

# Markscheme

**May 2022**

**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.

Marks	Level descriptor		
	<b>AO1: Knowledge and understanding of specified content</b>  <b>AO2: Application and analysis of knowledge and understanding</b>	<b>AO3: Synthesis and evaluation</b>	<b>AO4: Selection, use and application of a variety of appropriate skills and techniques</b>
0	The work does not reach a standard described by the descriptors below.		
1–2	<p><b>The response is too brief, lists unconnected information, is not focused on the question and lacks structure.</b></p> <ul style="list-style-type: none"> <li>• The response is very brief or descriptive, <b>listing</b> 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 <b>listed</b>.</li> <li>• There is no evidence of analysis.</li> <li>• Terminology is missing, not defined, irrelevant or used incorrectly.</li> </ul> <ul style="list-style-type: none"> <li>• No evidence of evaluation or conclusion is expected at this level.</li> </ul> <ul style="list-style-type: none"> <li>• Information presented is not grouped logically (in paragraphs or sections).</li> <li>• Maps, graphs or diagrams are not included, are irrelevant or difficult to decipher (only if appropriate to the question).</li> </ul>		
3–4	<p><b>The response is too general, lacks detail, is not focused on the question and is largely unstructured.</b></p> <ul style="list-style-type: none"> <li>• The response is very general. The knowledge and understanding presented <b>outlines</b> examples, statistics, and facts that are both relevant and irrelevant. Links to the question are <b>listed</b>.</li> <li>• The argument or analysis presented is not relevant to the question.</li> <li>• Basic terminology is defined and used but with errors in understanding or used inconsistently.</li> </ul> <ul style="list-style-type: none"> <li>• If appropriate to the question, the conclusion is irrelevant.</li> <li>• There is no evidence of critical evaluation of evidence (examples, statistics and case studies).</li> </ul> <ul style="list-style-type: none"> <li>• Most of the information is not grouped logically (in paragraphs or sections).</li> <li>• 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).</li> </ul>		
5–6	<p><b>The response partially addresses the question, but with a narrow argument, an unsubstantiated conclusion, and limited evaluation.</b></p> <ul style="list-style-type: none"> <li>• The response <b>describes</b> relevant supporting evidence (information, examples, case studies et cetera), <b>outlining</b> appropriate link(s) to the question.</li> <li>• The argument or analysis partially addresses the question or elaborates one point repeatedly.</li> <li>• Relevant terminology is defined and used with only minor errors in understanding or is used inconsistently.</li> </ul> <ul style="list-style-type: none"> <li>• If appropriate to the question, the conclusions are general, not aligned with the evidence presented and/or based on an incorrect interpretation of the evidence.</li> <li>• Other perspectives on evidence (examples, statistics and case studies) and/or strengths and weaknesses of evidence are <b>listed</b>.</li> </ul> <ul style="list-style-type: none"> <li>• Logically related information is grouped together (in sections or paragraphs) but not consistently.</li> <li>• Maps, graphs or diagrams included do not follow conventions, and include relevant and irrelevant interpretations in the text (only if appropriate to the question).</li> </ul>		

<p>7–8</p>	<p><b>The response addresses the whole question, the analysis is evaluated and the conclusion is relevant but lacks balance.</b></p>		
	<ul style="list-style-type: none"> <li>• The response <b>describes</b> relevant supporting evidence correctly (information, examples and case studies) that covers all the main points of the question, <b>describing</b> appropriate links to the question.</li> <li>• The argument or analysis is clear and relevant to the question but one-sided or unbalanced.</li> <li>• Complex terminology is defined and used correctly but not consistently.</li> </ul>	<ul style="list-style-type: none"> <li>• If appropriate to the question, the conclusion is relevant to the question, aligned with the evidence but unbalanced.</li> <li>• Other perspectives on evidence (examples, statistics and case studies) and/or strengths and weaknesses of evidence are <b>described</b>.</li> </ul>	<ul style="list-style-type: none"> <li>• Logically related information is grouped together (in sections) consistently.</li> <li>• Maps, graphs or diagrams included contribute to/support the argument or analysis (only if appropriate to the question).</li> </ul>
<p>9–10</p>	<p><b>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.</b></p>		
	<ul style="list-style-type: none"> <li>• The response <b>explains</b> correct and relevant examples, statistics and details that are integrated in the response, <b>explaining</b> the appropriate link to the question.</li> <li>• The argument or analysis is balanced, presenting evidence that is <b>discussed, explaining</b> complexity, exceptions and comparisons.</li> <li>• Complex and relevant terminology is used correctly throughout the response.</li> </ul>	<ul style="list-style-type: none"> <li>• If appropriate to the question, the conclusion is relevant to the question, balanced and aligned with the evidence.</li> <li>• Evaluation includes a systematic and detailed presentation of ideas, cause and effect relations, other perspectives; strengths and weaknesses of evidence are discussed; (if appropriate) includes justification of the argument and conclusion.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Maps, graphs or diagrams are annotated following conventions and their relevance is explained and support the argument or analysis (only if appropriate to the question).</li> </ul>

**Option A — Freshwater**

1. (a) (i) State the number of countries where more than 60 % of rural households rely on water from outside the home. **[1]**

13

- (ii) Identify the country where men and women have equal responsibility for collecting water from outside the home. **[1]**

Afghanistan

- (b) Outline **one** environmental impact of increased human pressure on aquifers. **[2]**

Award **[1]** for a valid impact and an additional **[1]** for development.

Ground subsidence **[1]** due to all the water having been removed/over-abstraction **[1]**.

Other impacts include:

- Pollution from agricultural chemicals / industry
- rivers/lakes drying up due to lowering of water table.

- (c) Explain **two** ways in which water can be managed to provide a more sustainable future for local communities in countries such as these. **[3+3]**

Award **[1]** for each way and a further **[2]** for development / explanation / exemplification.

For example, pipes/sewers/water filters can be built **[1]** in order to separate sewage and drinking water **[1]** thereby reducing the risk of disease for future generations **[1]**.

Reference to sustainability is not required although it may be implied.

Other ways include, but are not limited to:

- recycling water
- tube wells
- more efficient irrigation systems
- training local people to take responsibility for repairs
- building dams provides irrigation water for local communities
- alternative energy developed.

2. (a) Examine why geographers use a systems approach in the study of drainage basins.  
[10]

*Marks should be allocated according to the markbands.*

Drainage basins operate as open systems, in which inputs, stores, flows and outputs are inter-related. The relationships between these will vary depending on the characteristics of the drainage basin, including geology, slope, shape, and land use, and the nature of the inputs, including type, intensity and variability of precipitation.

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

- Drainage basins function as open systems, in which inputs, stores, flows and outputs are inter-related. The systems approach helps us understand these interrelationships.
- River discharge varies over time within drainage basins, and over space between different drainage basins, which produces knock on effects elsewhere in the system.
- The characteristics of drainage basins, such as geology, slope, vegetation cover and land use will affect flows and stores, which, in turn affect discharge: e.g. permeable rocks and low relief will result in underground flows and stores and a more even discharge.
- Stores may be on the surface, as lakes or wetlands, or underground as aquifers.
- Changes in land use, such as deforestation and urbanization, will affect flows and stores, and in turn affect discharge.
- The systems approach can help planners anticipate flooding and/or shortages.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the importance of a systems approach in the study of processes within a drainage basin. Another approach might be to examine drainage basins at different time and spatial scales, for example with changes in land use or climate.

**For 5–6 marks**, expect weakly-evidenced outlining of a systems approach to a drainage basin.

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

- either evidenced explanation of why a systems approach is useful to the study of drainage basins
- 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 how conflicts between different stakeholders in the management of wetlands might be resolved. **[10]**

*Marks should be allocated according to the markbands.*

There are growing pressures on wetlands, and it is important that they are managed for a sustainable future. The focus of the response should be on the varied and often conflicting pressures from different stakeholders, and the future possibilities for management.

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

- The importance of wetlands as major ecosystems which form a critical part of the natural environment: diverse ecosystems, flood control, improving water quality, carbon sinks, fertile farmland, recreation and tourism.
- Increasing pressures on wetlands include: water abstraction, land drainage, chemical and physical pollution, eutrophication.
- Different stakeholders at local, national and international scales, who may be in conflict, include: environmentalists, water management organisations, farmers, tourist organisations, local and national governments.
- The purpose of management from different perspectives – e.g. biodiversity, water security, flood control, tourism, climate change.
- Strategies for management of wetlands, including the roles of international (e.g. Ramsar Convention), national and local stakeholders.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the different perspectives and varying power of stakeholders for the future management possibilities of wetlands. Another approach might be to focus on how conflicts may partly depend on the scale of the issues.

**For 5–6 marks**, expect weakly-evidenced outlining of at least one conflict and/or how it could be resolved.

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

- either an evidenced explanation of the conflicts between different stakeholders on wetlands including some idea of resolution.
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, examining future management possibilities.

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

**Option B — Oceans and coastal margins**

3. (a) (i) Identify the chokepoint with the most barrels of oil moved per day. [1]

Strait of Hormuz

- (ii) State the number of millions of barrels of oil moved per day at the Strait of Malacca choke point. [1]

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- (b) Outline **one** reason why the ownership of **one named** ocean area or territory is contested. [2]

Award [1] for a valid reason and [1] for further development.

Award maximum [1] if no example.

For example: Spratley Islands – multiple countries claim ownership [1] because the islands are within their territorial waters [1].

- (c) Suggest **one** political challenge **and one** environmental challenge associated with the movement of oil around the globe by sea. [3+3]

Award [1] for a political challenge and a further [2] for development/explanation/exemplification.

For example, an international dispute can escalate between unfriendly countries [1] when one country's tankers move through the territorial waters of the other [1] because of geographical features, such as narrow straits, causing choke points [1].

Award [1] for an environmental challenge and a further [2] for development/explanation/exemplification.

For example, pollution from accidental spillage/ accidents from tankers [1] causing harm to marine eco-systems [1] which is extremely difficult/costly and difficult to clean up as ocean currents disperse it over a wide area [1].

Accept weather related conditions that may affect navigation.

4. (a) Examine the major threats to coral reef environments. [10]

*Marks should be allocated according to the markbands.*

Coral reefs play a vital role in physical processes and ecosystems of coastal margins and are an important economic and social resource to coastal communities. Threats to coral reefs include the possible impacts of climate change, and increasing pressure from varying human activities, such as resource exploitation, over-fishing and tourism.

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

- Coral reefs play a vital role in the functioning of coastal processes and ecosystems.
- They are under increasing threat from a variety of natural and human pressures.
- Coral reefs are very diverse ecosystems, and face multiple stresses caused by climate change, including rising sea levels and warmer ocean temperatures.
- Increased acidification of the oceans poses serious threats to the growth of coral reefs, other marine organisms, and the marine food chain.
- Threats from human activity include the impacts of resource exploitation (such as oil), over-fishing, pollution and increasing pressures from tourism.
- These threats may cause severe damage to fragile ecosystems.
- Coastal margins may also become more vulnerable to erosion by wave action associated with tropical storms.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines a variety of threats to processes on coral reefs, and the different perspectives and varying power of stakeholders. Another approach might be to examine the scale of the threats, and how these might vary over time.

**For 5–6 marks**, expect weakly-evidenced outlining of one or more threats to coral reef environments.

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

- either an evidenced explanation of two or more threats to coral reef environments
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, examining the different scale of the threats.

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

4. (b) Examine why conflicts often develop over the commercial use of coastal margins. **[10]**

*Marks should be allocated according to the markbands.*

Coastal margins are under increasing threat from commercial activities, including the concentration of urban development, tourism and industry. As population and economic activity becomes increasingly concentrated in coastal areas, there is a need to conserve and manage vulnerable landscapes and ecosystems.

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

- Coastal margins under increasing stress from commercial activities such as retailing, industry, fishing, waste disposal and tourism.
- Different stakeholders will have varying, and sometimes conflicting, priorities over development of coastal margins.
- Strategies for coastal protection from increased erosion and flooding may cause conflict between stakeholders.
- Conservation strategies to protect vulnerable coastal ecosystems may also cause conflict.
- Conflicts between stakeholders may be difficult to resolve: eg tourism and commercial development; conservationists; local peoples.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines a variety of conflicts between stakeholders, and the different perspectives and varying power of stakeholders. Another approach might be to examine the scale of the threats, and the outcomes for different stakeholders.

**For 5–6 marks**, expect weakly-evidenced outlining of at least one conflict developing from commercial use of coastal margins.

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

- either an evidenced explanation of two or more conflicts developing from commercial use of coastal margins
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, examining the outcomes for stakeholders.

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

**Option C — Extreme environments**

5. (a) (i) Estimate the desalination capacity of the United States, in thousands of cubic metres per day. **[1]**

2800 (allow 2700-2900).

- (ii) State the country shown on the map with the smallest desalination capacity. **[1]**

Chile

- (b) Outline **one** reason why some semi-arid areas with low annual rainfall are considered to be extreme environments. **[2]**

Award **[1]** for a valid reason and **[1]** for further development.

For example: Water scarcity **[1]** creates problems for arable or settled farming **[1]**.  
(Do not accept lack of water without further development.)

Other possibilities include:

- seasonal water shortages
- flash flooding
- although annual rainfall is low it can still be extreme/intense periodically
- lack of access to freshwater.

- (c) Explain **two** ways in which solar power can help the sustainable development of communities in hot, arid areas such as these. **[3+3]**

In each case, award **[1]** for the way solar power can help and up to **[2]** for further development/explanation/exemplification.

For example: The use of solar power provides energy for desalination plants **[1]** which increases water supply allowing sedentary farming **[1]** which can sustainably support a larger population **[1]**.

Other ways may include:

- social development – bringing electricity to remote villages – education / internet
- economic development – exporting energy to other countries
- climatically controlled greenhouses / irrigation / wells
- removing reliance on non-renewable fuels.

6. (a) Examine the possible long-term challenges associated with tourism in **one or more** types of cold environment. **[10]**

*Marks should be allocated according to the markbands.*

The focus of the response should be on tourism in different types of cold environment: including ice sheets, glaciers and permafrost in high altitude mountain regions, and high latitudes. Some long-term challenges will be similar for different types of environment, while others might be unique. Challenges might be physical, economic and social. Local and global stakeholders may be involved in the management of these long-term challenges for a sustainable future.

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

- Challenges might include pressure on local resources, such as landscapes, water supply, and timber: exceeding carrying capacities and environmental degradation.
- Pressures on fragile ecosystems in cold environments: destruction of natural vegetation, wildlife and habitats.
- Environmental pollution by tourist activities, e.g. waste disposal in oceans and on land; air, noise and visual pollution.
- Economic challenges include: accessibility, isolation and difficult terrain; land ownership; conflicts between national/international tour operators and local people — economic leakage.
- Social challenges might include conflicts between locals and tourists.
- Climate change (and associated warming) is a long term challenge.
- Consideration could be given as to how these challenges might be managed by different stakeholders for a sustainable future.
- There may be international and local agreements regarding the creation of protected areas and national parks, the development of “green tourism” and ecotourism.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the variety of long-term challenges in different places and scales. Another approach might be to examine the varying perspectives and varying power of stakeholders for possibilities of future management.

**For 5–6 marks**, expect weakly-evidenced outlining of one or more challenges associated with tourism in a cold environment

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

- either an evidenced explanation of a variety of long-term challenges associated with tourism in one or more types of cold environment
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

6. (b) Examine the importance of wind in the development of **two or more** hot, arid landscape features. **[10]**

*Marks should be allocated according to the markbands.*

Both wind and water are involved in the formation of desert landscapes, although their relative importance varies from place to place and over different time scales, including the effects of possible climatic change on processes. Despite the popular image of deserts as being dominated by extensive sand seas and dunes, wind often plays a relatively minor role in landform development in many desert regions.

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

- Understanding of the relative importance of processes of wind erosion, transportation and deposition in the formation of landscape features.
- These include: different dune systems, rock pedestals, yardangs, zeugen, deflation hollows and desert pavements.
- Wind processes are important where there is little vegetation cover, very little water, and a plentiful supply of sand.
- Wind is only able to transport fine particles, mainly very close to the ground surface, in suspension in the air, or close to the ground by saltation and creep.
- Wind deposition may lead to the formation of different types of dune systems, such as barchans and seifs, which may form part of large sand seas.
- Wind erosion is most effective close to the ground, as abrasion and sand blasting. This may result in the formation of distinctive rock pedestals, yardangs and zeugen. However, water may also be important in their formation.
- Wind erosion in the development of large deflation hollows, and desert pavements, where the selective removal of sand leaves larger rock fragments as a lag deposit.
- On a smaller scale, wind abrasion may result in polished and pitted rock surfaces, forming features such as ventifacts.
- The relative importance of wind and water in the formation of arid landscapes should be considered, especially in the formation of many large features, such as wadis, mesas and buttes, and inselbergs.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that reaches an evidenced judgment regarding the importance of wind processes in landscape development. Another approach might be to examine the relative importance of different processes over varying time scales and places.

**For 5–6 marks**, expect weakly-evidenced outlining of the importance / relative importance of wind in the formation of at least two landscape features

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

- either an evidenced explanation of the importance / relative importance of wind in the development of two or more landscape features
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, perhaps considering the relative importance of wind compared to other processes.

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

**Option D — Geophysical hazards**

7. (a) (i) Identify the location of the earthquake event with the highest magnitude. [1]

Indian Ocean

- (ii) State the number of deaths caused by the earthquake event in the USA. [1]

Accept answers between 130–160

- (b) Outline **one** reason why high-magnitude earthquake events do not occur very often. [2]

Award [1] a valid reason and [1] for development.

For example, it takes a long time for sufficient tension to build between plates [1] in order to generate the higher amounts of energy to be released in a high-magnitude earthquake event [1].

- (c) Explain how the risk to a community from earthquake events such as these might be affected by:

- (i) the age structure of its population; [3]

Award [1] for a basic link between a valid population factor and some aspect of vulnerability/risk (such as preparedness, resilience, response) and up to [2] for further development/exemplification.

For example, a population with a higher proportion of elderly people has greater vulnerability [1] as earthquakes /tsunamis are sudden events with little warning time [1] with insufficient time for people with limited mobility to reach higher ground (tsunami) [1].

It is acceptable that different aspects of the age structure (elderly / youthful) can be discussed rather than focusing on just one segment of the population.

Other factors include:

- vulnerable to injury *eg* falling masonry
- vulnerability to secondary hazards *eg* spread of disease
- older population may have greater perception of the hazard and are better prepared *eg* survival kits
- very young / old are more likely to be at home.

- (ii) political factors (governance of the country). **[3]**

Award **[1]** for a basic link between a valid political factor and some aspect of vulnerability/risk (such as preparedness, resilience, response) and up to **[2]** for further development/exemplification.

For example, governments have put in place effective communications to warn their people about earthquake risks **[1]** for example, United States Geological Survey (USGS) providing information to the Californian people about the San Andreas fault **[1]** thereby prompting citizens to take steps to increase their resilience **[1]**.

Other factors include legislation for:

- land zoning
- education
- building controls
- availability and readiness of emergency personnel.

8. (a) Examine the severity of the impacts of different types of mass movement on human well-being. [10]

*Marks should be allocated according to the markbands.*

Human well-being is a broad concept, which can be measured in a variety of different ways. It includes social factors, morbidity and mortality rates, health, education, human rights, access to resources (food, shelter, water) and employment, and quality of life. Different types of mass movement include fast/slow, solid/loose: such as landslides, rockslides, debris or mud flows

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

- Human well-being is a broad concept, including social factors, such as health, education, access to resources and quality of life, economic and political factors.
- Different types of mass movement include: landslides, rockslides, debris or mud flows.
- Mass movement can have significant economic, social and health impacts, including — morbidity and mortality rates, deaths and injuries.
- The severity of the impact on human well-being will partly depend on the type of mass movement and will vary spatially between different places.
- The severity may be considered in terms of long and short-term impacts.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that reaches an evidenced judgment regarding the importance of different types and processes of mass movement in affecting human well-being in different places. Another approach might be to examine the severity of the impacts in terms of different time scales (long and short term).

**For 5–6 marks**, expect weakly-evidenced outlining of the impact of at least one type of mass movement on human well-being.

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

- either an evidenced explanation of the severity of impacts of two or more types of mass movement on human well-being
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, perhaps considering severity at different time scales.

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

8. (b) Examine the effectiveness of technology and planning strategies in reducing human vulnerability to volcanic hazards. [10]

*Marks should be allocated according to the markbands.*

Increasing numbers of people are living in areas of hazardous volcanic activity, especially near destructive plate margins associated with violent, explosive volcanoes. People may be especially vulnerable to the destructive effects of rapid flows of lava and pyroclastics, and large-scale ash falls. Management strategies involving the use of planning and technology might contribute to the reduction of human vulnerability to volcanic hazards.

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

- Technologies might be used to predict future volcanic eruptions, including monitoring of volcanic activity, seismic and crater monitoring surveys; GPS surveys to measure changes in shape of volcanoes, and monitoring of movements in the magma chamber.
- Other technological strategies might include: improving telecommunications (SMS messages) to give warnings of possible eruptions.
- Planning strategies could include mapping of volcanic areas to produce hazard-zone maps; land use zoning.
- Education and drills to warn and inform people what to do in case of an eruption; evacuation plans.
- Planning and technologies to locate and rescue survivors, and rehabilitation plans for the aftermath of an eruption.
- The effectiveness of these strategies will depend partly on levels of economic development, and on the perception of the hazard by local people and other stakeholders.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that reaches an evidenced judgment regarding the effectiveness of different strategies, and the power of different stakeholders in reducing vulnerability. Another approach might be to consider effectiveness in terms of the scale of hazard events in different places.

**For 5–6 marks**, expect weakly-evidenced outlining of technological and/or planning strategies.

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

- either an evidenced explanation of the effectiveness of technology and planning strategies in reducing human vulnerability
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, discussing the relative effectiveness of strategies.

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

**Option E — Leisure, tourism and sport**

9. (a) Using the photograph, identify **two** characteristics of this area that may reduce accessibility for visiting football supporters. **[1+1]**

Award **[1]** for each characteristic inferred or identified.

Possibilities include:

- parking-no parking spaces shown
- congestion-narrow streets
- lack of main road / railway / public transport.

- (b) Outline **one** reason why some city stadiums have a large sphere of influence. **[2]**

Award **[1]** for a valid reason relating to the sports or leisure hierarchy and **[1]** for development/explanation/exemplification.

For example: The team that plays there has a high status **[1]** people are prepared to travel long distances to see them play **[1]**.

Other possibilities include:

- city is well-connected therefore people can travel from long distances
- stadium is used for other events eg music festivals attracting international visitors.

- (c) Suggest how large numbers of visitors in an area such as this could have:

- (i) **one** positive economic impact for local communities;**[3]**

Award **[1]** for a valid impact and up to **[2]** for development / explanation /exemplification.

For example, employment opportunities **[1]** as a result of multiplier effects built around the stadium eg catering jobs **[1]** providing long term economic sustainability **[1]**.

Other impacts include:

- improved transport leading to more visitor spending
- increased income to local businesses

- (ii) **one** negative economic impact for local communities. **[3]**

Award **[1]** for a valid impact and up to **[2]** for development/ explanation/ exemplification.

For example: rental prices for houses increase due to Airbnb **[1]** placing them beyond reach of some local people **[1]** resulting economic costs of relocating elsewhere **[1]**.

Other possibilities include:

- increased costs for security / police / waste management
- increased congestion increases cost of transport
- TNCs are attracted to such venues and may take income away from local businesses.

10. (a) Examine why views may differ on the benefits of tourism as a development strategy.  
[10]

*Marks should be allocated according to the markbands.*

There has been a rapid growth in international tourism, especially to low-income countries. Tourism is an important area of economic policy in many countries, stimulating domestic growth and improving international links. However, there is debate regarding the benefits of tourism in economic and social development, and its impact on local cultures.

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

- Rapid growth of international tourism, especially towards low income countries; facilitated by rising living standards, growth in communications, and the power of transnational corporations (TNCs).
- Economic advantages might include: earning of foreign currency, growth in gross national product (GNP), development of infrastructure (airports, roads, hotels and resorts), increased employment, rise in living standards.
- Tourist industry may be dominated by foreign TNCs; leakage of profits; tourism develops in small enclaves (core-periphery); employment may be low skilled, poorly paid and seasonal.
- Cultural impacts might include: increasing pressure of numbers in areas of historical/archaeological/scenic importance, resulting in degradation; need for effective management.
- Increasing “westernization” of culture; problems relating to crime, drugs and prostitution.
- Views regarding the benefits of tourism will vary between different stakeholders, from local to national and international.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that reaches an evidenced judgment regarding the benefits of tourism as a development strategy. Views regarding possible benefits of tourism will differ between stakeholders in different places, and processes operating at different scales.

**For 5–6 marks**, expect weakly-evidenced outlining of one or more benefits of tourism.

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

- either an evidenced explanation of varying viewpoints concerning the benefits of tourism as a development 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 influence of cultural and political factors on participation in sport at varying scales. **[10]**

*Marks should be allocated according to the markbands.*

Political and cultural influences are important in the increasing participation in international sports by different individuals and societies, for example in the Paralympics and the increasing participation by people of different gender. The globalization of sport has resulted in increased participation by all groups in society.

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

- The growing importance of international sporting events, including the Paralympics, with increased numbers of athletes participating from different countries.
- Political influences include training facilities and support by national governments; pride and prestige for governments to host international events, construction of facilities to host international events.
- Cultural influences include: changing public attitudes towards disabilities; changing gender roles and the increasing high profile of female participation in sports.
- Many countries (especially low income) are poorly represented in international sport, partly due to high cost and lack of funding. Discrimination remains a major issue in many countries.

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 cultural and political factors affecting participation, and that these may differ between places and at various spatial scales. Another approach might be to evaluate the temporal scale over which political and cultural factors view may differ.

**For 5–6 marks**, expect weakly-evidenced outlining of at least one political and/or cultural factor.

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

- either an evidenced explanation of a range of political and cultural factors affecting participation in sport at different scales
- 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 age group which had the highest incidence of dengue fever in 2012. **[1]**

55–59

- (ii) Estimate the mean incidence rate of dengue fever for all years in the 20–24 age group. **[1]**

6.2 (allow 6 to 6.4)

- (b) Outline **one** strategy used to limit the spread of a water-borne disease. **[2]**

Award **[1]** for the strategy and a further **[1]** for development/explanation.

For example, only use safe (boiled/bottled) water **[1]**, to ensure that disease is not transmitted by drinking potentially infected water **[1]**.

- (c) Explain how using genetically modified organisms (GMOs) to increase food production can lead to:

- (i) **one** environmental disadvantage; **[3]**

Award **[1]** for a valid disadvantage and up to **[2]** for further development / exemplification.

For example: potential loss of biodiversity/ depletion of wildlife **[1]** due to the extensive use of herbicides to cultivate GMOs **[1]** for example, the use of glyphosate/RoundUp as an herbicide could cause the decline of the monarch butterfly **[1]**.

Other possible environmental disadvantages include:

- pressure on water resources/ depletion of groundwater supplies, due to need for irrigation for GMOs
- decrease in resilience to issues such as drought and insect infestation; due to lack of bio-diversity in GMO crops
- the “out-crossing” of GM crops with wild relatives, and the potential to create new weeds.

(ii) **one** social disadvantage.

**[3]**

Award **[1]** for a valid disadvantage, and up to **[2]** for further development/exemplification.

For example: population health issues **[1]** GMOs may increase resistance to anti-biotics **[1]**, due to the manipulation of genes in a laboratory environment **[1]**.

Other possible social disadvantages include:

- possible increased risk of cancer; because the disease is caused by mutations in DNA, it is dangerous to introduce new genes into the body
- rise in inequality between rich and poor farmers, as poor are unable to afford high cost of inputs required by GMOs
- debt reduces farmers spending on health/education as farmers borrow money for high input costs of GMOs (seeds/fertilizer/irrigation) so have to cut back elsewhere.

12. (a) Examine how food production systems can use water and energy more sustainably.  
[10]

*Marks should be allocated according to the markbands.*

The sustainability of food production systems can be assessed by consideration of their energy efficiency and water footprints. The water footprint is the volume of freshwater used in the production of food; a measure developed to address issues relating to water security and sustainable water use. Energy efficiency measures the amount of energy input to a farming system compared with output.

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

- The sustainable use of water can be measured by the water footprint — the volume of freshwater used in the production of food. The size of the water footprint varies between different animal and crop production systems.
- The intensification of farming has resulted in increased demands for water and an increase in the water footprint.
- The increase in agricultural demands for water may result in the need to use water more efficiently and reduce waste using strategies such as drip irrigation, re-using water, rainwater harvesting.
- Energy efficiency measures the input of energy into a farming system compared with outputs of food yield and quantity.
- Where energy inputs, such as in labour, machinery, pesticides and fertilizers are greater than the energy in food produced, the system may be unsustainable.
- In order to be more sustainable, energy inputs need to reduce, and outputs need to increase eg using alternative energy sources, or reducing high energy consuming inputs, such as machinery.
- Increasing commercialization and capital-intensity of farm systems, with higher energy inputs, may result in unsustainable production.

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 how water and energy can be used more sustainably in agricultural processes and systems in different places. Another approach might be to consider the power and perspectives of different stakeholders.

**For 5–6 marks**, expect weakly-evidenced outlining of the sustainable use of water and/or energy in food production systems.

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

- either an evidenced explanation of how water and energy can be used more sustainably in different food production systems
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

12. (b) Examine how different stakeholders influence the diets of individuals and societies.  
[10]

*Marks should be allocated according to the markbands.*

The diet of different communities concerns the type and amount of food consumed and has a direct influence on people's health and well-being. The diets of individuals and societies can be influenced by a variety of different stakeholders, at varying scales. These include transnational corporations (TNCs) — for example, agribusiness, supermarkets and fast-food outlets — international food organizations (eg Food and Agriculture Organization (FAO)), and governments. At a more local scale, the roles of doctors, teachers and family members are important.

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

- A variety of stakeholders influence people's diets, from international to local.
- TNCs have a strong influence on food production and supply through fast-food outlets and supermarkets. The food chain, from supplier to consumer is dominated by a few TNCs, who have a large influence on diets.
- International organisations, such as the FAO and World Health Organization (WHO) also play a large role in influencing diets.
- The role of the media is significant, either through advertising for TNCs, or through educating people to consume a balanced diet and healthy lifestyle.
- National governments play a role in advising about diets, and their views/policies are transmitted to people through doctors, health workers and teachers.
- At a local scale, community groups and family members may influence the diets of other individuals.

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 and perspectives of different stakeholders. These may vary between different places and spatial and temporal scales.

**For 5–6 marks**, expect weakly-evidenced outlining of the influence of one or more stakeholders on the diets of people.

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

- either an evidenced explanation of the influence and perspectives of a variety of different stakeholders
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

**Option G — Urban environments**

13. (a) (i) Identify the state highway located in grid reference 6105. **[1]**

6A

(ii) State **one** physical reason for the location of the airport to the east of Frankton (Queenstown Airport). **[1]**

Accept any possible physical reason such as:

Flat land **[1]** / prevailing winds **[1]** / orientation of valleys **[1]**

(b) Outline **one** reason why land values are higher in some parts of an urban area. **[2]**

Award **[1]** for the reason and **[1]** for development/explanation.

For example: many people want to live by the coast due to the nice view **[1]** so demand drives up prices **[1]**.

Other possible factors (these may or may not relate to the map) include:

- proximity to the city centre / CBD
- transport
- access
- physical factors such as flat land
- planning decisions may limit development.

(c) Explain **two** challenges associated with making infrastructure improvements in urban settlements such as Queenstown. **[3+3]**

For each one, award **[1]** for the challenge, and up to **[2]** for explanation, development and/or exemplification.

For example: provision of a new airport runway may require the use of existing residential areas **[1]** involving the resettlement / out migration of residents **[1]** possibly leading to urban sprawl if new suburbs are to be built **[1]**.

Other challenges include:

- older infrastructure
- site restrictions – two entirely different ones are acceptable.
- community unwillingness / pressure groups eg environmental
- planning restrictions / loss of countryside.

14. (a) Examine the strengths and weaknesses of resilient city design as a way of managing climatic challenges. **[10]**

*Marks should be allocated according to the markbands.*

Climatic challenges to urban areas occur at both the macro and local scale, long and short term. They include challenges from global climatic change, including secondary impacts such as rising sea levels and increasing frequency and intensity of storms. At the local scale, increasing air pollution poses a serious threat to the environment, human health and increasing death rates. The local heat island effect might also intensify. Strategies to manage escalating climatic risks include adopting resilient city design. Resilient cities are cities that have the ability to absorb, recover and prepare for future shocks, especially challenges associated with climate change.

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

- Challenges include global warming, resulting in rising sea levels, increased storm activity and flooding, especially in low-lying coastal cities.
- Man-made climate challenges include increased air pollution and heat island effects, causing serious health issues and possible death.
- Strength of resilient city design include equipping cities to face future climate challenges. For example, improved flood defences; land-use zoning; strategies to improve air quality. Cities become more sustainable, and better-suited to face future climate shocks.
- Increased provision of open space; conservation and enhancement of natural systems.
- Weaknesses include high economic costs in modifying infrastructure; rapid growth of population, and low incomes, in some cities makes it difficult to enact to design principles.

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 how the principles of resilient city design can be used to manage climatic challenges, and illustrates the power and different perspectives of stakeholders. Another approach might be to consider how the challenges and their management might vary between different places, at varying levels of development, or at different timescales.

**For 5–6 marks**, expect weakly-evidenced outlining of at least one resilient city design to manage a climatic challenge.

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

- either an evidenced explanation of the strengths and weaknesses of resilient city design in managing climatic challenges
- or a discursive conclusion grounded in geographical concepts and/or perspectives, evaluating the strengths and weaknesses of resilient city design.

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

14. (b) Examine why social deprivation occurs for different reasons in urban areas at varying stages of development. **[10]**

*Marks should be allocated according to the markbands*

Urban social deprivation includes increasing levels of poverty, low living standards, poor health, low educational attainment, and poor access to resources. Deprivation occurs in all urban areas, in countries at varying levels of economic development. The causes of deprivation are often difficult to determine. It is often associated with high unemployment and rising crime levels. Urban deprivation is concentrated in particular areas of cities, including inner-city and outer-city housing estates and areas of informal housing.

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

- Urban social deprivation includes: poverty and low living standards; lack of access to resources, low provision of health care and education; high crime rates.
- Social deprivation is concentrated in particular areas of cities.
- There is an increasing divide between “rich” and “poor” areas in cities, and increasing social and economic inequalities.
- Management of deprivation involves perspectives of different stakeholders, including national and local governments, city planners, and local residents.
- Causes of social deprivation may differ between urban areas at varying stages of development.
- Low income countries have rapidly growing populations, resulting in low quality housing, shanty towns and high levels of unemployment and poverty.
- In high income countries the deprivation may be on a smaller scale, and concentrated in specific areas of a city. Deprivation linked to poor housing and low income levels may be caused by factors such as closure of traditional industries and planning policies.

Good answers may be **well-structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that shows evidenced judgment of the processes causing social deprivation in different urban places. Another approach might be to consider the power and perspectives of different stakeholders.

**For 5–6 marks**, expect weakly-evidenced outlining of one or more reasons for urban social deprivation.

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

- either an evidenced explanation of a variety of different reasons for social deprivation in two or more cities at different stages of development
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

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