

Markscheme

May 2025

Geography

Higher level and standard level

Paper 1

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Paper 1 markbands

These markbands are to be used for paper 1 at both standard level and higher level.

Mark s	Level descriptor		
	AO1: Knowledge and understanding of specified content AO2: Application and analysis of knowledge and understanding	AO3: Synthesis and evaluation	AO4: Selection, use and application of a variety of appropriate skills and techniques
0	The work does not reach a standard described by the descriptors below.		
1–2	The response is too brief, lists unconnected information, is not focused on the question and lacks structure. - The response is very brief or descriptive, listing a series of unconnected comments or largely irrelevant information. The knowledge and understanding presented is very general with large gaps or errors in interpretation. Examples or case studies are not included or only listed. - There is no evidence of analysis. - Terminology is missing, not defined, irrelevant or used incorrectly.		
		No evidence of evaluation or conclusion is expected at this level.	- Information presented is not grouped logically (in paragraphs or sections). - Maps, graphs or diagrams are not included, are irrelevant or difficult to decipher (only if appropriate to the question).
3–4	The response is too general, lacks detail, is not focused on the question and is largely unstructured. - The response is very general. The knowledge and understanding presented outlines examples, statistics, and facts that are both relevant and irrelevant. Links to the question are listed. - The argument or analysis presented is not relevant to the question. - Basic terminology is defined and used but with errors in understanding or used inconsistently.		
		- If appropriate to the question, the conclusion is irrelevant. - There is no evidence of critical evaluation of evidence (examples, statistics and case studies).	- Most of the information is not grouped logically (in paragraphs or sections). - Maps, graphs or diagrams included lack detail, are incorrectly or only partially interpreted without explicit connections to the question (only if appropriate to the question).
5–6	The response partially addresses the question, but with a narrow argument, an unsubstantiated conclusion, and limited evaluation. The response describes relevant supporting evidence		
		If appropriate to the question	The response describes relevant supporting

	(information, examples, case studies et cetera), outlining appropriate link(s) to the question. • The argument or analysis partially addresses the question or elaborates one point repeatedly. • Relevant terminology is defined and used with only minor errors in understanding or is used inconsistently.	the conclusion is irrelevant. • There is no evidence of critical evaluation of evidence (examples, statistics and case studies).	evidence (information, examples, case studies et cetera), outlining appropriate link(s) to the question. • The argument or analysis partially addresses the question or elaborates one point repeatedly. • Relevant terminology is defined and used with only minor errors in understanding or is used inconsistently.
7–8	The response addresses the whole question, the analysis is evaluated and the conclusion is relevant but lacks balance. • The response describes relevant supporting evidence correctly (information, examples and case studies) that covers all the main points of the question, describing appropriate links to the question. • The argument or analysis is clear and relevant to the question but one-sided or unbalanced. • Complex terminology is defined and used correctly but not consistently.		
	• If appropriate to the question, the conclusion is relevant to the question, aligned with the evidence but unbalanced. • Other perspectives on evidence (examples, statistics and case studies) and/or strengths and weaknesses of evidence are described.	• Logically related information is grouped together (in sections) consistently. • Maps, graphs or diagrams included contribute to/support the argument or analysis (only if appropriate to the question).	
9–10	The response is in-depth and question-specific (topic and command term); analysis and conclusion are justified through well-developed evaluation of evidence and perspectives. • The response explains correct and relevant examples, statistics and details that are integrated in the response, explaining the appropriate link to the question. • The argument or analysis is balanced, presenting evidence that is discussed, explaining complexity, exceptions and comparisons.		
	• If appropriate to the question, the conclusion is relevant to the question, balanced and aligned with the evidence. • Evaluation includes a systematic and detailed presentation of	• Response is logically structured with discussion (and if appropriate to the question, a conclusion) focusing on the argument or points made, making it easy to follow. • Maps, graphs or diagrams are annotated following conventions, and their relevance is explained and support the argument or	

	• Complex and relevant terminology is used correctly throughout the response.	ideas, cause and effect relations, other perspectives; strengths and weaknesses of evidence are discussed; (if appropriate) includes justification of the argument and conclusion.	analysis (only if appropriate to the question).
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Option A — Freshwater

1. (a) (i) State which country's water availability has decreased the most between 1990 and 2025. [1]
Côte D'Ivoire

- (a) (ii) Identify which country's water availability decreased by approximately 1500 m³/person/year between 1990 and 2025. [1]
Burkina Faso

- (b) Outline **one** possible **physical** cause for water scarcity in regions such as these. [2]
Award [1] for the cause and [1] for explanation / development
 For example, low rainfall / drought [1] due to seasonal climate changes [1]
 Other causes of water scarcity include
 - Lower water table / lack of aquifer
 - Rain shadow
 - El Nino / La Niña
 - Continentality
 - Cold ocean currents
 - Physical induced climate change

- (c) Explain **two** reasons for the growing human pressure on lakes. [3+3]
In each case, award [1] for the reason and up to [2] for development / explanation / exemplification.
Maximum [2] for each reason if no explicit link to an increasing / growing reason.

 For example, increased recreational use [1], leading to the likelihood of fuel spills from boats / pollution [1] causing harm to wildlife / biodiversity loss [1]
 For example, increased agriculture [1] and possible run-off of fertilisers into the water [1] causing algae blooms / eutrophication / decrease in water quality [1]
 Other possible human reasons include:
 - Economic growth – settlement, infrastructure, industry
 - Population growth / migration
 - Industrial pollution
 - Overfishing
 - Over extraction of water (Irrigation / water supply)
 - Introduction of alien species

2. (a) Examine the role of the processes of river erosion and deposition in the formation of meanders and floodplains. [10]

Marks should be allocated according to the markbands.

Processes of river erosion and deposition play crucial roles in the formation of a variety of river landforms, including meanders and floodplains. The relative importance of these processes varies over time, both short and long term, and spatially in different parts of the river system. Variations in discharge and river velocity will affect the relative importance of these processes. Erosional and depositional processes are inter-dependent, both with each other and the process of transportation.

Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

- Both erosion and deposition are important in the formation of meanders, with erosion on the outside curve, with higher velocities, and deposition on the inside bend.
- Over time, the meander will move laterally across a floodplain, depositing sediments and contributing to the formation of the floodplain.
- Increases in discharge and velocity may result in meander cut-offs and ox-bow lakes.
- Floodplains are also formed by over-bank river deposition in times of high discharge. Coarser sediments may be deposited first, forming levees and building the river up above the floodplain.
- Changes in river discharge, velocity and energy will affect the balance between erosion and deposition over time. These may be caused by factors such as rainfall and storms or snowmelt.
- Although meanders are found throughout a river's course, floodplains and well-developed meander systems are usually features of the lower course of rivers, where discharges are greater, and river loads higher.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) that examines the roles of erosional and depositional processes in the formation of meanders and floodplains, and the importance of factors such as river discharge and velocity. The relative importance of erosion and deposition varies over different time scales (seasonal or short- and long-term) and space (in different parts of the river system).

For **5–6 marks**,

expect some weakly-evidenced outlining of at least one process in the formation of meanders and/ or floodplains.

For **7–8 marks**, expect a structured account that includes:

- Either an evidenced examination of the roles of erosional and depositional processes in the formation of meanders and floodplains
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

For **9–10 marks**,

expect both of these traits.

2. (b) Examine the role of local communities in managing access to clean and sustainable water supplies. [10]

Marks should be allocated according to the markbands.

Access to clean, reliable freshwater supplies is essential for human health and well-being. However, this varies in different economic development contexts, and is under pressure from increasing population and urbanisation, together with lack of effective infrastructure to supply clean water. The role of local communities in managing water supplies may vary between urban and rural areas, and between countries at different levels of economic development. The increasing, and possibly conflicting, demands for freshwater from domestic, agricultural and industrial purposes must also be managed in a sustainable way.

Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

- Access to clean, affordable and sustainable freshwater supply is essential for human health and well-being, and for economic and social development.
- Local communities may play a significant role in the supply and management of freshwater resources, especially in rural areas in less economically developed countries which often lack infrastructure.
- It is important to strengthen the participation of stakeholders within local communities to improve water management.
- Local communities may be involved in the construction of wells, bore-holes, irrigation channels, and small reservoirs to provide water supplies
- They may be involved in resolving the competing demands on fresh water from domestic consumption, agriculture and industry, to ensure sustainable water use and rates of consumption.
- Local communities may be important in education, raising awareness and the monitoring of pollution of rivers and lakes, from sewage and agricultural run-off, ensuring high water quality.
- Local communities often act as influential pressure groups, at local, national and international scales.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) that examines the participation and power of different stakeholders within local communities in varying economic and social contexts. Ensuring access to clean and sustainable water supplies, possibly over different time and spatial scales. Another approach might be to critically evaluate the importance of interactions between different scales/types of management using a sustainability framework.

For 5–6 marks,
expect some weakly-evidenced outlining of at least one way local communities might manage water supplies.

For 7–8 marks, expect a structured account that includes:

- Either an evidenced examination of the role of local communities in managing access to clean, sustainable water supplies
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

For 9–10 marks,
expect both of these traits.

Option B — Oceans and coastal margins

3. (a) (i) Identify the area with the greatest percentage of destroyed coral reefs. [1]
Indian Ocean

- (a) (ii) Estimate the percentage of coral reefs destroyed in the Caribbean and Atlantic Ocean. [1]
Accept 20-24%

- (b) Outline **one** human activity responsible for the decline in coral reefs. [2]

Award [1] for the activity and [1] for development / explanation

For example, tourists snorkelling [1] damage coral by touching or standing on it [1]

Other activities include

- Overfishing / dynamite fishing / bottom trawling
- Coral harvesting / quarrying
- Pollution from rubbish, drainage runoff, sewage pipes, oil spills
- Coastal development
- Human induced climate change

- (c) (i) Explain **one climatic** impact of a La Niña event. [3]

Award [1] for a valid climatic impact and up to [2] for development / explanation/ exact locational example

NB. The climatic impacts of La Niña are various and differ according to global location.

For example, may lead to tropical storms [1] caused by warm waters blown in from the oceans [1] resulting in heavy rainfall / flooding / landslides [1]

For example, La Niña may cause a drought [1] which leads to crop failure [1] in parts of central South America [1]

Other impacts include:

- Intensified walker circulation
- Altered jet stream
- Increased/decreased rainfall
- Increased/decreased ocean temperatures
- Global cooling

- (c) (ii) Explain **one economic** impact of a La Niña event. [3]

Award [1] for a valid economic impact and up to [2] for development / explanation / exact locational example

For example, increased fishing profits in western South America [1] fish stocks increase [1] due to upwelling of cold, nutrient rich waters [1]

Other economic impacts include:

- Increased agricultural yields due to higher rainfall
- Decreased agricultural yields caused by drought.
- Property and infrastructure destroyed - increased wildfires
- Agriculture destroyed e.g. floods – destroying agricultural growth
- Damage to infrastructure & settlement / enforced evacuations

NB. Do not double credit the same climatic impact but can credit its economic impact

4. (a) Evaluate the effectiveness of strategies to manage oil and plastic waste pollution in the oceans. [10]

Marks should be allocated according to the markbands.

Strategies for managing the oceans as global commons are increasingly important, including the exploitation of oceanic resources, and the pollution of oceans with oil and plastic waste causing significant environmental, social, and economic damage. Measures to manage and possibly reduce waste pollution involve local and global strategies which include a variety of stakeholders at various scales. Different priorities and interests between stakeholders may make it difficult to develop effective strategies of waste reduction.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Managing pollution includes reducing the incidence and amount of pollution, as well as clean-up and response strategies
- Most plastic waste originates from countries around the oceans, including discharges from rivers. Oil pollution may originate from sources within the oceans, such as from oil pipelines, production platforms and tankers, and from coastal communities.
- Strategies to manage pollution involve many stakeholders at different scales (local, national and international) from countries of contrasting economic, political and social interests and priorities.
- The ocean is a commons as most is outside national interest and jurisdiction
- Reducing plastic pollution includes national legislation concerning dumping of waste, monitoring of river pollution, and reducing consumption of plastics. Reducing oil pollution involves international political agreements and the co-operation of TNCs. Strategies such as improving ship design may reduce incidences of pollution, but tankers are registered and operated from many different countries, between whom agreements may be difficult to achieve
- Clean-up strategies for oil pollution include skimming and use of chemical dispersants, which may cause additional pollution.
- Plastic pollution may have long-term impacts. It is very difficult to remove and involves international co-operation. Plastic waste may pollute ocean ecosystems for thousands of years, and may enter the food chain

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) which examines the effectiveness of strategies at varying scales, and the roles and power of stakeholders in different places from local to international. It may be more difficult to tackle some forms of pollution than others (e.g. plastics and oil) because of different spatial scales of the problem. It may be difficult to enforce international strategies due to lack of agreements between stakeholders.

For 5–6 marks,

expect some weakly-evidenced outlining of one or more management strategies aimed at reducing either oil and/or plastic pollution.

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of the effectiveness of strategies for managing oil and plastic pollution
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts of the effectiveness of management strategies.

For 9–10 marks, expect both of these traits.

4. (b) Examine why conflicts between commercial development and conservation measures at coastlines may be difficult to resolve. **[10]**

Marks should be allocated according to the markbands.

Coastlines offer considerable potential for commercial development, including tourism, industry and housing, which are often in conflict with the pressures for environmental conservation. The varying interests of different stakeholders: those in favour of commercial development, and environmentalists concerned with conserving outstanding landscapes and ecosystems, may be difficult to resolve. Conflicts may be at different scales, from local to international and the power of different stakeholders will vary between different areas.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Coastlines are under increasing pressure from various forms of commercial development (tourism, industry, housing, fishing, shrimp farming, transport).
- Lack of physical space and intense commercial development on many coastlines increases the potential for conflict with conservation.
These areas may also be of outstanding natural beauty or include important and diverse ecosystems (such as sand dunes, wetlands, coral reefs and mangroves) in need of protection and conservation, leading to conflict with development.
- Different stakeholders (local, national and international) will have varying, and sometimes conflicting, priorities and power over land uses on coastlines.
- Resolution requires decision-making, planning controls, monitoring and effective legislation: these will vary in effectiveness between different regions and nations.
- It is difficult to put a monetary value on the natural environment, compared with commercial interests and employment opportunities.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) which examines conflicts between various stakeholders, their differing power and perspectives, and the difficulties in resolving their varying demands. Possibilities of resolving the conflicts might be considered, in context of different types of place and scale.

For 5–6 marks,

expect some weakly-evidenced outlining of at least one conflict arising from commercial development and conservation at coastlines

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of two or more reasons why it is difficult to manage the conflicts between commercial development and conservation at coastlines
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, examining the reasons why conflict management is difficult.

For 9–10 marks, expect both of these traits.

Option C — Extreme environments

5. (a) (i) Identify the main land use in the village of Widou Thiengoly. [1]
Reforestation (accept reforestation and fodder)
- (a) (ii) State the direction from the communal garden in Tessekere to the communal garden in Koyli Alpha. [1]
SW / WSW
- (b) Outline **one** way in which water might be obtained from the water points. [2]
Award [1] for the way and [1] for development / explanation
For example, drilling tube wells / pipes [1] in order to access underground aquifers / bring water to the surface [1]
Other ways include:
 - Small scale water retention techniques, for example, stone bunds
 - Using solar power to generate energy to the withdrawal of water
 - Stand pipe in the village with water being trucked in from outside the area / collected in containers
- (c) Explain how increasing tourism in hot, arid environments may lead to:
- (i) **one** positive economic impact; [3]
Award [1] for the positive economic impact and up to [2] for development / explanation / exemplification.
For example, income increased as visitors spend money locally [1] by hiring guides, camels, accommodation, desert tours, transport, buying tickets to sights [1] therefore increasing the local population's standard of living [1]
Other positive impacts include:
 - Money earned can go to conservation / restoration of damaged areas
 - Money earned can go to the preservation of heritage e.g. artefacts, customs
 - Increasing GDP in a country via tourist tax / spending / employment*NB. Maximum [2] if no reference made to an arid environment*
- (ii) **one** negative environmental impact. [3]
Award [1] for the negative environmental impact and up to [2] for development / explanation / exemplification.
For example, erosion / degradation of the land by off road vehicles [1] destroys the vegetation that binds the soil [1] which may cause desertification [1]
Other negative impacts include
 - Over extraction of water / water usage
 - Waste disposal
 - Biodiversity affected*NB. Maximum [2] if no reference made to an arid environment.*

6. (a) Examine the role of freeze-thaw and solifluction in the formation of periglacial landscape features. [10]

Marks should be allocated according to the markbands.

Periglacial activity is characteristic in high latitude and mountain regions, and on the margins of glaciers and ice sheets. Permanently frozen ground, permafrost, is overlain by an active zone where repeated freezing and thawing, and solifluction are important processes. Freeze thaw cycles create a variety of landscape features, while solifluction is a form of mass movement transporting sediments downslope. Other processes include nivation, frost heave, aeolian and fluvial action. Periglacial landscape features include patterned ground, thermokarst, solifluction terraces and lobes, and pingos.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Freeze thaw is an important weathering process, forming shattered rock faces and scree deposits and extensive sheets of shattered rock (blockfields / felsenmeer).
- Freeze thaw cycles are also important in the formation of patterned ground - stone circles and polygons - which may be modified by solifluction and increasing gradient into stone garlands and stripes, downslope beneath rocky outcrops.
- Thermokarst and ice wedges are also formed by freeze thaw processes.
- Solifluction occurs in the active layer, above the permafrost, in warmer months transporting material downslope, smoothing landscapes and forming characteristic terraces and lobes.
- Other periglacial processes include ice segregation and the formation of ice lenses and pingos. Aeolian and fluvial processes are also important in periglacial environments.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) which examines the relative importance of freeze thaw and solifluction processes in the formation of periglacial landscapes at different scales and places. Consideration may also be given to changes over time and the importance of past periglacial activities and formation of relict landscapes.

For 5–6 marks,

expect some weakly-evidenced outlining of one way freeze-thaw and/or solifluction processes form a periglacial landscape feature

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of the roles of freeze thaw and solifluction in the formation of periglacial landscape features
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts, which may include the role of other periglacial processes or other factors in the formation of periglacial landscapes.

For 9–10 marks,

expect both of these traits

6. (b) Examine the opportunities **and** challenges of using new technologies for sustainable development in **one or more** extreme environments. [10]

Marks should be allocated according to the markbands.

Extreme environments face considerable challenges to economic and social development. These include remoteness, isolation, low population densities, poverty and lack of basic infrastructure. Communities may also experience lack of basic healthcare and education, and access to freshwater supplies. New technologies bring opportunities for sustainable development of resources and increasing living standards; yet there are also significant challenges to their introduction and implementation. Some new technologies demand high inputs of energy and resources and cannot be considered sustainable.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Extreme environments face considerable physical, economic and social challenges to development: isolation, remoteness, poverty, poor infrastructure, and lack of access to freshwater and energy
- Key aspects of sustainable economic and social development include affordable and long-term access to water, energy, communications, education and health
- New technologies that might aid sustainable economic and social development include - solar power, desalinisation, the use of drones, internet/mobile phones/telecommunications
- Solar and wind power is renewable energy; give access to power for domestic and agricultural purposes – (e.g. pumps for access to groundwater, and irrigation opportunities)
- Internet/mobile phones/telecommunications – access to education, healthcare markets. Drones may be used to transport essential supplies, such as medical aid
- Desalinisation plants give increased access to freshwater – but may be energy intensive and not always sustainable
- Challenges to introduction and use of new technologies include poverty, lack of political will, and other barriers to diffusion and adoption of new ideas.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) which examines the opportunities and challenges of new technologies in different places and scales (local communities to regional and national), and the power of different stakeholders (local communities, national and international). Another approach might be to examine contrasting places and their varying prospects for sustainable development (economy, society, environment), perhaps at different scales or in varying geographic (arid versus cold) or economic (high income versus low income) contexts.

For 5–6 marks,

expect some weakly-evidenced outlining of at least one new technology and its use for sustainable development in one or more extreme environments

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of opportunities and challenges of the use of new technologies for sustainable development in one or more extreme environments
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts of the opportunities and challenges for sustainable development.

For 9–10 marks,

expect both of these traits

Option D — Geophysical hazards

7. (a) (i) Identify **one** effect of liquefaction on this settlement. [1]

Buildings sink / tilt / cracks appear on buildings and roads / cars move / roads destroyed

- (a) (ii) Identify **one** effect of liquefaction on the physical geography of the area. [1]

Pores in sand or soil open up / landslips / sinking land / rising water table / coastal erosion / trees uprooted / unstable land

Do not accept uneven land / soil erosion.

- (b) Outline **one** adaptation strategy that could be used where liquefaction occurs. [2]

Award [1] for a valid strategy and [1] for development / explanation / exemplification

For example, land use zoning [1] to include non-weight bearing users like dog parks, golf courses, bike tracks, skate parks [1]

For example, adopting technology by building liquefaction resistant buildings [1] by placing foundation mats of concrete to stop the building sinking / having reinforced piles to support the building's weight [1]

Other possibilities include:

- Insurance
- Using mapping to identify high risk liquefaction areas
- Ground water pumped out

- (c) Explain how the hazard risk from volcanic eruptions might be affected by:

- (i) **one demographic** characteristic of the population; [3]

Award [1] for a demographic characteristic [1] and up to [2] for further development/exemplification.

For example, the older generation [1] may have always lived near to the volcano due to economic or cultural reasons [1] and see no reason to leave the area / have limited mobility to evacuate safely [1]

Other demographic characteristics include:

- Women (gender) / very young / old are more likely to be at home.
- Older persons may have greater perception / knowledge and are prepared with survival kits or accept the inevitability
- Migrants and second language barriers

NB. Population density and population growth are not demographic characteristics

- (ii) **one economic** characteristic of the population. [3]

*Award **[1]** for an economic characteristic **[1]** and up to **[2]** for further development/exemplification.*

For example, level of wealth **[1]** people with less wealth may live in areas without proper land use zoning **[1]** which means they may live closer to the volcano and high-risk areas **[1]**

Other economic characteristics include:

- Reliance on the volcano for livelihoods (soil / tourist spot)
- Access to technology
- Infrastructure
- Pre-event planning / preparedness
- Insurance

8. (a) Examine the relationship between plate margin movements and the characteristics and distribution of earthquakes. [10]

Marks should be allocated according to the markbands.

Earthquake activity is caused by geophysical processes operating at plate margins; by friction between different plates as they interact with each other. Characteristics include depth, frequency, wave types and magnitude. These are related to different types of movement at plate margins – constructive, destructive or conservative/transform. The distribution of earthquakes is closely linked to plate margins. They also occur intraplate due to natural causes or human triggers – dam building, mining and resource extraction.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- The distribution of earthquake activity is closely linked to plate margins. Different types of plate margin (constructive, destructive and conservative) experience contrasting types of earthquake activity. This is related to different processes operating at plate margins
- Contrasting processes operating at destructive, constructive and conservative (transform) plate margins result in different earthquake characteristics, including magnitude, depth of focus and frequency.
- Deep-focus earthquakes of high magnitude and low frequency are associated with friction between plates at destructive margins. Here, denser oceanic plates thrust under the lighter continental plates, forming ocean trenches and volcanic activity. Subduction may also occur between two margins of oceanic crust. Subduction involves shallow earthquakes as well as deep focus, and these may cause more damage.
- Constructive margins occur when oceanic plates move apart due to up-welling magma, forming oceanic ridges, and volcanoes. These margins are usually associated with shallow-focus earthquakes of high frequency and low magnitude.
- At conservative (transform) plate margins two plates slide past each other. The sudden release of pressure when frictions between the plates is overcome may result in damaging high magnitude, shallow focus earthquakes.
- Earthquakes may also occur away from plate margins; for example, due to human activity such as explosions, mining, ground subsidence, and intraplate earthquakes along ancient faults or rift zones.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) which examines the relationship between the distribution and characteristics of earthquakes, and geophysical processes at contrasting plate margins in different places.

For 5–6 marks,

expect some weakly-evidenced outlining of at least one earthquake characteristic and/or distribution, related to plate margins.

For 7–8 marks, expect a structured account that includes:

- Either an evidenced explanation of the relationship between plate margins and the characteristics and distribution of earthquake activity
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspective.

For 9–10 marks, expect both of these traits

8. (b) Evaluate the effectiveness of pre-event management strategies in reducing human vulnerability to earthquake hazards. [10]

Marks should be allocated according to the markbands.

Earthquakes cause considerable loss of life, injury, damage to property and economic impacts. An understanding of geophysical processes, the distribution and characteristics of earthquakes will assist in measures designed to reduce vulnerability. Pre-event strategies to reduce risk and vulnerability include event prediction, hazard mapping, construction of resilient buildings and infrastructure, and education and awareness for vulnerable populations. The effectiveness of management strategies will vary between places and communities with different economic, political and social characteristics.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Knowledge of the distribution, frequency and characteristics of past earthquake activity is important in planning to reduce future vulnerability. The analysis and monitoring of earthquake activity makes possible prediction of timing and strength of future events.
- Prediction of earthquakes is very unreliable
- Hazard risk mapping; land use zoning of hazard prone areas.
- Building design and infrastructure to withstands effects of earthquakes and minimise risk of collapse and fracture.
- Preparation for secondary hazards, e.g. tsunami defences, landslides, liquefaction.
- Education, drills, warning systems and evacuation plans. Adequate emergency services, rescue plans and hospitals to reduce injury and loss of life
- Effectiveness of strategies will vary between different places, economic and social development.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement which examines the success and effectiveness of strategies in different places, and the roles and power of different stakeholders. Another approach might be to compare effectiveness in different places at varying levels of economic and social development, or how strategies may vary over time.

For 5–6 marks,

expect some weakly-evidenced outlining of at least one pre-event management strategy that reduces human vulnerability.

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of the effectiveness of different pre-event management strategies in reducing human vulnerability
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

For 9–10 marks,

expect both of these traits.

Option E — Leisure, tourism and sport

9. (a) (i) State the latitude of the hotel at Phunki Tenga (point **A**). [1]
27° 50'
- (a) (ii) State the altitude gain, in metres, walking from the spot height near Phunki Tenga (point **A**) to the spot height near Pangboche (point **B**). [1]
680 m
- (b) Outline **one** possible human problem caused by the large number of hotels in this area. [2]

Award [1] for the problem and [1] for explanation / development

For example, too many visitors attracted to the area / overcrowding at peak times [1]
leading to local deforestation which takes place to provide building materials / heating/
hot showers [1]

Other human problems include:

- Noise and parties in the lodges
- Depletion of local water sources due to over demand for showers
- Disposal of waste / sewage / rubbish from hotels
- Disruption of cultural practises in the temples / monasteries

NB. Do not accept litter / rubbish or any other possible problem that is not directly linked to the provision of hotels / lodges.

- (c) (i) Explain **one political** reason for the growing importance of the Paralympic Games. [3]

Award [1] for a political reason and up to [2] for explanation / development / exemplification

For example, a 2001 charter agreement / international agreement [1] that the Olympic Games must also have a Paralympian games [1] meant that deep rooted beliefs regarding disabilities were challenged [1]

For example, government funding for the London 2012 Paralympics [1] had a significant impact on perception [1] as one in three UK adults changing their attitude towards those with impairment after the event [1]

Other political reasons

- From 2022 government funding for some countries changed so that medal winners received the same financial rewards as Olympians
- Influence of pressure groups / sponsorship / agreements

- (c) (ii) Explain **one cultural** reason for the growing importance of the Paralympic Games. [3]

Award [1] for a cultural reason and up to [2] for explanation / development / exemplification

For example, disabled athletes are increasingly being recognised as role models [1] due to their ability to overcome adversity [1], so more countries are giving financial support for athletes to attend Paralympics [1]

Other cultural reasons include:

- Social inclusion
- Greater acceptance / human rights
- Media coverage and sponsorship

10. (a) Examine the role of movie location and/or heritage tourism as part of a niche national tourism strategy. [10]

Marks should be allocated according to the markbands.

Movie and heritage tourism are both types of niche tourism, focussed on the specific interests of a relatively small group of people. Niche tourism is one of the fastest growing tourism sectors, with a global sphere of influence. Generally small in scale and often tailored to the specific needs of a small group, it contrasts with mass tourism and package holidays. And in some cases, may be relatively short-lived. The growth and opportunities afforded by niche tourism contribute to its importance as a tourism strategy.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Niche tourism is focussed on the needs and interests of individuals, and generally occurs in small groups, in contrast to mass tourism.
- Rapidly growing tourism sector with global sphere of influence. Examples include heritage tourism and movie location tourism.
- Provides opportunities for growth of tourism, and opportunities for employment and economic development in specific local areas, or remote places with little else to attract visitors. It may also bring benefits to national economies through increased GDP and international reputation.
- Although often small in scale, niche tourism is increasingly being organised by TNCs and large travel companies – possibly reducing the benefits to stakeholders in local destination areas.
- Rapid growth of niche tourism may also result in overcrowding and environmental damage in destination hotspots, reducing their former attraction.
- Niche tourism may be short lived, as popular trends change.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement which examines the increasing role and importance of tourism as a national tourism strategy in different places and scales. The varying power of different stakeholders (local communities, national and international), which may change over time, should also be considered.

For 5–6 marks,

expect some weakly-evidenced outlining of at least one role of movie location and/or heritage tourism as part of a niche national tourism strategy.

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of the role of movie location and/or heritage tourism as part of a of niche national tourism strategy
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

For 9–10 marks, expect both of these traits.

10. (b) Examine the relative importance of human **and** physical factors in the growth of tourism hotspots. [10]

Marks should be allocated according to the markbands.

Tourism hotspots are characterised by high concentrations of tourists and experience high levels of tourist activity, occurring in both rural and urban areas. They include areas of outstanding natural beauty, coastal areas with attractive sandy beaches, historic urban areas with architectural heritage, large theme parks and leisure centres. Physical factors include the attractions of the natural landscape, while human factors include human-made features, attractions and services. Overcrowding by tourists at hotspots may lead to environmental degradation, pollution and negative economic and social impacts on local communities. Tourism needs to be carefully managed to overcome the challenges posed by large tourist numbers and over-crowding.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Tourism hotspots occur in both urban and rural areas, at a variety of scales. They are characterised by a high concentration of tourists and related activities, which may vary seasonally and diurnally.
- Both primary and secondary resources are the focus of tourism hotspots, including areas of outstanding beauty, wide sandy beaches, historic urban centres and theme parks.
- Human factors include:
 - Accessibility and transportation for large tourist numbers (airports, road and rail, and seaports)
 - The role of TNCs and travel companies; advertising and the media; cheap package holidays
 - Government policy, focussing and encouraging economic development in certain areas
 - Safety and political stability.
- Physical factors include outstanding scenery, climate, geographical features and degree of isolation.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) which examines the relative importance of human and physical factors in different places, and scales. The power of different stakeholders, and the changing nature of hotspots and tourism activity over time might also be considered.

For 5–6 marks,

expect some weakly-evidenced outlining of the importance of at least one human and/or physical factor in the growth of tourism hotspots.

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of the relative importance of human and physical factors in the growth of tourism hotspots
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

For 9–10 marks,

expect both of these traits.

Option F — Food and health

11. (a) (i) State the type of food production that is found in all three categories. [1]
City skyscraper farms

- (a) (ii) Identify the categories in which rooftop greenhouses are found. [1]
Indoor and urban (must have both)

- (b) Outline **one** disadvantage of vertical farming for farmers. [2]

Award [1] for a disadvantage, and [1] for explanation / development

For example, high energy demand [1] needed for the artificial lighting / heating in order to grow plants indoors [1]

Other disadvantages include:

- Expensive initial costs
- Only a limited number of crops can be grown economically.
- Cannot replace the farming of tall field crops e.g. cereal crops
- Requires specialised equipment
- Requires high level of skill and technological know-how – high labour costs
- Dependency on technology working properly / access to national grid / electricity
- Job loss due to mechanisation

- (c) (i) Explain how **one physical** factor can lead to a change in food **production** over time. [3]

Award [1] for the physical factor and up to [2] for development / explanation / exemplification

For example, global climate change leading to an area becoming warmer / drier / wetter / colder [1] means different crops can be grown / yields decrease [1] for example, vineyards now able to be cultivated in Southern England. [1]

Other physical factors include:

- Flooding / prolonged drought
- Change in soil type e.g. volcanic eruptions
- Tsunami / volcanic eruption covers agricultural land
- Pests and diseases
- Soil erosion
- New land areas become available

- (c) (ii) Explain how **one human** factor can lead to a change in food **consumption** over time. [3]

Award [1] for the human factor and up to [2] for development / explanation / exemplification.

For example, media advertisements / influencers promoting / social media for a particular food type [1] may lead to a switch to that food type [1] as it is considered a healthy alternative [1]

Other factors include:

- Amount of land available for food production
- Changing availability of certain foodstuffs / increased costs.
- Political influences / health initiatives
- Free or Fair trade / Food Aid
- Religious changes
- Migration and consequent cultural changes in the area including celebrations, festivals.
- Globalizing of fast food e.g. McDonalds
- Changing wealth / economic growth
- Technology – lab grown meat/GM crops
- Outbreak of civil wars
- Population growth / decline

NB. Consumption can refer to type or amount of food.

12. (a) Examine the relative importance of different geographic factors contributing to the diffusion of **one or more** vector-borne diseases. [10]

Marks should be allocated according to the markbands.

Vector-borne diseases include malaria, dengue fever, Lyme disease, Zika and West Nile fever. These are transmitted by various blood-sucking insects, including mainly mosquitoes and ticks. The incidence of these diseases is mainly in tropical and sub-tropical areas, and they disproportionately affect the poorest populations, and those under the age of 5 years. The diffusion of these diseases is influenced by the interaction of different physical, economic, social, demographic and political factors, which vary over time and space.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Physical factors affecting diffusion include climate (tropical), presence of stagnant water bodies, and altitude (upland areas are too cool for mosquitoes to thrive)
- Human factors include poverty (poorer people are mostly affected), population density and age structure, urban and rural distributions
- Diffusion may increase due to travel (tourism and trade) and migration
- Barriers which might serve to limit the diffusion include: health checks, medication, vaccinations, bed nets. Also, drainage of stagnant water, and spraying.
- Improved education and healthcare to limit the spread of disease.
- The effectiveness of preventative measures depends on relative wealth and poverty and government initiatives
- Over time, the diffusion of disease might be modified by climate change, war, research and understanding of the disease, technological developments such as vaccinations.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) that examines the complex interaction between factors affecting the diffusion of the disease, between places and time scales, and the relative power of stakeholders, local, national, and international. The spatial diffusion of disease is changing due to globalization and climate change.

For 5–6 marks,

expect some weakly-evidenced outlining of one or more factors affecting the diffusion of vector borne disease(s)

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of the relative importance of a variety of geographic factors affecting the diffusion of vector borne disease(s)
- Or an ongoing evaluation (or discursive conclusion) grounded in geographical concepts and/or perspectives.

For 9–10 marks,

expect both of these traits.

NB. Maximum [4] if the disease is not vector borne.

12. (b) Evaluate possible solutions to the problem of food insecurity. [10]

Marks should be allocated according to the markbands.

Food insecurity refers to the economic, social and political conditions that limit consistent access to safe, affordable and nutritious food for an active and healthy life. The main causes of food insecurity include low agricultural productivity, poor communications and trade, conflict and war, poverty, and low economic activity. Food insecurity mainly affects poorer people in low-income countries but also disadvantaged people in higher income countries. Tackling food insecurity is complex, and includes increasing food production, reducing poverty and raising income levels, increased trade, reducing political instability, and reducing waste. Also important are the roles of food banks and free school meals.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Food insecurity mainly affects people living in low-income countries, but also poorer people in high income countries; it occurs between and within different countries
- There is a need for understanding the causes, distribution, and scale of the problem. The causes are complex – physical, economic, political and social – and solutions are challenging, involving local, national and international stakeholders.
- Solutions to food insecurity include reducing food waste; improving agricultural productivity and food production; raising incomes and reducing poverty to make food more affordable; increasing trade and communications; reducing conflict, war and strife, and implementing innovative farming technologies, such as vertical farming, GMO's and in vitro meats.
- Addressing problems at a local scale may be more effective in reducing food insecurity than addressing large scale problems such as war.
- International organizations might facilitate trade and aid agreements
- Political challenges, such as war and civil unrest, and social challenges such as increasing inequality and poverty are difficult to resolve
- Natural causes of food insecurity, such as climate change, droughts and floods, are also challenging and require longer-term solutions.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that shows understanding of the power of different stakeholders and organisations, and the possibilities of various ways of tackling food insecurity in different scales of time and place.

For 5-6 marks,
expect some weakly-evidenced outlining of **one or** more possible solutions to tackling the problem of food insecurity.

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of the possible solutions to the problem of food insecurity
- Or an ongoing evaluation (or discursive conclusion) grounded in geographical concepts and/or perspectives, for example how solutions may vary in different scales of time and place.

For 9–10 marks, expect both of these traits.

Option G — Urban environments

13. (a) (i) Estimate the percentage of citizens who are more than 15 minutes travel from their essential destinations. [1]

Accept 12-14%

- (a) (ii) State the **average** travel time, in minutes, to reach the six types of essential destination. [1]

6 (minutes)

- (b) Outline **one** way in which becoming a 15-minute city could help reduce a city's ecological footprint. [2]

Award [1] for the way and [1] for explanation / development

For example, in the 15-minute city, most of the population can walk or cycle to their essential destinations [1] thereby reducing pollution (from transport) [1]

Other ways include:

- Reduced car usage
- Increased local shopping
- Efficient infrastructure

- (c) Explain how the pattern of urban residential areas can be affected by:

- (i) **one physical** factor; [3]

Award [1] for the physical factor and up to [2] for development / explanation of how it affects the residential pattern / exemplification

For example, residential areas tend not to be built on steep slopes/floodplains [1] due to the risk of destruction [1] so housing restricted unless low cost [1]

Other physical factors include:

- Site restrictions e.g. narrow valley / steep slopes
- Scenic views / parks / green spaces / coastal locations attract high-cost housing.

- (ii) **one human** factor. [3]

Award [1] for the human factor and up to [2] for development / explanation of how it affects the residential pattern / exemplification

For example, high land values in the city centre [1] means that residential housing tends to be absent from the CBD of big cities [1] due to high costs for renting or paying rates [1].

For example, certain ethnic groups prefer to live close together / cluster in areas [1] due to proximity of the same place of worship / specific shops / same language [1] this has resulted in diaspora groups / ghettos [1].

For example, urban planning / political decisions [1] ensure a mixture of housing suitable for different socio-economic groups [1] is available within the same area so providing affordable housing for the poorer people [1].

Other factors include:

- Lower land values on outskirts of cities – drives suburbanisation / counter urbanisation
- Gentrification
- Zoning - restriction on green belts, cemeteries, parks
- Historical legacies e.g. narrow streets / old infrastructure

14. (a) Examine the strengths **and** weaknesses of strategies to reduce air pollution in **one or more** urban areas. [10]

Marks should be allocated according to the markbands.

Air pollution is a significant problem in many urban areas. Poor air quality is responsible for premature deaths and illnesses, especially among the elderly and very young, and those living in densely built-up areas. Sources of air pollution are mainly derived from burning fossil fuels by vehicular traffic, industry and domestic activities. Varied attempts are being made to reduce air pollution, improve air quality and combat the possible impact on global climate change. Strategies to reduce pollution may be at different scales, from local to national and international; for example, international agreements to cut greenhouse gas emissions, establishment of low emission zones in urban areas, and low traffic zones in residential areas.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Air pollution is a significant problem in urban areas; mainly from burning fossil fuels by vehicular traffic, industrial and domestic sources.
- Pollution causes significant environmental, social and economic impacts, including significant numbers of premature deaths.
- Strategies to reduce pollution include: reducing vehicular traffic and congestion, replacing vehicles with EVs, improving public transport, urban planning, increasing green spaces, improving cycle lanes and safety measures, bans on use of wood/coal to reduce particulates
- Significant challenges to measures to reduce pollution include: cost of moving away from fossil fuels towards clean, renewable energy; cost and infrastructure for EVs, difficulties with urban planning, e.g. traffic free zones and management schemes; continuing rapid urban growth.
- Success of management strategies depends on a variety of factors: effective governance, cost of implementation, public acceptance and compliance, education, and increased awareness/perception.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) in a way that shows understanding of the strengths and weaknesses of strategies to reduce air pollution. The role and power of different stakeholders (local, national and international), the importance of scale, and how pollution may be reduced over time in different places.

For 5–6 marks,

expect some weakly-evidenced outlining of one or more strategies to reduce urban air pollution.

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of the strengths and weaknesses of strategies to reduce urban air pollution
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, such as the conflicting views of stakeholders.

For 9–10 marks, expect both of these traits.

14. (b) Examine the role of economic **and** demographic processes contributing to inner-city gentrification.

[10]

Marks should be allocated according to the markbands.

Gentrification is the process where poor housing and commercial areas in older inner areas of cities are changed by the influx of wealthier people, and displacement of the original residents. The character of inner-city areas is transformed with improved and new housing and commercial areas. As a result, significant demographic, social and economic changes occur in these areas.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):

- Gentrification is a characteristic of many cities, involving transformation of older housing, industrial and commercial areas by the influx of wealthy population
- The causes and effects of gentrification are economic, social and political, involving demographic change, including the out-migration of original residents, who may be older, poorer, and less educated/qualified, and the influx of new residents.
- Economic processes are related to the decline of traditional inner city industrial areas, resulting high levels of unemployment and deprivation, and deteriorating housing stock. This may result in out-migration of the population as they can no longer afford the higher prices charged by landlords/developers. Wealthier people desire to be closer to the city centre for employment in the tertiary sector and move into the inner-city areas.
- City planners / political stakeholders may encourage gentrification as a way of improving run-down inner-city areas
- Significant demographic, ethnic and social changes also occur as a result of the process.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) in a way that shows understanding of economic and demographic processes in gentrification, the changes over time in inner city areas in different places, and the role and power of different stakeholders, including local communities, developers and planning authorities.

For 5–6 marks,

expect some weakly-evidenced outlining of at least one aspect of economic and /or demographic processes contributing to inner-city gentrification.

For 7–8 marks, expect a structured account which includes:

- Either an evidenced examination of the role of economic and demographic processes which contribute to inner city gentrification
- Or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, such as the role of political stakeholders.

For 9–10 marks,

expect both of these traits.
