Unit 4: 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 unit 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 20 marks and Section B is 22 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 unit. The targeted AO(s) are also indicated, for example AO2.1c.

Assessment Objective	Strands	Elements
AO1 Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change, at a variety of scales.	N/A	This AO is a single element.
AO2 Apply knowledge and understanding in different contexts to interpret, analyse and evaluate geographical information and issues.	N/A	1a - Apply knowledge and understanding in different contexts to analyse geographical information and issues.
		1b - Apply knowledge and understanding in different contexts to interpret geographical information and issues.
		1c - Apply knowledge and understanding in different contexts to evaluate geographical information and issues
AO3 Use a variety of relevant quantitative, qualitative and fieldwork skills to: • investigate geographical questions and issues • interpret, analyse and evaluate data and evidence • construct arguments and draw conclusions.	1 - investigate geographical questions and issues	N/A
	2 - interpret, analyse and evaluate data and evidence	
	3 - construct arguments and draw conclusions	

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. This is followed by marking guidance which should be used to assess the quality of the learner's response.

Banded mark schemes are divided so that each band has a relevant descriptor. These provide 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

When deciding on a band, the answer should be viewed holistically. 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 also provided for banded mark schemes. 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.

The specialised concepts from the specification that apply in the indicative content are underlined.

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 infringements 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.

Contemporary themes in Geography– Section A Tectonics: Generic mark bands (20 marks)

	AO1 [6 marks]	**AO2 [13 marks]**	**AO3 [1 marks]**
Band	*Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change at a variety of scales*	*Apply knowledge and understanding in different contexts either to analyse or interpret or evaluate geographical issues and information*	*Use a variety of relevant 'geographical skills' to construct arguments and draw conclusions*
3	5-6 marks Secure factual knowledge and confident understanding of relevant concepts and principles Developed exemplification used with supporting geographical terminology Well-directed and well-annotated sketch maps / diagrams Spelling, punctuation and grammar used with a high degree of accuracy	9-13 marks Accurate application either to interpret or analyse or evaluate Synthesis of the connections between different elements of the response to the question Relevant application of the specialised concepts	1 mark The response is appropriately structured
2	3-4 marks Straightforward knowledge with some inaccuracies; some understanding of relevant concepts and principles Appropriate exemplification and geographical terminology is partially evident Annotated sketch maps / diagrams contain inaccuracies Spelling, punctuation and grammar used with a reasonable degree of accuracy	5-8 marks Some application either to interpret or analyse or evaluate with limited range, depth and development Incomplete synthesis between different elements of the response to the question	
1	1-2 marks Limited knowledge with errors and minimal understanding Limited use of examples and terminology; no supporting sketch maps / diagrams Spelling, punctuation and grammar used with limited accuracy	1-4 marks Application either to interpret or analyse or evaluate is poor; occasional relevant points are made	
	0 marks Response not creditworthy or not attempted	0 marks Response not creditworthy or not attempted	0 marks Response not creditworthy or not attempted

Section A: Tectonic Hazards

1. Analyse why processes associated with earthquake activity often result in hazards.
[20 marks]
AO1 [6] AO2.1.a [13] AO3.3 [1]

Focus: 3.1.3
Indicative content

Likely themes and specialised concepts include:

- definition of what constitutes a hazard (risk)
- primary hazards include ground moving and shaking (risk)
- secondary hazards include liquefaction, landslides, tsunami, fire and diseases (risk)
- the connections between the processes operative at tectonic plate boundaries and causes of earthquake hazards (risks). Two plates driven by convection currents in the Earth's mantle grind past one another. Friction causes stress and strain energy to build up, and when a critical point (threshold) is reached an earthquake occurs (causality)
- an example of a primary hazard is ground moving and shaking. Surface seismic waves (long waves) are the ones which shake the ground causing buildings and other structures to collapse. Underground pipes and power lines can be damaged by ground movement leading to fires and explosions. Near the epicentre (ie directly above the earthquake focus) all the waves arrive at once and so cause the most severe and complex ground motion (causality)
- different ground materials react in different ways to the shaking, so the amount of damage varies with rock type. Soils with a high water content act to amplify the shaking, causing it to essentially act like a liquid (liquefaction), taking away the support of buildings and other structures (causality) destroying life and property
- when an earthquake occurs under the ocean its seismic energy can dissipate as shockwaves through the ocean water and this can cause tsunami initiation. The movement of the sea bed upwards displaces billions of tonnes of water above it, some sea floor falls and water rushes in to replace it. The uplifted water collapses and rushes out radially outwards at a thousand km per hour. Tsunami waves themselves are not very high in the deep ocean (tens of cm) but when they approach land, they can become tens of metres, and be very destructive. They also travel very fast in the deep ocean, but when they get to shallower waters they slow down. Tsunami are often preceded by a drawdown of water that exposes the sea bed of the foreshore (causality)
- the characteristics of earthquake activity: magnitude, predictability, frequency,
- human factors affecting spatial variations in vulnerability (place)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section A)

The command word 'analyse' (AO2.1a) requires that candidates bring out the essential elements or structure about why processes associated with earthquake activity often result in hazards. At the upper end, answers that score highly should show application of knowledge and understanding by finding connections and causes and effects as well as deconstructing concepts, information and issues about why processes associated with earthquake activity often result in hazards. Responses in the middle range should show some application of knowledge and understanding to find some connections and causes and effects as well as deconstructing some concepts, information and issues. Lower end responses provide very limited application of knowledge and understanding of tectonic hazards to provide few connections, causes and effects.

2. Analyse why the impacts of volcanic activity vary. [20 marks]

AO1 [6] AO2.1a [13] AO3.3 [1]

Focus: 3.1.2/4
Indicative content

There are a variety of impacts of volcanic activity at the local scale (risks).
Likely themes and specialised concepts include:

- Volcanic processes and the production of associated hazards (causality) (risk)
- environmental impacts (eg damage to the built environment, landslides)
- demographic impacts (eg deaths, migration)
- economic impacts (eg disruption to production)
- social impacts (eg homelessness, injury, bereavement)
- primary and secondary effects
- local, regional and global impacts (scale)
- the characteristics of the volcanic activity that influence its impact
- its magnitude (as measured by Volcanic Explosivity Index), predictability, frequency, duration, speed of onset, timing and areal extent (risk)
- economic factors affecting spatial variations in vulnerability
  in terms of the level of development and level of technology (influencing resilience, mitigation and adaption)
- social factors affecting spatial variations in vulnerability in terms of the population profile (age, gender, level of education)
- political factors affecting spatial variations in vulnerability in terms of the quality of governance
- geographical factors affecting spatial variations in vulnerability in terms of rural / urban location and degree of isolation (place)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section A)

The command word 'analyse' (AO2.1a) requires that candidates bring out the essential elements or structure about why the impacts of volcanic activity vary. At the upper end, answers that score highly should show application of knowledge and understanding by finding connections and causes and effects as well as deconstructing concepts, information and issues about why the impacts of volcanic activity vary. Responses in the middle range should show some application of knowledge and understanding to find some connections and causes and effects as well as deconstructing some concepts, information and issues. Lower end responses provide very limited application of knowledge and understanding of tectonic hazards to provide few connections and causes.

Section B: Contemporary Themes in Geography: Generic Mark Bands (22 marks)

	AO1 [9 marks]	AO2 [11 marks]	AO3 [2 marks]
Band	*Demonstrate knowledge and understanding of places, environments, concepts, processes, interactions and change at a variety of scales*	*Apply knowledge and understanding in different contexts either to analyse or interpret or evaluate geographical issues and information*	*Use a variety of relevant 'geographical skills'* to construct arguments and communicate findings*
3	7-9 marks Wide-ranging and thorough knowledge and confident understanding of relevant concepts and principles Developed exemplification used with supporting geographical terminology Well-directed and well-annotated sketch maps / diagrams Spelling, punctuation and grammar used with a high degree of accuracy	8-11 marks Accurate application either to interpret or analyse or evaluate Synthesis of the connections between different elements of the response to the question Relevant application of the specialised concepts	2 marks A well-constructed, coherent and logical response
2	4-6 marks Secure, straightforward knowledge and reasonable understanding of relevant concepts and principles Appropriate exemplification and geographical terminology is partially evident Appropriate, basically accurate annotated sketch maps / diagrams are included Spelling, punctuation and grammar used with a reasonable degree of accuracy	5-7 marks Some application either to interpret or analyse or evaluate with limited range, depth and development Incomplete synthesis between different elements of the response to the question	1 mark The communication in the response is limited or incomplete
1	1-3 marks Limited knowledge with errors and minimal understanding Limited use of examples and terminology; no supporting sketch maps / diagrams Spelling, punctuation and grammar used with limited accuracy	1-4 marks Application either to analyse or interpret or evaluate is poor; occasional relevant points are made	
	0 marks Response not creditworthy or not attempted	0 marks Response not creditworthy or not attempted	0 marks Response not creditworthy or not attempted

3. Assess the importance of ecosystems as providers of goods and services.

[22 marks]
AO1 [9] AO2.1c [11] AO3.3 [2]

Focus 3.2.1
Indicative content

Likely themes and specialised concepts include:

- Ecosystem goods are products that can be derived directly from the ecosystem eg timber from trees, water, food (and the nutrients derived from plants and animals) and medicines
- Ecosystem services are benefits that people obtain from ecosystems. These services result from the interactions among organisms and their natural environments eg purification of air and water, mitigation of floods and droughts, decomposition of wastes, pollination of crops and natural vegetation, control of potential agricultural pests, dispersal of seeds and translocation of nutrients, moderation of temperature extremes (resilience) and the provision of aesthetic beauty and intellectual stimulation
- it has been argued that human well-being depends on the services provided by ecosystems (*The UN Millennium Ecosystem Assessment*) (causality)
- ecosystem goods are generally easier to value in a monetary sense than services
- ecosystem goods and services offer direct economic benefits and support economic activity at a range of scales from local to global (scale)
- ecosystem goods and services offer a variety of benefits: recreational benefits eg fishing and hunting; 'neglected' benefits eg scientific value; 'existence legacy value' eg philanthropic value and intergeneration equity
- ecological goods are not only important, they are essential to our survival. Human life depends on the continuing capacity of the biosphere's ecosystems to provide a multitude of benefits (sustainability)
- the unsustainable use of ecosystem goods may destroy the realisable role of services and place humans at risk when the system loses equilibrium; because of their value it is extremely important to reduce the threat of irreversible damage to ecosystems (equilibrium) (thresholds)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command word 'assess' (AO2.1c) requires that candidates weigh up the the value of ecosystems as providers of goods and services by giving a number of possible explanations / arguments / outcomes and justify which is/are favoured. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the value of ecosystems as providers of goods and services that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of ecosystems to provide few judgements.

4. Assess the role played by soil development in succession in *one* ecosystem.

[22 marks]

AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.2.5
Indicative content

Although ecosystems are largely self-regulating, they are subject to change, as illustrated by succession.

Likely themes and specialised concepts include:

- as plants colonise a 'sterile' area, such as bare rock or sand dunes they change the physical and chemical components of the environment making the way for a different range of organisms to colonise (causality)
- the colonisation by pioneer communities leads to the establishment of early colonisers (more advanced plants); once the early colonisers have established they also continue to change the environment in stages (seres)
- with the passage of time, the seral communities will become more complex and comprise larger plants, with each community helping to destroy that which precedes it (feedback)
- with each sere, soil and moisture conditions improve as humus is provided from the expanding plant cover and soil depth and the nutrient status of the soil increase
- given sufficient time, without interruption, the vegetation will come to comprise a wide range of plants fully adapted to the prevailing climatic conditions (climatic climax) with temperature and precipitation influencing the climatic climax vegetation (interdependence) (causality)
- the increasing diversity of plant species, increases in biomass and increase in vegetation height / density / canopy associated with succession is due to the development of the soil which increases in depth, organic content and associated nutrient status and has improved water retention properties (feedback)
- the protection afforded by established species will also aid succession
- the actual species involved in a succession in a particular area (place) are controlled by a range of factors including not only the climate, but also the geology and associated soil type as the mineral matter from the parent rock will influence nutrient availability and soil texture: the communities that occur on these soils may permanently differ from the surrounding climatic communities creating a subclimax community (causality)
- a subclimax occurs when the vegetation is prevented from reaching its climax due to interruptions by other local factors including relief and drainage (causality)
- when people are involved then secondary succession takes place. Secondary succession is more likely to occur on land on which the previous management has been discontinued eg abandoned farmland
- where human activity has permanently arrested and altered the natural succession and manages the resultant community the succession has achieved a deflected climax or plagioclimax eg deforestation (risk)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command word 'assess' (AO2.1c) requires that candidates weigh up the the role played by soil development in succession in one ecosystem by giving a number of possible explanations / arguments / outcomes and justify which is/are favoured. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the role played by soil development in succession in one ecosystem that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of ecosystems to provide few judgements.

5. Examine the role of government in the location and development of economic activity in India. [22 marks]

AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.3.4

Indicative content

The development of economic activity in India includes the development of manufacturing industries, service and financial industries and agriculture. Rapid economic growth in India has been due to the expansion of the service sector rather than to the growth of manufacturing. India's large service industry accounts for 57.2% of the country's GDP while the industrial and agricultural sectors contribute 28.6% and 14.6% respectively.

Likely themes and specialised concepts include:

- agribusiness plays an increasingly significant role in agricultural exports. They control much of the chain, from seeds and fertilisers to finance, distribution and marketing
- manufacturing includes the growth of modern steel, pharmaceuticals, textiles, clothing, and a substantial high-tech electronics sector eg mobile phones.
- the services sector, includes financial services, software services, accounting services and entertainment industries like Bollywood. The growth of service industries includes call centres, back office jobs, outsourcing from Europe / US
- locations of economic activity include rural areas such as Gujarat and the Punjab (agribusiness), SEZs (manufacturing), Bangalore (BPO), Mumbai (Bollywood) (place)
- India faced a major economic crisis in 1991 which forced the governing Congress Party to borrow money from the International Monetary Fund (IMF). This opened up the economy to economic globalisation. India is now among the ten fastest-growing economies in the world (causality)
- to attract larger foreign investments in India, the Special Economic Zones (SEZs) Policy was announced in April 2000 (causality) (globalisation)
- the National Highways Act has been modified to help reduce tolls on national motorways, bridges and tunnels. The government is also implementing a new policy that aims to improve India's telecommunication systems. All these much-needed infrastructure changes will promote economic development (causality)
- in addition to the role of government, factors responsible for the rapid growth of manufacturing industries include the emergence and investment policies of TNCs (causality)
- another contributing factor is the growth of an urban, educated, middle-class population whose members have become consumers themselves and who provide a large market for new consumer goods (feedback)
- technological factors have also played a significant role, particularly the speed and distance over which communications and movement can now take place due to changes in computer, transport and communication technologies (causality)
- reasons for the rapid expansion in the service sector include lower labour costs, a large English speaking workforce, a highly skilled and educated workforce and ICT skills shortages in some developed countries (interdependence)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command word 'examine' (AO2.1c) requires that candidates consider the role of government in the location and development of economic activity in India in a way that uncovers the assumptions and interrelationships of the issue. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the role of government in the location and development of economic activity in India that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of economic growth and challenge in India to provide few judgements.

6. Assess the success of strategies implemented in India to manage *one* environmental problem associated with economic growth. [22 marks]
AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.3.7
Indicative content

There are a range of environmental problems (risks) associated with economic growth in India.

Likely themes and specialised concepts include:

- environmental problems associated with fossil fuel use – the Indian government has committed to tripling its coal-fired electricity capacity to 450 gigawatts by 2030.To cater for coal-fired electricity, the Power Ministry plans to double coal production to 1 billion tons within five years. The coal expansion plans through 2030 will at least double sulphur dioxide levels, along with those of nitrogen oxide and particulate matter (causality)
- environmental problems associated with industrial pollution – 764 industrial units along the main stretch of the River Ganges and its tributaries discharge 500 million litres of toxic waste a day (causality)
- environmental problems associated with soil erosion – 30% of India's gross agricultural output is lost every year to soil degradation, poor land management and counter-productive irrigation (causality)
- environmental problems associated with desertification – 25% of India's total land is undergoing desertification while 32% is facing degradation that has affected its productivity, critically affecting the livelihood and food security of millions across the country: the major forms of land degradation include soil erosion (which accounts for over 71% of the total degradation), and wind erosion (10%). (risk)
- strategies to manage environmental problems associated with economic growth include the Chipko movement a livelihood protection movement and forest conservation movement which attempts to mitigate against the effects and strategy(ies) which increase resilience and involve adaptation
- the lack of political commitment, lack of a comprehensive environmental policy, poor environmental awareness, functional fragmentation of the public administration system, poor mass media concern, and prevalence of poverty which are some of the major factors responsible for increasing the severity of the problems
- comparison of the success of different measures employed in different environments (place)
- improvements in the use of strategies over time (time scales) and as a result of the international pressure/agreements (globalisation)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command word 'assess' (AO2.1c) requires that candidates weigh up the success of strategies implemented in India to manage one environmental problem associated with economic growth by giving a number of possible explanations / arguments / outcomes and justify which is/are favoured. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the success of strategies implemented in India to manage one environmental problem associated with economic growth that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of economic growth and challenge in India to provide few judgements.

7. Examine the role of government in the location and development of economic activity in China. [30 marks]
AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.3.4
Indicative content

The development of economic activity in China includes the development of manufacturing industries, service and financial industries and agriculture. Rapid economic growth in China has been largely due to the expansion of the manufacturing sector. Likely themes and specialised concepts include:

- since 1979, five special economic zones (SEZs) and 14 open cities have been proclaimed. These offer reduced restrictions on land, labour, wages, taxes and planning regulations to overseas firms, especially those involved in high-technology industries. The result has been the emergence and dominance of economic activity in coastal areas, which have received most of the internal investment as well as having imported capital, technology and entrepreneurial skills, at the expense of the interior. The PRC has established special economic zones in Shenzhen, Zhuhai and Shantou in Guangdong Province, Xiamen in Fujian province and designated the entire province of Hainan a special economic zone (causality)
- between 1949 and the late 1970s manufacturing in China was undertaken almost entirely by state-owned enterprises (SOEs), mainly heavy industries such as oil, chemicals, power, iron and steel. The 1980s focus on increased productivity forced SOEs towards reform. Large SOEs have improved their management and smaller SOEs eventually privatised. Chinese firms have gradually become more Westernised (globalisation)
- during Mao's era, rural industries called town and village enterprises (TVEs) produced heavy goods such as iron, steel, cement, chemical fertiliser and farm tools. After 1978 these enterprises expanded to develop a wider range of businesses. Many Chinese farmers preferred to invest their resources in rural industry rather than agriculture. This encouraged the growth of small businesses run by the most successful peasants. Thus a new entrepreneurial class began to emerge and TVEs have become the backbone of development in rural areas (place)
- although established by a communist government, SEZs were deliberately located far from the centre of political power in Beijing, minimising political influences. More specifically, the original four zones were sited in coastal areas of Guangdong and Fujian that had a long history of contact with the outside world through outmigration, and at the same time were near Hong Kong, Macao and Taiwan (place).The choice of Shenzhen was especially strategic because it is situated near Hong Kong, the key area from which to learn capitalist modes of economic growth (globalisation)
- the growth in economic activity in these locations has been reinforced by high levels of rural-urban migration, infrastructure improvements and the investment policies of TNCs. The result has been the emergence and dominance of economic activity in coastal areas, which have received most internal investment as well as having imported capital, technology and entrepreneurial skills, at the expense of the interior (inequalities)
- the government have been instrumental in implementing the Western China Development project, created in 2000, to help the western provinces to catch up with coastal areas. The main components of the strategy include the development of transport, hydropower plants, energy, and telecommunications, enticement of foreign investment, increased efforts on ecological protection, promotion of education and retention of talent flowing to richer provinces

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command word 'examine' (AO2.1c) requires that candidates consider the role of government in the location and development of economic activity in China in a way that uncovers the assumptions and interrelationships of the issue. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the role of government in the location and development of economic activity in China that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of economic growth and challenge in China to provide few judgements.

8. Assess the success of strategies implemented in China to manage *one* environmental problem associated with economic growth. [22 marks]
AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.3.7
Indicative content

There are a range of environmental problems (risks) associated with economic growth in China.

Likely themes and specialised concepts include:

- environmental problems associated with fossil fuel use: China opened two new coal-fired power stations every 10 days between 2005-8; coal demand doubled from 1990 to 2007 resulting in increased emissions of carbon dioxide, nitrous oxides, acid precipitation (which falls on 30% of China) and smog (causality)
- environmental problems associated with industrial pollution: 90% of urban waterways and lakes are severely polluted and major pollution incidents are common. Nine of the ten most polluted cities in the world are in China
- environmental problems associated with soil erosion: 40 percent of China's territory, or 3,569,200 square kilometres of land, suffers from soil erosion.
- environmental problems associated with deforestation: only 2% of China's forests remain intact and only 0.1% of these surviving forests are properly protected. The rest are threatened by plantations: in Hainan and Yunnan, for example, indigenous trees are felled to make way for fast-growing eucalyptus plantations, which are used to make paper pulp
- environmental problems associated with desertification: up to 400 million people are at risk of desertification in China – the affected area could cover as much as 3.317 million km2 – 34.6 per cent of the total land area. Much of it is happening on the edge of the settled area, which suggests that human activities are largely to blame (causality)
- strategies to manage environmental problems associated with economic growth include the 'Green Wall of China', which was launched in 1978 and aims to increase human-made tree cover from five per cent to 15 per cent of the country's vast landmass. These forests are envisioned to stretch across four million square kilometres of the country's north by the year 2050 (mitigation) (sustainability)
- although the Chinese government has mapped out ambitious environmental initiatives in recent five-year plans, experts say few have been realised
- assessment of the effectiveness and success of the strategy(ies) which increase resilience and mitigate against the effects
- comparison of the success of different measures employed in different environments (place)
- improvements in the use of strategies over time (time scales)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command word 'assess' (AO2.1c) requires that candidates weigh up the success of strategies implemented in China to manage one environmental problem associated with economic growth by giving a number of possible explanations / arguments / outcomes and justify which is/are favoured. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the success of strategies implemented in China to manage one environmental problem associated with economic growth that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of economic growth and challenge in China to provide few judgements.

9. 'Physical factors provide more constraints than opportunities for development'. Discuss with reference to two or more Sub-Saharan African countries. [22 marks]
AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.6.2
Indicative content

There are a range of physical factors influencing development in Sub-Saharan African countries (causality).

Likely themes and specialised concepts include:

- the influence of the resource base of minerals and energy sources on development eg oil in South Sudan, uranium in Niger
- the influence of soils, relief, climate and water availability on development
- the constraining effects of climate variability, droughts and / or floods on development
- the availability of cultivable agricultural land
- neo-colonial influences can lead to instability, 'the resource curse', with China challenging US economic hegemony in some countries such as South Sudan and compromising development (globalisation)
- recurrent natural hazards, particularly drought, constrain development (risk)
- the impact of natural hazards and climate change on water availability and soil erosion operate to constrain development (risk)
- the influence of locational factors eg access to ports or a landlocked location (place)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command word 'discuss' (AO2.1c) requires that candidates offer a considered review that includes a range of arguments with more than one side evident and reach a conclusion about whether pphysical factors provide more constraints than opportunities in two or more Sub-Saharan African countries for development. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about whether physical factors provide more constraints than opportunities in two or more Sub-Saharan African countries for development that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of development in an African context to provide few judgements.

10. Assess the success of strategies implemented in selected Sub-Saharan African countries to address the consequences of desertification. [22 marks]
AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.6.6
Indicative content

Likely themes and specialised concepts include:

- consequences of desertification include physical (water table lowering, rivers and wells dry up, land degradation and vegetation loss) and human (migration, food supply problems, famine, malnutrition and death) (risk)
- strategies to address the consequences of desertification include the development and promotion of good practices in terms of soil and water conservation techniques (stone bunds, magic stones) to mitigate against the effects
- adaptive strategies include the use of drought resistant crops (adaptation)
- assessment of the effectiveness and success of which increase resilience and mitigate against the effects
- comparison of the success of different measures employed in different environments (place)
- improvements in the use of strategies over time (time scales)
- evidence for success by making reference to indicators: indicators covered may include social, environmental and demographic measures of improvement indicative of progress made
- the scale of the strategy(ies), with the monitoring and measurement of the success of small-scale, bottom-up strategies being more effective (scale)
- the longevity of the strategy(ies) (sustainablilty)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command word 'assess' (AO2.1c) requires that candidates weigh up the success of strategies implemented to address the consequences of desertification in at least two Sub-Saharan African countries by giving a number of possible explanations / arguments / outcomes and justify which is/are favoured. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the success of strategies implemented to address the consequences of desertification in at least two Sub-Saharan African countries that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of development in an African context to provide few judgements.

11. 'Global patterns of energy demand are influenced mainly by economic factors.' To what extent do you agree? [22 marks]
AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.4.3
Indicative content

Global patterns of energy demand are influenced by economic, social and technological factors.

Likely themes and specialised concepts include:

- the growing demand for energy, which during the 20th century increased tenfold, with consumption expected to double to around 900 exajoules by 2050
- rising demand is linked to economic growth. This is particularly the case for the NICs and BRICS, where energy for manufacturing is an important driver of growth. Economies such as China's grow at about 10 percent a year. China is known as the 'Workshop of the World' and this exponential growth requires huge quantities of energy. Countries that experience a low level of development need to grow so that large proportions of their populations can rise out of poverty. As people acquire more wealth, more energy is used for appliances and gadgets for cooking, heating, air conditioning and lighting. In an increasingly globalised world, with growing international trade and tourism, the transport of people and goods by air, sea and land has increased the demand for energy enormously (causality) (globalisation)
- in social terms, leisure and social activities very often require energy: underlying all these are needs for transport, cooking, heating, air conditioning and lighting. In emerging economies car ownership becomes an aspiration and is rising rapidly in countries such as China, as people want to commute in comfort, travel to see friends and relatives and to enjoy hobbies and holidays (causality) (globalisation)
- technology has produced equipment that requires energy. Car ownership grows continuously. Growing international trade has led to the transport of goods by air, sea and land. Around the home, washing machines, vacuum cleaners, TVs, computers, games consoles, sound systems and mobile phones have developed. Electronic gadgets are found in almost all activities. The number of appliances and gadgets owned in the world increases daily, all needing energy (causality) (globalisation)
- economic growth as the main driver of the growing demand for energy as there is a strong positive correlation between GDP per capita and energy usage (causality)
- the interdependence of economic, social and technological factors as with a strong economy and increased affluence, people use more energy in their homes and for recreational purposes and a growing economy provides the investment for technological change (interdependence)
- demand reduction policies are increasingly driven by environmental concerns and the risks associated with climate change (mitigation) (sustainability)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command 'to what extent do you agree' (AO2.1c) requires that candidates give possible explanations for and against and justify a viewpoint about the extent to which they agree that global patterns of energy demand are influenced mainly by economic factors. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the extent to which they agree that global patterns of energy demand are influenced mainly by economic factors that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of energy challenges and dilemmas to provide few judgements.

12. 'The technological problems associated with alternative energy sources are greater than the environmental problems associated with fossil fuels'. Discuss.

[22 marks]
AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.4.5
Indicative content

There are a range of environmental problems associated with the extraction, transport and use of fossil fuels and technological problems associated with alternative energy sources.

Likely themes and specialised concepts include:

- 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 (eg 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
- the more electric energy supplied by renewables, the more unstable national grids become as renewables such as wind and solar only produce electricity intermittently and as more renewables come online it becomes more complex to manage fluctuations in the grid
- there are many ways of producing power to meet future demands, but most of the technology needed has yet to be developed. Only the most developed countries have the numbers of educated people, the research facilities and the funding to develop new technologies (inequalities). Many ideas for technological solutions are untested and may prove to be unfeasible or misguided.
- the interdependence of environmental problems and technological problems as new technologies for fossil fuels are being developed, including carbon capture and sequestration and gasification
- linked to the above, the environmental problems associated with fossil fuels, should decrease, therefore the relative importance of the problems may change over time (time scales)
- there are spatial variations in the energy mix of countries which will influence the relative importance of the two categories of problem (place)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command word 'discuss' (AO2.1c) requires that candidates offer a considered review that includes a range of factors with more than one side evident and reach a conclusion about the statement that the technological problems associated with alternative energy sources are greater than the environmental problems associated with fossil fuels. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the statement that the technological problems associated with alternative energy sources are greater than the environmental problems associated with fossil fuels that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of energy challenges and dilemmas to provide few judgements.

13. To what extent can the damaging effects of high-pressure systems be minimised?[22 marks]

AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.5.5
Indicative content

The main characteristics of hazards associated with high-pressure systems and strategies used to minimise the damaging effects of high-pressure systems within either tropical or temperate regions.

Likely themes and specialised concepts include:

- the risks to people associated with high-pressure systems including drought (tropical and temperate regions) and frost and fog (temperate regions)
- damaging effects include: environmental (eg water table, soil–water movement, land degradation and vegetation), demographic (eg migration), economic (eg food supply problems) and social (eg famine and health) in tropical regions (causality)
- damaging effects include: environmental (eg rivers may be used for water supply, reservoirs emptied and HEP production reduced), economic (eg dangers for shipping) and social (eg difficult driving conditions, water rationing) in temperate regions (causality)
- 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, preparedness and emergency plans including the hazard management cycle framework of monitoring, prediction, warning, immediate response and long term planning (mitigation and adaptation)
- 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)
- improvements in the use of measures have improved over time (time scales)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command 'to what extent' (AO2.1c) requires that candidates give possible explanations for and against and justify a viewpoint about the extent to which the damaging effects of high-pressure systems can be minimised. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the extent to which the damaging effects of high-pressure systems can be minimised that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of weather and climate to provide few judgements.

14. 'It is easier to adapt to climate change than to mitigate against it'. To what extent do you agree? [22 marks]
AO1 [9] AO2.1c [11] AO3.3 [2]

Focus: 3.5.7
Indicative content

Likely themes and specialised concepts include:

- mitigation involves reducing the output of greenhouse gases and increasing the size of greenhouse gas sinks. Strategies that mitigate against climate change include: replacing fossil fuel consumption, switching to renewable energy options, implementing transport policies to reduce congestion and air pollution, limiting deforestation, conserving and restoring existing forests, educating people to encourage them to conserve energy (mitigation)
- adaptation involves changing lifestyles to cope with a new environment rather than trying to stop climate change. Adaptive strategies include: relocation of people affected by sea-level rise, developing new technological solutions such as drought-resistant crops, modifying the threat using some form of protection eg a flood barrier, changing the use of land eg different crops grown in response to changing climate or developing hill walking holidays in former ski resorts (adaptation)
- low-income countries have less scope for mitigation as they are less likely to be heavy emitters of greenhouse gases (inequalities)
- low-income countries often depend on the support of high-income countries for support with coping with climate change as required by the Copenhagen Accord (interdependence)
- the heavy emitters have greater resources to cope with climate change through mitigation and adaptation (resilience)
- effective adaptation and mitigation strategies are tailored to local and regional needs and circumstances (place)

Credit other valid approaches.

Marking guidance (refer to the assessment grid at the start of Section B)

The command 'to what extent do you agree' (AO2.1c) requires that candidates give possible explanations for and against and justify a viewpoint about the extent to which they agree that it is easier to adapt to climate change than to mitigate against it. At the upper end, answers that score highly should show application of knowledge and understanding by appraising and judging utility and validity, synthesising information, and come to rational conclusions about the extent to which they agree that it is easier to adapt to climate change than to mitigate against it that are evidence based. Responses in the middle range should show some application of knowledge and understanding to provide some judgements and synthesis, prior to drawing partially supported conclusions. Lower end responses provide very limited application of knowledge and understanding of weather and climate to provide few judgements.