

Markscheme

November 2021

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		
	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.		
3–4	The response is too general, lacks detail, is not focused on the question and is largely unstructured.		
5–6	The response partially addresses the question, but with a narrow argument, an unsubstantiated conclusion, and limited evaluation.		

<p>7–8</p>	<p>The response addresses the whole question, the analysis is evaluated and the conclusion is relevant but lacks balance.</p> <ul style="list-style-type: none"> • 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.
<p>9–10</p>	<p>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.</p> <ul style="list-style-type: none"> • 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. • Complex and relevant terminology is used correctly throughout the response.

Option A — Freshwater

1. (a) (i) State the direction from point **A** to point **B**. **[1]**

South-east

- (ii) Estimate the percentage of the satellite image that is covered by dense vegetation. **[1]**

About 20% (accept 10–30%)

- (b) Outline the relationship between river discharge and hydraulic radius. **[2]**

Award **[1]** for the basic relationship and **[1]** for further development (either explanation or other outlined development, eg mention of Bradshaw model).

For example: The relationship is positive **[1]** / they both increase with distance downstream **[1]** as the river's size and energy increases **[1]**.

Do not award marks for definitions.

- (c) Suggest **two** landform changes that could be caused by river processes in an environment such as this. **[3+3]**

In each case, award **[1]** for a valid landform change resulting from fluvial processes, and up to **[2]** for development / explanation / exemplification.

For example: a meander develops into an ox-bow lake **[1]** when river erosion cuts through the neck of the meander **[1]** and deposition continues to isolate the lake **[1]**.

Other possibilities which are appropriate for the lowland fluvial environment shown in the photograph include:

- Meanders - accept increasing, more sinuosity, formation implying change
- Levees - formation implying change
- Floodplains - formation implying change

- Deltas
- Slip-off slope / river cliff
- River terraces.

2. (a) Examine the management challenges that internationally shared water resources can create.

[10]

Marks should be allocated according to the markbands.

The focus of the essay is on the management challenges facing the use of internationally shared water resources (rivers, lakes, wetlands and aquifers). Conflicts over shared water resources may be serious and difficult to resolve, especially where resources are scarce and demand is high. There are competing demands for water, which should be allocated on an equitable basis, to satisfy all users. Increasing demands from agriculture, industry and urban. Water scarcity is becoming an important issue; physical and economic water scarcity is increasing. The varying power of different stakeholders should be considered in relation to water management.

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

- Conflicts over aquifers, lakes and rivers which cross international boundaries.
- Conflicts over water for human consumption, irrigation and power generation; pollution resulting from such activities.
- Conflicts over access to scarce water resources, especially in arid regions.
- The power of different stakeholders varies between local people, water management organisations, and local and national governments.
- Disputes over water are an increasing source of international tension.
- Resolution of the conflict is difficult, and relies on international treaties regarding water management in drainage basins.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the management challenges, and may show that perspectives (eg, political, economic, social and environmental) may differ between stakeholders. Another approach might be to examine which stakeholders gain greater benefits, perhaps in relation to the varying power over the management process.

For 5–6 marks, expect weakly evidenced outlining of one or more management challenges created by internationally shared water resources.

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

- either an evidenced explanation of two or more management challenges created by internationally shared water resources
- 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 why some communities and environments may benefit more than others from the building of large dams.

[10]

Marks should be allocated according to the markbands.

The construction of large dams for multi-purpose water schemes can have significant benefits, but often come at a considerable cost. The cost and benefits are shared unevenly between different communities and environments, and some will benefit more than others.

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

- The benefits and costs of building large dams vary between different stakeholders, including local communities, farmers, environmentalists, organizations such as water management and power companies, national governments.
- The benefits and costs also vary between different environments/places.
- Benefits include: reducing flood risk, improved water supplies, and economic development through irrigation, power generation, recreation and tourism.
- There are also significant environmental, social and economic costs, which vary between different stakeholders and places.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the varying benefits of large dam construction for communities and environments, and may show that perspectives (eg political, economic, social and environmental) may differ between stakeholders. Another approach might be to examine which stakeholders gain greater benefits, perhaps in relation to their varying power over future management possibilities.

For 5–6 marks, expect weakly evidenced outlining of one or more benefits of large dam construction for communities and/or environments (places)

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

- either an evidenced explanation of two or more reasons why some communities and environments (places) benefit more than others
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, possibly examining future possibilities for management.

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

Option B — Oceans and coastal margins

3. (a) (i) Identify the country with the third largest aquaculture production. [1]

Indonesia

(ii) Estimate the aquaculture production in China in millions of tonnes. [1]

56 (accept 53–59)

(b) Outline **one** environmental problem associated with the growth of aquaculture. [2]

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

For example: Contamination of waters around the aquaculture farms [1] caused by leaked chemicals [1].

Other problems include:

- Escaped fish breeding with local wild fish
- Depleted fish stocks as used to feed farmed fish
- Spread of sea lice and diseases
- Eutrophication from fertilizers added to encourage greater phytoplankton growth.

(c) Suggest how sustainable management of ocean fish stocks in low- and middle-income countries may have benefits for:

(i) local communities; [3]

Award [1] for a valid suggestion and up to [2] for explanation or exemplification.

For example: Fishing provides employment [1] so there is long-term job security [1] due to lack of alternative employment options in industrializing/emerging countries where there is increased pressure on fish stocks [1].

Other suggestions include:

- Fishing provides protein source
- Tourism (people come to fish / scuba diving).

(ii) the global environment. [3]

Award [1] for a valid suggestion and up to [2] for explanation or exemplification.

For example: Stops fish becoming extinct / allows biodiversity to thrive [1], which maintains health of ocean ecosystems [1], thus protecting an important global commons [1].

Other suggestions include:

- Healthy food chains
- Environmental services
- Future stewardship.

4. (a) Examine the positive **and** negative impacts of La Niña events for different parts of the world. [10]

Marks should be allocated according to the markbands.

La Niña is the positive and cold phase of El Niño, and is associated with below average sea surface temperatures in the central and eastern tropical Pacific Ocean. La Niña may have significant impacts on weather systems, with environmental and economic consequences. La Niña can have positive and negative effects on different places, including changes in storm frequencies and rainfall amounts, causing flooding and droughts, and modification of ocean currents, affecting fishing industries.

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

- La Niña is the positive and cold phase of an El Niño event, associated with cooler than average sea surface temperatures in the central and eastern tropical Pacific Ocean.
- La Niña may have significant impacts on weather systems, with major environmental and economic consequences. It may lead to intense storms and flooding in some areas, and severe drought in others. For example, in Asia the formation of tropical cyclones causes heavy rainfall, flooding and landslides over SE Asia.
- Above average rainfall in NW India and Bangladesh is of benefit to agriculture, water supply and industry.
- La Niña may also increase the potential for tropical cyclones in the Atlantic Ocean.
- Drought also affects the coastal regions of California, Peru and Chile; while flooding affects the central Andes and Bolivia.
- La Niña has a positive impact on the fishing industry of western South America – upwelling of cold, nutrient-rich waters increase fish stocks, especially crustaceans and sea bass.
- The intensity and duration of La Niña cycles may increase with global climatic change.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the positive and negative impacts of La Niña in different areas. Another approach might be to examine which areas gain greater benefits, and whether these outweigh the negative impacts.

For 5–6 marks, expect weakly evidenced outlining of one positive and/or negative impact of La Niña.

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

- either an evidenced explanation of at least one positive and one negative impact of La Niña in different parts of the world
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives, possibly examining whether benefits outweigh the negative impacts.

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

4. (b) Evaluate the relative importance of vegetation in the development of coastal sand dunes.

[10]

Marks should be allocated according to the markbands.

Vegetation plays a vital role in the formation and development of coastal sand dunes, but wind and other coastal processes are also of importance. Sand dunes typically develop where there are strong onshore winds, and constructive wave action with the formation of wide, sandy beaches. There should also be a plentiful supply of sand, either from erosion of nearby cliffs or transported by ocean currents. Vegetation is important in trapping and stabilizing sand deposition to form dunes. A recognizable vegetation succession is evident from newer to older, more inland dunes. If vegetation is destroyed by human activity, sand dune erosion may occur.

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

- Vegetation plays a vital role in the formation and development of coastal sand dune systems.
- Other factors are also important, including the role of wind, and the availability of a large expanse of sand which can be transported inland.
- Strong prevailing onshore winds transport sediment inland, by saltation, suspension and creep.
- Vegetation traps and colonises the sand at the back of the beach, where wind velocities are lower. The roots and stems of the vegetation anchor the shifting sand, creating protection from the wind and hence more sand accumulation. Over time, more dunes will form at the back of the beach and plant succession occurs on the older, inland dunes.
- Dunes are vulnerable to erosion by human activities such as trampling which destroys the vegetation.
- Vegetation is vital in stabilising the sand dunes: protection and re-planting of dune vegetation is important in dune stabilisation.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the relative importance of vegetation in sand dune formation in relation to other factors such as wind and coastal processes that provide a wide expanse of sand. Another approach might be to examine the spatial variation in the role of vegetation, the way vegetation succession occurs over time scales, and the interaction of human activity.

For 5–6 marks, expect weakly evidenced outlining of the link between vegetation and coastal sand dune development.

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

- either an evidenced explanation of the importance of vegetation in coastal sand dune development
- or a discursive conclusion (or ongoing evaluation) which examines the relative importance of vegetation in relation to other factors, such as wind.

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

Option C — Extreme environments

5. (a) (i) Identify **one** feature of the way buildings are dispersed across Antarctica. [1]

Near ice shelves / on the edge of the continent / coastal / concentrated on the Antarctic Peninsula / concentrated between 135° E and 180° / to the east of Ross Ice Shelf / none at the South Pole.

(ii) Estimate the latitude of building **A**. [1]

Accept 80° or 80° South (credit 78–82)

(b) Outline **one** reason why a long-term fall in temperature might cause glaciers to advance. [2]

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

For example: Volume of ice increases due to more snowfall [1] accumulation exceeds ablation/melting [1].

Other possibilities include:

- Movement of glacier accelerated by greater mass of ice
- Mass balance changes
- Reaches pressure melting point.

(c) Explain **two** geographic factors that can make very high-latitude polar regions challenging for human activity. [3+3]

In each case, award [1] for a valid factor and up to [2] for development / explanation.

For example: Remoteness makes communications difficult [1] due to distance/time/hostile ocean/lack of infrastructure [1] and increases the cost of supplies/materials that have to be brought into the area [1].

Other factors include:

- Extreme cold – human discomfort
- Frozen ground/ice cover/permafrost – inaccessibility.

6. (a) Examine why opportunities for agriculture vary from place to place in hot, arid environments.

[10]

Marks should be allocated according to the markbands.

Hot, arid areas are characterized by high temperatures and low, variable annual rainfall. There is some possibility for farming, especially where water conservation and irrigation methods are used. Opportunities for agriculture will vary spatially due to factors such as access to water supply, for example by water transfer schemes, the exploitation of aquifers, access to land, capital and economic development, and different irrigation technologies. Challenges include low soil fertility, access to surface and groundwater supplies, salinization and desertification; economic and social inequalities.

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

- Hot, arid areas are characterised by low, variable rainfall, limited surface water supplies, low soil moisture content, lack of vegetation and infertile soils.
- Opportunities will vary partly due to differences in economic development between different places.
- Opportunities are created by traditional farming, including pastoral nomadism. Traditional irrigation systems allow intensive farming along rivers and oases.
- In recent years, large-scale irrigation systems, advanced irrigation technologies, utilization of aquifers, and desalinization plants have expanded commercial farming in different places.
- Large-scale water transfers have also allowed expansion of commercial farming in different places.
- Commercialization of agriculture, specialization in certain crops and access to capital and external markets have also occurred.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the way in which opportunities vary between different types of place and at different scales. These might reflect different agricultural systems, access to water supply and irrigation, access to capital and external markets, and the large-scale commercialization of agriculture. Another approach might be to examine the varying power of different stakeholders in the possibility of agricultural development.

For 5–6 marks, expect weakly evidenced outlining of some agricultural opportunities in hot, arid environments.

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

- either an evidenced explanation of why agricultural opportunities may vary in hot, arid environments
- 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) Evaluate the main opportunities **and** challenges for indigenous groups in extreme environments.

[10]

Marks should be allocated according to the markbands.

Candidates may refer to hot, arid or cold extreme environments, or to both. The main challenges and opportunities for indigenous groups include adaptation to global climatic change, management of desertification, increasing competition for access to resources (eg oil, minerals, fish), and access to new technologies. There may be conflicts between different stakeholders, including indigenous people, national governments and transnational corporations (TNCs). It is not expected that candidates will consider all of these traits, but the focus should be on opportunities and challenges facing indigenous groups.

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

- Adaptation to climate change – eg melting of ice sheets and permafrost; changes in rainfall patterns – eg droughts; and change to natural ecosystems, wildlife and migration patterns of animals.
- Economic development may be facilitated, leading to improvements in transport and communications, reduction in isolation, and increased wealth and job opportunities.
- Increased competition for access to resources – eg minerals, fossil fuels and fish).
- Challenges include threats to traditional ways of life, and conflicts between different stakeholders – indigenous groups, national governments and TNCs.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the way in which opportunities and challenges vary between different places, and how these might vary over time. The relative power of different stakeholders might be considered in relation to the impact on indigenous groups. Another approach might be to examine contrasting places and the varying prospects for sustainable development (economy, society, environment) for indigenous groups.

For 5–6 marks, expect weakly evidenced outlining of some opportunities and/or challenges for indigenous groups in extreme environments.

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

- either an evidenced explanation of the opportunities and challenges facing indigenous groups in extreme environments
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

Option D – Geophysical hazards

7. (a) (i) Identify the land use with the largest area. [1]

Tea

- (ii) Estimate the distance, in metres, between **A** and **B** of the landslide on the map. [1]

850 (*accept 820 to 900*)

- (b) Outline **one** physical factor that increases the speed of onset in a mass movement event. [2]

Award [1] for cause and [1] for development.

For example: Prolonged rainfall [1] will saturate the soil and accelerate soil movement on a slope [1].

Other possibilities include:

- relief/gradient
- soil structure
- geology.

- (c) Suggest how **two** pre-event management strategies could reduce the negative impact of mass movement in an area such as this. [3+3]

In each case, award [1] for a valid strategy and up to [2] for development, explanation or exemplification. (If strategy and/or development is not specific to mass movement hazard then maximum [2].)

For example: Increasing slope stability by terracing [1] therefore reducing the slope angle [1] and preventing damage to settlement / farmland [1].

Other strategies include, but are not limited to:

- land use zoning – infrastructure and buildings
- banning logging on steep slopes / Plant trees
- improving drainage/diverting surface water
- restraining structures eg gabions/walls
- netting/rock traps.

8. (a) Examine the reasons why earthquakes vary in magnitude and frequency between different places.

[10]

Marks should be allocated according to the markbands.

Earthquake activity is caused both by geophysical processes operating at plate margins, and also by human activities. The distribution, frequency and magnitude of earthquakes are chiefly related to different types of plate margin. Shallow earthquakes, of low magnitude and high frequency, are often associated with divergent plates, while high magnitude, deep earthquakes of lower frequency are associated with destructive plate margins. Human activity may also trigger low magnitude earthquakes.

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

- Different places are affected by varying types of earthquake activity. Some areas are more prone than others to earthquake activity.
- Earthquake activity occurs at constructive, destructive and transverse plate margins. High magnitude, deep-focus earthquakes occur at destructive margins. Shallow, low magnitude events characterize constructive and transverse margins. The latter are also associated with volcanic activity at hot spots, away from plate margins.
- Human activity, such as dam building and resource extraction, may also trigger low magnitude, shallow earthquakes.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the relationship between physical processes and earthquake frequency and magnitude. Another approach would be to examine earthquake characteristics at different places such as types of plate margin.

For 5–6 marks, expect weakly evidenced outlining of reasons why earthquakes vary in magnitude and/or frequency.

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

- either an evidenced explanation of processes of earthquake formation and associated magnitude and frequency at different places
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

8. (b) Examine how different human factors can affect community vulnerability to **one or more** geophysical hazards. [10]

Marks should be allocated according to the markbands.

The vulnerability of communities to geophysical hazards is influenced by various economic, social and demographic factors. These include levels of wealth and poverty, economic development and access to technology; population characteristics, education levels and degrees of awareness and perception. Vulnerability varies spatially, between different places, and at different scales from international to local.

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

- Economic factors include levels of wealth and poverty, building types, communications and access to technology, insurance.
- Demographic factors include population characteristics (age and gender) and population densities; migration.
- Social factors include levels perception and awareness, prior experience, and education level.
- These factors will also influence disaster pre- event management strategies designed to minimize vulnerability.
- The vulnerability of communities varies between different places and local contexts, and at different scales from international to local.
- Vulnerability may also vary between different types of geophysical hazard.

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 relationship between various human factors and geophysical processes that affect vulnerability. Another approach would be to examine vulnerability to communities at different places and scales.

For 5–6 marks, expect weakly evidenced outlining of human factors affecting vulnerability to a geophysical hazard.

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

- either an evidenced explanation of a range of human factors affecting vulnerability of communities to one or more geophysical hazards
- 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 range of number of visitors, in millions, for the 15 major tourist hotspots. [1]
20.0- 8.3 (or 11.7).
- (ii) State the median number of visitors, in millions, for the 15 major tourist hotspots. [1]
12
- (b) Outline **one** way in which investment by transnational corporations (TNCs) can help places grow as tourist destinations. [2]

Award [1] for a valid way and [1] for explanation or developed exemplification.

For example: TNCs organize/advertise package/all-in holidays [1] to destinations that people would otherwise not be aware of [1].

Other possibilities:

- A TNC/MNC might hold a conference in a city [1] helping to raise its profile and attracting visitors [1]
- Developing resort complexes (hotels, swimming pools etc) [1] attracting package holiday makers [1].

- (c) Suggest **two** reasons why further visitor growth at major tourist hotspots such as these could be unsustainable. [3+3]

In each case award [1] for a valid reason and [2] for further development / explanation / exemplification (with a link to sustainability).

For example: There may already be a shortage of accommodation in these hotspots [1] so prices are forced up further by increasing numbers [1] becoming unaffordable for local communities [1].

Other possibilities for the contexts shown include:

- Over-tourism
- Threats to culture
- Exceeds carrying capacity
- Increase in pollution.

10. (a) Examine how people's participation in leisure activities can be affected by their country's level of human development. [10]

Marks should be allocated according to the markbands.

The focus of the question is on the link between levels of human development and participation in leisure activities. Level of human development includes not only economic factors such as affluence, but also attitudes to gender and disability, demographic characteristics, changes in work habits and leisure time.

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

- There has been a significant growth in people's participation in different types of leisure activities in recent years.
- The growth in participation is linked to human and economic development, such as increases in personal affluence and disposable incomes.
- Some leisure activities are associated with more affluent people, while other activities may be associated with poorer groups.
- Social and demographic factors are also important. These include ageing populations and retired people with more leisure time; changes in the workplace, with more paid holidays; changing attitudes towards gender and disability.
- Participation in leisure activities varies spatially, both within and between countries at different levels of human development.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the relationship between various human factors and participation in leisure activities from different perspectives or on varying time and spatial scales. Another approach would be to examine changes in participation for different places at differing levels of development.

For 5–6 marks, expect weakly evidenced outlining of the relationship between human development and participation in leisure activities.

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

- either an evidenced explanation of the relationship between human development and participation in leisure activities
- 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 how different tourism strategies might contribute to the development of **one or more** countries.

[10]

Marks should be allocated according to the markbands.

The focus of the question is on how different tourism strategies, such as ecotourism, heritage tourism, and adventure tourism might contribute to development. The costs and benefits of different tourism strategies should be considered, including various economic and social/cultural effects. The growth of tourism has had significant impacts on the economy and communities in countries at varying levels of development.

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

- There are various types of tourist strategy, including ecotourism, heritage tourism and movie-location tourism.
- The growth of tourism has had significant economic, social and environmental costs and benefits.
- The relationship between the growth of tourism and development is complicated, and varies at different scales from local to national.
- The relative success of different tourism strategies for sustainable development should be examined.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the contribution of different strategies from different perspectives or on varying time or spatial scales. Another approach might be to examine countries at different levels of development, and why some places have benefitted more than others, and the varying power of different stakeholders.

For 5–6 marks, expect weakly evidenced outlining of how a tourism strategy contributes to the development of one or more countries

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

- either an evidenced explanation of how different tourism strategies contribute to the development of one or more countries
- 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 which world region has the least food waste created by food producers and shops. [1]

Sub-Saharan Africa

- (ii) Estimate the amount of food waste, in billions of tonnes, created by consumers in North America. [1]

100 (acceptable range of 90–110)

- (b) Outline how vertical farming can help increase long-term global food availability. [2]

Award [1] for a valid way and [1] for development/explanation.

For example: More food can be grown in the same land area / yields increase [1] because crops are being grown year-round/in layers [1].

- (c) Explain **two** strengths of food waste reduction as a strategy to improve food security in the world regions shown on the graph. [3 + 3]

In each case, award [1] for a valid reason and up to [2] for development / explanation / exemplification.

For example: Reducing food waste could make more food available without having to produce more [1] therefore regions where population growth is occurring will have enough food [1]. This is very efficient/sustainable in terms of energy and land use [1].

Other possibilities include:

- Cost of food is lower as less is wasted
- Less is stockpiled so costs saved.

12. (a) Examine the relative importance of prevention **and** treatment in limiting the spread of **one or more** diseases. [10]

Marks should be allocated according to the markbands.

The relative importance of policies of prevention and treatment will depend partly on the nature of the disease – chronic (non-communicable), or contagious/infectious – as well as on the economic, social, demographic and political characteristics of affected communities. Social marginalization issues, government priorities, means of infection and government priorities are also important considerations.

Possible **applied** themes (AO2) demonstrating **knowledge and understanding** (AO1):
The relative importance of prevention over treatment of disease will depend on a variety of factors, including:

- The nature of the disease (chronic or infectious) – e.g. cardiovascular disease or cholera): prevention may be more important in one than the other.
- Means of infection and transmission. The pattern and rate of diffusion of the disease.
- Economic characteristics and wealth of the community.
- Demographic characteristics – an ageing population may be more prone to particular chronic diseases.
- Availability of medical professionals and facilities; cost of medicines and healthcare.
- Government priorities; levels of education and awareness; access to social media.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the complex interactions between various factors affecting strategies of prevention and treatment from different perspectives and scales. The power of different stakeholders might also be examined. Another approach might be to consider the changing relative importance of prevention and treatment for countries and places at different levels of development.

For 5–6 marks, expect weakly evidenced outlining of prevention and/or treatment for one or more diseases.

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

- either an evidenced explanation of strategies of prevention and treatment for one or more diseases
- or a discursive conclusion (or ongoing evaluation) regarding the relative importance of prevention and treatment of one or more diseases.

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

12. (b) Examine how governments **and** other stakeholders can affect the severity of famine. **[10]**

Marks should be allocated according to the markbands.

The focus of the question is on the severity, rather than the causes, of famine, and the role and actions of different stakeholders. In some cases, the severity of the famine may be actually worsened, rather than alleviated. Apart from governments, other stakeholders include: international aid agencies and other humanitarian groups, local communities, and the media. Time scale is also important, as famine might be alleviated in the short term. In the long term, international aid may increase resilience and reduce the severity of future famines.

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

- The severity of famine is affected by a variety of human factors and the actions of different stakeholders.
- Stakeholders include local and national governments, international aid agencies and humanitarian groups, local communities and the media.
- The views and attitudes of different stakeholders (local, national and international) should be considered.
- The actions of the media may play an important role in highlighting the severity of famine.
- International aid may be both short and long term. In the short term, medical, food aid and water supplies will reduce death tolls from hunger and malnutrition. However, in the long term this may increase dependency on foreign aid.
- Long-term aid may increase resilience and reduce the severity of future famine.
- Local communities may also increase resilience to famine, through actions such as introduction of improved farming techniques, irrigation practices, and drought-resistant crops/animals.
- Improvements in education, health care and infrastructure in local communities are also important.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the contribution and power of different stakeholders in reducing the severity of famine. Another approach might be to examine the severity of famine in different places and geographical contexts, and how severity might be alleviated over time scales.

For 5–6 marks, expect weakly evidenced outlining of the influence of governments and/or other stakeholders in affecting the severity of famine.

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

- either an evidenced explanation of the influence of governments and other stakeholders in affecting the severity of famine
- 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) State which neighbourhood has the lowest amount of green space remaining. [1]

B

(ii) State which neighbourhood has 30 % of green space remaining on its streets. [1]

C

(b) Outline **one** reason why urban temperatures are sometimes higher than those of surrounding rural areas. [2]

Award [1] for a correct factor and [1] for development.

For example: Higher density of buildings/concrete compared with rural areas absorb/store heat during the day [1] which is then released during the night [1].

Other possibilities include:

- Buildings emitting heat
- Air pollution
- Transport routes
- Hard surface reverberation
- Albedo effect
- Valid reasons why rural areas are cooler.

(c) Suggest how the loss of green spaces over time in large cities like this could be explained by:

(i) **one** economic factor; **[3]**

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

For example: In large cities, there is very high demand for land [1] so green space is turned into more profitable land uses in the inner areas [1] for example for new housing projects [1].

Other possibilities include:

- retail use
- industry
- services.

(ii) **one** political factor. **[3]**

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

For example: lack of protection of green spaces by planning authorities/governments [1] leading to the uncontrolled urban sprawl of industry/housing/transport [1] particularly where there is great public pressure for new housing that governments must act on [1].

Other possibilities include:

- planning ie designating areas for housing / industrial use
- corruption means protected areas are developed unofficially
- local tax revenues increased by new housing/car parks.

14. (a) Examine reasons for the location of different economic activities in **one or more** cities. [10]

Marks should be allocated according to the markbands.

The focus of the question is on the location/distribution/pattern of different economic activities (retail, commercial and industrial) in urban areas. The factors affecting the pattern might be physical, economic and political. The relative importance of these will vary between different urban areas in countries at contrasting levels of development.

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

- There is a variety of physical, economic and political factors that influence the location of different economic activities.
- Physical factors might include relief, drainage, proximity to the sea or rivers.
- Economic factors include land values, access to transportation, proximity to a CBD.
- Political factors include planning and controls over development.
- Social factors might include relative wealth and poverty, and deprivation which influence informal economic activities.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines varying reasons for the location of economic activities in urban areas. The power of different stakeholders might be considered in urban places and scales. Another approach might be to consider the different time scales of changing locations of economic activity in urban areas.

For 5–6 marks, expect weakly evidenced outlining of reasons for location of economic activities in an urban area.

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

- either an evidenced explanation of the influence of different factors affecting the location of economic activity in one or more urban areas
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

14. (b) Evaluate the use of eco-city design as a way of managing large cities more sustainably. [10]

Marks should be allocated according to the markbands

The increasing concentration of people into large urban areas poses considerable challenges to urban planners, including management of the urban ecological footprint. Ecological issues include: atmospheric pollution and production of greenhouse gases, dependence on fossil fuels, pollution and over-use of water supplies; damage to natural ecosystems and wildlife. Sustainable management aims to reduce these ecological stresses and the urban ecological footprint. The use of eco-city designs is important, but these are often only at small scale, are expensive and can only play a small role in overcoming future urban challenges. Eco-cities may not always be appropriate, but the design principles may be successfully applied to existing cities.

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

- Eco-cities are designed to reduce ecological footprint, including minimizing greenhouse gas emissions, reduce dependence on fossil fuels, the sustainable use of water, and disposal of waste.
- Several eco-cities and eco-communities have been constructed, but these are often of small scale and expensive.
- Planned eco-cities may be more appropriate in richer countries, with lower rates of urbanization, but less appropriate in large, rapidly growing cities in NICs.
- Principles of eco-city design may be “retro-fitted” to sustainable management of existing cities.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines the contribution of eco-city design processes to the sustainable management of cities. The power and perspectives of different stakeholders might be considered. Another approach might be to examine the success in terms of different spatial scales, the time scale of the changes, and whether the cities are new or long established.

For 5–6 marks, expect weakly evidenced outlining of eco-city design and/or sustainable management.

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

- either an evidenced explanation of the contribution of eco-city design to sustainable management in large cities
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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