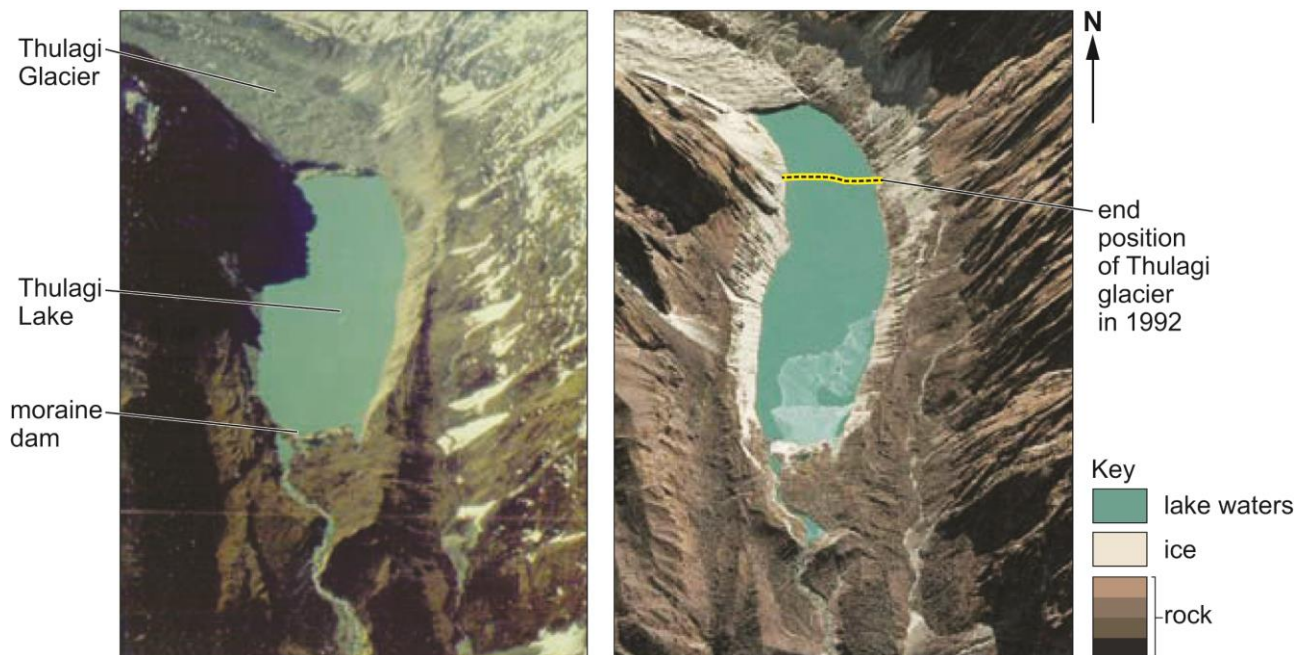
**Figure 3: Polar Ice Mass Balance 1992 – 2010**



Greenland and Antarctic Ice Sheets – 1992 is the base line, subsequent values show seasonal and longer term relative +/- values.

Source: earthobservatory.nasa.gov

5. (a) (i) Use **Figure 3** to assess variations in the rates of change in the polar ice mass. [5]
- (ii) Explain why seasonal changes in the polar ice mass balance are the result of variations in inputs and outputs. [6]
- (b) Distinguish between warm-based and cold-based glaciers. [2]

**Figure 4: Thulagi Glacier and Lake, Nepal, in 1992 and 2009****Photograph and data for 1992**

- Length of Thulagi Lake is 1.85 km (*estimated*)
- Length of Thulagi Glacier is 5.10 km
- Ice core in terminal moraine is 5m below surface
- Surface area of lake is 0.81 sq. km

**Photograph and data for 2009**

- Length of Thulagi Lake is 2.55 km
- Length of Thulagi Glacier is 5.03 km
- Ice core in terminal moraine is 20+ m below surface
- Surface area of lake is 0.94 sq. km
- Thulagi lake is approximately 5.8m lower than in 1992

Source: adapted from icimod.org

6. (a) (i) Use **Figure 4** to compare changes to the landscape caused by climate change between 1992 and 2009. Include relevant data in your answer. [5]
- (ii) Contrast the depositional location of terminal and medial moraines. [2]
- (b) Outline **two** processes of glacial erosion. [6]

**Either:**

7. Evaluate the importance of geological factors in affecting rates of glacial erosion. [15]

*Within your answer to question 7, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*

**Or:**

8. Evaluate the importance of fluvioglacial transport in the characteristics and formation of **one** fluvioglacial landform. [15]

*Within your answer to question 8, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*

## Section B – Changing Places

Answer questions 9, 10 and, **either** 11 **or** 12.

Make the fullest possible use of examples to support your answers.

**Figure 5: Relationship between the percentage of residents aged 16-64 with degree level or above qualifications and the percentage of high tech industry in the 12 regions of the UK**

UK Region	Qualifications		Quaternary industry		Rank differences	
	% of residents aged 16-64 with degree level or above	Rank	% high tech industry	Rank	Difference (d)	Difference squared (d <sup>2</sup> )
South East	32.3	2	9.8	1	-1	1
Eastern	28.1	4	8.3	3	-1	1
Scotland	26.0	7	8.6	2	-5	25
London	40.5	1	7.3	7	6	36
South West	29.5	3	7.6			
North West	26.6	5	7.6			
East Midlands	25.8	8	7.5	6	-2	4
West Midlands	25.5	9	6.8	9	0	0
North East	24.3	11	7.0	8	-3	9
Wales	26.5	6	6.5	10	4	16
Yorkshire & Humberside	25.4	10	6.1	11	1	1
Northern Ireland	23.6	12	5.1	12	0	0
	$\sum d^2 = 95.5$					

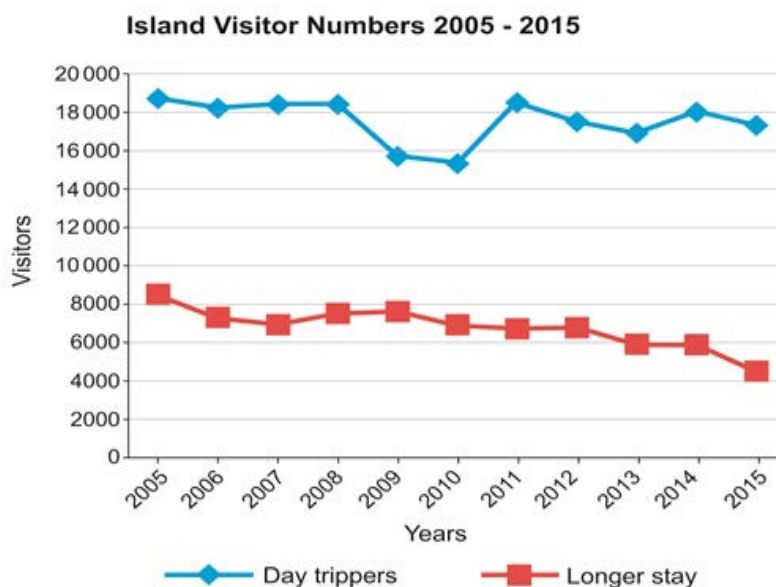
Source: Adapted from ONS 2011 census data

9. (a) (i) Define the term *quaternary industry*. [2]
- (ii) Study **Figure 5**. Calculate the missing figures for the South West and the North West. [2]
- (iii) The Spearman Rank Correlation Co-efficient ( $r_s$ ) was calculated as  $r_s = 0.67$ . Using the values of  $r_s$  in the table below, state the statistical significance of the result and explain your decision. [3]

Significance (confidence level)		
n	95%	99%
10	0.56	0.75
12	0.50	0.71

- (b) Describe how the process of gentrification leads to changes in the characteristics of places. [6]

**Figure 6: Tourism information for a Scottish island, 2005-2015**



**Comments in the visitor book at the island tourist centre**

‘My family come over here for a daytrip every year; it’s a brilliant place to visit. Beautiful scenery. Great restaurants.’

‘We tried staying here for a week for the first time this year but I don’t know if we’ll be back. It’s overpriced and it rained a lot. Sorry.’

**Comments in letters sent to the local newspaper**

‘This island was a whole lot better when there were no tourists on the road driving at 5 miles an hour and holding up traffic.’

‘We need proper jobs with skills and good money to keep the young people here, not part-time jobs cleaning hotel rooms and waiting tables.’

10. (a) Use the information in **Figure 6** to assess the success of tourism in this location. [5]
- (b) Suggest how the trends shown in **Figure 6** can affect local rural communities. [8]

**Either :**

11. Evaluate why some people have benefited more than others from recent changes in the central areas of cities. [15]

*Within your answer to question 11, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*

**Or:**

12. Assess how far different aspects of the rural rebranding process may rely on internet availability. [15]

*Within your answer to question 12, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*



## **Component 1: Changing Landscapes and Changing Places**

### **Mark Scheme**

#### **Guidance for Examiners**

##### **Positive marking**

It should be remembered that learners are writing under examination conditions and credit should be given for what the learner writes, as opposed to adopting an approach of penalising him / her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Marks should not be deducted for a less than perfect answer if it satisfies the criteria of the mark scheme.

The mark scheme for this component includes both point-based mark schemes and banded mark schemes.

##### **Point-based mark schemes**

For questions that are objective or points-based the mark scheme should be applied precisely. Marks should be awarded as indicated and no further subdivision should be made. Each creditworthy response should be in red ink. Annotations must reflect the mark awarded for the question. The targeted assessment objective (AO) is also indicated.

##### **Banded mark schemes**

For questions with mark bands the mark scheme is in two parts.

The first part is advice on the indicative content that suggests the range of concepts, processes, scales and environments that may be included in the learner's answers. These can be used to assess the quality of the learner's response. This is followed by an assessment grid advising on bands and the associated marks that should be given in responses that demonstrate the qualities needed in the three AOs; AO1, AO2 and AO3, relevant to this component. The targeted AO(s) are also indicated, for example AO2.1c.

Banded mark schemes are divided so that each band has a relevant descriptor. The descriptor for the band provides a description of the performance level for that band. Each band contains marks. Examiners should first read and annotate a learner's answer to pick out the evidence that is being assessed in that question. Once the annotation is complete, the mark scheme can be applied. This is done as a two stage process.

##### **Banded mark schemes Stage 1 – Deciding on the band**

Beginning at the lowest band, examiners should look at the learner's answer and check whether it matches the descriptor for that band. Examiners should look at the descriptor for that band and see if it matches the qualities shown in the learner's answer. If the descriptor at the lowest band is satisfied, examiners should move up to the next band and repeat this process for each band until the descriptor matches the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the learner's response should be used to decide on the mark within the band. For instance if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content.

Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

### **Banded mark schemes Stage 2 – Deciding on the mark**

Once the band has been decided, examiners can then assign a mark. During standardising (marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner.

When marking, examiners can use these examples to decide whether a learner's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Indicative content is not exhaustive, and any other valid points must be credited. In order to reach the highest bands of the mark scheme a learner need not cover all of the points mentioned in the indicative content but must meet the requirements of the highest mark band. Where a response is not creditworthy, that is contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded.

Where the specialised concepts are integral to knowledge and understanding, they are underlined in the indicative content.

The mark scheme reflects the layout of the examination paper. Mark questions 1, 2 and either questions 3 and 4 in Section A, or 5, 6 and either question 7 or 8 which reflects the learner's chosen theme of either coastal landscapes or glaciated landscapes, mark questions 9, 10 and either 11 or 12 in Section B. If the candidate has responded to all questions in Section A and B mark all these responses. Award the higher marks that have been attained; further, possible rubric infringement will be discussed at the marking conference.

Be prepared to reward answers that give **valid and creditworthy** responses, especially if these do not fully reflect the 'indicative content' of the mark scheme.

## Section A: Changing Landscapes

Mark questions 1 and 2 if this is the selected landscape.

### Either: Coastal Landscapes

1. a (i) Use <i>Figure 1</i> to outline how the choice of the shoreline management strategies shown in boxes <i>A</i> and <i>B</i> suggests that the principles of cost-benefit have been used.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
					5		5
<p><b>Indicative content</b></p> <p>Outline, AO3 includes identifying the type of coastal management strategy chosen and linking this to the principle of cost-benefit i.e. the choice of coastal defences will take into account the cost of a defence (building and maintenance) together with the value of the land (and properties) that it protects.</p> <p><b>Box A</b></p> <ul style="list-style-type: none"> <li>Choice is 'Hold the line' which may involve costly defences</li> <li>The value of land will be higher where there are settlements and transport infrastructure and this is more likely to be protected e.g. settlements – Wells-next-the-Sea with homes, school transport routes – A149 at Wells and tourist attractions – miniature railway and stations</li> </ul> <p><b>Box B</b></p> <ul style="list-style-type: none"> <li>Choice is 'No active intervention' which will involve no cost for defence</li> <li>The land may not be regarded as having economic value as it lacks costly infrastructure</li> <li>Mostly salt marsh and sand dunes</li> </ul> <p><b>Marking guidance</b></p> <p>Near the upper end, answers will show a clear link between cost-benefit analysis and the specific management strategies and evidence shown on the resource.</p> <p>Near the lower end there will be limited application of principles of cost-benefit analysis and/or linkage to the resource.</p> <p>Credit other valid approaches.</p>							

Award the marks as follows:

Band	Marks	
3	4-5	Well-developed outline of how the choices made suggest that the principle of cost-benefit has been used Wide use of the resource as evidence to support the choice
2	2-3	Unbalanced or partial outline of how the choices made suggest that the principle of cost-benefit has been used Partial use of the resource as evidence to support the choice
1	1	Limited outline of how the choices made suggest that the principle of cost-benefit has been used Very little use of the resource as evidence to support the choice
	0	Response not creditworthy or not attempted

1 a (ii) With reference to <i>Figure 1</i> , suggest why there is likely to be an increasing need for shoreline management.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
			6				6
<b>Indicative content</b> <ul style="list-style-type: none"> <li>Increasing need may be because of (<u>causality</u>) increasing storms, coastal flooding, sea level rise, together with more human activities along coasts e.g. building at Wells-next-the-sea, tourism. Increasing costs arise if coastal flooding were to occur in the areas shown in Figure 1 (rebuilding, insurance, emotional, impact on infrastructure such as the A149 and the B1105).</li> </ul> <b>Marking guidance</b> <p>Near the upper end, answers may, through introducing the idea of Shoreline Management Plans (SMP), show applied understanding by suggesting that piecemeal coastal protection schemes may not always be compatible with coastline needs shown in Figure 1 and elsewhere within the same sediment cell i.e. the concept of 'integrated strategies' (<u>systems concept</u>).</p> <p>Near the lower end there will be limited application of the increased need for SMPs.</p> <p>Credit other valid approaches.</p>							

Award the marks as follows:

Band	Marks	
3	5-6	Well-developed suggestions of reasons for an increasing need for shoreline management in a structured way Applies a range of knowledge and understanding about shoreline management (strategies) and their importance that is well linked to the resource
2	3-4	Partial and / or unstructured suggestions for an increasing need for shoreline management Some application of knowledge of shoreline management (strategies) linked to the resource
1	1-2	Few suggestions or suggestions are poorly applied Very limited or fragmented applied knowledge with very limited link to the resource
	0	Response not creditworthy or not attempted

1.b State what is meant by the term <i>isostatic change</i> .	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following, up to a maximum of 2 marks.	2						2
<b>Indicative content</b> <ul style="list-style-type: none"> <li>Isostatic change refers to the relative movement of the land (1 mark), a local effect (1 mark)</li> <li>When the ice melts the weight is removed and land slowly rises (1 mark)</li> <li>When ice is on the land, the weight causes land to sink relative to sea level (1 mark)</li> </ul> <p>Credit other valid points.</p>							

2. a (i) Use <i>Figure 2</i> to examine to what extent the coastline dynamics of Klaipeda and Kaliningrad differ.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
						5	5
<b>Indicative content</b> <ul style="list-style-type: none"> <li>Kaliningrad has higher % eroding (accept reverse as alternative) – 72% against 27%</li> <li>Kaliningrad has lower % stable (accept reverse as alternative) – 20% against 60%</li> <li>Kaliningrad has lower % accreting (accept reverse as alternative) – 7% against 12%</li> <li>Highest in Kaliningrad is eroding whilst highest in Klaipeda is stable – 72% against 60%</li> <li>Accreting lowest in both – 7% and 12%</li> <li>Klaipeda increasing in stability whilst Kaliningrad decreasing in stability - 20%</li> </ul> <b>Marking guidance</b> <p>Near the upper end, answers will examine the extent that the coastlines differ and use figures and/or percentages to examine differences/similarities between the two coasts.</p> <p>Near the lower end, answers lack examination of the extent and/or figures/percentages from the resource.</p> <p>Credit other valid points.</p>							

Award the marks as follows:

Band	Marks	
3	4-5	Clear assessment of difference Wide use of the resource as evidence to support examination of extent
2	2-3	Some assessment of difference Partial use of the resource as evidence to support the choice
1	1	Limited descriptive statements that fail to assess difference Very little use of the resource as evidence to support the choice
	0	Response not creditworthy or not attempted

2. a (ii) Suggest <i>one</i> reason why rates of coastal erosion vary.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for valid interpretation of rates of coastal erosion, with the further mark for development			2				2
<b>Indicative content</b> <p>Suggestions may include the following:</p> <ul style="list-style-type: none"> <li>Geology – including hardness, joints, folds / faults</li> <li>Oceanographic – fetch, wave characteristics, ocean floor character</li> <li>Coastal characteristics – orientation, elevation</li> <li>Human activity – coastal defence, sea level changes</li> </ul> <p>Credit other valid points.</p>							

2. b Describe two ways in which coastal sediment is transported.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	6						6
<p><b>Indicative content</b></p> <p>Candidates may approach the identification of ways in one of two approaches – some may define it as:</p> <ul style="list-style-type: none"> <li>small scale and refer to suspension, saltation, solution or traction (3 marks) or</li> <li>some may define it at a larger scale and refer to waves, longshore drift, tides, storm surges, currents and aeolian (3 marks)</li> </ul> <p>Credit either approach.</p> <p>Give full credit to knowledge demonstrated within a well-annotated diagram.</p> <p><b>Marking guidance</b></p> <p>Near the upper end, answers that score highly in AO1 should identify the distinctive features of each selected method of transport and give a clear description of how it moves sediment in the coastal environment. Descriptions should show clear factual detail on sediment transport.</p> <p>Near the lower end, answers may describe the processes with limited knowledge of their distinctive features or of their contribution to sediment transport.</p> <p>Credit other valid approaches.</p>							

Award the marks as follows:

Band	Marks	
3	5-6	Clear knowledge of two methods of coastal sediment transport
2	3-4	Some and / or unstructured knowledge of coastal sediment transport Developed knowledge of one method of coastal sediment transport
1	1-2	Limited knowledge of coastal sediment transport
	0	Response not creditworthy or not attempted

3. Evaluate the importance of sediment transport in the development of one coastal depositional landform.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10			5			15

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

AO1 content encompasses knowledge and understanding of the processes of sediment transport and their link to landform development. This may include:

- The formation of spits or bars or tombolos or cusped forelands by longshore drift, the detailed characteristics of spits such as sediment size variation and the form of beach profile can be explained by the varying strength of waves to transport sediment
- The formation of beaches by wave transport and longshore drift, the detail of beach profile can be explained by wave types and strength of swash and backwash
- The formation of marshes or tidal flats in a low energy environment with transport of sediment into the environment by tidal currents and fluvial action
- The formation of sand dunes by aeolian transport
- The formation of deltas and the interaction of a number of transport processes such as fluvial action, wave action and tidal action

### AO2

Candidates demonstrate application of knowledge and understanding through an evaluation of the importance of sediment transport in the development of one coastal landform. Relevant responses may include:

- The relative importance of different forms of sediment transport in the production of the whole landform for example, the relative importance of tidal and fluvial transport processes in inter-tidal zones (marshes)
- The relative importance of different transport processes in the formation of features of different scales for example, contrasting the relative importance of longshore drift in the formation of larger scale features (such as spits) with the role of wave action in smaller scale features (such as berms and ridges/runnels)
- A critical synthesis of the sources, flows and stores of sediment within a systems framework of a coastal sediment cell
- The extent to which associated factors may have a role in the formation of landforms of coastal deposition for example, the role played by vegetation in the formation of sand dunes and marshes
- Comparison of the relative importance of sediment transport in the same landform in different locations for example, in the development of arcuate and birds foot deltas

Near the upper end, answers could reflect on causality and will comment on the importance of transport. Answers that score highly will judge the importance of transport in the coastal system relative to different processes of transport or other processes such as erosion, weathering or human impact. Some may evaluate how the process of transport fits into the development of the landform.

Near the lower end, there will be very limited evaluation of the relative role of transport.

Credit other valid approaches.

Award the marks as follows:

	<b>AO1 (10 marks)</b>	<b>AO2.1c (5 marks)</b>
	<i>Demonstrates knowledge and understanding of coastal processes and how they produce one coastal depositional landform</i>	<i>Applies (AO2.1c) to appraise / judge through evaluating the importance of sediment transport in the production of one coastal depositional landform</i>
<b>Band</b>		
<b>3</b>	<p>7-10 marks</p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate, accurate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of coastal transport and their link to the development of one coastal depositional landform</p> <p>Demonstrates detailed and accurate knowledge and understanding of other coastal processes and their link to landforms</p> <p>Well annotated sketches / diagrams may be used and should be credited</p>	<p>4-5 marks</p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation that is supported by evidence</p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation of the importance of sediment transport in the development of one coastal depositional landform</p> <p>Balanced evaluation of the other appropriate processes in the development of one coastal depositional landform, recognising that coastal depositional landforms are the result of the interaction of a number of processes operating at the coast</p>
<b>2</b>	<p>4-6 marks</p> <p>Demonstrates accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates accurate knowledge and understanding of coastal transport processes and their link to the development of one coastal depositional landform</p> <p>Demonstrates accurate knowledge and understanding of other coastal processes and their link to landforms</p> <p>Sketches / diagrams may be used and should be credited</p>	<p>2-3 marks</p> <p>Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some evidence</p> <p>Applies knowledge and understanding to evaluate the importance of sediment transport in the development of one coastal depositional landform</p> <p>Partial evaluation of the other appropriate processes in the development of one coastal depositional landform, recognising that coastal depositional landforms are the result of a number of processes operating at the coast</p>
<b>1</b>	<p>1-3 marks</p> <p>Demonstrates limited knowledge and understanding through a limited number of undeveloped examples</p> <p>Demonstrates limited knowledge and understanding of coastal transport processes and their link to the development of one coastal depositional landform</p> <p>Demonstrates limited knowledge and understanding of other coastal processes and their link to landforms</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p>1 mark</p> <p>Applies knowledge and understanding to produce an evaluation with limited coherence and support from some evidence</p> <p>Limited application of knowledge and understanding to evaluate the importance of sediment transport in the development of one coastal depositional landform</p> <p>Limited evaluation of the other appropriate processes in the development of one coastal depositional landform, recognising that coastal depositional landforms are the result of some processes operating at the coast</p>
	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>



4. To what extent has a fall in sea level modified coastal landscapes?	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10			5			15

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

#### Indicative content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

#### AO1

AO1 content encompasses knowledge and understanding of the processes of sea level fall and its link to the development of coastal landscapes. This may include:

- Knowledge and understanding of how a fall in sea level occurs to include the positive balance between isostatic rebound and eustatic sea level rise
- Knowledge and understanding of how a relative (negative) fall in sea level results in more of the coastline being exposed (causality)
- Knowledge and understanding of raised beach formation where depositional processes produce a beach at a higher sea level which becomes a relict landform as isostatic recovery occurs
- Knowledge and understanding of the formation of raised cliffs, stacks, caves and wave cut platforms where erosional processes produce coastal landscapes of erosion at a higher sea level which becomes a relict landform as isostatic recovery occurs
- Knowledge and understanding that these features are being modified by present day coastal processes, weathering and mass movement

#### AO2

Candidates demonstrate application of knowledge and understanding through an evaluation of the role played by a fall in sea level in the formation of coastal landscapes. This may include:

- The extent to which the magnitude of a fall in sea level impacts in different locations e.g. by comparing the relative importance of a fall in sea level in Western Scotland compared to the Gower, Wales
- The extent to which repeated falls in sea level may modify coastal landscapes more or less than in locations where there is only one episode of falling sea level
- Synthesis of the complex interactions and processes that occur in coastal landscapes which are the result of complex sequences of sea level change
- Evaluation of the extent to which coastal landscapes are the result of historic sea level fall rather than present day coastal and subaerial processes

Expect answers to include description of coastal features of emergence; exemplification, with possible use of diagrams.

Near the upper end, answers will focus on the extent coastlines are modified due to a fall in sea level. Answers that score highly will consider the size and extent of the modification or how later processes (e.g. weathering) have continued the modification.

Near the lower end, there will be limited consideration of 'to what extent' and a limited number of features.

Credit other valid approaches.

Award the marks as follows:

	<b>AO1 (10 marks)</b>	<b>AO2.1c (5 marks)</b>
	<i>Demonstrates knowledge and understanding of the features associated with a fall in sea level</i>	<i>Applies (AO2.1c) to appraise 'to what extent' a fall in sea level has modified the coastal landscape</i>
<b>Band</b>		
<b>3</b>	<p><b>7-10 marks</b></p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of sea level fall and its link to the modification of a coastal landscape</p> <p>Demonstrates detailed and accurate knowledge and understanding of other coastal and subaerial processes and their link to the modification of a coastal landscape</p> <p>Well-annotated sketches / diagrams may be used and should be credited</p>	<p><b>4-5 marks</b></p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation that is supported by evidence</p> <p>Applies knowledge and understanding to thoroughly and coherently consider 'to what extent' a fall in sea level has modified the coastal landscape</p> <p>Balanced evaluation of the other appropriate processes in the modification of a coastal landscape</p>
<b>2</b>	<p><b>4-6 marks</b></p> <p>Demonstrates accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates accurate knowledge and understanding of sea level fall and its link to the modification of a coastal landscape</p> <p>Demonstrates accurate knowledge and understanding of other coastal and subaerial processes and their link to the modification of a coastal landscape</p> <p>Sketches / diagrams may be used and should be credited</p>	<p><b>2-3 marks</b></p> <p>Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some evidence</p> <p>Applies knowledge and understanding to consider 'to what extent' a fall in sea level has modified the coastal landscape</p> <p>Partially developed evaluation of the other appropriate processes in the modification of a coastal landscape</p>
<b>1</b>	<p><b>1-3 marks</b></p> <p>Demonstrates limited knowledge and understanding through a limited number of undeveloped examples</p> <p>Demonstrates limited knowledge and understanding of the features associated with a fall in sea level</p> <p>Demonstrates limited knowledge and understanding of other coastal and subaerial processes and their link to the modification of a coastal landscape</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p><b>1 mark</b></p> <p>Applies knowledge and understanding to produce an evaluation with limited coherence and support from some evidence</p> <p>Applies knowledge and understanding to produce limited consideration of 'to what extent' a fall in sea level has modified the coastal landscape.</p> <p>Limited evaluation of the other appropriate processes in the modification of a coastal landscape</p>
<b>0</b>	<p><b>0 marks</b></p> <p>Response not creditworthy or not attempted</p>	<p><b>0 marks</b></p> <p>Response not creditworthy or not attempted</p>

**Or: Glaciated Landscapes**

Mark questions 5, 6 and, either 7 or 8 if this is the selected landscape.

5. a (i) Use <b>Figure 3</b> to assess variations in the rates of change in the polar ice mass.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
					5		5
<b>Indicative content</b> <p>Assessment should use the data to weigh up the importance of the changes and this can be related to the base line, the rate of change and the variability of change which are shown on the graph. Candidates could:</p> <ul style="list-style-type: none"> <li>Recognise the overall decline between 1991 and 2010 relative to the base line</li> <li>Recognise that at times the rate of decline is rapid e.g. between 1993 and 1995</li> <li>Recognise that at times the rate of decline is less rapid e.g. 1996 to 2006</li> <li>Recognise that in some years there is an increase relative to the base line e.g. 1992 to 1993</li> <li>Recognise that change is variable over the time period shown</li> </ul> <p><b>Marking guidance</b></p> <p>Near the upper end, answers may recognise a variety of changes specifically linked to the resource, using dates and figures to assess appropriately.</p> <p>Near the lower end, answers may simply identify a general trend with occasional use of dates.</p> <p>Credit other valid comments.</p>							

Award the marks as follows:

Band	Marks	
3	4-5	Clear assessment of the rates of change Wide use of the resource as evidence to support the assessment
2	2-3	Some assessment of different rates of change Partial use of the resource as evidence to support the assessment
1	1	Limited statements that fail to identify rates of change
	0	Response not creditworthy or not attempted

5. a (ii) Explain why seasonal changes in the polar ice mass balance are the result of variations in inputs and outputs.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
		6					6
<b>Indicative content</b> <p>The question explores applied knowledge and understanding through analysis (AO2) of possible reasons for variations in polar ice mass balance introduced in the resource.</p> <p>Answers should show applied understanding of how inputs and outputs impact upon accumulation and ablation.</p> <ul style="list-style-type: none"> <li>Seasonal changes in snowfall input impact on accumulation</li> <li>Temperature changes throughout the year impact on the overall amount of ablation and location of ablation within the glacial system</li> <li>Reference could be made to calving at snout of polar ice masses</li> <li>Some answers may be stimulated by the graph to examine how seasonal changes have varied over time. There may be a comparison of the relative value of inputs and outputs overtime. This can be given credit as long as the seasonal element is included</li> </ul> <p><b>Marking guidance</b></p> <p>Near the upper end, answers will have clear applied knowledge and understanding of input / output processes and their role in how these lead to changes in ice mass balance. Near the lower end, there may be a focus on process with limited detail and link to ice mass balance.</p> <p>Credit other valid approaches.</p>							

Award the marks as follows:

Band	Marks	
3	5-7	Well-developed explanation of the processes involved in inputs and outputs Applies knowledge of the link between inputs / outputs and ice mass balance
2	3-4	Partial or unbalanced and / or unstructured explanation of the processes involved in inputs and outputs Some application of knowledge of the link between inputs / outputs and ice mass balance
1	1-2	Little or no explanation of the processes involved in inputs and outputs Very limited / fragmented applied knowledge of the link between inputs / outputs and ice mass balance
	0	Response not creditworthy or not attempted

5. b Distinguish between warm-based and cold-based glaciers.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 2 marks for distinction of characteristics	2						2
<b>Indicative content</b>  Cold based glaciers (1 mark): <ul style="list-style-type: none"> <li>Are frozen to the bedrock all year round</li> <li>Temperature of the ice stays at zero degrees constantly</li> <li>Tend to move via internal deformation</li> </ul> Warm based glaciers(1 mark): <ul style="list-style-type: none"> <li>Are not frozen to the bedrock all year round</li> <li>The temperature of these glaciers is not constantly below freezing so water exists within the ice</li> <li>The water acts as a lubricant so basal sliding can occur</li> </ul> Credit other valid points.							

6. a (i) Use <i>Figure 4</i> to compare changes to the landscape caused by climate change between 1992 and 2009. Include relevant data in your answer.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
						5	5
<b>Indicative content</b> <ul style="list-style-type: none"> <li>Area of Lake Thulagi has increased</li> <li>Length of lake has increased; 2.55 km (2009) and 1.85 km (1992) = + (0.7 km) 700 in 17 years <math>700 \div 17</math></li> <li>Quantification – increase of 0.13 sq.km (0.81 to 0.94 sq.km)</li> <li>Length of the Thulagi Glacier has decreased</li> <li>Quantification – it is now 0.007 km shorter (5.1km – 5.03km)</li> <li>Ice core in recessional moraine has melted by 15m</li> </ul> <b>Marking guidance</b>  Near the upper end, answer will compare the changes by making specific reference to the resource using dates and data where appropriate.  Near the lower end, answers may state changes and occasionally use date and data to back up the points made.  Credit other valid points.							

Award the marks as follows:

Band	Marks	
3	4-5	Well-developed comparison of changes to the landscape Wide use of the resource as source of data to support the description
2	2-3	Partial identification of changes to the landscape with some comparison Partial use of the resource as source of data to support the description
1	1	Limited statements of change with no use of the resource as source of data
	0	Response not creditworthy or not attempted

6. a (ii) Contrast the depositional location of terminal and medial moraines.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for correct contrasting statement of one with another moraine		2					2
<b>Indicative content</b>  <b>Terminal moraines</b> (1 mark) <ul style="list-style-type: none"> <li>Mark the end of a glacier</li> <li>Run in arcs at snout of glacier</li> <li>Mark former positions of a glacier front</li> </ul> <b>Medial moraines</b> (1 mark) <ul style="list-style-type: none"> <li>Ridge of unconsolidated material in the middle of an existing glacier</li> <li>Two alpine glaciers flow together their lateral moraines join to form a medial moraine</li> <li>Downstream from rock outcrops extending up through the surface of alpine glaciers</li> </ul> Credit other valid points.							

6. b Outline two processes of glacial erosion.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	6						6
<b>Indicative content</b> <ul style="list-style-type: none"> <li>Erosion by ice may include abrasion and plucking / quarrying</li> <li>Erosion by meltwater may include subglacial fluvial erosion</li> <li>There may be reference to unusual but valid processes such as chemical denudation in special geological situations or bulldozing of unconsolidated sediment by glacial surges</li> </ul> Give full credit to a well-annotated diagram and other valid approaches.							
<b>Marking guidance</b>  Near the upper end, answers that score well will identify two valid methods of glacial erosion and provide a clear summary of their main characteristics and operation as erosion processes.  Near the lower end, answers will display limited knowledge of the characteristics and operation of methods of glacial erosion.							

Award the marks as follows:

Band	Marks	
3	5-6	Well-developed outline of two processes of glacial erosion
2	3-4	Some and / or unstructured outline of two processes of glacial erosion Or, developed knowledge and understanding of one method of glacial erosion
1	1-2	Limited outline of two processes of glacial erosion
	0	Response not creditworthy or not attempted

7. Evaluate the importance of geological factors in affecting rates of glacial erosion.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10			5			15

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

AO1 content encompasses knowledge and understanding of the importance of geology in affecting the rate of glacial erosion. This may include:

- Knowledge and understanding of the geological characteristics that influence the rate of glacial erosion, for example rock hardness, jointing and permeability
- Knowledge and understanding of the link between geological characteristics and erosional processes (plucking, abrasion, meltwater, pressure release and freeze thaw weathering), for example the link between jointing and plucking
- Knowledge and understanding of the indirect impacts of geology on the rate of threat of glacial erosion, for example the influence of geology upon topography and gradient and how these link to the rate of erosion
- Knowledge and understanding of the interactions that influence the rate of glacial erosion, for example well jointed rocks produce more debris that can be used as an abrasive tool
- Knowledge and understanding of the other factors that influence the rate of glacial erosion, for example ice thickness, ice velocity, warm/cold based glaciers
- Knowledge and understanding of the other factors and how they impact upon the rate of glacial erosion, for example where ice thickness is greater, erosion increases as ice moves faster and increased pressure causes melting at the base

### AO2

Candidates demonstrate application of knowledge and understanding through the evaluation of the importance of geological factors in the rate of glacial erosion. This may include:

- Evaluation of geological factors in relation to other factors such as climatic factors or rates of climate change
- The extent to which geology is capable of influencing rates of glacial erosion compared to the importance of different types of glacier, for example, warm based and cold based
- Whether or not geology is a critical factor in determining erosion rates dependent on different processes of glacial erosion, for example plucking may be more influenced by geology than meltwater erosion
- Evaluation of the relative influence of geology over time during the development of a suite of glacial landforms, for example, whether the role of geology becomes more or less important as ice thickness varies

Near the upper end, answers that score well will understand that geology is not the only factor that impacts upon rates of glacial erosion and put this into a systems context. Evaluation may reflect on causality and could develop a comparison of one other factor with geology or a less developed consideration of a number of other factors. There should be an indication of the relative importance that can be an overview or comments interspersed within the text.

Near the lower end, there will be limited evaluation of the 'importance.'

Credit other valid approaches.

Award the marks as follows:

<b>AO1 (10 marks)</b>		<b>AO2.1c (5 marks)</b>
<i>Demonstrates knowledge and understanding of processes and links to rates of glacial erosion</i>		<i>Applies (AO2.1c) to appraise / judge through evaluating the importance of geology</i>
Band		
3	<p>7-10 marks</p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of geological factors and their link to rates of glacial erosion</p> <p>Demonstrates detailed and accurate knowledge and understanding of other appropriate factors and their link to rates of glacial erosion</p> <p>Well-annotated sketches / diagrams may be used and should be credited</p>	<p>4-5 marks</p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation that is supported by evidence</p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation of the relative importance of geological factors on rates of glacial erosion</p> <p>Balanced evaluation of the other appropriate factors influencing rates of glacial erosion</p>
2	<p>4-6 marks</p> <p>Demonstrates accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates accurate knowledge and understanding of geological factors and their link to rates of glacial erosion</p> <p>Demonstrates accurate knowledge of other appropriate factors and their link to rates of glacial erosion</p> <p>Sketches / diagrams may be used and should be credited</p>	<p>2-3 marks</p> <p>Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some evidence</p> <p>Applies knowledge and understanding to produce an evaluation of the relative importance of geological factors on rates of glacial erosion</p> <p>Partial evaluation of the other appropriate factors influencing rates of glacial erosion</p>
1	<p>1-3 marks</p> <p>Demonstrates limited knowledge and understanding through a limited number of examples</p> <p>Demonstrates limited knowledge and understanding of geological factors and their link to rates of glacial erosion</p> <p>Demonstrates limited knowledge and understanding of other appropriate factors and their link to rates of glacial erosion</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p>1 mark</p> <p>Applies knowledge and understanding to produce an evaluation with limited coherence and support from some evidence</p> <p>Applies knowledge and understanding to produce a limited evaluation of the importance of geological factors on rates of glacial erosion</p> <p>Limited evaluation of the other appropriate factors influencing rates of glacial erosion</p>
	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>



8. Evaluate the importance of fluvioglacial transport in the characteristics and formation of <i>one</i> fluvioglacial landform.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10			5			15

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

#### Indicative content:

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

#### AO1

AO1 content encompasses knowledge and understanding of the importance of fluvioglacial transport in the characteristics and formation of a fluvioglacial landform. This may include:

- Knowledge and understanding of the processes of fluvioglacial transport, for example traction, saltation and suspension
- Knowledge and understanding of how variations in fluvioglacial energy impact upon transportation processes
- Knowledge and understanding of how fluvioglacial transport influences the characteristics and formation of an ice contact fluvioglacial landform. For example the sinuous nature of eskers is rallied to their origin in glacial streams that transport sediment in sub-, en- and supra-glacial streams. The rounded nature of the sediment relates to water movement
- Knowledge and understanding of how fluvioglacial transport influences the characteristics and formation of a pro glacial landform. For example the seasonal differences in transport leading to the formation of sedimentary characteristics of varves
- Knowledge and understanding of other glacial processes that influence the characteristics and formation of a fluvioglacial landform. For example the influence of ice melt on the shape of kames and kame terraces
- Knowledge and understanding of post glacial processes on the characteristics of an ice contact/pro glacial landform. For example the impact of mass movement on the degradation of esker slopes

#### AO2

Candidates demonstrate application of knowledge and understanding through the evaluation of the relative importance of fluvioglacial transport in the characteristics and formation of a fluvioglacial landform. This may include:

- Evaluation of the relative importance of fluvioglacial transport with reference to depositional processes, for example the role of seasonal deposition in the formation of landforms varies after transport has delivered the sediment
- Evaluation of the relative importance of fluvioglacial transport with reference to erosional processes, for example the erosional processes that produce different sediment sizes that give sorted character of sandur plains
- Evaluation of the relative importance of fluvioglacial transport with reference to location within the glacial system, for example the frequency of kettle holes in relation to ice margins
- Evaluation of the relative importance of fluvioglacial transport with reference to post glacial processes, for example the changes in slope angle that are the result of fluvial erosion of kames

Near the upper end, answers that score well will focus on the importance of fluvioglacial transport that may be relative to other processes such as deposition or variations in types of materials carried and should evaluate the role of water in the processes.

Near the lower end, there is likely to be limited evaluation of 'importance' of fluvioglacial transport.

Credit other valid approaches.

Award the marks as follows:

	<b>AO1 (10 marks)</b>	<b>AO2.1c (5 marks)</b>
	<i>Demonstrates knowledge and understanding of the characteristics and formation of one fluvioglacial landform</i>	<i>Applies (AO2.1c) to appraise / judge through evaluating the importance of fluvioglacial transportation in the characteristics and formation of the selected landform</i>
<b>Band</b>		
<b>3</b>	<p><b>7-10 marks</b></p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of fluvioglacial processes and their link to the characteristics and the formation of a fluvioglacial landform</p> <p>Demonstrates detailed and accurate knowledge and understanding of other appropriate processes and their link to the characteristics and formation of a fluvioglacial landform</p> <p>Well-annotated sketches / diagrams may be used and should be credited</p>	<p><b>4-5 marks</b></p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation that is supported by evidence</p> <p>Applies knowledge and understanding to reach a thorough and coherent evaluation of the relative importance of fluvioglacial processes and their link to the characteristics and formation of a fluvioglacial landform</p> <p>Balanced evaluation of the other appropriate processes influencing the characteristics and formation of a fluvioglacial landform</p>
<b>2</b>	<p><b>4-6 marks</b></p> <p>Demonstrates accurate knowledge and understanding through the use of partially developed examples</p> <p>Demonstrates accurate knowledge and understanding of fluvioglacial processes and their link to the characteristics and the formation of fluvioglacial landforms</p> <p>Demonstrates accurate knowledge and understanding of other appropriate processes and their link to the characteristics and formation of a fluvioglacial landform</p> <p>Sketches / diagrams may be used and should be credited</p>	<p><b>2-3 marks</b></p> <p>Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some evidence</p> <p>Applies knowledge and understanding to evaluate the relative importance of fluvioglacial processes and their link to the characteristics and formation of a fluvioglacial landform</p> <p>Applies knowledge and understanding to provide an evaluation of the other appropriate processes influencing the characteristics and formation of a fluvioglacial landform</p>

1	<p>1-3 marks</p> <p>Demonstrates limited knowledge and understanding through the use of undeveloped examples</p> <p>Demonstrates limited knowledge and understanding of fluvioglacial processes and their link to the characteristics and the formation of fluvioglacial landforms</p> <p>Demonstrates limited knowledge and understanding of other appropriate processes and their link to the characteristics and formation of a fluvioglacial landform</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p>1 mark</p> <p>Applies knowledge and understanding to produce an evaluation with limited coherence and support from some evidence</p> <p>Limited application of knowledge and understanding to evaluate the relative importance of fluvioglacial processes and their link to the characteristics and formation of a fluvioglacial landform</p> <p>Limited evaluation of the other appropriate processes influencing the characteristics and formation of a fluvioglacial landform</p>
	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>

## Section B: Changing Places

Mark questions 9, 10 and, **either** 11 **or** 12 in this section.

<b>9. a (i) Define the term <i>quaternary industry</i>.</b>	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following, up to a maximum of 2 marks	2						2
<b>Indicative content</b> <ul style="list-style-type: none"> <li>Research and development activities / new knowledge creation (1 mark)</li> <li>High-skilled / highly-paid / professional workforce (1 mark)</li> <li>Straddles several sectors including biotechnology, ICT, etc. (1 mark)</li> </ul>							

9 a (ii) Study Figure 5. Calculate the missing figures for the South West and the North West.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
					2		2
Indicative content							
UK Region	% of residents aged 16-64 with degree level or above	Rank	% Quaternary industry	Rank	Difference (d)	Difference squared (d <sup>2</sup> )	
South West				4.5	1.5	2.25	
North West				4.5	-0.5	0.25	
Marking Guidance							
Correct value for rank, difference (d) and difference squared (d2) for South West region (1) and North West region (1). The South West region and North West region have tied ranks and in order to allocate a rank order it is necessary to calculate the average rank that they occupy. Rankings are calculated by adding up the rankings 4 and 5 and dividing by the number of regions (2) to find the mean.							

<b>9 a (iii) The Spearman Rank Correlation Co-efficient (<math>r_s</math>) was calculated as <math>r_s = 0.67</math>. Using the values of <math>r_s</math> in the table below, state the statistical significance of the result and explain your decision.</b>	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
					3		3
<b>Indicative content</b> <p>As the calculated figure of +0.67 is above the tabulated figure at the 95% confidence level at <math>n=12</math> (0.50) but below the tabulated figure at the 99% confidence level at <math>n=12</math> (0.71), it can be stated with 95% confidence that there is a statistically significant positive correlation between the percentage of residents aged 16-64 with degree level or above qualifications and the percentage of quaternary industry in the 12 regions of the UK</p>							
<b>Marking Guidance</b> <p>1 mark for correct result 2 marks for explanation</p> <p>Correct confidence level (95%) selected at <math>n=12</math> (1). Correct interpretation of the statistical significance of the result that there is a positive correlation between the percentage of residents aged 16-64 with degree level or above qualifications and the percentage of high tech industry in the 12 regions of the UK (1) that is significant at the 95% but not the 99% confidence level (1)</p>							

9. b Describe how the process of gentrification leads to changes in the characteristics of places.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	6						6
<p><b>Indicative content</b></p> <ul style="list-style-type: none"> <li>• Renovation/refurbishment/renewal of a place</li> <li>• Gives a detail of physical landscape changes</li> <li>• Gives a detail of social changes/displacement</li> <li>• Process may be driven by investors, government or both</li> <li>• Can take place in inner cities or rural villages</li> <li>• Describes (not simply names) an example</li> </ul> <p><b>Marking guidance</b></p> <p>Near the upper end, answers that score well will provide a clear description and may use place specific examples to back up the points made.</p> <p>Near the lower end, answers will display limited knowledge of the variety of factors that lead to changes.</p> <p>Credit other valid points.</p>							

Award the marks as follows:

Band	Marks	
3	5-6	<p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Clear knowledge and understanding of the process of gentrification and description of how it changes the characteristics of places</p>
2	3-4	<p>Demonstrates accurate knowledge and understanding through the partial use of appropriate and partially developed examples</p> <p>Partial knowledge and understanding of the process of gentrification and description of how it changes the characteristics of places</p>
1	1-2	<p>Demonstrates limited knowledge and understanding through the use of undeveloped examples</p> <p>Limited knowledge and understanding of the process of gentrification and description of how it changes the characteristics of places</p>
	0	Response not creditworthy or not attempted

10. a Use the information in <i>Figure 6</i> to assess the success of tourism in this location.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
						5	5
<p><b>Indicative content</b></p> <p>The responses are expected to address both qualitative and quantitate aspects of the resource.</p> <p>Negatives</p> <ul style="list-style-type: none"> <li>• Longer stay visitor numbers are decreasing</li> <li>• Overall decrease in day trippers although trend is variable</li> <li>• Comments on weather and value for money</li> <li>• Impact of tourism on traffic</li> <li>• Lack of high quality employment</li> </ul> <p>Positives</p> <ul style="list-style-type: none"> <li>• Day tripper numbers remain high</li> <li>• Attractions of physical environment</li> </ul> <p>Credit other valid points.</p> <p><b>Marking guidance</b></p> <p>Near the upper end, answers that score well will make specific reference to the comments and data provided in order to assess success. Answers will make reference to both the positive and negative aspects highlighted by the resource and their relative merits and importance, addressing both qualitative and quantitate aspects, in order to assess the success of tourism in the location.</p> <p>Near the lower end, answers will display limited use of the resource and may focus only on the positives or the negatives.</p>							

Award the marks as follows:

Band	Marks	
3	4-5	Well-developed assessment of success of tourism in this location Wide use of the resource as source of data to support opinion
2	2-3	Partial assessment of success of tourism in this location Partial use of the resource as source of data to support opinion
1	1	Limited assessment of success of tourism in this location Limited use of the resource as source of data to support opinion
	0	Response not creditworthy or not attempted

10. b Suggest how the trends shown in <i>Figure 6</i> can affect local rural communities.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
			8				8
<p><b>Indicative content</b></p> <p>The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.</p> <p>Analysis of the trends and viewpoints in Figure 6 could suggest the following interpretations:</p> <ul style="list-style-type: none"> <li>• Reduction in longer stay visitors between 2005 and 2015 could result in a reduction of jobs available for the local community</li> <li>• Those jobs that are available may be low paid and only provide seasonal employment</li> <li>• The fluctuation in the number of day trippers year on year could result in lack of predictability for workers and businesses. This could increase the use of zero-hours contracts</li> <li>• Increased cost of housing</li> <li>• The lack of jobs and falling number of longer stay visitors (approx. 4000 reduction between 2005 and 2015) could force local people to move away in search of work, changing the culture of the rural community</li> <li>• Environmental damage</li> <li>• Employment opportunities viable as day tripper numbers are still high</li> <li>• Capital injections are still made as tourists continue to arrive</li> <li>• Continuation of tourism enables preservation of traditional industries, culture and art</li> <li>• Renovation of buildings and preservation of the natural environment is more likely in order to keep attracting the tourists such as those who commented in the visitor book</li> </ul> <p>Credit other valid approaches.</p> <p><b>Making guidance</b></p> <p>Near the upper end, those that score highly will interpret the resource by suggesting how there is a link between tourism in the post productive countryside and changes in rural communities. The concept of <u>causality</u> can be introduced related to the changes and the resultant changing <u>identity</u> of the community. Some answers may reflect on the <u>resilience</u> of communities and use places they have studied within a similar context, to illustrate points made.</p> <p>Near the lower end, there is likely to be limited suggestions about possible impacts.</p>							

Award the marks as follows:

Band	Marks	
3	6-8	<p>Applies knowledge and understanding to produce a thorough and coherent interpretation that is supported by evidence</p> <p>Applies knowledge and understanding to make well-developed suggestions of a range of possible impacts in a structured way, which makes specific reference to the resource and the context</p> <p>Selectively applies a range of relevant knowledge about rural communities / issues related to the resource</p>
2	3-5	<p>Applies knowledge and understanding to produce a coherent but partial interpretation that is supported by some evidence</p> <p>Applies knowledge and understanding to make partial and / or unstructured suggestions of relevant impacts (two or more), which makes some reference to the resource and the context</p> <p>Some application of generalised knowledge about rural communities / issues related to the resource</p>
1	1-2	<p>Applies knowledge and understanding to produce an interpretation with limited coherence and support from some evidence</p> <p>Few or no suggestions of any impacts</p> <p>Very limited / fragmented applied knowledge of rural communities / issues</p>
	0	Response not creditworthy or not attempted

11. Evaluate why some people have benefited more than others from recent changes in the central areas of cities.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10			5			15

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

AO1 content encompasses knowledge and understanding of the impact of changes in the central areas of cities. This may include:

- New office growth, the development of 24-hour consumption of services provided in central areas, culture and entertainment growth, the growth of student accommodation, removal of polluting industry
- Office and service growth in many central areas, such as Cardiff and London, provides new employment for residents
- Associated construction, supply chain work due to multiplier effect (A8 migrants may benefit)
- Central areas of cities are being reclaimed for residential uses
- Everyone benefits from less polluted post-industrial environment (less industry in inner cities)
- The decline of retail outlets due to out-of-town competition, local market failure (post-2008), the homogenisation of town centres, increased rates of building vacancy, declining environmental quality, increasing crime rates
- Not everyone has found employment (e.g. unskilled manual workers)
- Some people prefer the new sense of place – lively 24-hour bars and clubs – but not all agree
- Town centres lose their individuality and become less interesting places to shop or use for entertainment

### AO2

The candidate demonstrates application of knowledge and understanding through evaluation of variations in why people have benefited from the recent changes in the central areas of cities. This requires a judgement and should be accompanied by supporting evidence. This may include:

- Some changes may provide more benefit to people living within the city's sphere of influence than others
- The extent to which changes may provide different levels of benefit to different age groups. For example, older people and young families may not benefit from 24-hour entertainment culture in some urban areas whilst younger age groups make full use of the services provided
- The 'benefits' may be contested by different groups of people who have different perceptions. For example, the relative social benefits of change, such as late night entertainment, may be contrasted with perceived problems such as the potential increase in anti-social behaviours such as drunkenness, vandalism and littering
- The 'benefits' created by economic change, such as job opportunities created by globalising economic development, may be contrasted with the loss of local identity that is associated with a corporate homogenous urban landscape
- The decline of services and increased vacancy in central urban areas may benefit people involved in pop-up shops but less so for those who value economic vibrancy and variety

Credit other valid approaches.

Near the upper end, answers that score well will evaluate why benefits vary for different groups of people living within the same place (incomers / gentrifies / residents / visitors) and also between different settlements, with decline in some but not others.

Near the lower end, there is likely to be limited evaluation of benefits for different people.



Award the marks as follows:

AO1 (10 marks)		AO2.1c (5 marks)
	<i>Demonstrate knowledge and understanding of changes in central areas of cities</i>	<i>Applies (AO2.1c) to appraise / judge through evaluating the uneven benefits that changes bring</i>
Band		
3	<p>7-10 marks</p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of the economic, social, environmental and demographic changes that have taken place in the central areas of cities and why different people have benefited.</p> <p>Well annotated sketches / diagrams / maps may be used and should be credited</p>	<p>4-5 marks</p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation that is supported by evidence</p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation of why some groups of people have benefited more from the economic, social, environmental and demographic changes than others</p> <p>Balanced evaluation of interaction of the elements of benefit experienced by different people</p>
2	<p>4-6 marks</p> <p>Demonstrates accurate knowledge and understanding through the use of appropriate and partially developed examples</p> <p>Demonstrates accurate knowledge and understanding of the economic, social, environmental and demographic changes that have taken place in the central areas of cities and why different people have benefited</p> <p>Sketches / diagrams may be used and should be credited</p>	<p>2-3 marks</p> <p>Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some evidence</p> <p>Applies knowledge and understanding to evaluate why some groups of people have benefited more from the economic, social, environmental and demographic changes than others</p> <p>Partial evaluation of interaction of the elements of benefit experienced by different people</p>
1	<p>1-3 marks</p> <p>Demonstrates limited knowledge and understanding through the use of examples</p> <p>Demonstrates limited knowledge and understanding of the economic, social, environmental and demographic changes that have taken place in the central areas of cities and why different people have benefited</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p>1 mark</p> <p>Applies knowledge and understanding to produce an evaluation with limited coherence and support from some evidence</p> <p>Applies limited knowledge and understanding to provide a limited evaluation of why some groups of people have benefited more from the economic, social, environmental and demographic changes than others</p> <p>Limited evaluation of interaction of the elements of benefit experienced by different people</p>
0	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>

12. Assess how far different aspects of the rural rebranding process may rely on internet availability.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10			5			15

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

AO1 content encompasses knowledge and understanding of the different aspect of rural rebranding process and how it may rely on broadband. This may include:

- How rebranding rural areas as tourist destinations is enhanced by broadband connection giving internet connection for customers and advertising
- How rebranding rural areas as business locations is enhanced by broadband connection giving access to marketing and enabling large amounts of data to be transferred for high tech businesses
- How rebranding rural areas as telecommuting locations are enhanced by broadband connection as it gives access to main offices in urban areas
- How rural areas can be rebranded as desirable places for families to live as broadband connections provide support for health and education services
- How rural areas can be rebranded as diversified locations as broadband enables traditional industries to market their products (e.g. organics) and provide a greater variety of services (tourist accommodation and craft workshops)
- How rebranding rural areas may depend on a variety of other factors such as government support, road access and environmental improvement

### AO2

Candidates go beyond knowledge and understanding to weigh up the importance of broadband in rebranding rural areas. This may include:

- The extent to which internet availability is important to different elements of rebranding, for example it is vital for telecommuting but less important for tourism
- The relative importance of internet availability in different rural locations where areas that seek to attract high tech industries must have access to broadband
- The changing importance over time of internet availability as economy and society become more dependent on technology
- The importance of internet availability relative to other factors that contribute to rebranding rural areas such as environmental quality and a desire for isolation
- The importance of internet availability relative to the cost of installation and frequent upgrade to keep abreast of technology

Credit other valid approaches.

Near the upper end, answers that score well will assess how these different aspects are interdependent (economic growth supports in-migration of families which in turn builds school numbers) and may be carefully structured around the stages of rural rebranding process (from funding, through representation, to delivery of new services; a view might even be taken as to which stage needs broadband most).

Near the lower end, there is likely to be limited examination of the reliance of rural rebranding on internet availability.

Award the marks as follows:

		<b>AO1 (10 marks)</b>	<b>AO2.1c (5 marks)</b>
		<i>Demonstrates knowledge and understanding of broadband and rural rebranding</i>	<i>Applies (AO2.1c) to appraise / judge through assessing the different aspects of the rebranding process</i>
3	4-5	<p>7-10 marks</p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of the aspects of rebranding and how broadband can assist in the process</p> <p>Demonstrates detailed and accurate knowledge and understanding of other appropriate factors and their contribution to the aspects of rural rebranding</p> <p>Well annotated sketches / diagrams / maps may be used and should be credited</p>	<p>4-5 marks</p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation that is supported by evidence</p> <p>Applies knowledge and understanding to produce a thorough and coherent assessment of the importance of broadband in different aspects of rural rebranding</p> <p>Balanced assessment of the importance of the other appropriate factors influencing different aspects of rural rebranding</p>
2	2-3	<p>4-6 marks</p> <p>Demonstrates accurate knowledge and understanding through the use of appropriate and partially developed examples</p> <p>Demonstrates accurate knowledge and understanding of the aspects of rebranding and how broadband can assist in the process</p> <p>Demonstrates accurate knowledge and understanding of other appropriate factors and their contribution to the aspects of rebranding</p> <p>Sketches / diagrams / maps may be used and should be credited</p>	<p>2-3 marks</p> <p>Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some evidence</p> <p>Applies knowledge and understanding to assess the importance of broadband in different aspects of rural rebranding</p> <p>Partial assessment of the importance of the other appropriate factors influencing different aspects of rural rebranding</p>
1	1	<p>1-3 marks</p> <p>Demonstrates limited knowledge and understanding through the use of limited examples</p> <p>Demonstrates limited knowledge and understanding of the aspects of rebranding and how broadband can assist the process</p> <p>Demonstrates limited knowledge and understanding of other appropriate factors and their contribution to the aspects of rural rebranding</p> <p>Basic sketches / diagrams / maps may be used and should be credited</p>	<p>1 mark</p> <p>Applies knowledge and understanding to produce an evaluation with limited coherence and support from some evidence</p> <p>Applies limited knowledge and understanding to simply assess the importance of broadband in different aspects of rural rebranding</p> <p>Limited assessment of the importance of the other appropriate factors influencing different aspects of rural rebranding</p>
	0	<p>0 marks</p> <p>Response not creditworthy or not attempted.</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted.</p>





**A LEVEL GEOGRAPHY**

**COMPONENT 2**

**GLOBAL SYSTEMS AND  
GLOBAL GOVERNANCE**

**SAMPLE ASSESSMENT MATERIALS**

**2 hours**



### **ADDITIONAL MATERIALS**

In addition to this examination paper, you will need **one** 12 page answer book and a calculator.

### **INSTRUCTIONS TO CANDIDATES**

Answer questions 1, 2 and, **either** 3 **or** 4 in Section A.

Answer questions 5, 6 and, **either** 7 **or** 8 in Section B.

Answer **one** question in Section C.

Use black ink or black ball-point pen.

Write your answers in the separate answer book provided.

Write your name, centre number and candidate number in the spaces at the top of the answer book.

### **INFORMATION FOR CANDIDATES**

The number of marks is given in brackets [ ] at the end of each question or part-question; you are advised to divide your time accordingly.

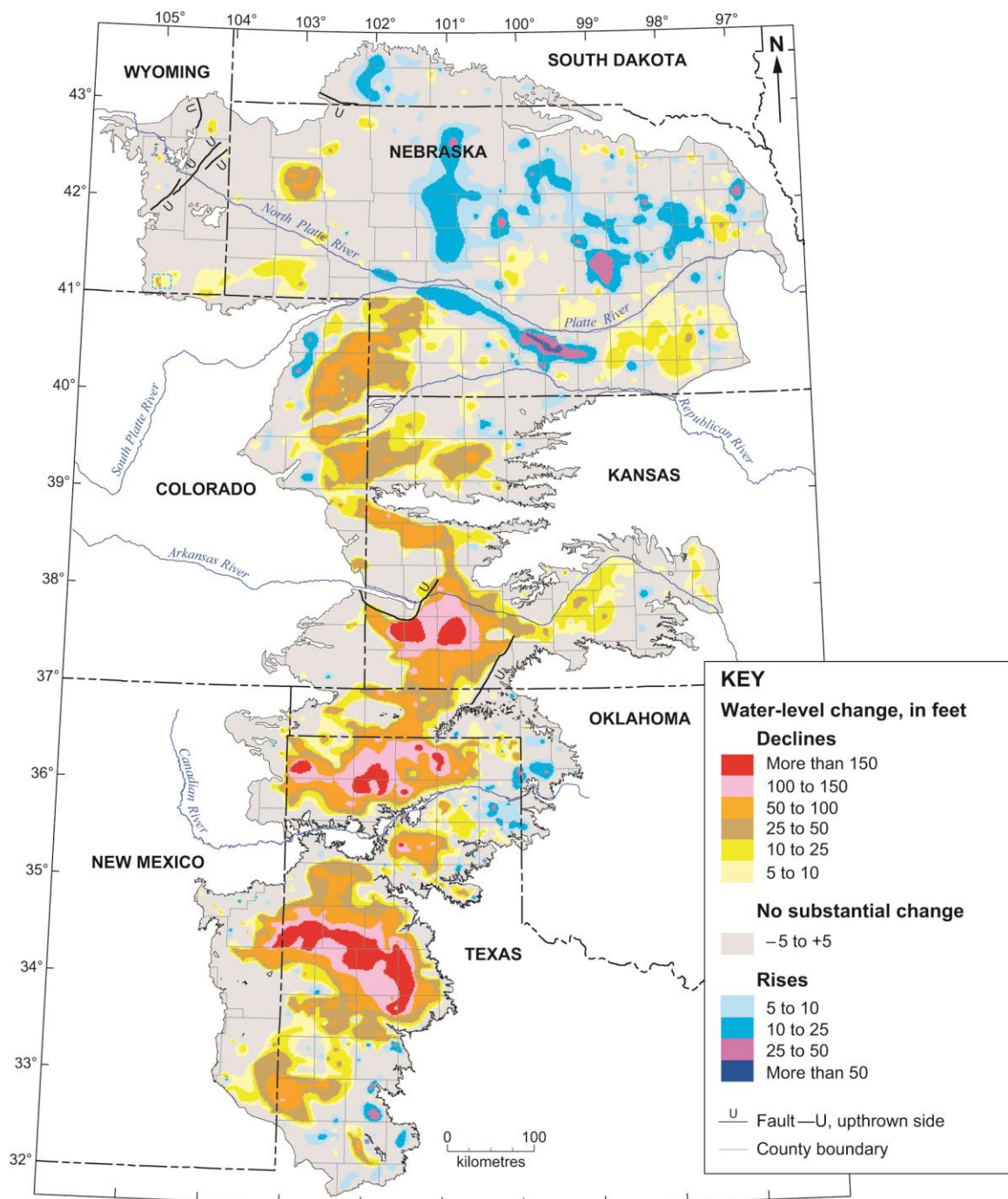
**This paper requires that you make as full use as possible of appropriate examples and reference to data to support of your answers. Sketch maps and diagrams should be included where relevant.**

## Section A: Global Systems – Water and Carbon Cycles

Answer questions 1 and 2 **and**, either 3 **or** 4.

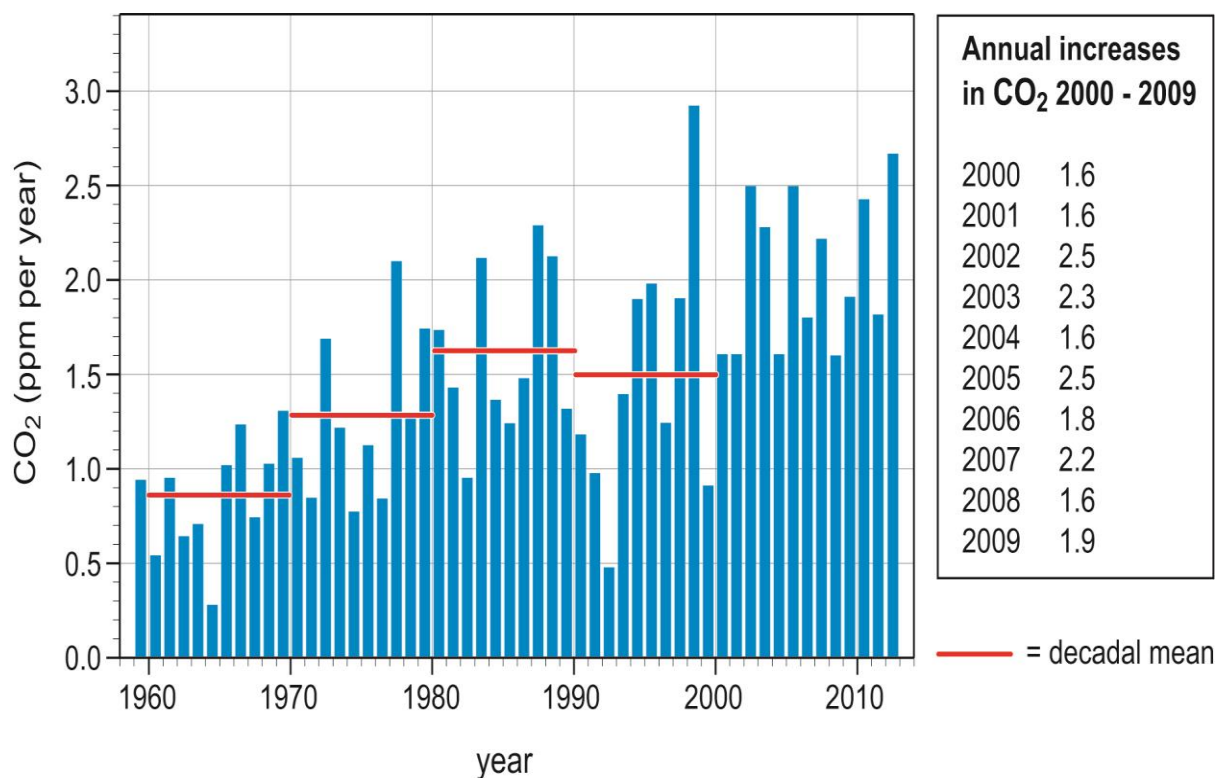
Where possible, make full use of examples and data in support of your answers.

**Figure 1: Water level changes in the High Plains aquifer, USA.**



Source: adapted from [ne.water.usgs.gov](http://ne.water.usgs.gov)

1. (a) Use **Figure 1** to assess the severity of water level decline in the High Plains aquifer. [5]
- (b) Suggest how human activities may result in falls in water levels in the High Plains aquifer. [5]

**Figure 2: Annual increases in atmospheric CO<sub>2</sub> at Mauna Loa**Source: adapted from <http://www.esrl.noaa.gov>

2. (a) (i) Use **Figure 2** to calculate the decadal mean increase in CO<sub>2</sub> for 2000–2009. Show your workings. [2]
- (ii) Describe the trend of decadal mean values shown in **Figure 2**. [3]
- (b) Explain how natural processes give rise to short-term fluctuations in the size of the atmospheric CO<sub>2</sub> store. [5]

**Either**

3. Analyse the effects of forest removal on the operation of physical systems.

*Refer to both the water cycle and the carbon cycle in your answer.*

[20]

*Within your answer to question 3, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*

**Or**

4. To what extent do geological factors influence water and carbon cycle flows in different contexts.

[20]

*Within your answer to question 4, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*

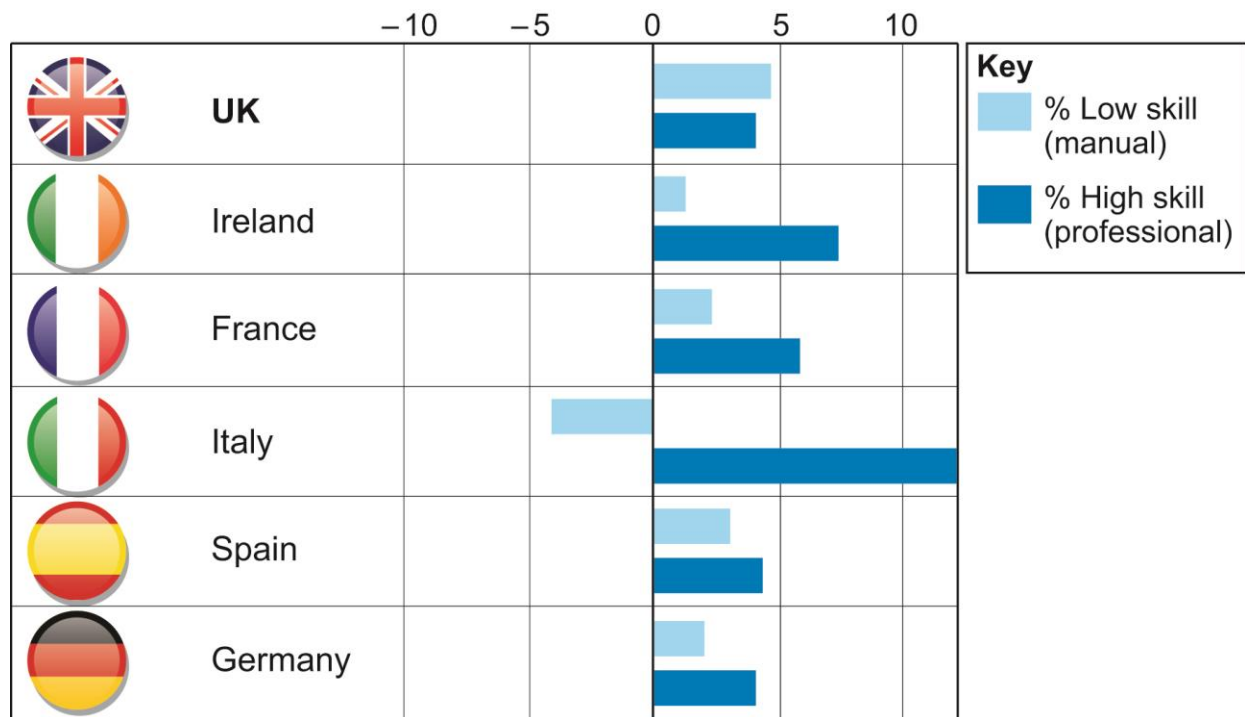


## Section B – Global Governance: Change and Challenges

Answer questions 5 and 6, and either 7 or 8.

Make the fullest possible use of examples in support of your answers.

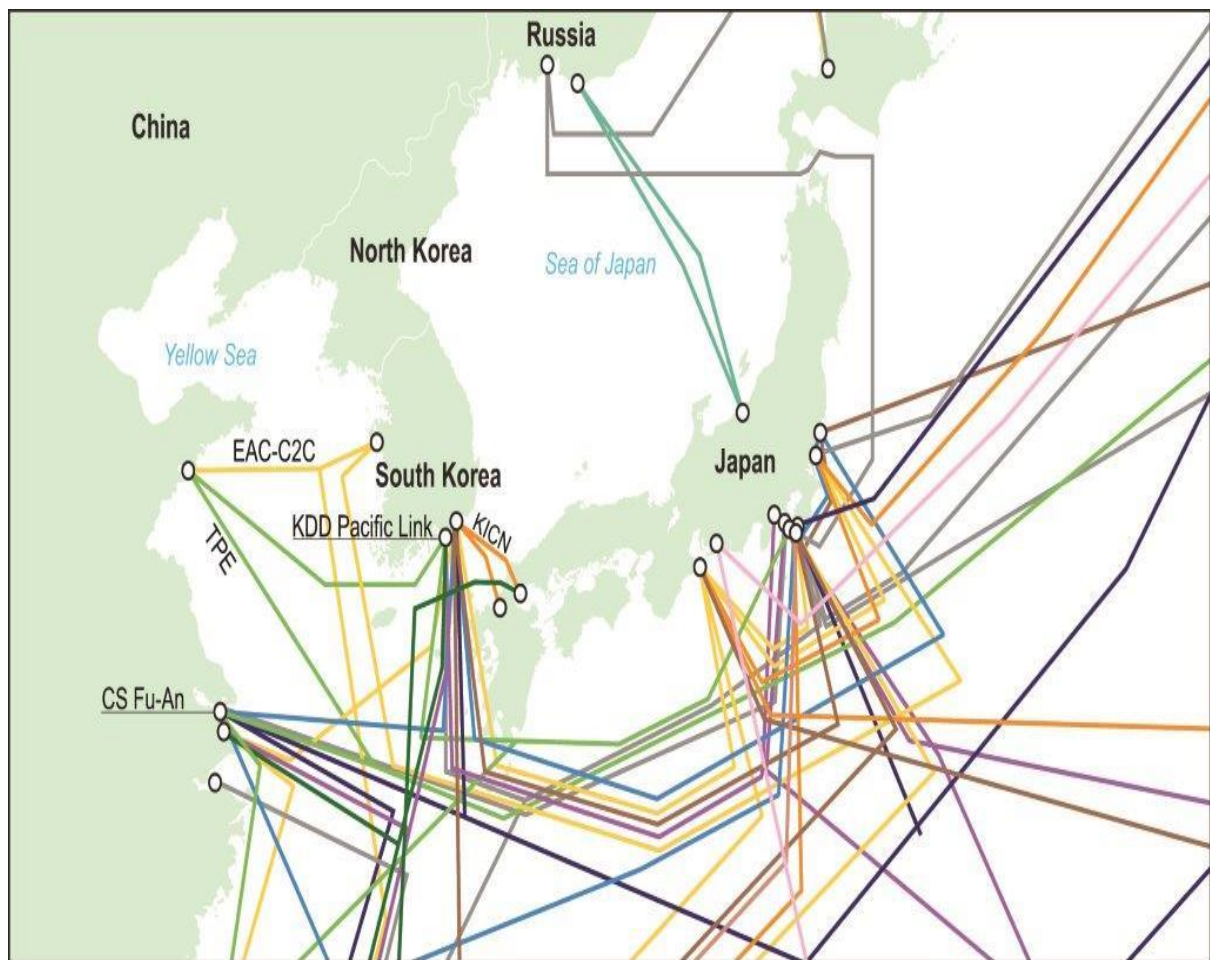
**Figure 3: Low skill (manual) and high skill (professional) employment changes in selected EU countries (2000-2015)**



Source: www.ft.com

- 5 (a) Use **Figure 3** to compare employment changes for the EU member states shown. Include relevant data in your answer. [5]
- (b) Analyse how the employment changes shown in **Figure 3** could have affected international migration. [5]

**Figure 4: Undersea data cable networks in the Asia-Pacific region, 2014**



Source: adapted from: [www.submarinecablemap.com](http://www.submarinecablemap.com)

6. (a) Use **Figure 4** to contrast the connectivity of Japan, North Korea and South Korea. [5]
- (b) Outline how human and physical factors influence the global distribution of seafloor cables. [5]

**Either:**

7. 'National governments have lost control of who and what is crossing their borders.' Discuss.

*Refer to both migration management and ocean governance in your answer.*

[20]

*Within your answer to question 7, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*

**Or:**

8. Assess the relative importance of strategies used by powerful countries to maintain global influence.

*Refer to both migration management and ocean governance in your answer.*

[20]

*Within your answer to question 8, you are required to demonstrate your ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.*

## Section C – 21<sup>st</sup> Century Challenges (synoptic exercise)

Answer question 9 or question 10.

Either

9. Assess the severity of the different risks that cities increasingly face. [30]

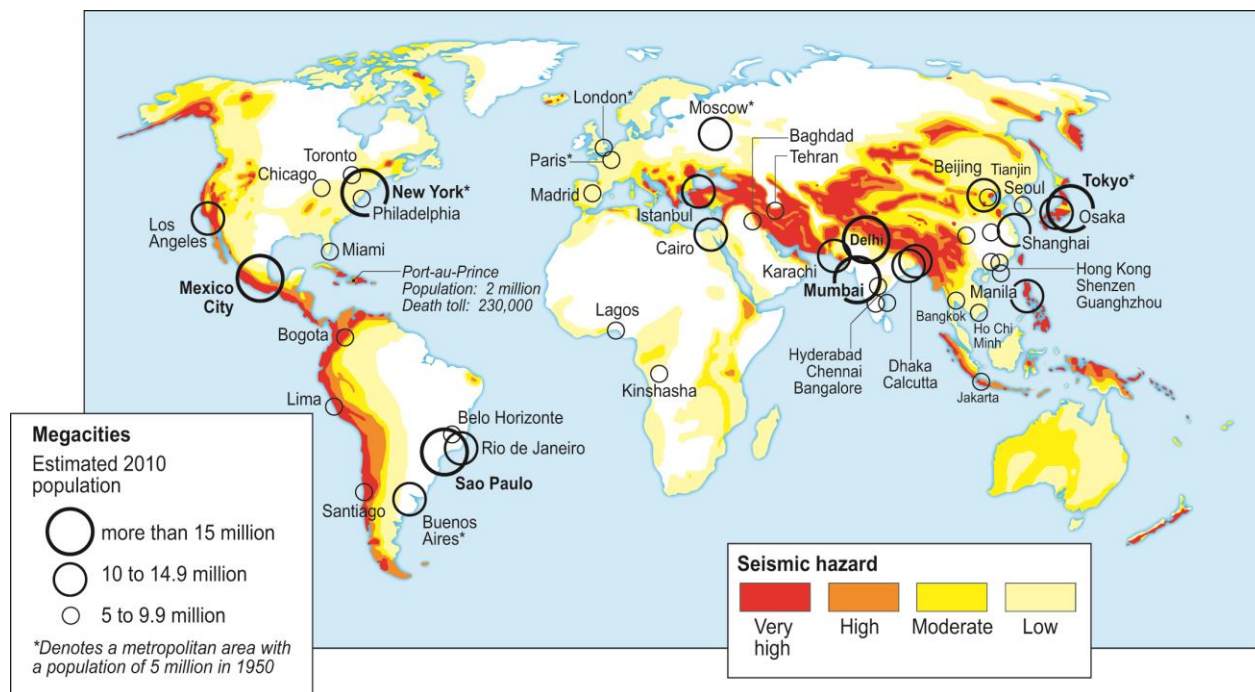
Or

10. To what extent could the management of different risks lead to changes in the characteristics of urban places? [30]

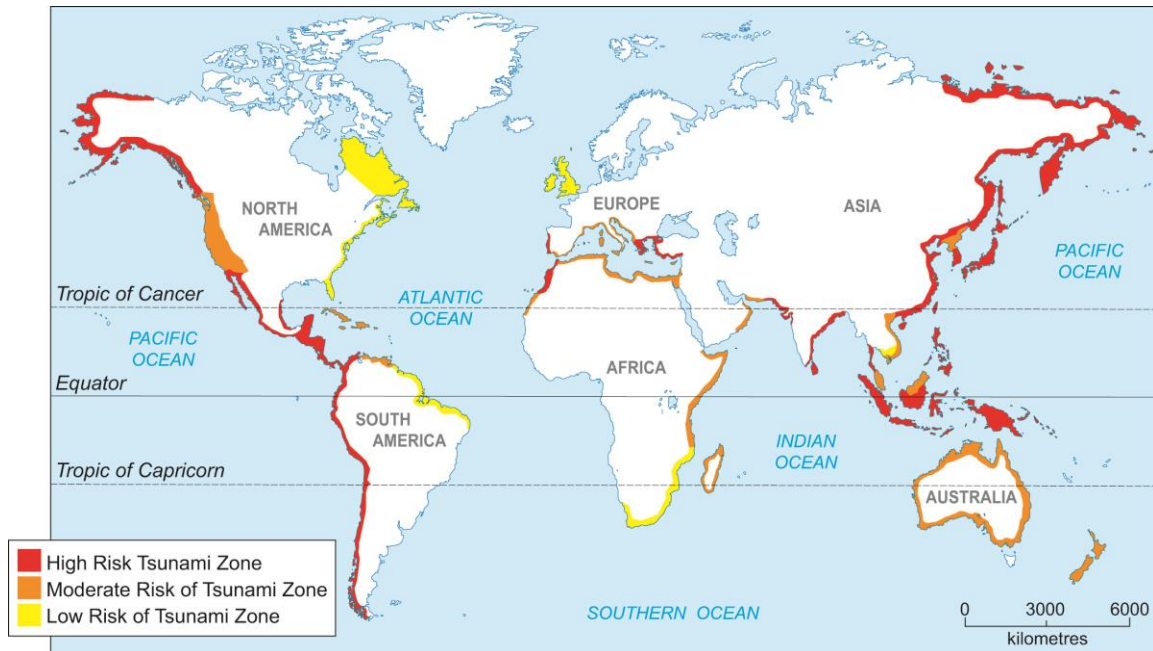
In your answer to either question 9 or 10, you should use the maps in **Figures 5, 6, 7 and 8** and apply your knowledge and understanding from across the whole specification.

You should develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

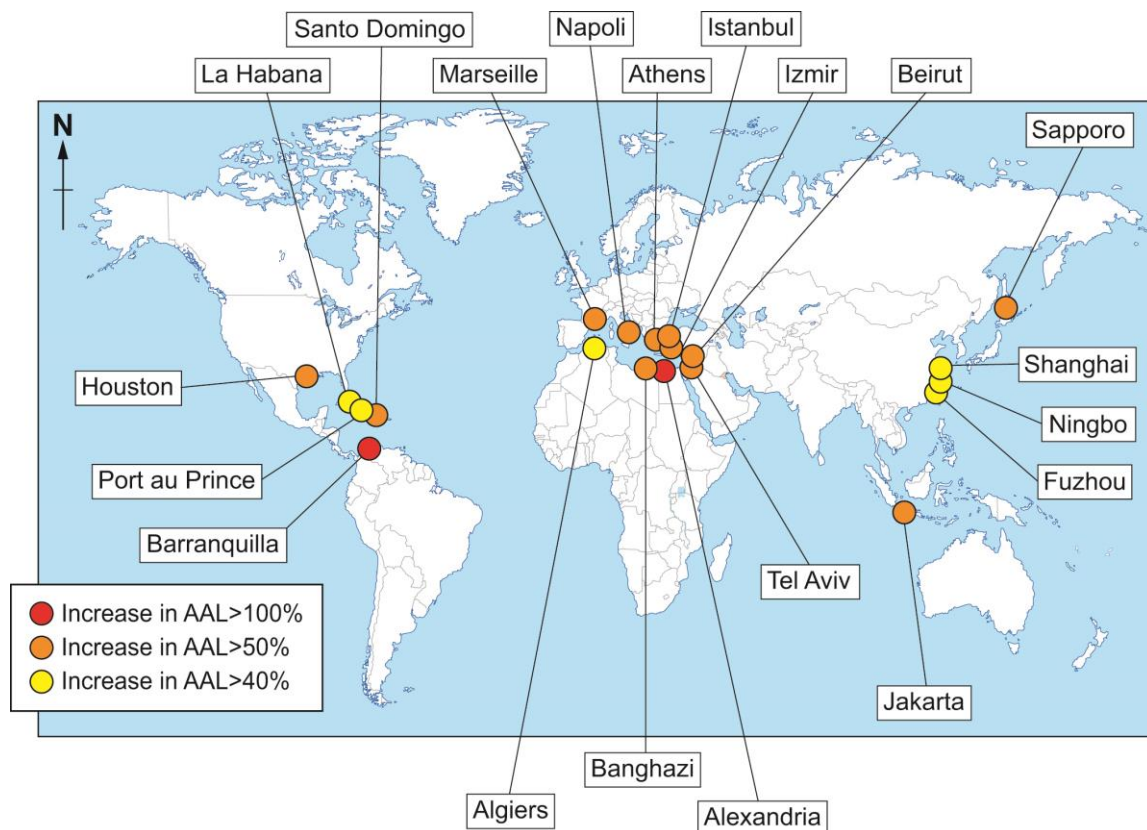
**Figure 5: Major cities and earthquake risk**



**Figure 6: Tsunami warning zones**



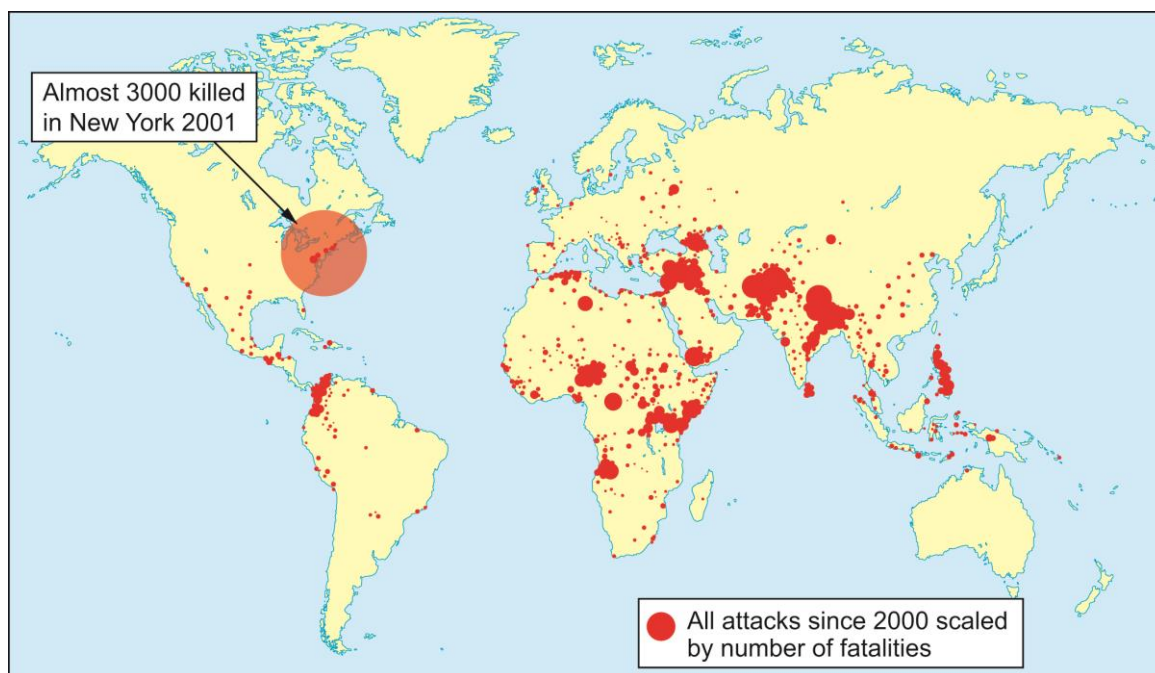
**Figure 7: The 20 cities that face the biggest relative increase in average annual losses (AAL) due to sea-level rise by 2050**



Source: adapted from: <http://www.washingtonpost.com>



**Figure 8: Terrorist attacks worldwide 2000-2013**



Source: adapted from: <http://c3.thejournal.ie/>

## Component 2: Global Systems and Global Governance

### Mark Scheme

#### Guidance for Examiners

##### Positive marking

It should be remembered that learners are writing under examination conditions and credit should be given for what the learner writes, as opposed to adopting an approach of penalising him / her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Marks should not be deducted for a less than perfect answer if it satisfies the criteria of the mark scheme.

The mark scheme for this component includes both point-based mark schemes and banded mark schemes.

##### Point-based mark schemes

For questions that are objective or points-based the mark scheme should be applied precisely. Marks should be awarded as indicated and no further subdivision should be made. Each creditworthy response should be in red ink. Annotations must reflect the mark awarded for the question. The targeted assessment objective (AO) is also indicated.

##### Banded mark schemes

For questions with mark bands the mark scheme is in two parts.

The first part is advice on the indicative content that suggests the range of concepts, processes, scales and environments that may be included in the learner's answers. These can be used to assess the quality of the learner's response. This is followed by an assessment grid advising on bands and the associated marks that should be given in responses that demonstrate the qualities needed in the three AOs; AO1, AO2 and AO3, relevant to this component. The targeted AO(s) are also indicated, for example AO2.1c.

Banded mark schemes are divided so that each band has a relevant descriptor. The descriptor for the band provides a description of the performance level for that band. Each band contains marks. Examiners should first read and annotate a learner's answer to pick out the evidence that is being assessed in that question. Once the annotation is complete, the mark scheme can be applied. This is done as a two stage process.

##### **Banded mark schemes Stage 1 – Deciding on the band**

Beginning at the lowest band, examiners should look at the learner's answer and check whether it matches the descriptor for that band. Examiners should look at the descriptor for that band and see if it matches the qualities shown in the learner's answer. If the descriptor at the lowest band is satisfied, examiners should move up to the next band and repeat this process for each band until the descriptor matches the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the learner's response should be used to decide on the mark within the band. For instance if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content.

Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

### **Banded mark schemes Stage 2 – Deciding on the mark**

Once the band has been decided, examiners can then assign a mark. During standardising (marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner.

When marking, examiners can use these examples to decide whether a learner's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Indicative content is not exhaustive, and any other valid points must be credited. In order to reach the highest bands of the mark scheme a learner need not cover all of the points mentioned in the indicative content but must meet the requirements of the highest mark band. Where a response is not creditworthy, that is contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded

Where the specialised concepts are integral to knowledge and understanding, they are underlined in the indicative content.

The mark scheme reflects the layout of the examination paper. Mark questions 1, 2 and, either 3 or 4 in Section A. Mark questions 5, 6 and, either 7 or 8 in Section B. Mark one question in Section C.

Be prepared to reward answers that give **valid and creditworthy** responses, especially if these do not fully reflect the 'indicative content' of the mark scheme.



**Section A: Global Systems – Water and Carbon Cycles***Mark all questions in this section.*

1. a Use <b>Figure 1</b> to assess the severity of water level decline in the High Plains aquifer.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
						5	5
<p><b>Indicative content</b></p> <p>Likely AO3 content includes identifying variability in the level of water level decline and providing an explicit assessment of the severity from place to place.</p> <ul style="list-style-type: none"> <li>The mixture of blues and reds suggests that the severity is not spread evenly across the whole area. The most severe decline has taken place in the south / Texas where there has been a 150 foot water level fall in places, covering an area stretching for 200 km from west to east</li> <li>Substantial areas of decline occur in the states of Texas and Kansas. Here the decline is severe, with some areas suffering a substantial change of more than 150 feet. Such a reduction is likely to have a noticeable impact on both people (domestically and economically) and the environment. However, parts of Texas and Kansas have seen a rise of between 10-25 feet. Larger areas have seen a fall than have seen a rise, suggesting that the water level decline has been severe for the southern states</li> <li>The northern part of the aquifer has seen much less of a decline in water level and the extent of the decline is far less severe. In Nebraska, the extent of the blue shading would suggest that there has been a net increase in the water level. This therefore makes it more challenging to assess the severity of the decline across the High Plains aquifer as a whole due to the variability of the changes</li> <li>The evidence would therefore suggest that the decline in water level has been severe for large areas of the High Plains aquifer. Although some areas have seen an increase, these tend to be no more than a 10-25 foot increase and cover relatively small areas. Whereas the areas showing a decline cover much larger areas in the southern states, many of such areas show more than a 150 foot decline</li> </ul> <p>Credit other valid assessments of severity.</p> <p><b>Marking guidance</b></p> <p>Near the upper end, answers that score well will make specific reference to the resource provided, making an explicit assessment of the severity from place to place.</p> <p>Near the lower end, answers will display limited use of the resource.</p>							

Award the marks as follows:

Band	Marks	
3	4-5	Well-developed assessment of the severity of changes Wide use of the resource as evidence to identify water level decline
2	2-3	Partial assessment of the severity of the changes Partial use of the resource as evidence to identify water level decline
1	1	Limited statements with no use of evidence
	0	Response not creditworthy or not attempted

Credit other valid points.

1. b Suggest how human activities may result in falls in water levels in the High Plains aquifer.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
			5				5
<p><b>Indicative content</b></p> <ul style="list-style-type: none"> <li>• Direct extraction via wells sunk into the aquifer / water store</li> <li>• Water taken from rivers has indirect implications for aquifer water levels</li> <li>• Fall in levels where there is higher population, resulting in water cycle deficit</li> <li>• Water needed for industry, domestic and agricultural extraction</li> <li>• Agricultural extraction</li> <li>• Small scale changes can take place, such as fall over the week and recovery at weekend</li> <li>• Extraction takes place more than natural or artificial recharge (system theory)</li> </ul> <p><b>Marking guidance</b></p> <p>Near the upper end, answers that interpret will suggest a range of human activities that contribute to water level falls in general, or suggestions of how activities may vary from place to place, resulting in uneven falls in water levels for the High Plains aquifer. Some may adopt a systems approach and show an understanding of outputs exceeding inputs, with implications for system equilibrium and water cycle deficits.</p> <p>Answers near the lower end, will have limited suggestions about the operation of aquifers.</p>							

Award the marks as follows:

Band	Marks	
3	4-5	Well-developed suggestions of a range of human activities in a structured way Applies developed knowledge and understanding of water cycle deficits to the resource
2	2-3	Partial and/or unstructured suggestions of human activity Some application of knowledge and understanding of the water cycle to the resource
1	1	Limited suggestion of human activities Fragmented or no knowledge of the water cycle
	0	Response not creditworthy or not attempted

Credit other valid approaches.

2. a (i) Use <i>Figure 2</i> to calculate the decadal mean increase in CO <sub>2</sub> for 2000–2009. Show your workings.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following, up to a maximum of 2 marks					2		2
<b>Indicative content</b> <ul style="list-style-type: none"> <li>Workings: Sum of the 10 years = 19.6. This should be ÷ 10 (1 mark)</li> <li>Answer: Decadal mean is 1.96 or 2.0 if rounded up (1 mark)</li> </ul>							

2. a (ii) Describe the trend of decadal mean values shown in <i>Figure 2</i> .	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
Award 1 mark for any of the following, up to a maximum of 3 marks					3		3
<b>Indicative content</b> <ul style="list-style-type: none"> <li>The decadal mean growth rate shows an increase (1 mark)</li> <li>Increase from 0.85 ppm in 1960-69 to 1.95 in 2000-2009 (1 mark) <i>tolerance of 0.01 ppm for 1960-69</i></li> <li>Anomaly for 1990-1999 (1 mark)</li> <li>Anomaly: as lower than trend (1 mark)</li> <li>Anomaly: or lower by 0.1 ppm than for 1980-89 (1mark)</li> </ul>							

2. b Explain how natural processes give rise to short-term fluctuations in the size of the atmospheric CO <sub>2</sub> store.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	5						5
<b>Indicative content</b> <p>Likely AO1 content includes a range of explanations of different natural processes that are linked with short-term changes. Seconds, seasons, years and decades are acceptable 'short-term' time-scales.</p> <ul style="list-style-type: none"> <li>Seasonal changes in biomass and respiration affects the volume of CO<sub>2</sub> in the atmosphere, especially in the northern hemisphere with its larger land mass and biomes:</li> <li>Daily changes due to daytime photosynthesis when CO<sub>2</sub> is taken in and O<sub>2</sub> is released as plants produce carbohydrates</li> <li>Year to year changes can be linked with fluctuations in ocean temperatures and functioning of ocean as a carbon store (this can be linked with ENSO cycles of periods of 'global dimming')</li> </ul> <p>Credit other valid approaches.</p> <p><b>Marking guidance</b></p> <p>Near the upper end, answers will show knowledge and understanding of a wider range / interpretation of short time-scales and / or more developed understanding of physical and biological processes.</p> <p>Answers near the lower end may have very little knowledge and understanding of the physical processes involve hand merely identify one or two simple reasons why atmospheric CO<sub>2</sub> rises or falls in some years.</p> <p>Credit other valid approaches.</p>							

Award the marks as follows:

Band	Marks	
3	4-5	Clear knowledge and understanding of two or more natural processes Sustained focus on appropriate short-term time-scales
2	2-3	Some knowledge and understanding of one or two natural processes Partial focus on appropriate short-term time-scales
1	1	Limited knowledge and understanding of natural processes Limited or absent focus on appropriate short-term time-scales
	0	Response not creditworthy or not attempted

3. Analyse the effects of forest removal on the operation of physical systems.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10	10					20

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative Content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

Candidates will provide a description and explanation of how forest removal impacts on the operation of water and carbon cycles. This may include:

- The direct effect of a reduction in size of major stores in the carbon and water cycles such as carbon storage as biota and water storage as interception
- Indirect effects on other water store sizes and the size and rate of flows. In the water cycle removal of forests will result in more water reaching the soil store which will then reach capacity more quickly
- Indirect effects on other carbon store sizes and the size and rate of flows. In the carbon cycle removal of forests will result in less dead organic matter reaching the soil store and depleting carbon in the soil

### AO2

Candidates demonstrate application of knowledge and understanding through synthesis. This may include:

- Analysis of different scales and rates of forest removal. Small amounts of forest removal will result in less impact on carbon and water stores. The scale and rate of removal of stores will impact upon indirect effects so small removal of biota will mean less impact on soil stores. Slow removal of forest cover may give time for the soil store to recover and adapt
- Analysis of varying contexts and type of forest removal and the resultant effects. The removal of an open forest such as eucalypt forests will have less impact on water flows than equatorial rainforest removal
- Analysis of the complexity of system interconnections. The removal of forests will decrease a carbon sink which may increase the amount of carbon in the atmosphere which in turn can have an impact on climate change. This can result in changes to the water cycle

Near the upper end, answers that score highly will show application of knowledge and understanding by analysing complex, interlinked effects, synthesising information, and coming to rational conclusions which highlight underlying assumptions of the statement (such as rate, scale and nature of forest removal).

Responses in the middle range will show some application of knowledge and understanding to provide some analysis and synthesis, prior to drawing partially supported conclusions.

Near the lower end, responses provide very limited application of knowledge and understanding of physical systems to provide little analysis.

Credit other valid approaches.

Award the marks as follows:

	<b>AO1 [10 marks]</b>	<b>AO2.1a [10 marks]</b>
	<i>Demonstrates knowledge and understanding of forest removal and physical systems (both the water cycle and the carbon cycle)</i>	<i>Applies AO2.1a to analyse the varied effects and varied contexts for forest removal</i>
<b>Band</b>		
<b>3</b>	<p><b>7-10 marks</b></p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of the water and carbon cycles</p> <p>Demonstrates detailed and accurate knowledge and understanding of the effect of forest removal on the operation of physical systems in terms of the stores and flows of the water and carbon cycles</p> <p>Well-annotated sketches / diagrams may be used and should be credited</p>	<p><b>7-10 marks</b></p> <p>Applies knowledge and understanding to produce a thorough and coherent analysis that is supported by evidence</p> <p>Applies knowledge and understanding to thoroughly and coherently analyse the complex and interlinked effects and contexts of forest removal</p> <p>Balanced analysis of the effect of forest removal on the operation of the stores and flows of the water and carbon cycles in terms of scale, rate, context and the complexity of interactions</p>
<b>2</b>	<p><b>4-6 marks</b></p> <p>Demonstrates accurate knowledge and understanding through examples, which are partially developed</p> <p>Demonstrates accurate knowledge and understanding of the water and carbon cycles</p> <p>Demonstrates accurate knowledge and understanding of the effect of forest removal on the operation of physical systems in terms of the stores and flows of the water and carbon cycles</p> <p>Sketches / diagrams may be used and should be credited</p>	<p><b>4-6 marks</b></p> <p>Applies knowledge and understanding to produce a coherent but partial analysis that is supported by some evidence</p> <p>Applies knowledge and understanding to produce an analysis of the importance of forest removal on the operation of both carbon and water cycles.</p> <p>Partial analysis of the effect of forest removal on the operation of the stores and flows of the water and carbon cycles in terms of either the scale, rate, context or complexity of interactions</p>
<b>1</b>	<p><b>1-3 marks</b></p> <p>Demonstrates limited knowledge and understanding through a limited number of un-developed examples</p> <p>Demonstrates limited knowledge and understanding of the water and carbon cycles</p> <p>Demonstrates limited knowledge and understanding of the effect of forest removal on the operation of physical systems in terms of the stores and flows of the water and carbon cycles</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p><b>1-3 marks</b></p> <p>Applies knowledge and understanding to produce an analysis with limited coherence and support from some evidence</p> <p>Limited application of knowledge and understanding to produce a limited analysis of effects or contexts of forest removal</p> <p>Limited analysis of the effect of forest removal on the operation of the stores and flows of the water and carbon cycles in terms of the scale, rate, context or complexity of interactions</p>
	<p><b>0 marks</b></p> <p>Response not creditworthy or not attempted</p>	<p><b>0 marks</b></p> <p>Response not creditworthy or not attempted</p>

4 To what extent do geological factors influence water and carbon cycle flows in different contexts.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10			10			20

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

Candidates will provide a description and explanation of water and carbon cycle flows that have been influenced by geological factors, exemplification may include local-scale catchment water cycles (and their underlying geology) and the importance of geology for the global cycling of carbon between land and oceans (carbon sequestration). Development of this may include:

- The direct effect of geology on water cycle flows. The permeability and porosity of different geologies impact upon the rate and amount of water flowing through the water cycle. An impermeable rock will inhibit infiltration flows and result in increased overland flow. Where non porous rocks are common there will be increased overland flow as the groundwater store will be quickly filled
- Indirect effects of geology on other water flow factors where there are hard rocks there may be an increase in slope angle which will increase the speed of overland flow. Unconsolidated sandstone may produce porous soils which will increase infiltration. Volcanic rocks produce fertile soils which can increase the density of vegetation cover which will decrease overland flow
- The direct role geology plays in carbon flows from the land e.g. limestone, via the carbonation process, will release more carbon dioxide into the atmosphere than non-calcareous rocks
- Geological processes will accumulate carbon in carbonaceous rocks which decrease the amount of carbon that flows from vegetation to atmosphere and oceans
- Indirect effects on geology on other carbon cycle factors, volcanic rocks contain minerals that stimulate vegetation growth which impacts upon flows of carbon into the atmosphere
- Effects of other factors such as climate where amounts and rates of precipitation will impact on flows within the drainage basin. The effect of temperature on the solution and removal of carbon from limestone. Human factors that increase the amount of carbon flowing into the atmosphere

### AO2

Candidates demonstrate application of knowledge and understanding through evaluation of the influence of geological factors. This may include:

- Discussion of the relative importance of geology as opposed to other factors such as climate or vegetation
- Discussion of different spatial scales of geological influence such as the relative area covered by different geologies within a drainage basin which may influence flows of both water and carbon
- Varying contexts for studying the influence of geological factors (e.g. arid or humid environments) where the impact of geology is modified by climate
- Synthesis of the complexity of system interconnections. The impact of geology may be seen throughout flows associated with the water and carbon cycles. An impermeable geology may not only impact on overland flow but also on discharge. There may also be connections between water and carbon associated with fossil carbon in oil and coal
- Varying timescales of influence, comparing the short-term influence of geology on water flows with long term influence of geology in the carbon cycle

Near the upper end, answers that score highly will show application of knowledge and understanding by analysing complex, interlinked effects, synthesising information, and coming to rational conclusions which highlight underlying assumptions.

Responses in the middle range will show some application of knowledge and understanding to provide some analysis and synthesis, prior to drawing partially supported conclusions.

Near the lower end, responses provide very limited application of knowledge and understanding of physical systems to provide little analysis.

Credit other valid approaches.

Award the marks as follows:

	<b>AO1 [10 marks]</b>	<b>AO2.1c [10 marks]</b>
	<i>Demonstrates knowledge and understanding of the influence of geological factors on the water cycle and the carbon cycle</i>	<i>Applies AO2.1c to appraise / judge through an evaluation of the extent to which geological factors influence water and carbon cycle flows</i>
<b>Band</b>		
<b>3</b>	<p><b>7-10 marks</b></p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of how geological factors have influenced flows within the water cycle and the carbon cycle.</p> <p>Demonstrates detailed and accurate knowledge and understanding of other factors and their influence on water and carbon cycle flows</p> <p>Well-annotated sketches / diagrams may be used and should be credited</p>	<p><b>7-10 marks</b></p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation that is supported by evidence</p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation of the extent to which geological factors influence water and carbon cycle flows</p> <p>Balanced evaluation of the extent to which geological factors influence water and carbon cycle flows in terms of scale, context, timescale and the complexity of interactions</p>
<b>2</b>	<p><b>4-6 marks</b></p> <p>Demonstrates accurate knowledge and understanding through the use of mostly appropriate and mostly accurate examples, which may not be fully developed</p> <p>Demonstrates accurate knowledge and understanding of water cycle and the carbon cycle flows that have been influenced by geological factors</p> <p>Demonstrates accurate knowledge and understanding of other factors and their influence on water and carbon cycle flows</p> <p>Sketches / diagrams may be used and should be credited</p>	<p><b>4-6 marks</b></p> <p>Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some evidence</p> <p>Applies knowledge and understanding to partially evaluate the extent to which geological factors influence water cycle and the carbon cycle flows</p> <p>Partial evaluation of the extent to which geological factors influence water and carbon cycle flows in terms of scale, context, timescale or complexity of interactions</p>



1	<p>1-3 marks</p> <p>Demonstrates limited knowledge and understanding through the use of examples, which are un-developed</p> <p>Demonstrates limited knowledge and understanding of water cycle and / or the carbon cycle flows that have been influenced by geological factors</p> <p>Demonstrates limited knowledge and understanding of other factors and their influence on water cycle and the carbon cycle flows</p> <p>Basic sketches / diagrams may be seen and should be credited</p>	<p>1-3 marks</p> <p>Applies knowledge and understanding to produce an evaluation with limited coherence and support from some evidence</p> <p>Limited application of knowledge and understanding to make a limited evaluation of the extent to which geological factors influence water and carbon cycle flows</p> <p>Limited evaluation of the extent to which geological factors influence water and carbon cycle flows in terms of scale, context, timescale or complexity of interactions</p>
	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>

**Section B: Global Governance: Change and Challenges***Mark all questions in this section.*

<b>5. a Use Figure 3 to compare employment changes for the EU member states shown. Include relevant data in your answer.</b>	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
						5	5
<p><b>Indicative content</b></p> <p>AO3 content includes identifying from Figure 3, employment changes for different states and providing an explicit comparison of how they vary from place to place.</p> <ul style="list-style-type: none"> <li>• Overall growth in low and high skill employment in all countries</li> <li>• Anomaly of negative growth in low skill in Italy, losing as much as the UK has gained</li> <li>• Italy also has maximum in high skill growth, more than twice that of many others</li> <li>• Range of high skill growth from 3-4% to 12-13% (10-11% range) (1 mark) - quantification</li> <li>• Range of low skill growth from -4% to +4% (8-9% range) (1 mark) - quantification</li> <li>• UK, Spain and Germany show similar pattern (1 mark)</li> </ul> <p>Credit other valid points.</p> <p><b>Marking guidance</b></p> <p>Near the upper end, answers that score well will make specific reference to the resource provided, making an explicit comparison of how employment changes vary from place to place.</p> <p>Near the lower end, answers will display limited use of the resource with limited or no comparison.</p>							

Award the marks as follows:

Band	Marks	
3	4-5	Well-developed comparison of the different states shown Wide use of the resource as evidence to identify employment changes
2	2-3	Partial comparison of some of the states shown Partial use of the resource as evidence to identify employment changes
1	1	Limited statements with no use of evidence
	0	Response not creditworthy or not attempted

5. b Analyse how the employment changes shown in Figure 3 could have affected international migration.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
		5					5
<p><b>Indicative content</b></p> <p>Likely AO2 content includes a range of possible effects of employment changes on immigration, emigration, migration within the EU and migration from outside of the EU.</p> <ul style="list-style-type: none"> <li>• High skill employment growth may result in an increase in skilled applicants from outside EU, especially where a points system applies (e.g. Indian computer workers seeking UK visas), plus selective 'brain drain' from EU periphery to core countries (e.g. Polish dentists moving to UK)</li> <li>• Low skill employment growth in core EU nations is a magnet for low skilled workers from EU periphery (1 million A8 migrants have travelled to UK since 2004)</li> <li>• Decline in low skill employment in Italy may have triggered out-migration / return migration of lower-skilled.</li> <li>• Analysis of net migration figures may show them to be more complex. High skilled workers may out-migrate from UK to seek better position in Germany, for instance</li> <li>• Other factors may weigh against migration, such as restrictions on movement or the political reaction against migration in some countries (migrants may choose not to move despite opportunities)</li> </ul> <p>Credit other valid approaches.</p> <p><b>Marking guidance</b></p> <p>Near the upper end, answers may provide a structured analysis that encompasses different categories of migration (emigration, immigration etc) and which is well linked to sectoral change in different places.</p> <p>Answers near the lower end may have very little knowledge and understanding of the components of international migration and merely addresses uneven pull factors.</p>							

Award the marks as follows:

Band	Marks	
3	4-5	Well-developed analysis of a range of possible effects of employment changes in a structured way and applies a range of knowledge about international migration
2	2-3	Partial and / or unstructured analysis of the possible effects of employment changes and some narrow application of knowledge about international migration
1	1	Little analysis of any possible effects and limited / fragmented applied knowledge about international migration
	0	Response not creditworthy or not attempted

6. a Use <i>Figure 4</i> to contrast the connectivity of Japan, North Korea and South Korea.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
						5	5
<b>Indicative content</b>  Likely AO3 content includes identifying variability in the connectivity of the three countries and providing an explicit contrast of connectivity from place to place and perhaps at varying scales. <ul style="list-style-type: none"> <li>• High connectivity of Japan, South Korea in contrast to North Korea</li> <li>• Three major hubs for Japan compared to two for South Korea providing a contrast in the extent to which connectivity is spread between different regions within each country</li> <li>• High connectivity within the region between Japan-S.Korea-China whilst North Korea is totally isolated within the region, providing a stark contrast</li> <li>• Only Japan connected to Russia</li> </ul> Credit other valid descriptions of connectivity.							
<b>Marking guidance</b>  Near the upper end, answers that score well will make specific reference to the resource provided, making an explicit contrast of connectivity from place to place (all three countries identified) and perhaps at varying scales.  Near the lower end, answers will display limited use of the resource with limited or no contrasting statements.							

Award the marks as follows:

Band	Marks	
3	4-5	Well-developed contrast drawn between the connectivity of different places Wide use of the resource as evidence to identify connectivity levels
2	2-3	Partial contrast between the connectivity of different places Partial use of the resource as evidence to identify connectivity levels
1	1	Limited statements with no use of evidence
	0	Response not creditworthy or not attempted

6. b Outline how human and physical factors influence the global distribution of seafloor cables.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	5						5
<b>Indicative content</b>  Likely AO1 content links the global distribution pattern with a range of physical threats / obstacles for cable operation (undersea mass movement, ocean trenches) and variability in markets for broadband. <ul style="list-style-type: none"> <li>• Tsunami and undersea landslides risk</li> <li>• Subduction zones (no cables north of Japan)</li> <li>• Cables may not be present in extremely deep water</li> <li>• Concentration of cabling through narrow straits / canals e.g. Suez</li> <li>• High density connections between developed economies e.g. USA-EU cross-Atlantic</li> <li>• Low connectivity between African continent and rest of world, reflecting poverty</li> <li>• Growing connectivity linking emerging economies (BRIC, MINT nations) with developed world</li> </ul> Credit other valid approaches.							

**Marking guidance**

Near the upper end, answers may show knowledge and understanding of a balanced range of physical and contemporary human factors.

Answers near the lower end may have very little knowledge and understanding of either the physical factors or the human factors.

Award the marks as follows:

Band	Marks	
3	4-5	Clear and specific outlining of the global distribution of seafloor cables Detailed knowledge and understanding of a balance of human and physical factors
2	2-3	Some outlining of the global distribution of seafloor cables Partial knowledge and understanding of human and / or physical factors
1	1	Limited or no outlining of the global distribution of seafloor cables Very little knowledge and understanding of human or physical factors
	0	Response not creditworthy or not attempted

<b>7</b>	<b>'National governments have lost control of who and what is crossing their borders.' Discuss.</b>	<b>AO1</b>	<b>AO2.1a</b>	<b>AO2.1b</b>	<b>AO2.1c</b>	<b>AO3.1</b>	<b>AO3.2</b>	<b>Total</b>
		10			10			<b>20</b>

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative Content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

AO1 content encompasses knowledge and understanding of major global migration flows, information and commodity flows across oceans, and ways of controlling/managing global flows across national borders in the era of globalisation. Development of this may include:

- Economic migration and/or refugee flows. These can be described at different scales from migration into neighbouring states or migration across and between continents
- Migration at different scales. This can refer to the magnitude of movement to identify small scale and mass migration or it can refer to the temporal scale of migration from temporary to permanent migrations across international borders
- Exploitation of oceans such as fishing within exclusion zones
- Flows of money across borders such as the electronic transfer of remittances between countries
- Transfer of information via technology
- Transfer of polluting substances in oceans such as oil, nitrates and plastics
- National migration policies and examples of attempts to manage/regulate ocean flows.
- Attempts to decrease exploitation in a nations waters such as marine conservation zones and quotas
- Inclusion of supporting data to quantify migration, information exchanges, smuggling, etc

### AO2

Candidates demonstrate application of knowledge and understanding through evaluation of the extent to which national governments can control their borders. Responses may include:

- Discussion of the relative ability of different states to control flows of people and material. This may be related to economic and technological abilities as well as political powers
- The extent to which political and trade blocs inhibit the power of the state
- The extent to which states may be able to control the flow of pollution due to physical processes such as ocean currents
- Contrasting the relative ability to control materials and people. Arguing that it may be easier to control materials than illegal migration
- Evaluating the power and influence of criminal groups that ignore the laws of different states

Near the upper end, answers that score highly at will show application of knowledge and understanding by discussing complex, interlinked effects, synthesising information, and coming to rational conclusions (dependent on the types of border/flow and different national contexts that are included).

Responses in the middle range will show some application of knowledge and understanding to provide some discussion and synthesis, prior to drawing partially supported conclusions.

Near the lower end, responses provide very limited application of knowledge and understanding of borders/flows to provide little discussion.

Credit other valid approaches.

Award the marks as follows:

	<b>AO1 [10 marks]</b>	<b>AO2.1c [10 marks]</b>
	<i>Demonstrates knowledge and understanding of national borders (in relation to international migration and global ocean movements)</i>	<i>Applies AO2.1c to appraise / judge through a discussion of the ability of national governments to exercise controls</i>
<b>Band</b>		
<b>3</b>	<p><b>7-10 marks</b></p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate, accurate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of national borders and global movements in relation to both major global migration flows, information and commodity flows across oceans</p> <p>Demonstrates detailed and accurate knowledge and understanding of other factors and their influence on international migration, information and commodity flows</p> <p>Well-annotated sketches / diagrams / maps may be used and should be credited</p>	<p><b>7-10 marks</b></p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation that is supported by evidence</p> <p>Applies knowledge and understanding to thoroughly and coherently discuss the complex, interlinked effects that impact on the ability of governments to be in control of their borders</p> <p>Balanced discussion of the ability of national governments to exercise controls in terms of technological abilities, political power, the influence of supranational bodies, physical processes and the types and nature of flows, recognising the complexity, interlinkages and contexts of other controls on international migration, information and commodity flows</p>
<b>2</b>	<p><b>4-6 marks</b></p> <p>Demonstrates accurate knowledge and understanding through the use of mostly appropriate and mostly accurate examples, which may not be fully developed</p> <p>Demonstrates accurate knowledge and understanding of national borders and global movements in relation to major global migration flows, information and commodity flows across oceans</p> <p>Demonstrates accurate knowledge and understanding of other factors and their influence on international migration, information and commodity flows</p> <p>Sketches / diagrams may be used and should be credited</p>	<p><b>4-6 marks</b></p> <p>Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some evidence</p> <p>Applies knowledge and understanding to create a partial discussion of the effects that impact on the ability of governments to be in control of their borders</p> <p>Partial discussion of the ability of national governments to exercise controls in terms of technological abilities, political power, the influence of supranational bodies, physical processes and the types and nature of flows, recognising the complexity, interlinkages or contexts of other controls on international migration, information and commodity flows</p>

1	<p style="text-align: center;">1-3 marks</p> <p>Demonstrates knowledge and understanding through the limited use of examples</p> <p>Demonstrates limited knowledge and understanding of national borders and global movements in relation to either major global migration flows, or information and commodity flows across oceans</p> <p>Demonstrates limited knowledge and understanding of other factors and their influence on international migration, information and commodity flows</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p style="text-align: center;">1-3 marks</p> <p>Applies knowledge and understanding to produce an evaluation with limited coherence and support from some evidence</p> <p>Limited application of knowledge and understanding to create a limited discussion of the ability of governments to be in control of their borders</p> <p>Limited discussion of the ability of national governments to exercise controls in terms of technological abilities, political power, the influence of supranational bodies, physical processes and the types and nature of flows</p> <p>Limited recognition of the complexity, interlinkages or contexts of other controls on international migration, information and commodity flows</p>
	<p style="text-align: center;">0 marks</p> <p>Response not creditworthy or not attempted</p>	<p style="text-align: center;">0 marks</p> <p>Response not creditworthy or not attempted</p>



8 Assess the relative importance of strategies used by powerful countries to maintain global influence.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	10			10			20

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative Content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

AO1 content includes knowledge and understanding of economic strategies to create global hubs that drive global systems and attract skilled migrants, alongside political and military strategies that give disproportionate influence over supranational institutions, maritime commerce, oceanic resources and global information flows.

Development of this may include:

- Strategies used by powerful countries to establish global economic hubs such as EPZs and the development of supranational bodies and consequent economic migration flows that support their growth (e.g. Doha)
- Strategies used by powerful countries to attract skilled labour and maintain their global influence – immigration on the basis of skills in Australia, visas in USA
- How geopolitical strategies increase the influence of some countries such as land grabs and contesting ownership of ocean resources e.g. Arctic Ocean
- How countries use colonies and former colonies to enhance economic power eg diaspora communities
- How international laws and organisations may not work to the benefit of all states

### AO2

Candidates demonstrate application of knowledge and understanding through evaluation of the importance of strategies used by powerful countries to maintain global influence. Responses may include:

- Assessment of the relative importance of different strategies to the maintenance of geopolitical and economic power
- Assessment of how the importance of different strategies change over time, their changing, or in varying contexts such as changing political circumstance
- The relative importance of strategies used by countries with different economic and political power – China and Canada in the Arctic Ocean
- The relative attractiveness of powerful countries for highly skilled and well educated labour for example, the relative success of Germany in attracting labour to a knowledge economy

Near the upper end, answers that score highly will show application of knowledge and understanding by assessing and synthesising information and coming to rational conclusions (dependent on the types of strategy and different contexts that are assessed).

Responses in the middle range will show some application of knowledge and understanding to provide some assessment and synthesis, prior to drawing partially supported conclusions.

Near the lower end, responses provide very limited application of knowledge and understanding of any strategies to provide little assessment.

Credit other valid approaches.

Award the marks as follows:

	<b>AO1 [10 marks]</b>	<b>AO2.1c [10 marks]</b>
	<i>Demonstrates knowledge and understanding of strategies (in relation to international migration and global ocean movements)</i>	<i>Applies AO2.1c to appraise / judge through an assessment of the relative importance of ways of maintaining global influence</i>
<b>Band</b>		
<b>3</b>	<p>7-10 marks</p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples</p> <p>Demonstrates detailed and accurate knowledge and understanding of strategies used by powerful countries</p> <p>Demonstrates detailed and accurate knowledge and understanding of strategies used to satisfy geopolitical, economic and social aims</p> <p>Well-annotated sketches / diagrams / maps may be used and should be credited</p>	<p>7-10 marks</p> <p>Applies knowledge and understanding to produce a thorough and coherent evaluation that is supported by evidence</p> <p>Applies knowledge and understanding to reach a thorough and coherent assessment of the relative importance of ways of maintaining global influence</p> <p>Balanced assessment of the relative importance of strategies in terms of strategy aims/objectives, varying contexts, changes over time and type and degree of power</p>
<b>2</b>	<p>4-6 marks</p> <p>Demonstrates accurate knowledge and understanding through the use of mostly appropriate and mostly accurate examples, which may not be fully developed</p> <p>Demonstrates accurate knowledge and understanding of strategies used by powerful countries</p> <p>Demonstrates accurate knowledge and understanding of strategies used to satisfy geopolitical, economic and social aims</p> <p>Sketches / diagrams may be used and should be credited</p>	<p>4-6 marks</p> <p>Applies knowledge and understanding to produce a coherent but partial evaluation that is supported by some evidence</p> <p>Applies knowledge and understanding to produce a partial or unbalanced assessment of the relative importance of ways of maintaining global influence</p> <p>Partial assessment of the relative importance of strategies in terms of strategy aims/objectives, varying contexts, changes over time or type and degree of power</p>
<b>1</b>	<p>1-3 marks</p> <p>Demonstrates limited knowledge and understanding through a limited number of undeveloped examples</p> <p>Demonstrates limited knowledge and understanding of strategies used by powerful countries</p> <p>Demonstrates limited knowledge and understanding of strategies used to satisfy geopolitical, economic and social aims</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p>1-3 marks</p> <p>Applies knowledge and understanding to produce an evaluation with limited coherence and support from some evidence</p> <p>Limited assessment of relative importance of ways of maintaining global influence</p> <p>Limited assessment of the relative importance of strategies in terms of strategy aims/objectives, varying contexts, changes over time or type and degree of power</p>
	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>

**Section C: Challenges of the 21<sup>st</sup> Century**

9 Assess the severity of the different risks that cities increasingly face.	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	8			12		10	30

Within the answer to question 9, candidates should use the maps in Figures 5, 6, 7 and 8 and apply their knowledge and understanding from across the whole specification in order to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative Content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

AO1 content includes knowledge and understanding of the risks that are faced by cities. With reference to the resources this may include:

- The risks produced by earthquake activity which may refer to demographic, economic and social risks in addition to risks faced by damage to the built environment
- Risks produced by tsunamis which may refer to demographic, economic and social risks in addition to risks faced by damage to the built environment
- Risks produced by climate change in the form of sea level rise which may refer to flood damage, health issues, erosion and saltwater intrusions
- The risks produced by terrorism which may refer to death and injury through attacks, psychological impacts on urban populations, costs of protection
- The risks associated with deindustrialisation such as employment, social exclusion and dereliction
- Risks associated with changing central areas such as vacancy rates, dereliction and homogeneity of urban landscapes
- The risks associated with migration such as ghettoisation and the development of squatter settlements

**AO2**

Candidates demonstrate application of knowledge and understanding through evaluation of the identified risks faced by cities. Responses may include:

- Evaluation of the different categories of risk that may compare large scale physical risk to smaller scale economic risks to the central areas.
- Assessment of the risk in relation to the city's location relative to the source of tectonic hazards
- Comparing and contrasting the risks faced by coastal and inland cities
- Assessment of the risk in relation to terrorist targets that may pick out cities in colonising countries or oppressing countries at higher risk
- Assessment of the risks faced by one or more identified cities or risks faced by cities in specific areas of the world e.g. risks in HICs as opposed to LICs
- Assessment of the risks in relation to the speed of onset with tectonic risks occurring with rapid onset whilst changes to the CBD may develop over decades
- Assessment of the risks in relation to the city's ability to manage the risk, either a financial assessment or ability of the risk to be managed (the terrorist risk is so dangerous as it difficult to stop)

**AO3**

This may include:

- Assessment of information shown in Figures 5, 6, 7 and 8 in order to map varying physical risks and their geographies
- Assessment of existence of multiple risk 'hot spots' and varying magnitudes of risk in Figures 5, 6, 7 and 8
- Exemplification of significant and/or anomalous risks/cities shown in Figures 5, 6, 7 and 8
- Construction of arguments using resource information, and content from other areas of the specification and draw conclusions about the severity of different risks

'Assess' requires candidates progress beyond explaining risks. At the upper end, answers that score highly will show application of knowledge and understanding by assessing uncertain, interlinked risks, synthesising information, and coming to rational conclusions which highlight underlying assumptions of the statement drawn from across the specification.

Responses in the middle range will show some application of knowledge and understanding to provide some assessment and synthesis from across the specification, prior to drawing partially supported conclusions.

Lower end responses provide very limited application of knowledge and understanding of urban risks to provide little assessment.

Credit any other valid approaches. Candidates should be credited for the use of examples drawn from across the specification.

Award the marks as follows:

	<b>AO1 [8 marks]</b>	<b>AO2.1c [12 marks]</b>	<b>AO3 [10 marks]</b>
	<i>Knowledge and understanding of risks to cities in Figures 5-8, and any additional risks</i>	<i>Apply AO2.1c to assess the severity of different risks that cities increasingly face</i>	<i>Apply AO3 to analyse the distribution of risks to cities shown in Figures 5-8</i>
<b>Band</b>			
<b>3</b>	<p><b>7-8 marks</b></p> <p>Demonstrates detailed and accurate knowledge and understanding of the severity of risks increasingly faced by cities for factors that are shown in the resources</p> <p>Demonstrates detailed and accurate knowledge and understanding of the severity of risks increasingly faced by cities for factors that originate from across the specification</p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples from across the specification</p> <p>Well-annotated sketches / diagrams may be used and should be credited</p>	<p><b>9-12 marks</b></p> <p>Applies knowledge and understanding to thoroughly assess the severity of risks faced by cities to factors that are shown in the resources</p> <p>Applies knowledge and understanding to thoroughly assess the severity of risks faced by cities to factors that originate across the specification</p> <p>Well-developed synthesis of geographical ideas, concepts and issues from the resources provided and from across the course and in different contexts, in order to make well-judged connections</p> <p>Well-developed assessment of scale, time, preparation and location on the severity of risks that are faced by cities recognising the contexts influencing the severity of the different risks that cities increasingly face</p> <p>Developed discussion of the extent to which interconnections have influenced the severity of risks faced by cities</p>	<p><b>8-10 marks</b></p> <p>Demonstrates well-developed analysis of the risks shown in Figures 5-8</p> <p>Demonstrates detailed use of data throughout the response</p> <p>Well-constructed, coherent and logical arguments assessing the severity of risks to cities</p> <p>Well-developed conclusions concerning the severity of risks to cities</p>

2	<p>4-6 marks</p> <p>Demonstrates accurate knowledge and understanding of the severity of risks increasingly faced by cities for factors that are shown in the resources</p> <p>Demonstrates accurate knowledge and understanding of the severity of risks increasingly faced by cities for factors that originate from across the specification</p> <p>Demonstrates accurate knowledge and understanding through the use of appropriate examples from across the specification</p> <p>Sketches / diagrams may be used and should be credited</p>	<p>5-8 marks</p> <p>Applies knowledge and understanding to partially assess the severity of risks faced by cities to factors that are shown in the resources</p> <p>Applies knowledge and understanding to partially assess the severity of risks faced by cities to factors that originate across the specification</p> <p>Partial synthesis of geographical ideas, concepts and issues from the resources provided and from across the course and in different contexts, in order to make partial connections</p> <p>Partial assessment of scale, time, preparation and location on the severity of risks that are faced by cities recognising the contexts influencing the severity of the different risks that cities increasingly face</p> <p>Partial discussion of the extent to which interconnections have influenced the severity of risks faced by cities</p>	<p>4-7 marks</p> <p>Demonstrates partial analysis of the information shown in Figures 5-8</p> <p>Demonstrates partial use of data throughout the response</p> <p>Partial arguments assessing the severity of risks to cities</p> <p>Partial conclusions concerning the severity of risks to cities</p>
1	<p>1-3 marks</p> <p>Demonstrates limited knowledge and understanding of the severity of risks increasingly faced by cities for factors that are shown in the resources</p> <p>Demonstrates limited knowledge and understanding of the severity of risks increasingly faced by cities for factors that originate from across the specification</p> <p>Demonstrates limited knowledge and understanding through the use of examples from across the specification</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p>1-4 mark</p> <p>Applies knowledge and understanding to assess the severity of risks faced by cities to factors that are shown in the resources in a limited manner</p> <p>Applies knowledge and understanding to assess the severity of risks faced by cities to factors that originate across the specification in a limited manner</p> <p>Limited synthesis of geographical ideas, concepts and issues from the resources provided and from across the course and in different contexts, making limited connections</p> <p>Limited assessment of scale, time, preparation and location on the severity of risks that are faced by cities recognising the contexts influencing the severity of the different risks that cities increasingly face</p> <p>Limited discussion of the extent to which interconnections have influenced the severity of risks faced by cities</p>	<p>1-3 marks</p> <p>Demonstrates limited analysis of the information shown in Figures 5-8</p> <p>Demonstrates limited use of data throughout the response</p> <p>Limited arguments assessing the severity of risks to cities</p> <p>Limited conclusions concerning the severity of risks to cities.</p>
	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>		

10 To what extent could the management of different risks lead to changes in the characteristics of urban places?	AO1	AO2.1a	AO2.1b	AO2.1c	AO3.1	AO3.2	Total
	8			12		10	30

Within the answer to question 10, candidates should use the maps in Figures 5, 6, 7 and 8 and apply their knowledge and understanding from across the whole specification in order to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative Content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

AO1 content includes knowledge and understanding of the management of different risks and their impact on the characteristics of cities. With reference to the resources this may include:

- Hard engineering strategies to overcome tectonic hazards and sea level change. Major works such as the building of sea walls changes the physical characteristics of cities by adding large structures to the urban landscape. The retrofitting of buildings may alter their characteristics. The stabilising of slopes may have a visual impact
- Soft engineering strategies to overcome tectonic hazards and sea level change. Their management may involve such things as land use planning which can alter the characteristics of cities by rearranging the distribution of urban functions
- The management of terrorism may impact on the physical characteristics of cities as certain key buildings and areas may have their defences strengthened such as Downing Street. Management of terrorism may also alter the characteristics of transport by blocking off certain areas for movement or alter the speed of movement by security checks
- The management of the risks that result from de-industrialisation may change the characteristics of cities with major changes to land use that take place in regeneration projects such as changing functions of buildings and alteration of transport system. Management of de-industrialisation may involve changes to the type of industry to tertiary and quaternary and reduce pollution which will change the characteristics of the urban landscape
- The management of the risks that may result from migration to urban areas may change the characteristics of cities with the removal of squatter settlements, the renovation of squatter settlements and the building of alternative accommodation areas
- The management of the risks that may result from changes to central areas of cities may change the characteristics of cities with the development of new retail malls, pedestrianisation, improved transport such as bus lanes

### AO2

Candidates demonstrate application of knowledge and understanding through evaluation of whether management of risks changes the characteristics of cities. Responses may include:

- Discussion of the level of change to characteristics that are involved with different management schemes where hard engineering schemes provide large changes whilst others provide little physical change e.g. retrofitting alters individual buildings
- Level of change shown may vary in different cities depending on the function of location or economic development
- Level of change may vary depending on the risks that have been identified. For example, the management of tectonic hazards by land use planning may involve more physical change to the urban character whereas the management of terrorism may involve greater social change to urban character
- Discussion of management of change may relate to cities that have constraints via historical value, planning constraints or political influence

AO3 content (analysis of data) includes:

- Analysis of Figures 5, 6, 7 and 8 in order to map physical risks for urban places
- Identification of more and less manageable risks based on type and magnitude risks
- Analysis of existence of multiple risk 'hot spots' in Figures 5, 6, 7 and 8
- Evaluation of the extent to which different categories of risks may lead to changing places
- Evaluation of the extent to which different management choices could result in changing places
- Evaluation of which urban characteristics are changed to the greatest extent
- Construct arguments using resource information, and content from other areas of the specification, and draw conclusions about the severity of different risks

'To what extent' requires that candidates progress beyond explaining changes. At the upper end, answers that score highly will show application of knowledge and understanding by evaluating changes, synthesising information, and coming to rational conclusions which highlight underlying assumptions of the statement (such as the level of risk or the type and scale of place) drawn from across the specification.

Responses in the middle range will show some application of knowledge and understanding to provide some evaluation and synthesis from across the specification, prior to drawing partially supported conclusions.

Lower end responses provide very limited application of knowledge and understanding of risks for urban places to provide little evaluation.

Credit other valid approaches. Candidates should be credited for the use of examples drawn from across the specification.

	<b>AO1 [8 marks]</b>	<b>AO2.1c [12 marks]</b>	<b>AO3 [10 marks]</b>
	<i>Knowledge and understanding of how to manage different risks for places</i>	<i>Apply AO2.1c to evaluate the extent of changes in the characteristics of places</i>	<i>Apply AO3 to analyse the range of risks (type and scale) for cities in Figures 5, 6, 7 and 8</i>
<b>Band</b>			
<b>3</b>	<p><b>7-8 marks</b></p> <p>Demonstrates detailed and accurate knowledge and understanding of the management strategies used for risks shown in the resources and the resultant changes to the characteristics of urban places</p> <p>Demonstrates detailed and accurate knowledge and understanding of the management strategies used for risks that originate from across the specification and the resultant changes to the characteristics of urban places</p> <p>Demonstrates detailed and accurate knowledge and understanding through the use of appropriate and well-developed examples from across the specification</p> <p>Well-annotated sketches / diagrams may be used and should be credited</p>	<p><b>9-12 marks</b></p> <p>Applies knowledge and understanding to thoroughly discuss the extent to which management strategies used for risks shown in the resources lead to changes in the characteristics of urban places</p> <p>Applies knowledge and understanding to thoroughly discuss the extent to which management strategies used for risks that originate from across the specification lead to changes in the characteristics of urban places</p> <p>Well-developed assessment of scale, time and location on the extent to which management strategies used for risks lead to changes in the characteristics of urban places</p> <p>Well-developed synthesis of geographical ideas, concepts and issues from the resources provided and from across the course and in different contexts, in order to make well-judged connections</p> <p>Well-developed evaluation of the extent of changes in the characteristics of urban places in terms of category of management, category of risk and urban characteristics recognising the contexts that influence the management of different risks</p>	<p><b>8-10 marks</b></p> <p>Demonstrates well-developed analysis of the information shown in Figures 5-8</p> <p>Demonstrates detailed use of data throughout the response</p> <p>Well-constructed, coherent and logical arguments assessing the extent to which management strategies lead to changes in the characteristics of cities</p> <p>Well-developed conclusions concerning the extent to which management strategies lead to changes in the characteristics of cities</p>



2	4-6 marks	5-8 marks	4-7 marks
	<p>Demonstrates accurate knowledge and understanding of the management strategies used for risks shown in the resources and the resultant changes to the characteristics of urban places</p> <p>Demonstrates accurate knowledge and understanding of the management strategies used for risks that originate from across the specification and the resultant changes to the characteristics of urban places</p> <p>Demonstrates accurate knowledge and understanding through the use of appropriate examples from across the specification</p> <p>Sketches / diagrams may be used and should be credited</p>	<p>Applies knowledge and understanding to partially discuss the extent to which management strategies used for risks shown in the resources lead to changes in the characteristics of urban places</p> <p>Applies knowledge and understanding to partially discuss the extent to which management strategies used for risks that originate from across the specification lead to changes in the characteristics of urban places</p> <p>Partial assessment of scale, time and location on the extent to which management strategies used for risks lead to changes in the characteristics of urban places</p> <p>Partial synthesis of geographical ideas, concepts and issues from the resources provided and from across the course and in different contexts, in order to make partial connections</p> <p>Partial evaluation of the extent of changes in the characteristics of urban places in terms of category of management, category of risk and urban characteristics recognising the contexts that influence the management of different risks</p>	<p>Demonstrates partial analysis of the information in Figures 5-8</p> <p>Demonstrates partial use of data throughout the response</p> <p>Partial arguments assessing the extent to which management strategies lead to changes in the characteristics of cities</p> <p>Partial conclusions concerning the extent to which management strategies lead to changes in the characteristics of cities</p>

1	<p>1-3 marks</p> <p>Demonstrates limited knowledge and understanding of the management strategies used for risks shown in the resource and the resultant changes to the characteristics of urban places.</p> <p>Demonstrates limited knowledge and understanding of the management strategies used for risks that originate from across the specification and the resultant changes to the characteristics of urban places.</p> <p>Demonstrates limited knowledge and understanding through the use of examples from across the specification</p> <p>Basic sketches / diagrams may be used and should be credited</p>	<p>1-4 mark</p> <p>Applies knowledge and understanding to discuss the extent to which management strategies used for risks shown in the resources lead to changes in the characteristics of urban places in a limited manner</p> <p>Applies knowledge and understanding to discuss the extent to which management strategies used for risks that originate from across the specification lead to changes in the characteristics of urban places in a limited manner</p> <p>Limited assessment of scale, time and location on the extent to which management strategies used for risks lead to changes in the characteristics of urban places</p> <p>Limited synthesis of geographical ideas, concepts and issues from the resources provided and from across the course and in different contexts, making limited connections</p> <p>Limited evaluation of the extent of changes in the characteristics of urban places in terms of category of management, category of risk and urban characteristics</p> <p>Limited recognition of the contexts that influence the management of different risks</p>	<p>1-3 marks</p> <p>Demonstrates limited analysis of the information shown in Figures 5-8</p> <p>Demonstrates limited use of data throughout the response</p> <p>Limited arguments assessing the extent to which management strategies lead to changes in the characteristics of cities</p> <p>Limited conclusions concerning the extent to which management strategies lead to changes in the characteristics of cities</p>
	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>		



**A LEVEL GEOGRAPHY**  
**COMPONENT 3**  
**CONTEMPORARY THEMES IN**  
**GEOGRAPHY**  
**SAMPLE ASSESSMENT MATERIALS**  
**2 hours 15 minutes**



**ADDITIONAL MATERIALS**

In addition to this examination paper, you will need **one** 12 page answer book.

**INSTRUCTIONS TO CANDIDATES**

Answer **one** question in Section A.

Answer **two** questions in Section B, **one** from each of your **two** selected themes.

Use black ink or black ball-point pen.

Write your answers in the separate answer book provided.

Write your name, centre number and candidate number in the spaces at the top of the answer book.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets [ ] at the end of each question.

**This paper requires that you make the fullest possible use of appropriate examples and specialised concepts to support your answers. Sketch maps and diagrams should be included where relevant.**

### Component 3: Contemporary Themes in Geography

*Make the fullest possible use of examples in support of your answers.*

#### Section A

*Answer **one** question.*

##### Theme 1: Tectonic Hazards

1. 'Volcanic activity results in only local hazards'. Discuss. [38]

**OR**

2. 'The economic impacts of earthquake activity are always greater than the social impacts'. Discuss. [38]

#### Section B

*Answer **two** questions, **one** only from each of your two selected themes.*

##### Theme 2: Ecosystems

3. Assess the significance of climate in influencing the nutrient cycle. Use **two** biomes to support your answer. [45]

**OR**

4. To what extent is the conservation of biodiversity achievable? [45]

##### Theme 3: Economic Growth and Challenge: India or China or Development in an African Context

###### India

5. 'India's natural resource base provides more opportunities than constraints for economic development'. Discuss. [45]

**OR**

6. Assess the importance of India's political and economic influence in the wider world. [45]

###### China

7. 'China's natural resource base provides more opportunities than constraints for economic development'. Discuss. [45]

**OR**

8. Assess the importance of China's political and economic influence in the wider world. [45]

**Development in an African Context**

9. 'Political factors hinder rather than promote development'. With reference to two or more Sub-Saharan African countries to what extent do you agree? [45]

**OR**

10. Evaluate the success of strategies used to promote development in selected Sub-Saharan African countries. [45]

**Theme 4: Energy Challenges and Dilemmas**

11. 'The environmental problems associated with fossil fuels are greater than political ones'. To what extent do you agree? [45]

**OR**

12. Discuss the view that a country's energy mix is mainly determined by its level of development. [45]

**Theme 5: Weather and Climate**

13. To what extent can the destructive effects of low-pressure systems be minimised? [45]

**OR**

14. To what extent do large cities affect local climates? [45]



## Component 3: Contemporary Themes in Geography

### Mark Scheme

#### Guidance for Examiners

##### Positive marking

Learners are writing under examination conditions and credit should be given for what the learner writes, as opposed to adopting an approach of penalising him / her for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Marks should not be deducted for a less than perfect answer if it satisfies the criteria of the mark scheme.

The mark scheme for this component uses banded mark schemes.

##### Banded mark schemes

The mark scheme is in two parts to reflect the sections (A and B in the examination paper). Section A is 38 marks and Section B is 45 marks.

The first part of the mark scheme in each section is an assessment grid advising on bands and the associated marks that should be given in responses that demonstrate the qualities needed in the three AOs; AO1, AO2 and AO3 relevant to this component. The targeted AO(s) are also indicated, for example AO2.1c.

The second part of the mark scheme is advice on the indicative content that suggests the range of likely themes and specialised concepts, processes, scales and environments that may be included in the learner's answers.

Banded mark schemes are divided so that each band has a relevant descriptor. The descriptor for the band provides a description of the performance level for that band. Each band contains marks. Examiners should first read and annotate a learner's answer to pick out the evidence that is being assessed in that question. Once the annotation is complete, the mark scheme can be applied. This is a two stage process.

##### **Banded mark schemes Stage 1 – Deciding on the band**

Beginning at the lowest band, examiners should look at the learner's answer and check whether it matches the descriptor for that band. Examiners should look at the descriptor for that band and see if it matches the qualities shown in the learner's answer. If the descriptor at the lowest band is satisfied, examiners should move up to the next band and repeat this process for each band until the descriptor matches the answer.

If an answer covers different aspects of different bands within the mark scheme, a 'best fit' approach should be adopted to decide on the band and then the learner's response should be used to decide on the mark within the band. For instance if a response is mainly in band 2 but with a limited amount of band 3 content, the answer would be placed in band 2, but the mark awarded would be close to the top of band 2 as a result of the band 3 content.

Examiners should not seek to mark candidates down as a result of small omissions in minor areas of an answer.

### **Banded mark schemes Stage 2 – Deciding on the mark**

Once the band has been decided, examiners can then assign a mark. During standardising (marking conference), detailed advice from the Principal Examiner on the qualities of each mark band will be given. Examiners will then receive examples of answers in each mark band that have been awarded a mark by the Principal Examiner. Examiners should mark the examples and compare their marks with those of the Principal Examiner.

When marking, examiners can use these examples to decide whether a learner's response is of a superior, inferior or comparable standard to the example. Examiners are reminded of the need to revisit the answer as they apply the mark scheme in order to confirm that the band and the mark allocated is appropriate to the response provided.

Indicative content is not exhaustive, and any other valid points must be credited. In order to reach the highest bands of the mark scheme a learner need not cover all of the points mentioned in the indicative content but must meet the requirements of the highest mark band. Where a response is not creditworthy, that is contains nothing of any significance to the mark scheme, or where no response has been provided, no marks should be awarded.

Where the specialised concepts are integral to knowledge and understanding, they are underlined in the indicative content.

The mark scheme reflects the layout of the examination paper. Mark the chosen question in Section A and the two chosen questions from Section B. If the candidate has responded to both questions in Section A or more than two in Section B mark all the answers. Award the higher marks attained for the correct number of required questions; further, possible rubric infringement will be discussed at the marking conference.

Be prepared to reward answers that give **valid and creditworthy** responses, especially if these do not fully reflect the 'indicative content' of the mark scheme.



**Section A: Tectonic Hazards - Generic Mark Bands (38 marks)**

	<b>AO1 [14 marks]</b>	<b>AO2 [20 marks]</b>	<b>AO3 [4 marks]</b>
<b>Band</b>	<i>Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change at a variety of scales</i>	<i>Apply knowledge and understanding in different contexts either to analyse or interpret or evaluate geographical issues and information</i>	<i>Use a variety of relevant quantitative and qualitative skills to construct arguments and draw conclusions</i>
<b>4</b>	<p>10-14 marks</p> <p>Demonstrates thorough and accurate knowledge; confident understanding of relevant concepts and principles throughout the response that is wholly relevant to the question</p> <p>Demonstrates knowledge and understanding through the use of appropriate, accurate and well-developed examples</p> <p>Wholly appropriate, accurate and relevant supporting geographical terminology is well used</p> <p>Well-directed and well-annotated sketch maps / diagrams are included and should be credited</p>	<p>16-20 marks</p> <p>Demonstrates sophisticated application of knowledge and understanding either to analyse or interpret or evaluate in order to produce a full and coherent response that is supported by wholly appropriate evidence</p> <p>Demonstrates application of knowledge and understanding through the synthesis of the connections between different elements of the question</p> <p>Demonstrates application of knowledge and understanding through the confident application of the specialised concepts throughout the response</p>	<p>4 marks</p> <p>The response uses wholly relevant qualitative skills to construct clear, coherent and appropriately structured arguments and conclusions</p>

3	<p>7-9 marks</p> <p>Demonstrates secure factual knowledge and reasonable understanding of relevant concepts and principles for large portions of the response that is mostly relevant to the question</p> <p>Demonstrates knowledge and understanding through the use of appropriate, generally accurate and developed examples</p> <p>The use of appropriate and mostly relevant geographical terminology is evident</p> <p>Appropriate, basically accurate annotated sketch maps / diagrams are included and should be credited</p>	<p>11-15 marks</p> <p>Demonstrates accurate application of knowledge and understanding either to interpret or analyse or evaluate in order to produce a partial but coherent response that is supported by mostly appropriate evidence</p> <p>Demonstrates application of knowledge and understanding through the partial synthesis of the connections between different elements of the question</p> <p>Demonstrates application of knowledge and understanding through the mostly relevant application of the specialised concepts</p>	<p>3 marks</p> <p>The response uses mostly relevant qualitative skills to construct structured arguments and conclusions where coherence is variable</p>
2	<p>4-6 marks</p> <p>Demonstrates straightforward knowledge with some inaccuracies; some understanding of relevant concepts and principles that is linked to the question</p> <p>Demonstrates knowledge and understanding through the use of limited examples that may not always be appropriate or accurate</p> <p>The use of geographical terminology are limited</p> <p>Annotated sketch maps / diagrams are basic and should be credited</p>	<p>6-10 marks</p> <p>Demonstrates some application of knowledge and understanding either to interpret or analyse or evaluate in order to produce a response which is limited in coherence and is supported by limited appropriate evidence</p> <p>Demonstrates application of knowledge and understanding through the limited synthesis of the connections between different elements of the question</p> <p>Demonstrate application of knowledge and understanding through limited application of the specialised concepts</p>	<p>2 marks</p> <p>The response uses limited qualitative skills to construct argument(s) and conclusion(s) that are superficial in structure with minimal coherence</p>

1	<p>1-3 marks</p> <p>Demonstrates poor knowledge with errors and minimal understanding and linkage to the question</p> <p>Basic use of examples or if evident, lack relevance to the question asked</p> <p>Geographical terminology is rarely used within the response</p>	<p>1-5 marks</p> <p>Demonstrates application either to interpret or analyse or evaluate in order to produce a response which lacks coherence and is unsupported by appropriate evidence</p> <p>Demonstrates application of knowledge and understanding through the superficial synthesis of the connections between different elements of the question</p> <p>Demonstrate application of knowledge and understanding through superficial application of the specialised concepts</p>	<p>1 mark</p> <p>The response uses qualitative skills superficially to construct an argument / conclusion that is incomplete and lacks coherence</p>
	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>

**1. 'Volcanic activity results in only local hazards.' Discuss**

**[38 marks]**

**AO1 [14] AO2.1.c [20] AO3.3 [4]**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of the hazards that result from volcanic activity could include:

- The connections between the processes operating at tectonic plate boundaries and causes of volcanic hazards (causality)
- Primary hazards include lava flows, pyroclastic flows, ash and tephra falls and volcanic gases (risk)
- Secondary hazards include lahars, landslides and tsunamis (risk)
- The characteristics of volcanic activity: magnitude, predictability and frequency

**AO2**

Application of knowledge and understanding is deployed to evaluate whether volcanic activity results in only local hazards. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- Some volcanic activity may result in hazards that are only concentrated locally, for example Lake Nyos, Cameroon (1986)
- Some volcanic activity may result in hazards that are more important at a regional or global scale, for example the ash associated with the eruption of Eyjafjallajökull (2010) had profound impacts on aviation over European air space which in turn had global scale impacts on travel and the economy
- Relatively little volcanic activity results in hazards that are more important at the global scale in relation to impacts in terms of climate change (Mount Pinatubo 1991)
- The globalisation of the world economy means that medium magnitude volcanic events are more likely to have widespread or even global economic impacts than they did in the past
- The scale of the hazard may vary according to the nature of the hazard, volcanic gases often have a greater impact at the local scale (Lake Nyos, Cameroon 1986) compared to lahars at a regional scale (Nevada del Ruiz, Colombia 1985) and ash which can have an impact at a global scale (Eyjafjallajökull, Iceland 2010)
- The extent of magnitude of volcanic activity, with the understanding that the greater the magnitude the more widespread the hazards are likely to be
- Global impacts associated with volcanic hazards, such as those associated with VEI8 events are so rare on the geological timescale that they have little bearing on normal, everyday life
- Volcanic activity may result in hazards operating over different time scales, initially volcanic activity can have local impacts, but over time these may spread more widely and have a more global impact

**AO3**

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the hazards that result from volcanic activity
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions about whether volcanic activity results in only local hazards

Credit other valid approaches.

**2. 'The economic impacts of earthquake activity are always greater than the social impacts'. Discuss.**

**[38 marks]**

**AO1 [14] AO2.1c [20] AO3.3 [4]**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of the economic and social impacts of earthquake activity could include:

- Economic impacts (disruption to production)
- Social impacts (e.g. homelessness, injury, bereavement)
- Primary and secondary effects
- Local, regional and global scale impacts (scale)

**AO2**

Application of knowledge and understanding is deployed to evaluate whether the economic impacts of earthquake activity are always greater than the social impacts. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- The relative severity of economic and social impacts varies according to the economic and social characteristics of the place. For example the Nepal earthquake (2015) had greater social impacts including homelessness and damage to important temples and monuments compared to Kobe (1995) where, due to the port's importance in terms of global trade, economic impacts were more important
- The relative severity of economic and social impacts may be related to vulnerability which in turn is determined by inequalities of wealth and power in society
- The relative severity of economic and social impacts varies according to scale, for example at the local scale social impacts may be more important than at the regional or global scale
- The relative severity of economic and social impacts varies over time (time scales) as initially economic impacts may be more important, but areas with the capacity to recover from the economic impacts through insurance and good governance (Fukushima 2011), may experience greater social impacts (e.g. associated with the 100,000 evacuations) in the longer term
- The relative severity of economic and social impacts varies according to the perception of different groups of people, whether from the business sector or the local community
- The interdependence between economic and social impacts can make it difficult to isolate the economic impacts as the greater

**AO3**

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the economic and social impacts of earthquake activity
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions about whether the economic impacts of earthquake activity are always greater than the social impacts

Credit other valid approaches.

**Section B: Contemporary Themes in Geography - Generic Mark Bands (45 marks)**

	<b>AO1 [20 marks]</b>	<b>AO2 [20 marks]</b>	<b>AO3 [5 marks]</b>
<b>Band</b>	<i>Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change at a variety of scales</i>	<i>Apply knowledge and understanding in different contexts either to analyse or interpret or evaluate geographical issues and information</i>	<i>Use a variety of relevant 'geographical skills' to construct arguments and draw conclusions</i>
<b>5</b>	<p>17-20 marks</p> <p>Demonstrates wide ranging, thorough and accurate knowledge with a high order of conceptual understanding throughout the response that is wholly relevant to the question</p> <p>Demonstrates knowledge and understanding through the use of wholly appropriate, accurate and well-developed examples</p> <p>Wholly appropriate, accurate and relevant supporting geographical terminology is well used</p> <p>Well-directed and well-annotated sketch maps / diagrams are integrated and should be credited</p>	<p>17-20 marks</p> <p>Demonstrates sophisticated application of knowledge and understanding either to analyse or interpret or evaluate in order to produce a full, comprehensive and coherent response that is supported by wholly appropriate, wide ranging and relevant evidence</p> <p>Demonstrates application of knowledge and understanding through the sophisticated synthesis of the connections between different elements of the question</p> <p>Demonstrates application of knowledge and understanding through the confident application of the specialised concepts throughout the response</p>	<p>5 marks</p> <p>The response uses wholly relevant qualitative skills to produce well-constructed, coherent, sophisticated and logical arguments and conclusions</p>



4	<p>13-16 marks</p> <p>Demonstrates accurate factual knowledge and confident understanding of relevant concepts and principles throughout the response that is relevant to the question</p> <p>Demonstrates knowledge and understanding through the use of appropriate, accurate and developed examples</p> <p>Appropriate, accurate and relevant geographical terminology is evident</p> <p>Appropriate, mostly accurate and relevant annotated sketch maps / diagrams are included and should be credited</p>	<p>13-16 marks</p> <p>Demonstrates accurate application of knowledge and understanding either to interpret or analyse or evaluate in order to produce a coherent response that is supported by appropriate evidence</p> <p>Demonstrates application of knowledge and understanding through the synthesis of the connections between different elements of the question</p> <p>Demonstrates application of knowledge and understanding through the relevant application of the specialised concepts</p>	<p>4 marks</p> <p>The response uses relevant qualitative skills to produce clear, coherent and appropriately structured arguments and conclusions</p>
3	<p>9-12 marks</p> <p>Demonstrates secure, straightforward knowledge and reasonable understanding of relevant concepts and principles throughout most of the response that is mostly relevant to the question</p> <p>Demonstrates knowledge and understanding through the use of mostly appropriate, mostly accurate and developed examples</p> <p>Mostly appropriate, accurate and mostly relevant geographical terminology is evident but is variable in its use</p> <p>Appropriate, basically accurate and partial use of annotated sketch maps / diagrams are included and should be credited</p>	<p>9-12 marks</p> <p>Demonstrates partial application either to analyse or interpret or evaluate in order to produce a partial but coherent response that is supported by mostly appropriate evidence</p> <p>Demonstrates application of knowledge through the partial synthesis between different elements of the question</p> <p>Demonstrates application of knowledge and understanding through the partial application of some specialised concepts</p>	<p>3 marks</p> <p>The response uses mostly relevant qualitative skills to produce a structured response but where coherence is variable</p>

2	<p>5-8 marks</p> <p>Demonstrates some knowledge, but limited in scope with some inaccuracies; some understanding of relevant concepts and principles</p> <p>Demonstrates knowledge and understanding through the use of limited examples, which are mostly accurate but un-developed</p> <p>Limited geographical terminology is evident, not all of which is appropriate or accurate</p> <p>Basic sketch maps / diagrams are used but contain inaccuracies. Credit should be given when used appropriately</p>	<p>5-8 marks</p> <p>Demonstrates limited application either to analyse or interpret or evaluate in order to produce a limited response where most points are generalised or of limited relevance to the question.</p> <p>Limited synthesis between different elements of the question</p> <p>Demonstrates application of knowledge and understanding through the limited application of some specialised concepts</p>	<p>2 marks</p> <p>The response uses some qualitative skills to produce a response with superficial structure, with minimal coherence</p>
1	<p>1-4 marks</p> <p>Demonstrates poor knowledge with errors and minimal understanding and linkage to the question</p> <p>No use of examples or, if evident, lack relevance to the question asked</p> <p>Geographical terminology is rarely used within the response</p>	<p>1-4 marks</p> <p>Demonstration of application either to analyse or interpret or evaluate is poor, producing a response which lacks coherence and is unsupported by appropriate evidence</p> <p>Synthesis between different elements of the question is poor</p> <p>Demonstrates application of knowledge and understanding through the superficial application of basic specialised concepts</p>	<p>1 mark</p> <p>The communication in the response is incomplete</p>
	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>	<p>0 marks</p> <p>Response not creditworthy or not attempted</p>

## Section B: Contemporary Themes in Geography

3. Assess the significance of climate in influencing the nutrient cycle. Use two biomes to support your answer. [45 marks]  
AO1 [20] AO2.1.c [20] AO3.3 [5]

### Focus 3.2.2

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

### Indicative content

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

### AO1

Knowledge and understanding of factors influencing the nutrient cycle could include:

- A generalised Gersmehl nutrient cycle model of a system with inputs of weathering and nutrients dissolved in rainfall, stores of biomass, litter and soil, flows of uptake by plants, fall-out as tissues die and release as litter decomposes and outputs through leaching and runoff
- Relative size of nutrient stores in two biomes
- Relative thickness of nutrient flows in two biomes
- The influence of temperature on the size of inputs, stores, flows and outputs (causality)
- The influence of precipitation on the size of inputs, stores, flows and outputs (causality)
- Seasonal variations in temperature and precipitation influence the growth of biomass, fallout and decomposition (causality)
- The different sizes of the component stores, for example between the equatorial biome with its large above-ground biomass store which is in contrast to the smaller biomass store of the taiga forest biome where growth and biodiversity are lower due to the cold conditions. The litter store for the tropical rainforest biome is small due to the rapid decomposition in the hot, wet conditions compared to the large litter store in the taiga forest biome where the cold conditions inhibit the breakdown and decay of litter. The small nutrient soil store in the tropical rainforest biome results from rapid leaching due to high precipitation whereas the soil store in the taiga forest biome is very small due to the cold conditions which inhibit weathering
- The influence of factors other than climate on nutrient cycling including abiotic factors of geology and pH and biotic factors of human activity, species migration and seed dispersal on the size of inputs, stores, flows and outputs (causality)

### AO2

Application of knowledge and understanding is deployed to assess the significance of climate in influencing the nutrient cycle. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- It may be argued that the role of climate in influencing nutrient cycling varies over time (time scales). Human activity may be seen to be increasingly influencing nutrient cycling through deforestation, harvesting, the application of fertilisers and livestock rearing

- Human influences may be seen as significant at present, but, over geological time, climate may be seen as having greater influence
- The significance of climate in influencing nutrient cycling varies according to location (place). In more remote, less accessible areas the role of climate in influencing nutrient cycling may be greater
- Anthropogenic climate change may be linked to changes in rates of nutrient cycling. For example, climate change in the Arctic accelerates decomposition and release of methane from soils stores. In this way, it may be argued that complex interconnections between people and climate make it difficult to isolate the significance of climate alone
- The significance of climate in influencing nutrient cycling varies according to scale. On a small-scale other factors such as geology (in its influence on pH, leaching and runoff) can exert a greater influence
- The complexity of interconnections between climate and geology, making it difficult to isolate and evaluate the significance of climate alone

### **AO3**

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the influence of climate on the nutrient cycle
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions about the role played by climate in the nutrient cycle

Credit other valid approaches.

**4. To what extent is the conservation of biodiversity achievable? [45 marks]**  
**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.2.4**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of the conservation of biodiversity could include:

- There are a variety of threats to biodiversity, with a decline in the quality and geographical extent of ecosystems leading to the risk of high rates of biodiversity loss
- A range of conservation schemes have been implemented to address these threats to biodiversity (sustainability)
- Different methods of conservation (in situ or ex situ)
- The choice of what to conserve (whole ecosystems or hot spots)
- The decision as to how to conserve (maximum diversity or rare / endemic species)
- Different scales of conservation from single large to several small reserves (SLOSS) and international sites (RAMSAR convention for conservation and sustainable use of wet lands) to local strategies (scale)

**AO2**

Application of knowledge and understanding is deployed to evaluate the extent to which the conservation of biodiversity is achievable. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- The extent to which the cost, legislation and financing of conservation strategies influences the achievability of the conservation of biodiversity
- The extent to which conflicts arising because of the interdependence between economic development and some conservation strategies. Fewer conflicts may make strategies more achievable
- Economic globalisation has inevitably led to increased demand for resources, making conservation of habitats and biodiversity increasingly difficult
- Consumerism and conservation may be seen to be mutually exclusive
- Economic and social sustainability may be seen to be more important than environmental sustainability by the political elite in countries that have valuable natural resources
- Failure to tackle poverty in biodiversity hotspots and increased demand for wildlife and animal products mean that conservation of biodiversity in some regions may not be possible
- The scale of conservation strategies, as the narrow focus of some policies make them more achievable
- Assessment of geographical considerations, as many conservation schemes are based on the boundaries of countries, whereas ecosystems are not restricted within political borders (place) therefore influencing the extent to which the conservation of biodiversity is achievable

- The relative reliance on the co-ordination of agencies for the success of some conservation strategies, which sometimes fail to act together (interdependence) therefore influencing the extent to which the conservation of biodiversity is achievable
- Whether some conservation strategies are more achievable because they are sustainable and holistic, with strategies involving local economic development as a conservation tool (sustainability)

### **AO3**

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the conservation of biodiversity
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions about the extent to which the conservation of biodiversity is achievable

Credit other valid approaches.

**5. 'India's natural resource base provides more opportunities than constraints for economic development'. Discuss. [45 marks]**

**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.3.3**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of India's natural resource base could include:

- India has a large mineral and energy resource base
- The geological and metallurgical background in India is similar to mineral-rich Australia, South Africa and South America, all of which formed a continuous landmass before the break up of Gondwanaland
- India's resource base includes abundant reserves of coal (fourth-largest reserves in world), iron ore, bauxite and zinc
- India is well endowed with oil and gas reserves
- Other resources include manganese, mica, titanium ore, chromite and diamonds
- Physical resources include land and water as well as minerals and energy

**AO2**

Application of knowledge and understanding is deployed to discuss whether India's natural resource base provides more opportunities than constraints. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- The relative impact of the types and amounts of resources available; opportunities exist where there is an abundance of resources, particularly those that have the potential to supply the key products for the production of steel and aluminium (coal, iron ore, bauxite), create many opportunities for economic development (causality)
- India's varied landscape and climate may present both opportunities and constraints in the same place. For example, the deserts of Rajasthan may present many opportunities for the development of tourism (causality) but water insecurity in this region constrains economic development
- The relative availability of resources in relation to the demand for them. Despite being well endowed with oil and gas reserves, consumption exceeds production meaning that India is heavily dependent on crude oil imports, with net oil import dependency rising from 43% in 1990 to an estimated 71% in 2012. India imports three-quarters of its crude oil needs from countries such as Saudi Arabia, Iran, Iraq, Nigeria and the United Arab Emirates (interdependence)
- The extent to which accessibility has an impact on the opportunities provided by natural resources. Multiple structural and regulatory challenges results in India's resource abundance remaining largely unexplored (India's exploration spend as a proportion of global non-ferrous exploration spend is low at 0.2%) presenting constraints for economic development.

- Discussion of whether the increase in international concerns and controls surrounding greenhouse gas emissions (globalisation), pollution and environmental damage (risk) associated with the combustion of coal (in particular) will lead to increases in the cost of environmental amenity and repair, placing constraints on India's economy (sustainability)
- The significance of the control of supplies of natural resources. The agencies controlling the supply of physical resources are largely MNCs. Where these are indigenous (for example, Tata) their growth creates opportunities. However, where the MNCs are foreign owned the economic benefits of mineral extraction accruing to India are constrained (globalisation)

### AO3

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the opportunities and constraints of India's natural resource base for economic development
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions about whether India's natural resource base provides more opportunities than constraints

Credit other valid approaches.



**6. Assess the importance of India's political and economic influence in the wider world.**

**[45 marks]**

**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.3.5**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of India's political and economic influence in the wider world could include:

**Political influence**

- Recent visits from leaders and officials from the United States, France, Germany and Russia have spotlighted India's rise
- India's active participation in global organisations, such as the WTO (globalisation)
- India's active participation in global organisations, governance, conventions and treaties, such as the UN and IPCC (Intergovernmental Panel on Climate Change)

**Economic influence**

- Economic growth, following the launch of economic reforms in 1991, is driving India's emergence as a regional and global power
- India's economy has grown an average of around 6% annually over the past decade and 8% over the past three years
- India has made great strides in fields such as information technology. Its large, skilled workforce makes it a popular choice for international companies seeking to outsource work (globalisation)
- India launches its own satellites and in 2008 sent its first spacecraft to the moon. It also boasts a massive cinema industry, the products of which are among the most widely-watched films in the world (globalisation)
- India is home to 54 of the world's top 5000 global companies (globalisation)

**AO2**

Application of knowledge and understanding is deployed to assess the importance of India's political and economic influence in the wider world. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- Changes over time (time scales) leading to assessment of the extent to which India's political and economic influence in the wider world has grown significantly since the economic reforms of 1991. Wealthier nations now see India as a trading partner with enormous potential. India is Asia's third-largest economy and new growth estimates make India the world's fastest-growing economy, surpassing China's
- Assessment of the variation in factors limiting India's political and economic influence. Given the size of India's poor and unskilled population and the massive challenge of domestic poverty and underdevelopment (inequalities), it is a challenge for the Indian state to allocate scarce resources into making it an economically powerful nation. However with its enormous coastline and respected navy India is well-placed to provide security in a critical part of the global commons.

- Assessment of the varied contexts in relation to India's formal political status and its softer political influence. The five permanent members of the United Nations Security Council support India's claim to join them, earned by India being one of the most consistent contributors to UN peacekeeping operations (interdependence). In terms of soft power, it may be argued that India has huge potential as it is committed to democratic institutions, the rule of law and human rights, has a huge and talented diaspora, shares many Western values and is culturally rich
- The extent to which Indian MNCs have a global economic and political influence. For example, the relative influence within the global economy of Indian MNCs such as Tata Steel and JSW
- Assessment of the balance between India's political and economic influence in the wider world. India's economic power may be regarded as of greater significance than its political power, but it may be argued that economic power is a fundamental pre-condition for, and prelude to, India's emergence as a global hegemon

### AO3

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about India's political and economic influence in the wider world
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions to assess the importance of India's political and economic influence in the wider world

Credit other valid approaches.

**7. 'China's natural resource base provides more opportunities than constraints for economic development'. Discuss.**

**[45 marks]**

**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.3.3**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of China's natural resource base could include:

- China has a large mineral and energy resource base
- China is well endowed with coal reserves
- Petroleum and natural gas resources are also available, but in smaller proportions
- China's has large reserves of metallic minerals such as tungsten, tin, molybdenum, antimony and rare earth
- Other metallic minerals include iron, manganese, aluminium and copper
- China has the world's largest hydropower potential
- Physical resources include land and water as well as minerals and energy

**AO2**

Application of knowledge and understanding is deployed to discuss whether China's natural resource base provides more opportunities than constraints. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- The relative impact of the types and amounts of resources available; the opportunities for economic development presented by the abundance of China's resources (causality). The ability of China to meet its energy demand from domestic sources due to China's relatively rich endowment in coal. China's varied landscape including the picturesque karst landscapes in Guilin and Yanshuo, lakes in Jiuzhaigou and the Rainbow Mountains in Zhangye present many opportunities for the development of tourism (causality)
- China's varied landscape and climate may present both opportunities and constraints in the same place. For example, the cultural and environmental attractions of Tibet may present opportunities for the development of tourism (causality) but physical and political isolation in this region constrains economic development
- The relative availability of resources in relation to the demand for them. China's resource base is insufficient to meet the increased use of energy and minerals as China's economy becomes more urban and export oriented (estimates are that in twenty years' time, assuming there is no dislocation to its growth process, China is likely to consume more energy and metals than all of the industrialised economies today) therefore constraining its economic development
- The extent to which quality has an impact on the opportunities provided by natural resources. Many important metallic minerals such as iron, manganese, aluminium and copper are of poor quality and difficult to smelt, constraining China's economic development

- The extent to which accessibility has an impact on the opportunities provided by natural resources. The uneven distribution of China's coal reserves and limited reserves of high-quality coking coal and anthracite coal constrain its economic development
- Discussion of whether the increase in international concerns (globalisation) and controls surrounding greenhouse gas emissions, pollution and environmental damage (risk) associated with the combustion of China's low grade coal, which will lead to increases in the cost of environmental amenity and repair, placing a strain on China's economy (sustainability)

### AO3

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about China's natural resource base
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions about whether China's natural resource base provides more opportunities than constraints

Credit other valid approaches.

**8. Assess the importance of China's political and economic influence in the wider world.** [45 marks]

**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.3.5**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of China's political and economic influence in the wider world could include:

Political influence

- China's active participation in global organisations such as the WTO (globalisation and interdependence)
- China's active participation in global organisations, governance, conventions and treaties such as the UN and IPCC (Intergovernmental Panel on Climate Change)

Economic influence

- China's importance as is a major economic power: it has been projected that by 2030 China's economy could be twice the size of the USA's
- In 2014 Chinese overseas investment surpassed foreign direct investment into China
- Chinese overseas investment is important in both developed and developing countries, especially in the continent of Africa
- In 2014, the list of the world's largest 500 corporations included 95 Chinese companies

**AO2**

Application of knowledge and understanding is deployed to assess the importance of China's political and economic influence in the wider world. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- Changes over time (time scales) leading to assessment of the extent to which China's political and economic influence in the wider world has grown significantly over the past 35 years since the introduction of Deng Xioping's 'Open Door' policy
- The extent to which China's political and economic influence varies according to location (place) and here it is important to distinguish between the developing and the developed world: China enjoys less influence in the latter, but its extraordinary success as a developing country is seen by many in the developing world as a model from which they can learn and which they seek to emulate. Africa is the clearest case in point. China's transformation is most strongly felt in East Asia, which has become increasingly China-centric
- The relative variation in factors affecting China's political and economic influence. China remains a poor country (recent figures show that the US expends five times more on national security than China), with a standard of living only one-fifth of USA's and China's relative poverty (inequalities) may act as a major constraint on China's capacity for its political (soft) power to appeal for several decades

- China's economic influence in the global market is emerging rapidly and presents other superpowers with a dilemma. For example, the large emerging Chinese middle class represents an export opportunity for European countries. Placing higher import duties on cheap Chinese steel is therefore contested by politicians but requested by European steel makers
- Given the world's unfamiliarity with China, it is possible to argue that the West has consistently underestimated the speed of China's rise, with the consequence that it underestimates the extent of China's political and economic influence
- Assessment of the balance between China's political and economic influence in the wider world. China's economic power may be regarded as of greater significance than its political power, but it may be argued that economic power is a fundamental pre-condition for, and prelude to, China's emergence as a global hegemon

### **AO3**

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about China's political and economic influence in the wider world
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions to assess the importance of China's political and economic influence in the wider world

Credit other valid approaches.

**9. 'Political factors hinder rather than promote development'. With reference to two or more Sub-Saharan African countries to what extent do you agree?**

**[45 marks]**

**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.6.4**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of political factors influencing development could include:

- The political instability, armed rebellions, coups and austere military rule that characterises countries such as Niger and Mali (a military coup in Mali in 2012 brought to a halt 20 years of stable democracy)
- The growth in terrorism in these countries (risk)
- The porous nature of the borders of most countries results in a political crisis in one country becoming a serious threat to neighbouring countries
- The prevalence of modern slavery in many of these countries, including forced labour, child labour and human trafficking, with Mauritania having proportionally the highest prevalence of slaves in the world
- International intervention by former colonial powers (France in Mali) (interdependence)
- International intervention and neo-colonial influences (Chinese investment) (globalisation)
- International intervention by global organisations such as the UN (interdependence)
- A major failing common to many Sub-Saharan African countries has been the quality of their government and leadership which has had a negative impact on development (causality). Development measures, such as the human development index (HDI), indicate that levels of development in many of these countries are amongst the lowest in the world
- Political problems and associated instability affect development directly by disrupting economic activity, mainly agriculture
- Political problems and associated instability affect development indirectly through their impact on educational achievement, infrastructure, population change and displacement with conflicts compounding security and humanitarian crises disrupting supply routes and causing food shortage

**AO2**

Application of knowledge and understanding is deployed to evaluate whether political factors hinder rather than promote development in Sub-Saharan countries. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- Arguments that evaluate the scale of political influence on development (local, regional, national or international). Neo-colonial influences on an international scale can lead to further political instability, with China challenging US economic hegemony in these countries, such as Sudan and South Sudan, and compromising development

- The extent of change in political factors over time (time scales). Political factors may shift to a position where they promote rather than hinder development. Some countries are becoming gradually more democratic (in 2009 a civilian leader was elected in Mauritania leading to improvements in freedom, human rights and accountability)
- The extent that place and location hinder rather than promote development (place). Examples of countries such as Zimbabwe are affected by the structure of the current political system, including misuse and misappropriation of aid and income
- The extent of variation of the type of political influence. Supranational organisations (interdependence) such as the UN and former colonial powers are attempting to reverse negative trends and promote development but their success in setting and monitoring development targets may be hindered by local political instability or corruption
- The relative impact of the rise of terrorist groups which have a variety of effects with regard to development including impact on local populations (Boko Haram) and on international reputation and investment

### AO3

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about political factors influencing development
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions about whether political factors hinder rather than promote development

Credit other valid approaches.



**10. Evaluate the success of strategies used to promote development in selected Sub-Saharan African countries.** [45 marks]

**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.6.7**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of the strategies used to promote development could include:

- Aid provided by international aid agencies and NGOs: a distinction may be made between 'top down' and 'bottom up' strategies (interdependence)
- Strategies implemented by the World Bank, IMF and SAPs (structural adjustment programmes) / PRSPs (poverty reduction strategy papers), HIPC (heavily indebted poor countries) (interdependence)
- Micro-finance schemes (interdependence)
- Free trade (globalisation)
- Fair trade (globalisation)
- Foreign direct investment and the role of MNCs (globalisation)

**AO2**

Application of knowledge and understanding is deployed to evaluate the success of strategies used to promote development in selected Sub-Saharan African countries. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. To evaluate the extent of success of strategies, this evidence could include:

- The validity and reliability of various indicators may be contested: the indicators covered will be mainly economic, but may include social, environmental and demographic measures of improvement indicative of progress made
- Consideration of how those living in poverty are involved in the development process. Who are the decision makers and gate-keepers to the development aid budget?
- Consideration of the scale of the chosen strategies, with the monitoring and measurement of the success of small-scale, bottom-up strategies being more straightforward
- Comparison of the success of similar strategies employed in different environments (place)
- The extent of the improvements in the success of measures over time (time scales)
- Consideration of time-scales for the implementation of strategies, such as World Bank and IMF strategies, may be long, reducing their effectiveness
- The extent of reliance on the co-ordination of agencies for the success of strategies, which sometimes fail to act together (interdependence)
- That some strategies are more successful because they are sustainable and holistic, with strategies involving local economic development often being more sustainable (sustainability)

### **AO3**

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the strategies used to promote development
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions evaluating the success of strategies

Credit other valid approaches.

- 11. 'The environmental problems associated with fossil fuels are greater than political ones'. To what extent do you agree? [45 marks]**  
**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.4.5**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of the environmental problems and political problems associated with the extraction, transport and use of fossil fuels could include:

Environmental problems:

- Coal is the most polluting source of energy (greenhouse gases, acid rain and smog) (causality). Underground mines lead to surface subsidence and toxic waste and water. Opencast pits scar the landscape. Although legislation requires restoration, new ecosystems are of low quality
- Oil infrastructure from large oilfields visually pollutes a large area. Oil spills at production sites (Gulf of Mexico Deepwater Horizon oil spill) along pipelines and tanker routes are ecologically disastrous. Ecological issues surround oil exploration in fragile, environmentally sensitive areas such as the Arctic (risk)
- Natural gas is generally seen as the cleanest of fossil fuels in greenhouse gas terms, but flare-off as a waste product of oilfields causes major environmental problems (causality)
- Unconventional sources of oil and gas such as tar sands and shale gas may lead to water contamination, the threat of earthquakes and environmental degradation

Political problems:

- Problems of energy security where fossil fuel resources cross international boundaries (interdependence)
- The problems of risk associated with unstable suppliers and volatile pathways (Russia/Ukraine, Libya)
- The pricing and production of oil is largely controlled by cartels such as OPEC (globalisation) or national governments, with prices often high and volatile
- Public protests such as anti-fracking campaigns and the refusal of planning permission in the UK have delayed plans for the extraction of shale gas

**AO2**

Application of knowledge and understanding is deployed to consider whether the environmental problems associated with fossil fuels are greater than political ones. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- Consideration of whether new technologies for fossil fuels, including carbon capture and sequestration and gasification (mitigation) which will reduce the environmental problems associated with fossil fuels (sustainability), therefore the relative importance of the two categories of problem may change over time (time scales)

- Whether in some countries the political concern for energy security over-rides environmental concerns (China) particularly in the short-term (time scales), although this is changing due to concerns about the pollution associated with fossil fuels
- The relative importance of the two categories of problem may vary spatially and temporally. The mine disaster at the Gleision colliery, Swansea Valley in 2011 raised concerns about site safety and inspection which, locally and temporarily, raised the profile of political vis-a-vis environmental problems
- Consideration of the interdependence of environmental problems and political problems; whether governments need to harmonise actions to limit CO<sub>2</sub> output from fossil fuels
- The extent to which finding agreement is difficult and whether implementing policies can make governments unpopular with their electorates

### **AO3**

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the environmental problems and political problems associated with the extraction, transport and use of fossil fuels
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions on whether the environmental problems associated with fossil fuels are greater than political ones

Credit other valid approaches.

**12. Discuss the view that a country's energy mix is mainly determined by its level of development.**

**[45 marks]**

**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.4.6**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of the influence of the level of development on a country's energy mix could include:

- The use of traditional sources of energy such as fuelwood and animal dung by developing countries due to their low cost and degree of accessibility (causality) compared to other energy sources; lower level of technology will also limit the use of other sources of energy (in Botswana there is extensive use of woody biomass, providing over 90% of the country's energy mix)
- The diminishing importance of traditional sources of energy such as fuelwood and animal dung in emerging economies and the replacement of traditional sources with fossil fuels and alternative energy sources associated with increased economic and technological change (in Vietnam the contribution of traditional sources of energy is declining, with fossil fuels, wind, solar, nuclear and biofuels taking a greater share)
- The more limited use of traditional sources of energy such as fuelwood and animal dung in developed economies' energy mix and the growing proportion of renewables as developed countries develop the technology for harnessing renewable energy and implement energy policies to mitigate against climate change (sustainability)

**AO2**

Application of knowledge and understanding is deployed to discuss whether a country's energy mix is mainly determined by its level of development. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- The relative availability of energy sources as an important factor influencing a country's energy mix. The oil crises and subsequent rises in oil prices in 1973 and 1979 led many countries to develop alternative energy sources such as biofuels in Brazil
- The extent to which specialised location factors (place) influencing a country's energy mix. Botswana has significant reserves of coal estimated at over 200 billion tons, the country's amount of solar insolation is one of the highest levels in the world, and as the country is landlocked and high pressure dominates, average wind speeds are too low to make wind energy attractive
- The contested role of government policies on a country's energy mix. International emissions' targets have led to a shift towards cleaner fossil fuels and renewables and government taxation policies can promote renewable energy, as in Germany, through community grants and subsidies (mitigation)

- The scale of appropriate micro generation of solar, biogas, wind and hydro power (sustainability) promoted by international aid agencies and NGOs (interdependence) in developing countries through technology transfer
- The extent to which security of supplies can influence a country's energy mix (risk)
- How far public opinion and cultural preferences can influence a country's energy mix. In Germany public distrust following the Fukushima nuclear disaster in 2011 (risk) has led to the policy decision to phase out nuclear power in Germany by 2022

### AO3

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the influence of the level of development on a country's energy mix
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions on whether a country's energy mix is mainly determined by its level of development

Credit other valid approaches.

**13. To what extent can the destructive effects of low-pressure systems be minimised?**

**[45 marks]**

**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.5.5**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of the main characteristics of hazards associated with low-pressure systems and strategies used to minimise the destructive effects could include:

- The risks to people associated with low-pressure systems including high rainfall, strong winds, storm surges and landslides
- Destructive effects include direct impacts: wind and storm surge effects on buildings, power transmission, telecommunications, transport (causality)
- Destructive effects include indirect impacts: landslides, flooding, contamination
- Impacts are environmental (eg water contamination), demographic (eg deaths, migration), economic (disruption to production) and social (eg homelessness, illness, bereavement)
- Ways to manage the damaging effects may follow a temporal sequence – pre, during and post disaster (Park's model of response curve) and involve risk assessment, mitigation and adaption preparedness and emergency plans including the hazard management cycle framework of monitoring, prediction, warning, immediate response and long-term planning

**AO2**

Application of knowledge and understanding is deployed to consider the extent to which the destructive effects of low-pressure systems can be minimised. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- Evaluation of the vulnerability of different groups in society and whether or not strategies are designed to help them
- Strategies such as hazard mapping prioritise mitigating economic risk or social risk
- Assessment of the effectiveness and success of different elements of the hazard management cycle which increase resilience and mitigate against the effects
- Comparison of the success of different measures employed in different environments (place). For example the response in November 2013 to Typhoon Haiyan was more effective in Vietnam than in the Philippines
- The extent of improvements in the use of measures over time (time scales)
- Evaluation of the size and intensity of the low-pressure system (scale) with the assertion that the larger and more intensive the low-pressure system is, the more difficult it will be to minimise its destructive effects (Typhoon Haiyan, Philippines, November 2013)
- Consideration of changes over time (time scales) as climate change, rising sea levels and water temperatures provide increasing amounts of energy for major

weather events (causality), making the minimisation of their destructive effects more difficult

- Discussion of the effects of the magnitude, the timing and the track of low-pressure systems as, when low-pressure systems reach locations at their peak, the destructive effects are greater and more difficult to minimise
- Evaluation of the vulnerability of various populations in various locations and their ability to mitigate against the effects of low pressure weather systems

### **AO3**

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the destructive effects of low-pressure systems and strategies to minimise these
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions on the extent to which the destructive effects of low-pressure systems can be minimised

Credit other valid approaches.



**14. To what extent do large cities affect local climate? [45 marks]**  
**AO1 [20] AO2.1.c [20] AO3.3 [5]**

**Focus: 3.5.6**

This question requires candidates to demonstrate their ability to develop a sustained line of reasoning which is coherent, relevant, substantiated and logically structured.

**Indicative content**

The indicative content is not prescriptive and candidates are not expected to cover all points for full marks. Credit other valid points not contained in the indicative content.

**AO1**

Knowledge and understanding of the various ways in which large cities affect local climate could include:

- The main effect of large cities on local climates is to destroy the existing microclimate and create a new one (causality)
- Large cities affect all microclimate variables
- increases in temperatures, particularly during anticyclonic conditions, in the night and in winter
- Changes in atmospheric composition, higher concentrations of gases such as carbon dioxide and sulphur dioxide and particulates
- Higher incidence of cloud, and therefore lower amounts of sunshine
- Higher levels of precipitation with thunderstorms and hail more likely
- Higher frequency, duration and intensity of fog
- Changes to the hydrology of urban areas in terms of humidity levels (lower) and evapotranspiration rates (higher) (interdependence)
- Altered wind characteristics, including wind speed and direction and turbulence

**AO2**

Application of knowledge and understanding is deployed to consider the extent to which large cities affect local climate. Synthesis will be demonstrated by the drawing together of evidence to reach a rational conclusion. This evidence could include:

- The extent to which the scale of the city influences the existence, intensity and shape of the urban heat island (scale). The larger the city, the more pronounced the effects
- The relative impact of different locations (places) as the effect of regional climates may operate to intensify the effects. The 'urban heat island' is more pronounced under high pressure conditions and in continental interiors
- The relative impact of different factors that influence the effects of cities on local climates including density of housing, existence of parkland / water surface, vertical development of buildings, relief, energy consumption and the nature of economic activity (causality)
- The contested role of climate change in exaggerating the effects of large cities on local climates (causality)
- The extent to which changes over time influence local climate (time scales) as with the projected growth in urbanisation (70% by 2050), there will be more megacities which will have a more profound effect on local climates
- How far building efficiency and transport efficiency measures implemented in cities to reduce energy use have affected local climates
- (resilience, mitigation)

### **AO3**

Skills evidenced could include:

- The skill of presenting well-constructed, coherent and logical arguments about the ways in which large cities affect local climates
- The skill of constructing relevant diagrams (qualitative skills) which are annotated to meet the requirements of the question
- The skill of reaching conclusions on the extent to which large cities affect local climate

Credit other valid approaches.