

Markscheme

May 2021

Geography

Higher level and standard level

Paper 1

26 pages

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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	<p>The response is too brief, lists unconnected information, is not focused on the question and lacks structure.</p> <ul style="list-style-type: none"> • The response is very brief or descriptive, listing a series of unconnected comments or largely irrelevant information. The knowledge and understanding presented is very general with large gaps or errors in interpretation. Examples or case studies are not included or only listed. • There is no evidence of analysis. • Terminology is missing, not defined, irrelevant or used incorrectly. <ul style="list-style-type: none"> • No evidence of evaluation or conclusion is expected at this level. <ul style="list-style-type: none"> • Information presented is not grouped logically (in paragraphs or sections). • Maps, graphs or diagrams are not included, are irrelevant or difficult to decipher (only if appropriate to the question). 		
3–4	<p>The response is too general, lacks detail, is not focused on the question and is largely unstructured.</p> <ul style="list-style-type: none"> • The response is very general. The knowledge and understanding presented outlines examples, statistics, and facts that are both relevant and irrelevant. Links to the question are listed. • The argument or analysis presented is not relevant to the question. • Basic terminology is defined and used but with errors in understanding or used inconsistently. <ul style="list-style-type: none"> • If appropriate to the question, the conclusion is irrelevant. • There is no evidence of critical evaluation of evidence (examples, statistics and case studies). <ul style="list-style-type: none"> • Most of the information is not grouped logically (in paragraphs or sections). • Maps, graphs or diagrams included lack detail, are incorrectly or only partially interpreted without explicit connections to the question (only if appropriate to the question). 		
5–6	<p>The response partially addresses the question, but with a narrow argument, an unsubstantiated conclusion, and limited evaluation.</p> <ul style="list-style-type: none"> • The response describes relevant supporting evidence (information, examples, case studies et cetera), outlining appropriate link(s) to the question. • The argument or analysis partially addresses the question or elaborates one point repeatedly. • Relevant terminology is defined and used with only minor errors in understanding or is used inconsistently. <ul style="list-style-type: none"> • 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. • Other perspectives on evidence (examples, statistics and case studies) and/or strengths and weaknesses of evidence are listed. <ul style="list-style-type: none"> • Logically related information is grouped together (in sections or paragraphs) but not consistently. • Maps, graphs or diagrams included do not follow conventions, and include relevant and irrelevant interpretations in the text (only if appropriate to the question). 		

<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) Identify which country has the most waterfalls between 780 m and 860 m in height. **[1]**
USA.
- (ii) State the mode for height from the table above. **[1]**
840 (“m” not needed)
- (b) Outline the main features of **one** landform, **other than** a waterfall, created by river erosion. **[2]**

Award [1] for a basic outline of a valid landform and [1] for further development of its main feature(s) or the process relating to its formation.

For example: A meander is a winding/sinuuous section of a river **[1]** with a steep river cliff on the outside bend **[1]**.

Other erosional landforms include:

- gorges
- v-shaped valleys
- plunge pools
- rapids
- potholes
- terraces
- ox-bow lakes

- (c) Explain **two** reasons why rates of erosion could vary at different waterfalls, such as those shown in the table. **[3+3]**

In each case, award [1] for a valid reason and [2] for further explanation/development of variation in rates of erosion at different waterfalls.

For example: If the drop in height is great **[1]**, the water will be very fast **[1]**; therefore, there will be more rapid abrasion/hydraulic action **[1]**.

Other possible reasons include:

- geology
- scale / size of drainage basin
- variations in discharge levels
- load causing abrasion in plunge pool.

2. (a) Examine how human **and** physical factors can contribute to a low risk of river flooding. [10]

Marks should be allocated according to the markbands.

River flooding continues to cause serious human and environmental problems, especially in urban and densely populated rural areas. In order to reduce the impact, severity and frequency of flooding it is important that there should be an understanding of the physical and human causes of river flooding.

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

Human factors that may contribute to low flood risk include:

- flood mitigation schemes, such as structural changes to river systems, including levees, channel modification, dams and flood reservoirs
- land use planning and zoning; changes in land use, agricultural techniques and afforestation
- changes in land use and afforestation
- also important are factors such as weather forecasting and flood prediction.

Physical factors that may contribute to low flood risk include:

- geology, including rock permeability
- relief, including slope steepness
- rainfall amounts and seasonality
- land use, including types of vegetation cover.

Good answers may be **well structured** (AO4) and may examine the relative importance (AO3) of the two sets of processes, or the interaction of the two sets of processes, or how influences may vary from place to place.

For 5–6 marks, expect some weakly evidenced outlining of how human and/or physical factors contribute to a low flood risk.

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

- either an evidenced explanation of how human and physical factors (do not expect balance) contribute to a low flood risk
- 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 it can be difficult to achieve stakeholder agreement over how best to manage **one or more** water resources. **[10]**

Marks should be allocated according to the markbands.

As the quantity of water resources available to meet rising demands over time intensifies, and the quality of water degrades, there is increasing competition and possible conflict between water users. The rising demands include freshwater supplies from rivers, lakes and aquifers, fishing, irrigation and navigation. Many river basins cross political boundaries and there is a need for international agreements and cooperation to avoid possible conflicts over increasingly scarce resources.

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

- Freshwater resources include rivers, lakes, reservoirs and aquifers.
- Many large river basins cross political boundaries, and there is potential conflict over the use of water resources.
- Increasing demands for water resources come from meeting the needs of water supply, fishing, agriculture, energy and navigation, and there is a potential for conflict between different stakeholders.
- There is a need for international treaties and agreements to resolve the potential conflicts.
- The different stakeholders involved in resolving possible conflicts include local populations, national governments and international associations like the UN, FAO and UNESCO.
- International agreements may also be important in water management, conservation and protection.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the roles and power of different stakeholders in relation to water management issues. Perspectives can differ so greatly that no consensus can be arrived at. Different stakeholders have unequal power, which means that some views are ignored. The scale and complexity of the issue affects outcomes.

For 5–6 marks, expect some weakly evidenced outlining of the management of one or more water resources.

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

- either an evidenced explanation of the management of one or more water resources, and why it is difficult to get stakeholder agreement
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

Option B – Oceans and coastal margins

3. (a) (i) State the direction that Hurricane Irma is predicted to track in the first three days as a hurricane. [1]

WNW (*allow W and NW*)

- (ii) Estimate the number of hours it is predicted for Hurricane Irma to track from the Leeward Islands to the eastern tip of the Dominican Republic. [1]

66 hours (*allow 64–68*)

- (b) Outline **one** reason why hurricane activity may increase when ocean temperatures are warmer. [2]

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

For example: Higher ocean temperatures result in greater evaporation [1], which provides more energy for the formation of hurricanes [1].

- (c) Explain **two** effects of a hurricane on the physical environment of a coastal margin such as that shown in the diagram. [3+3]

In each case, award [1] for the effect and [2] for explanation/development.

Do not credit human impacts.

For example: Hurricanes can cause significant damage to coral reefs [1] due to high wave energy destroying the coral [1] and high rainfall reducing salinity, causing coral to die [1].

Other physical impacts include:

- loss of wetlands
- coastal erosion
- destruction of mangroves
- loss of biodiversity
- coastal flooding and debris deposited
- destruction of sand dunes
- landslides.

4. (a) Examine how the importance of wind and waves varies for the development of **two or more** coastal landforms. **[10]**

Marks should be allocated according to the markbands.

Erosional landforms include cliffs, stacks and wave-cut platforms, while depositional features include beaches, spits, bars and sand dunes. The actions of wind and waves are interrelated in the formation of such landforms.

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

- The actions of wind and waves are interrelated in the formation of coastal landforms, although their relative importance may vary.
- Wind affects wave strength and type – whether constructive or destructive – and the direction of longshore drift.
- Constructive waves – of low energy – produce depositional features. Destructive waves – of high energy – are responsible for erosional features.
- The importance of wind is dominant in the formation of sand dunes; other factors include adequate sediment supply and the role of vegetation.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) that examines the interrelationships between the two sets of processes, the relative power of the different influences in shaping environments, and the possibility of extreme wind and wave processes at different timescales, eg tsunamis.

For 5–6 marks, expect some weakly evidenced outlining of the formation of one or more coastal landforms by wind and/or waves.

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

- either an evidenced examination of the relative importance of wind and waves (do not expect balance) in the formation of two coastal landforms
- or a discursive conclusion (or ongoing evaluation) regarding their relative importance.

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

4. (b) Evaluate strategies designed to manage pollution caused by **two or more** types of waste materials in the oceans. **[10]**

Marks should be allocated according to the markbands.

Waste in the oceans includes radioactive materials, oil and chemical waste, and solid materials such as plastics. The consequences of the disposal of plastic waste have been of particular concern in recent years.

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

- Chemical waste includes SO₂ and NO_x and nitrates.
- Oil pollution may come from offshore oil production and effluent from ships.
- Physical waste includes plastic materials and sediment inputs from rivers.
- Waste may be deliberately disposed of in the oceans, or may come from effluent and output from rivers and land run-off, such as from agriculture.
- Oceanic pollution from waste may lead to significant damage to marine ecosystems, including fisheries and coral reefs.
- Strategies to manage pollution occur at both the local and global scales, including monitoring of levels of pollution, regulations and laws to limit different types of waste disposal, and clean-up operations following a significant pollution event.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) that examines a variety of strategies and the roles of different stakeholders in varying places and different scales from local to global. For example, strategies to deal with oil pollution may be more successful than plastics because of the temporal and spatial scales of the problem. It is hard to get stakeholder agreement to tackle plastic waste because of scale.

For 5–6 marks, expect some weakly evidenced outlining of management strategies aimed at reducing oceanic pollution for one or more types of waste materials.

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

- either an evidenced explanation of strategies for managing pollution caused by two or more types of waste materials
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives regarding the success of management strategies.

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

Option C – Extreme environments

5. (a) (i) Identify which state has the largest area of named deserts. [1]

Western Australia

- (ii) Identify the **two** deserts with the greatest longitudinal (east to west) extent. [1]

Great Sandy Desert and Great Victoria Desert

Both are needed for [1].

- (b) Outline **one** reason why rainfall is low in hot, arid deserts. [2]

Award [1] for the reason and [1] for some explanation of how it limits rainfall.

Diagrams should be given credit.

For example: Rain shadow [1] due to descending dry air on leeward side of a mountain range [1].

Other possibilities include:

- cold ocean currents
- latitude/sub-tropical high pressure
- continentality / interior.

- (c) Explain **two** challenges that low rainfall creates for agriculture in inland deserts such as those shown on the map. [3+3]

The challenges may relate to difficulties growing crops or raising livestock in arid environments, or finding alternative water resources because of inaccessibility.

Award [1] for each challenge and up to [2] for further development / explanation / exemplification.

For example, desertification can occur due to the dryness of the soil [1], and susceptibility to wind erosion [1] results in loss of soil for plant roots [1].

Other possible challenges include, but are not limited to:

- salinization
- problems with water collection and storage, cost of irrigation systems.
- problems with locating/accessing underground aquifers
- competition with other water users.

6. (a) Examine the importance of permafrost in the development of periglacial landscapes. [10]

Marks should be allocated according to the markbands.

Permafrost is the most distinctive feature of periglacial environments. Many periglacial landforms are associated with permafrost. Permanently frozen ground is overlaid by an “active layer”, which undergoes seasonal melting and freezing.

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

- The importance of permafrost and the active layer in periglacial environments.
- Freeze–thaw processes in the active layer and frost wedging of exposed bedrock produce large areas of coarse, angular rock debris (blockfields or felsenmeer).
- Widespread areas of patterned ground, thermokarst and polygons, formed by thermal contraction, cracking and frost heave.
- The formation of pingos within the active layer.
- The role of solifluction as a transportation process within the active layer, forming solifluction lobes and terraces.
- Sediment transport by solifluction may modify the patterned ground into stone nets and stripes and produce depositional solifluction lobes and terraces.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) that examines the role of permafrost in the formation of periglacial landscapes. Periglacial landscapes may depend on the type of permafrost, seasonal process changes and the interrelationships between processes. The different scale of landform features – *eg*, widespread areas of thermokarst, isolated patterned ground features or pingos.

For 5–6 marks, expect some weakly evidenced outlining of the formation of periglacial landforms/landscapes.

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

- either an evidenced explanation of the importance of permafrost in the formation of periglacial landforms/landscapes
- 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 political issues associated with mineral extraction in **two or more** extreme environments. [10]

Marks should be allocated according to the markbands.

Extensive valuable mineral resources occur in different extreme environments and their exploitation poses significant human and physical challenges. Opportunities include economic gains by TNCs, governments and local populations from the exploitation of resources. They also provide employment opportunities and higher wages for local people.

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

- Valuable mineral deposits occur in extreme environments, such as oil in North America and iron ore in Australia.
- Political issues may arise between different stakeholders, including national governments, TNCs and local peoples.
- Financial gains by TNCs and local and national government may contribute to economic and social development.
- There is the political problem of “leakage” to TNCs and a lack of skilled local labour
- Other political issues may concern environmental degradation, pollution, and disagreements over land ownership and rights.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the varying power of different stakeholders, interactions between different political forces and the connected issues, and possibilities for conflict resolution.

For 5–6 marks, expect some weakly evidenced outlining of some political issues associated with mineral extraction in one or more extreme environments.

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

- either an evidenced explanation of the political issues in two or more extreme environments
- or a discursive and structured 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 altitude range within which the majority of mass movements occur. [1]
2000–2999 (m not needed)
- (ii) Estimate the number of mass movements occurring above the altitude of 3500 m. [1]
11 (*allow 10–12*)

- (b) Outline **one** physical factor affecting the speed of a mass movement. [2]

Award [1] for physical factor and [1] for development.

For example: Gradient/slope [1] influences the effect of gravity on how fast material moves [1].

Other possible factors include:

- water content
- sediment size
- vegetation
- rainfall amount.

- (c) Explain **two** possible strategies to reduce human vulnerability to rapid mass movement hazards in a mountainous area such as this. [3+3]

In each case, award [1] for outlining the strategy and up to [2] for the explanation and development/exemplification of how the strategy reduces human vulnerability.

For example: Land-use zoning keeps people away from dangerous areas [1]. This could be at the base of rock faces where debris might fall/slide [1]. This prevents loss of life/economic loss [1].

Other possible strategies include:

- insurance
- slope stabilization, eg netting, rock armour, revetments, snow fences
- excavation and infilling of slopes to realign them
- improving groundwater drainage / diverting water
- diverting roads/infrastructure from known areas
- evacuation warnings / education
- banning logging on hillsides.
- controlled explosions
- housing design, to withstand impact of mass movement.

8. (a) Examine the relationship between plate margin type and the character of volcanic activity.

[10]

Marks should be allocated according to the markbands.

Most volcanic activity occurs along plate margins, although some is related to hotspots (eg, Hawaii). Volcanoes occur along both destructive (convergent) and constructive (divergent) boundaries but are generally absent along strike-slip boundaries such as the San Andreas Fault. There is a relationship between the type of plate margin and the character of volcanic activity and resultant landforms.

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

- Most volcanic activity occurs along plate margins, and there is a close relationship between the type of plate margin and character of activity.
- Destructive (convergent) plate margins are associated with violent, explosive, andesitic eruptions, formed in relation to subduction processes. These form large strato-volcanoes, ash cones, ash falls, pyroclastic flows and lahars.
- Constructive plate margins are associated with less violent basaltic eruptions, forming large shield volcanoes, fissure vents, and basaltic lava plains. They often form on the ocean floors and mid-oceanic ridges, such as Iceland.
- Volcanic eruptions also occur away from plate margins, such as on “hot-spots” like Hawaii.
- Passive, strike-slip plate margins, such as the San Andreas Fault are not normally associated with volcanic activity.

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 complex relationship between volcanic activity and processes operating at different types of plate margin. The relationship is sometimes complicated because in some places volcanic activity occurs away from plate margins. There may also be temporal change with changing characteristics at the same plate margin. Another approach might be to look at the varying scale of volcanic activity.

For 5–6 marks, expect some weakly evidenced outlining of one or more plate margin types and the characteristics of volcanic activity.

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

- either an evidenced explanation of the relationship(s) between two types of plate margin and varying characteristics of volcanic activity
- 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 geophysical factors were responsible for the differing impacts of **two** earthquake hazard events. [10]

Marks should be allocated according to the markbands.

The focus of the question is on the relationship between geophysical factors and their differing impacts. Earthquake hazard events are associated with the impact of ground shaking and rupture, landslides, tsunamis, and liquefaction. The geophysical characteristics of an area will have a major influence on the severity of impacts of an earthquake event. The impacts may be physical, human, or a combination of the two.

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

- The type of plate boundary affects the impact of earthquakes: convergent/destructive boundaries often produce stronger (higher magnitude) earthquakes than divergent (constructive) plate margins.
- The severity of the impact will vary with the intensity and depth of the earthquake event, and the nature/frequency of aftershocks. Shallow focus earthquakes have greater impact than deep earthquakes.
- Type of plate movement is important – vertical movement between plates (as on a convergent plate boundary) may cause more impact than horizontal (strike-slip) movement (as on a destructive plate margin).
- Other geophysical factors may include geology/rock type/sediments – which influence intensity of shaking, and possible liquefaction.
- Relief/slope steepness, and coastal topography may affect the incidence of landslides, and coastal flooding due to tsunamis.
- Time of day may also be considered as a geophysical factor.
- Impacts of earthquakes include ground shaking, liquefaction, landslides and tsunamis, as well as coastal flooding, collapsed buildings and damage to infrastructure.

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 complex relationship between the nature of earthquake activity and resultant impacts. Good answers will have a wider variety of physical factors and associated processes. Another approach is to look at the interactions between physical factors and systems. There may be a clear contrast in the power and scale of examples used.

For 5–6 marks, expect some weakly evidenced outlining of geophysical factors affecting one or more earthquake hazard events/impacts.

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

- either an evidenced explanation of how geophysical factors led to differing impacts for two earthquake hazard events (do not expect balance)
- 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) Estimate the range of costs shown for the Winter Olympics, in billions of US dollars. **[1]**

21 (allow 20-22 or 22-1 / 22-2 / 23-1 / 23-2)

- (ii) Estimate the total cost shown for the Summer Olympics between 2004 and 2016, in billions of US dollars. **[1]**

29 (allow 27–31)

- (b) Outline **one** possible reason why some higher-income countries have chosen to host the Olympics on multiple occasions. **[2]**

Award [1] for the reason and [1] for development linked to hosting on multiple occasions.

Award a maximum of [1] for the simple reason that “they can afford it and infrastructure is expensive” (this does not address the choice to hold events on multiple occasions).

For example: Some wealthy countries hope to gain political influence **[1]** and are prepared to commit high amounts of money regularly to achieve this **[1]**.

Other possible factors include:

- re-use of existing infrastructure
- legacy / regeneration
- highly advantageous physical conditions
- economic benefits if linked to tourism
- nationalism / patriotism

- (c) Explain **two** ways in which participation in international sporting events became more diverse during the years shown in the graph. **[3+3]**

In each case award [1] for identifying the way diversity has increased (eg, more women participating) and up to [2] for further explanatory development.

Responses should focus on who is affected and what has happened to make sports more inclusive. Award up to a maximum of **[4]** for a response dealing with an increase in the number of countries **participating** (which may imply diversity).

For example: There has been an increase in participation by disabled athletes (at the Paralympics) **[1]**. The Paralympics have been invested in and received large amounts of financial sponsorship **[1]** and high-profile media coverage **[1]**.

Other possibilities include:

- women participating
- religion
- transgender inclusion
- economically disadvantaged people

10. (a) Examine the contribution that ecotourism can make to the sustainability of tourism on local and global scales. [10]

Marks should be allocated according to the markbands.

Ecotourism is a form of sustainable tourism that aims to reduce the impact on the natural environment and sustain the economic and social wellbeing of local people. However, in recent years, considerable doubt has been cast on whether the aims have been fulfilled and on the negative environmental, economic and social impacts. Ecotourism may not be entirely sustainable, especially on a global scale.

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

- Ecotourism has gained in popularity as a form of sustainable and responsible tourism. It aims to conserve the natural environment and promote the economic and social wellbeing of local people.
- However, the aims may not always be realized, and ecotourism may do more harm than good in certain places.
- Poor management may harm the environment by introducing people to ecologically sensitive areas; the carrying capacity may be exceeded.
- As a destination's popularity grows, resources suffer from overuse.
- Human activity might disrupt wildlife; encourage soil erosion and habitat loss, and put pressure on limited water resources.
- Ecotourism is promoted and advertised in the media as responsible tourism, resulting in a large increase in tourist numbers globally.
- Many ecotourism destinations are in remote areas, requiring extensive air and vehicle travel and creating large carbon footprints.
- International developers may divert money away from the local community; corrupt governments may take a large cut of the profits.
- There may be threats to indigenous cultures. However, the promotion of ecotourism may educate people of the need for responsible and sustainable tourism.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) that show a good understanding of sustainable tourism, and may examine how ecotourism works well in particular places, but does not necessarily translate to a global scale.

For 5–6 marks, expect some weakly evidenced outlining of ecotourism as a form of sustainable tourism locally and/or globally.

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

- either an evidenced explanation of ecotourism at local and global scales (do not expect balance) and its contribution to sustainability
- 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 geographic relationship between the hierarchy of teams and the distribution of supporters for **one named** national sports league. **[10]**

Marks should be allocated according to the markbands.

The position of a team in a hierarchy is shown by its position in that league. The team's position will go up and down in the league, depending on success, over different timescales. The relative success of a team is partly related to economic power and influence. An example of a national sports league should be clearly identified.

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

- The hierarchy of teams includes: the position of teams in the sports league, their economic wealth, and the value and importance of players.
- Teams at the top of a hierarchy, such as in the English Premier Football League, are often located in major urban areas and have a large number of supporters from a wide sphere of influence.
- They may attract supporters from a local, national and international scale.
- Teams lower in the hierarchy will attract fewer supporters, mainly from a local scale. They will have much less wealth and power.
- Reference could be made to factors such as the role of the media, sponsorship and advertising in influencing the sphere of influence.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement, recognizing that the economic power of the top tier gives rise to a truly global scale of influence. Another approach would be to question how the relationship changes over time.

Award a maximum of [4] if a non-national league is discussed eg Champions League, Super Rugby.

For 5–6 marks, expect some weakly evidenced outlining of the hierarchy of a national sports league and/or the distribution of supporters.

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

- either an evidenced explanation of the relationship between team hierarchy and distribution of supporters in a named national league
- 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 four-figure grid reference for the spot height of 1062 metres in the northeast of the map. [1]

Allow **only** 1462, 14 62 and 14,62 (no E /N or dashes)

- (ii) Estimate the area, in km², of cultivated land to the west of easting 02. [1]

10 (allow 9–11)

- (b) Outline **one** way in which the use of genetically modified organisms (GMOs) could help increase food production from cultivated land. [2]

Award [1] for a basic outline point about increasing productivity/yield and [1] for further development.

For example: Scientists use GM technology to increase, say, the amount of fruit grown by a plant [1], which means there is a higher yield per unit area [1].

Other possibilities include:

- growing season/time of germination
- frost or pest resistance
- size and number of fruits/nuts/seeds *etc.*

- (c) Explain **one** physical factor **and one** human factor contributing to the diffusion of **one named** water-borne disease through an area such as this. [3 + 3]

In each case, award [1] for outlining a relevant factor and up to [2] for an explanation of why diffusion occurs through an area/from place to place.

For example: Physical – heavy rainfall [1], which may lead to flooding in the area [1] and spreads the cholera bacteria away from source [1].

For example: Human – some sections of the city are densely populated, so the sewage system is inadequate [1] and it overflows into rivers [1], which contaminates the drinking supply of places downstream [1].

Other possible factors include:

Physical

- drainage issues/swampy land
- warm temperatures / increased evaporation
- reduced water level-salinity (cholera conditions)

Human

- through transport links, where infection is carried/spread through feces
- education about water safety

Award a maximum of [4] if no specific disease is named, or if a water-borne disease is incorrectly identified.

12. (a) Examine how spatial variations in food consumption can impact upon life expectancy. [10]

Marks should be allocated according to the markbands.

Life expectancy shows considerable variation in different regions of the world. There is a close relationship between life expectancy and spatial variations in food consumption. Life expectancy tends to be lower in poorer regions with low food security and higher in richer, more developed areas. The relationship between life expectancy and food consumption will vary with time and scale.

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

- Life expectancy varies spatially, between different regions and places.
- There is a relationship between life expectancy and patterns of food consumption.
- Food consumption refers to the quantity and nutritional quality of food, and is linked to food security.
- Significant inequality exists between life expectancy and food consumption in different places/regions.
- There is a close relationship between life expectancy, food consumption and income levels.
- Increases in food consumption may lead to a reduction in life expectancy due to the increased incidence of obesity and heart disease.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement. They could examine the statement at different scales – eg, food consumption in different continents or in different parts of a city (places) linked to incomes. Another approach might be to look at interactions between food and health in contrasting ways – eg, increased food supply can both increase and decrease life expectancy.

For 5–6 marks, expect some weakly evidenced outlining of the relationship between life expectancy and food consumption.

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

- either an evidenced explanation of the spatial variations in the relationship between life expectancy and food consumption
- 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 the reasons why food insecurity remains high in many places. [10]

Marks should be allocated according to the markbands.

Food security considers the core issues of availability, affordability, quality and safety; that people should have access to sufficient, safe and nutritious food that meets their dietary needs. The lack of food security affects people on a variety of spatial scales, from village to nation, in many areas of the world. Food insecurity may be caused by many inter-related physical, economic, social and political factors. It is often associated with poverty, poor economic development and political instability. Attempts to tackle food insecurity have met with only limited success, and it remains high in many places.

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

- Food security considers the core issues of availability, quality and safety of food.
- Low food security affects people in many areas of the world, from local to national scales.
- Low food security is often related to poverty; many people are trapped in a cycle of poverty, with poor diets, low productivity and short life expectancy.
- Other factors, such as adverse physical environment, lack of economic development, agricultural practises, crop disease, poor communications and political unrest, also contribute to low food security.
- Stakeholders involved in attempts to tackle food insecurity include international organisations (eg, WHO/FAO), national governments and NGOs, and local communities – often with only limited success.
- The priorities and power of different stakeholders is also important.
- Strategies to reduce food insecurity include improving agricultural production, improving infrastructure and storage, trade agreements to facilitate trade in food crops, international aid, overcoming political instability, food waste reduction.
- Food insecurity remains high; it is a difficult problem to resolve and many attempts to reduce the problem have had only limited success.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement. They could examine the statement on a variety of scales – eg, food insecurity in different countries, regions, or in different areas of a city (places) – linked to various geographic factors, together with attempts to reduce insecurity. Another approach might be to look at changes in food insecurity over different time scales, possibly linked to global climatic changes, or the power of different stakeholders.

For 5–6 marks, expect some weakly evidenced outlining of causes of food insecurity.

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

- either an evidenced examination of the reasons for high food insecurity in many places
- 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 the factor that belongs in **box A**. [1]

Reduced job opportunities/unemployment/outmigration

(ii) State **one** political factor that could be included in **box B**. [1]

Award [1] for a valid political factor.

Possibilities include:

- Clean Air Act
- adoption of sustainability goals
- land-use planning
- tariffs and trade (including trade barriers)
- government policies.

(b) Outline how **one** physical factor can affect the location of low-income residential areas in a city. [2]

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

For example, favelas on steep slopes [1] because they are prone to landslides and other people don't want to live there [1].

Other possible factors include:

- swampy area
- contaminated land
- prevailing wind or strong winds

Do not accept distance from the CBD as this is being interpreted as an economic factor (bid rent).

- (c) Explain **two** possible ways of solving the long-term issue of urban social deprivation in an area such as this. **[3 + 3]**

In each case, award [1] for the strategy and up to [2] for development/explanation/exemplification.

For example: Re-training of people who have lost their job and lack skills **[1]** in order for them to get work in new service industries **[1]**, which attracts new employers/industry to the area and breaks the cycle **[1]**.

Other possibilities include:

- movement of new industries into these brownfield sites
- micro-financing / lending
- re-industrialization
- provision of affordable housing
- government intervention
- encouraging a wider range of leisure activities/night life
- developing flag ship attractions
- constructing new offices, conference centres, hotels
- re-urbanization with new apartment blocks.

Do not accept gentrification as a factor.

14. (a) Examine the influence of **two or more** physical factors on patterns of economic activity in urban environments. [10]

Marks should be allocated according to the markbands.

Patterns of economic activity are influenced by several different physical factors, such as geology, relief, drainage, site (eg coastal or riverside) and local climates (which might influence patterns of pollution). Geological factors might include proximity to mineral deposits (mining); areas of low relief might be suitable for industrial and retailing activities and influence the development of infrastructure. Coastal regions may attract port activities.

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

- Physical factors that might influence patterns of economic activity include geology, relief, drainage, site (coastal/riverside) and climate.
- Relief is an important factor – low relief is a site factor influencing the location of large scale industrial or retail activities, which will avoid areas of steep slopes.
- Economic activities will also tend to avoid areas of poor drainage/marshland liable to flooding. On the other hand, these areas may be of low economic value and so suitable for extensive industrial activities.
- Infrastructure development is also favoured by areas of low relief.
- A coastal or riverside location is an important site factor for the development of port-related activities.
- Geology may be important – proximity to mineral resources may lead to the development of mining; unstable ground may be unsuitable for urban development.
- Local climates, such as the direction of prevailing winds, may influence the location of polluting industrial activities.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that examines interactions between different factors (such as physical, economic, and planning) at varying scales; eg different site factors in different places. Examination may also be made of the changing role of physical factors over varying time scales.

For 5–6 marks, expect some weakly evidenced outlining of the influence of one or more physical factors on urban economic activities.

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

- either an evidenced explanation of the influence of two or more physical factors in urban environments
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and perspectives.

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

14. (b) Examine the management challenges in cities experiencing rapid population growth. [10]

Marks should be allocated according to the markbands

In recent years there has been a dramatic growth of population in cities, especially in Asia and Africa, caused by a combination of rural–urban migration and high rates of natural increase. This rapid growth causes significant challenges to urban planners, especially in relatively poor areas of the world.

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

- Rapid population growth in large urban areas is causing significant challenges to urban planners, especially in Asia, Africa and Latin America.
- Challenges include provision of employment, housing, water supply, sanitation and health.
- Other challenges include reducing urban stress caused by traffic congestion, pollution and waste disposal.
- Urban planners need to devise strategies to manage the urban systems for a sustainable future, such as resilient city design, reducing the urban ecological footprint, and purpose-built settlements.

Good answers may be **well structured** (AO4) and may additionally offer a **critical evaluation** (AO3) of the statement in a way that links the challenges to the scale of the city and growth (*i.e.*, some worse than others); demographic processes of migration and natural increase mean management goals must keep changing. Different places/world regions may have different context-specific challenges.

For 5–6 marks, expect some weakly evidenced outlining of one or more management challenges caused by rapid population growth in cities.

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

- either an evidenced explanation of management challenges facing cities experiencing rapid population growth
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and perspectives.

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