

# Markscheme

November 2016

Geography

Higher level and standard level

Paper 2

31 pages

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**Paper 2 markbands**

These markbands are to be used for paper 2 at both standard level and higher level.

	AO1	AO2	AO3	AO4	Paper 2
Level descriptor	Knowledge/ understanding	Application/ analysis	Synthesis/ evaluation	Skills	Marks 0–10
A	No relevant knowledge; no examples or case studies	No evidence of application; the question has been completely misinterpreted or omitted	No evaluation	None appropriate	0
B	Little knowledge and/or understanding, which is largely superficial or of marginal relevance; no or irrelevant examples and case studies	Very little application; important aspects of the question are ignored	No evaluation	Very low level; little attempt at organization of material; no relevant terminology	1–2
C	Some relevant knowledge and understanding, but with some omissions; examples and case studies are included, but limited in detail	Little attempt at application; answer partially addresses question	No evaluation	Few or no maps or diagrams, little evidence of skills or organization of material; poor terminology	3–4
D	Relevant knowledge and understanding, but with some omissions; examples and case studies are included, occasionally generalized	Some attempt at application; competent answer although not fully developed, and tends to be descriptive	No evaluation or unsubstantiated evaluation	Basic maps or diagrams, but evidence of some skills; some indication of structure and organization of material; acceptable terminology	5–6
E	Generally accurate knowledge and understanding, but with some minor omissions; examples and case studies are well chosen, occasionally generalized	Appropriate application; developed answer that covers most aspects of the question	Beginning to show some attempt at evaluation of the issue, which may be unbalanced	Acceptable maps and diagrams; appropriate structure and organization of material; generally appropriate terminology	7–8
F	Accurate, specific, well-detailed knowledge and understanding; examples and case studies are well chosen and developed	Detailed application; well-developed answer that covers most or all aspects of the question	Good and well-balanced attempt at evaluation	Appropriate and sound maps and diagrams; well structured and organized responses; terminology sound	9–10

**Option A — Freshwater – issues and conflicts**

1. (a) (i) Describe the changes in flood frequency shown on the graph. **[3]**

Possibilities include:

- increasing number of floods **[1]**
- appears to be cyclical **[1]**
- there are two flood-rich periods (1940s to 1960s; 1980s to 2000s) **[1]**
- one/two flood-poor periods (1900s to 1940s; possibly 1970s) **[1]**.

*If no quantification, maximum [2].*

- (ii) Estimate how many more floods occurred in the 1990s than in the 1930s. **[1]**

31 **[1]**

*Allow answers between 29 and 33 [1].*

- (b) Suggest **one** physical reason **and one** human reason why the risk of a river flooding can change over time. **[3+3]**

*Award [1] for each valid reason and [2] for development/explanation/exemplification.*

Physical reasons (over different timescales) include more rainfall/storms, climate change, antecedent conditions. Human reasons include deforestation/reforestation, increase in urbanization, climate change, change in agricultural practices, river management, increased monitoring.

For example: An increase in building/urban areas leads to more impermeable **[1]** surfaces which leads to more surface run-off **[1]** and a greater amount of water entering the river **[1]**.

For example: Very intense rainstorms **[1]** caused by low pressure systems/strong monsoonal winds/La Niña, *etc*, **[1]** create flooding as river channels are unable to cope with increased water **[1]**.

- (c) To what extent are floodplain landforms the result of river deposition? **[10]**

Deposition on floodplains does help explain the majority of landforms, but some are explained by a combination of erosion and deposition.

A number of various landforms should be looked at and explained. Responses are not expected to give detailed accounts of the formation of each feature but the contribution of deposition and erosion (as required) should be made clear. Not all features are expected to be covered.

Features include meanders, oxbow lakes, river terraces (formed by both erosion and deposition) and floodplains, braiding, levees, point bars and deltas (depositional only).

Good answers may be carefully structured around mainly depositional landforms and landforms formed by other processes, *eg* erosion or mass movement. Some might consider the extent to which both erosion and deposition contribute to a particular landform, *eg* meanders, or are of varying importance at different times, *eg* seasons or longer-term change, or places.

*Do not credit landforms found outside the floodplain area, eg waterfalls.*

*At band D, expect a number of features to be described but mainly attributed to deposition.*

*At band E, expect either an explanation of a number of features attributed to erosion/deposition or a combination of the two or a discussion of the extent to which deposition dominates.*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

2. (a) (i) Define the term *wetland area*. [2]

An area regularly/seasonally/permanently/always saturated [1] by surface water and/or groundwater [1].

- (ii) Describe the pattern of wetland areas shown on the map. [3]

Possibilities include:

- mainly in the Tropics (Mexico/Central America/Caribbean) [1]
- fewer in higher latitudes [1]
- fewer in the Amazon/Brazil [1]
- concentrated along the coast [1]
- islands [1].

- (b) (i) State **one** component of agricultural run-off that contributes to the eutrophication of lakes and wetlands. [1]

nitrates/fertilizers/phosphates/manure [1]

- (ii) Suggest **two** impacts of eutrophication that can have adverse effects for people. [2+2]

*In each case, award [1] for a valid impact and [1] for further development.*

For example: Reduction of water quality for humans [1] resulting in health risks due to high nitrate concentrations [1].

Other possibilities include:

- loss of wildlife/fish reduces tourism potential
- high cost of cleaning water
- other valid impacts.

- (c) “The drainage basin is an open system with inputs, outputs, transfers and stores.”  
Discuss how this knowledge helps people to prevent flooding.

[10]

The drainage basin is the area of land drained by a river and its tributaries, separated from adjacent basins by a watershed. The drainage basin is an open system as it has an input in the form of precipitation and a series of outputs such as evapotranspiration and water returning to the sea. There are stores and transfers facilitating the movement of water.

Flood prevention could be achieved by modifying different stores or parts of the system, *eg* forestry (interception) or reservoirs (less transfer). Knowledge of saturated soil stores can help with flood prediction though not prevention.

Some candidates may work systematically through each aspect of the drainage basin system, commenting on flood management in each case.

Good answers may discuss reasons why knowledge of the drainage basin system does not necessarily help prevent floods, for instance there are long-term unpredictable changes, *eg* climate change. Good answers might discuss the difference between flood prediction and flood prevention (knowledge of systems helps predict but not prevent).

*At band D, expect some description of parts of the drainage basin system, with some relation to flooding.*

*At band E, expect either a more detailed explanation of the drainage basin system and possible flood prediction/prevention (may query whether a knowledge of drainage basins actually helps to prevent flooding) or explicitly discusses the relative importance of inputs, outputs, transfers and stores.*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

**Option B — Oceans and their coastal margins**

3. (a) (i) Identify **two** of the landforms shown in the diagram. [1]

*Any two of the following for [1]:*

- A cave
- B stack
- C arch
- D wave-cut platform or shore-cut platform

- (ii) Outline how wave action could lead to the collapse of the cliff. [3]

*Award [1] for each valid point.*

Possibilities include:

- eroded by hydraulic action/force of the wave
- abrasion/marine processes
- chemical processes, *eg* carbonation
- a notch is formed between low water mark and high water mark
- the notch is enlarged, the cliff becomes unstable and collapses.

*Maximum [2] for an outline of processes that does not address the final point about notch and collapse.*

- (b) Explain **three** factors favouring the growth of coral reefs. [2+2+2]

*Award [1] for each reason and a further [1] for development/exemplification.*

Possibilities include:

- sunlight is important for photosynthesis [1] – coral reefs contain algae (zooanthellae) which photosynthesize [1]
- salinity – coral not favoured by low salinity/freshwater [1] and is mainly in areas where the salinity is between 32 and 40 PSU (practical salinity units) – sudden decreases in salinity in oceans off major rivers may destroy coral [1]
- depth – coral is limited to about 100 m [1] as below that it is too dark to photosynthesize effectively [1]
- temperature – coral reefs grow most between 18–30°C [1] – most reef building coral cannot tolerate temperatures below 18°C and can only survive high temperatures for short periods [1]
- acidity of seawater [1] – increased acidity leads to less growth/decreases capacity of coral to build skeletons [1]
- pollution of oceans [1] – decreases water quality/less coral growth [1]
- management strategies [1], to protect reef/research/encourage growth [1].



- (c) Examine the environmental and economic impacts of the pollution of oceans by oil. **[10]**

Environmental impacts might include: degraded ecosystems, flora and fauna mortality, reduced ecosystem productivity. The impacts may be concentrated in particular areas *eg* shipping lanes, offshore oil fields and nearby coasts.

Economic impacts might include: cost of clean-up, reduced fishery catches, unemployment, reduced tourism/recreational value, higher cost of oil (linked with possible restrictions on oil production or fines for companies, *eg* costs incurred by BP in relation to Gulf of Mexico).

Good answers may be carefully structured around an examination of different kinds of environmental and economic impacts. These may be local or global, short-term or long-term, small-scale or large-scale, intentional or unintentional. Impacts may also be experienced at a different place from the source of pollution due to tidal movements, and this may be examined. Good answers may also examine how impacts and cost may be spread across different user groups/stakeholders.

*At band D, expect a description of some environmental and economic impacts of oil pollution.*

*At band E, expect either a more detailed and balanced explanation of the economic and environmental impacts of oil pollution or a structured attempt to examine some different aspects of the impacts (*eg* severity or spatial extent).*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

4. (a) (i) State **one** natural cause **and one** human cause of sand dune degradation. [1+1]

Natural cause – strong winds / blow outs / storms [1]

Human cause – trampling/foot path erosion / fire/barbeques / introduction of exotic species (eg rabbits) / dune boarding [1].

- (ii) Identify **two** ways in which people are attempting to restore the sand dunes shown in the photograph. [1+1]

*Award [1] for each valid statement.*

Possibilities include:

- fencing off/closing off areas to prevent further erosion of the dunes/destruction of the vegetation
- signage to keep people out
- replanting of sand dune species, eg sea couch and marram grass.

- (b) Briefly explain the characteristics **and** formation of **two ocean floor** landforms found at a constructive plate boundary. [3+3]

*For each landform explained, award up to [2] for a description of the landform's characteristics and up to [2] for an explanation of its formation, up to a maximum of [3].*

For example: A mid-ocean ridge is a submarine linear mountain range [1] formed by two plates moving apart due to convection currents [1] and magma rising to produce a volcanic ridge [1].

Other possibilities include:

- rift valleys at constructive plate boundaries
- seamounts (guyots) are formed at constructive boundaries but have since moved away
- transform faults
- shield volcanoes
- pillow lava
- black smokers.

- (c) Examine the possible impacts of changes in the ocean carbon store. [10]

Oceans play a key role in the carbon cycle. The major reservoirs of carbon dioxide are fossil fuels ( $10\,000 \times 10^{12}$  kilograms of carbon), the atmosphere ( $750 \times 10^{12}$  kilograms of carbon) and the oceans ( $38\,000 \times 10^{12}$  kilograms of carbon). Photosynthesis by plankton generates organic compounds of carbon dioxide. Some of this material passes through the food chain and sinks to the ocean floor, where it is decomposed into sediments.

Oceanic uptake of  $\text{CO}_2$  has halved since the 1990s. This may be due to the oceans being saturated with respect to  $\text{CO}_2$ . As the oceans absorb more carbon, they become more acidic. The implications of this are that climate change may accelerate if the oceans can no longer absorb carbon; coral reefs may die back due to acidification; species such as crabs and lobsters may decline due to the decrease in calcium building.

Good answers may be carefully structured around different kinds of possible impact, *eg* positive and negative, environmental and economic, short-term and long-term. These will be grounded in an understanding of the role of the oceans as a store of  $\text{CO}_2$ .

*At band D, expect a description of the role of the oceans in the carbon cycle.*

*At band E, expect either a more detailed explanation of the role of the ocean carbon store or an examination of possible impacts of changes.*

*At band F, expect both.*

**Option C — Extreme environments**

5. (a) (i) Estimate the latitude at which the percentage of land is highest in the Northern Hemisphere. [1]

latitude: 67° North (accept 65–70° N inclusive) [1]

- (ii) State **one** reason why extreme cold environments can even be found at latitude A. [1]

altitude/elevation [1]

- (iii) Briefly outline the seasonal variations in temperature likely to be found at latitude B. [2]

*Award [1] for each of the following:*

- most months below freezing
- wide range of monthly temperatures
- lowest temperatures (–40°C) in June/July
- highest temperatures (could reach +5°C) in November/December.

- (b) Explain the characteristics **and** formation in periglacial environments of:

- (i) patterned ground; [3]

*Award up to [2] for a description of the characteristics and up to [2] for an explanation of formation, up to a maximum of [3].*

Characteristics include:

- patterned ground consists of stone-circles, polygons and stripes [1]
- they can be up to several metres wide [1].

Formation points include:

- formation occurs in soils that have experienced intense frost heave [1]
- steep slopes/gradient cause the circles to be replaced by polygons [1]
- role of ice sorting/differential frost heave [1]
- solifluction may play a role [1].

- (ii) thermokarst. [3]

*Award up to [2] for a description of the characteristics and up to [2] for an explanation of formation, up to a maximum of [3].*

Characteristics include:

- wet hollows/depressions/lakes [1]
- uneven/irregular relief/hummocks [1].

Formation points include:

- permafrost melting, leading to wet areas/lakes [1]
- ice lens growth explaining hills/hummocks/higher areas [1]
- doming due to frost heave [1]
- warming climate may explain increased thermokarst [1].

- (c) Referring to examples, evaluate the varied economic opportunities in hot, arid environments.

[10]

Most hot environments are not densely populated due to the challenging nature of the environment. Expect details of opportunities to include forms of agriculture including nomadism (the traditional way of dealing with insufficient amounts of rainfall and pasture) or commercial crops in places with irrigation (in areas close to rivers or oases), *eg* cotton, dates.

Other examples include mineral and oil exploitation, or possibly tourism using the arid environment as an attraction (either natural features or cultural landscape, *eg* world heritage sites).

Good answers may evaluate the relative merits of these opportunities (*eg* high value of oil and some tourism industries compared with the low profitability of some forms of agriculture). Good answers may also evaluate the sustainability/durability of some types of activity. Another approach might be to evaluate the likelihood of opportunities being exploited, or not, in different places (*eg* conflict or local poverty could deter potential visitors in some arid places).

*At band D, two opportunities should be described.*

*At band E, expect either more detailed explanation of two opportunities or some evaluation of how the opportunities may vary in terms of potential/realized benefits (*eg* for different places, environments, societies or levels of development).*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

6. (a) Outline **two** physical causes of aridity in hot, arid environments. **[2+2]**

Sub-tropical high pressure **[1]** brings dry, descending air **[1]**.

Continentality / interior has higher temperatures than coastal margins **[1]** due to lack of proximity to the sea **[1]**.

Cold offshore currents **[1]** mean air does not rise / limits potential precipitation over land **[1]**.

Rain shadow effect **[1]** means a lack of moisture/rain/water for places on lee side/far side/downwind of relief features/mountains **[1]**.

- (b) Explain **two** processes of weathering commonly found in hot, arid environments. **[3+3]**

Possibilities include:

- exfoliation (involves layers of rock peeling off)
- granular and block disintegration (rock breaks down into grains/blocks)
- freeze-thaw (blocks break off due to ice expansion)
- salt crystal growth (crystals in pores create stress).

*Do not credit erosion processes such as sand abrasion.*

*Award **[1]** for each process outlined (not simply named) and a further **[2]** for the brief explanation offered.*

For example: Exfoliation involves layers of rock peeling off **[1]** due to expansion/contraction due to (large) temperature range/changes **[1]** in the presence of some moisture/water **[1]**.

- (c) “Human activity within periglacial environments is unsustainable.” Discuss this statement.

[10]

Sustainability has been defined in a number of ways. One common one is using resources wisely without compromising the needs of future users. Within an extreme environment the resource base is quite fragile. There are a variety of approaches to analysing the question based on sustainable activities.

Indigenous people have generally lived sustainably in these environments. More recent activity by newer arrivals has not been as sustainable. Human activity includes settlement, infrastructure, communications, and resource development, including tourism. This more recent development has had adverse effects not only on the environment, *eg* degradation of soil or fauna within ecosystems, but perhaps on the culture of indigenous people.

Good answers may discuss the concept of sustainability and the degree to which environmental, social and economic needs can all be met in periglacial environments. Good answers might be carefully structured around different periglacial environments/places/levels of development and may discuss the extent to which sustainable goals can be met in each.

*At band D, two human activities should be described and their sustainability commented on.*

*At band E, expect either more detailed explanation of different activities, or some discussion of the concept of sustainability in relation to periglacial environments.*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

**Option D — Hazards and disasters – risk assessment and response**

7. (a) Describe the distribution **and** tracks of hurricanes (tropical cyclones, typhoons) affecting **mainland Asia**.

**[2+2]**

*Award [1] for each point, to a maximum of [2] in each case.*

Distribution:

- Most of southern mainland Asia experiences hurricanes
- Eastern section has hurricanes which are formed a long way away
- East coast affected but not at higher latitudes
- In the western Pacific Ocean / Bay of Bengal / Arabian Sea.

Tracks:

- Longer tracks move westwards and curve away from the Equator
- Shorter tracks move north and are straighter.

- (b) Briefly explain **two** geographical consequences of a recent human-induced (technological) hazard.

**[3+3]**

*Award [1] for each consequence and up to [2] for further development/exemplification.*

For example: The Deepwater Horizon oil spill in the Gulf of Mexico in 2010 had a devastating environmental impact on marine life and food chains in the Gulf [1], including death of dolphins, bluefin tuna and bird life [1]. The loss of marine life severely impacted local fish catches [1].

Other consequences (depending on the hazard event) might include:

- destruction of buildings
- loss of farmland due to contamination
- loss of incomes
- social effects such as injuries, loss of life, and health issues.



- (c) Using **one or more** recent examples, discuss the relative importance of short-term and long-term responses to hazard events and/or disasters.

[10]

Short-term responses take place over a few hours, days and weeks, and might involve: search and rescue; provision of essential medical care; provision of emergency food and water supplies; combating the threat of disease; establishing communications to the outside world; alerting relief agencies.

Long-term responses go on for months and years after a disaster, and might include: provision of long-term shelter, rebuilding destroyed houses, schools, hospitals *etc*, re-establishing communications; re-establishing the local economy; undertaking protective measures and educating the local community in case of a future disaster; establishing monitoring stations to warn/help predict of a future hazard.

Good candidates may conclude that short-term responses may be more important, to reduce the immediate threats to loss of life and re-establishing the local economy, whereas long-term responses are important in a different way (long-term development) and more problematic, involving continued aid, re-structuring and investment into the area, which may not be forthcoming, especially in poorer countries. Good candidates may also discuss the importance of making adaptation integral to the long-term strategy in order to build resilience.

*At band D, responses are likely to be descriptive accounts of some short-term and long-term responses.*

*At band E, expect either a more detailed explanation of the importance of short-term and long-term responses for a named disaster, or some explicit discussion of their relative importance (perhaps in relation to different goals or objectives).*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

8. (a) (i) Describe the change in the total number of reported disasters between 1971 and 2010. [2]  
The total number of disasters increased [1] from about 750 to about 3500 [1].
- (ii) State the type of natural hazard that has **not** increased in frequency since 1981. [1]  
drought [1]
- (iii) Estimate the total economic losses due to storms and floods between 1971 and 2010. [1]  
US\$1.65 billion (accept 1.6–1.75) [1]

- (b) Explain **three** reasons why communities may underestimate the probability of a major hazard event occurring in the area in which they live. [2+2+2]

*In each case, award [1] for a valid reason and [1] for further development.*

For example, lack of data about previous events [1] may mean that it is impossible to predict the likely return interval of the hazard [1].

Other reasons could include:

- lack of awareness
- lack of information from governments
- lack of education
- low impact of previous hazard events
- delayed impact of a long-term event, such as drought
- fatalistic attitude.

- (c) Discuss the view that human vulnerability to natural hazards (excluding river flooding) is greater in urban areas than in rural areas.

[10]

Rapid urbanization and the concentration of large numbers of people in large urban areas is a feature of many poorer countries. Often, these are major ports occupying low-lying land at or near to sea level. Hurricanes can cause storm surges with major impacts for urban areas. Large unplanned, poorly built shanty towns develop in vulnerable areas, such as steep hillsides or low-lying ground, making them vulnerable to landslides in tectonically active areas or during hurricanes (saturated ground). Poor urban migrants are likely to be unaware of their vulnerability to hazards and lack access to information about what to do in the event of a disaster.

On the other hand, rural areas can be hard to reach after a hazard event/disaster and so mortality may be much higher. Poverty and lack of education in rural areas may also contribute to a high death toll. Some rural areas may be especially prone to certain hazard events, eg areas along plate boundaries, fold mountains, Pacific islands in typhoon belt.

Good answers may discuss dimensions other than rural/urban, such as the level of development as the main influence on vulnerability. They may also discuss how the magnitude/frequency of events may be higher in either rural or urban areas (eg many large cities are on coastal margins where hurricane/typhoon strikes are more likely than in inland rural areas; distribution of coastal cities also corresponds with plate margins).

*At band D, expect some description of people's vulnerability to hazards in different rural/urban places.*

*At band E, expect either a more detailed explanation of how hazard/hazard vulnerability varies between rural and urban places or some explicit discussion of the statement (eg may argue that many other factors affect vulnerability, and these must be considered too, or may conclude on relative importance of vulnerability in urban areas compared to rural).*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

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

9. (a) Describe **two** characteristics of the leisure hierarchy. **[2+2]**

*Responses may refer to number, frequency, sizes, spacing, range, catchment areas or cost of installation/facilities.*

*In each case, award [1] for a valid characteristic and [1] for development or exemplification.*

For example: One characteristic of the leisure hierarchy is that there will be many more sports fields [1] for junior/student teams for a particular sport in a city than there are sports fields for professional teams [1] in the same city. In addition, while student team fields will have only a relatively small catchment area [1], the catchment area of the professional fields will be much larger [1].

- (b) Explain **three geographic** factors that might influence decision-makers in choosing a host city for an international sports event. **[2+2+2]**

*Award [1] for the identification of each suitable factor, and an additional [1] for further development/exemplification.*

For example: Pre-existing venues, reducing construction costs [1] – eg Rio de Janeiro hosting the 2016 Olympics using venues developed for the World Cup [1].

Other factors might include:

- good international transport links, such as airports, increasing accessibility
- good local transport infrastructure, increasing accessibility
- available accommodation, for participants and supporters
- suitable climate, such as snow for winter sports
- corruption/money/politics.

- (c) Using **one or more** examples, evaluate the strategies designed to manage tourism in rural areas.

[10]

Strategies might include:

- designation of areas as National Parks or similar protected zones
- restrictions on use of cars in sensitive areas
- encouragement of cycling by provision of bike hire and cycleways
- improvement of local public transport
- improved education and signage; education and information centres
- increased focus on ecotourism
- limiting tourist numbers
- redistributing tourists from honeypot sites.

Good answers may carefully structure management to encompass minimizing environmental damage, reducing conflict between local residents and visitors and meeting economic needs, maximising carrying capacity, *etc.* Good answers might also evaluate the strategies from different perspectives of different user groups, or may evaluate the success of strategies in the short and long term, or for different places within the rural area.

Responses that do not name a rural area are unlikely to be awarded above band C.

*To access band D, at least one example of a rural environment should be considered and candidates may describe some relevant management strategies.*

*At band E, expect either a wider variety of strategies discussed in more depth, or some evaluation of their success.*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

10. (a) Using map evidence, identify **and** locate **two** secondary tourist resources. **[2+2]**

*In each case, award [1] for the tourist resources and [1] for correct location.*

For example: Campsite [1] in the gorge at Sainte-Enimie [1].

Other possibilities include:

- campsites
- equestrian (riding) centre
- hostel/refuge/shelter
- viewpoints
- tourist information centre.

- (b) Describe how **one** characteristic of the valley of the River Tarn limits its environmental carrying capacity. **[2]**

*Award [1] for identifying the characteristic and [1] for development.*

For example: The valley/gorge is very narrow and steep-sided [1] and therefore access/transport is difficult [1].

- (c) (i) State the direction in which the camera was pointing when photograph A was taken. **[1]**

NNE; accept N, NNE or NE [1]

- (ii) Referring to photograph A, suggest the evidence that the perceptual carrying capacity of Sainte-Enimie may already have been exceeded. **[3]**

Shows some understanding of perceptual carrying capacity [1].

*Allow [1] for each of two pieces of evidence, such as:*

- crowded car park beside river [1]
- congestion in narrow streets of the town [1]
- noise pollution from vehicles and people [1]
- intense development/cramped cafes along road [1]
- large number of day-trippers (cars/canoes) [1].

- (d) Using examples, evaluate the use of tourism as a development strategy in some low-income countries.

[10]

The advantages and disadvantages of using tourism as a development strategy should be examined. Tourism is a rapid growth industry and many low-income countries see its promotion as a development strategy.

The benefits might include: the creation of jobs in the tertiary sector (such as in hotels and as tour guides) and stimulates the multiplier effect; generating income for the country through tourist expenditure and taxes; improvements in infrastructure; developing new skills and technology.

The disadvantages include: creating dependency on one industry – which might be a problem if tourists stop visiting because of a natural disaster or political unrest; unequal development and the growth of tourist enclaves; economic leakage as profits go overseas; worker exploitation – much employment is unskilled and low-paid, while better-paid, more skilled jobs go to foreign workers; increased rural–urban migration and development of shanty towns and the informal sector.

*At band D, there should be an understanding of how tourism might be used as a development strategy in low income countries.*

*At band E, there should be either more details or explanation of tourism as a development strategy or an evaluation of its effectiveness/usefulness.*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

**Option F — The geography of food and health**

11. (a) Describe the trends in food aid between 2000 and 2011. [4]

- Overall decrease [1]
- With significant annual variations (eg 2003) [1]
- Local purchases becoming more important as proportion of total [1]
- Very steep decline in food aid given directly by a donor country [1]
- Decline in *relative* importance of food aid given directly by a donor country [1].

*Award a maximum of [3] if no quantification.*

(b) Explain **two** possible disadvantages of food aid for a community that is currently experiencing food shortages. [3+3]

*Award [1] for each disadvantage, with a further [2] for development/exemplification.*

For example:

Food aid may reduce the market for (and/or price of) locally-grown food [1], making it more difficult for local farmers to produce food profitably [1].

This may lead to some local farmers choosing to switch from planting food crops to non-food crops, reducing food production in the community [1].

Other possible disadvantages of food aid include:

- it may increase the opportunities for speculation/corruption/power struggles
- it may increase inequalities within the community
- it may deter local innovation/solutions to the food shortage that might be more beneficial in the long term.



- (c) “Prevention should always be prioritized over treatment.” Discuss this statement, with reference to specific diseases and communities.

[10]

There are many reasons/factors that affect whether a community emphasizes prevention over treatment or vice versa, including:

- the nature of the disease
- the diffusion pattern of the disease (relocation/expansion)
- whether the disease is local/endemic or introduced
- the wealth of the community
- the quality/availability of local health care
- the cost of medicines
- the availability of health insurance.

Good answers may unpack the terms “prevention” and “treatment” and provide a structured examination of different communities. Another approach might be to evaluate the statement using context, scale, perspectives, types of disease etc. There may also be recognition that the statement could refer equally to high income countries as well as low income countries, or there could be inequalities within countries depending on factors such as location and wealth.

*For band D, expect description of treatment/prevention for two diseases and/or communities.*

*At band E, expect either more detailed explanation of the treatment/prevention of two or more specific diseases/communities or some discussion of the validity of the statement (for example considers different contexts/scales/types of disease).*

*At Band F, expect both.*

*Marks should be allocated according to the markbands.*

12. (a) (i) Define the term *food miles*. [2]

Food miles are a measure of the distance that food travels from its source (farm) to the consumer [1], either in units of actual distance **or** energy consumed during transport [1].

(ii) State the fruit or vegetable that ranks sixth in terms of the highest number of food miles. [1]

garlic [1]

(iii) Estimate the average (mean) food miles for the fruit and vegetables shown in the graph above. [1]

1500 miles (accept 1400–1600 inclusive) [1]

(b) Suggest **one** advantage **and two** disadvantages of using food miles as an indicator of the environmental impacts associated with food production. [2+2+2]

*Award [1] for each advantage/disadvantage and [1] for further development.*

Advantages include:

- they are relatively easy to quantify [1], and therefore simple to state and explain [1]
- they provide an indication of the carbon footprint [1] from farm gate to retail location [1]
- they give consumers information about the origin of the food they consume [1] and the likely form of transportation used [1].

Disadvantages include:

- they do not take account of the carbon footprint of the food production methods used [1], or of the energy/water requirements [1] of different kinds of farming systems
- they do not give any indication of the farming system employed [1], organic/free-range [1]
- they do not give a reliable indication of other environmental aspects [1], such as sustainability, the use of chemical fertilizers, pesticides and herbicides [1].

- (c) To what extent are food availability, malnutrition and diseases of poverty connected with one another?

[10]

There is a range of possible different approaches.

None of the three concepts is restricted to economically less wealthy countries.

In general, diseases of poverty and some forms of malnutrition (including under-nutrition) tend to overlap in distribution with areas where food may not always be readily available.

Malnutrition includes both under and over-nutrition and is therefore also found in many areas where diseases of poverty are absent and food is available.

Individuals suffering from under-nutrition, which may be due to poor food availability, may have weakened immune systems and less resistance to catching and suffering from diseases of poverty, such as malaria, tuberculosis and intestinal parasites. Equally, subsistence farmers and others suffering from diseases of poverty may be unable to work as productively as necessary to produce the food they need, thereby causing a lack of food availability and subsequent malnutrition.

Good answers may recognise the links between food availability, malnutrition and diseases of poverty, and provide a structured examination of these links. Diseases of poverty and some forms of malnutrition tend to overlap in distribution with areas where food may not be always readily available. There may be recognition that these areas may be in less economically wealthy countries, or in poorer sectors of the population within more wealthy countries. Another approach might be to challenge the links between food availability and the other concepts.

*At band D, expect a description of two links/connections between the concepts/problems.*

*At band E, expect either a more detailed explanation of some simple linkages or a more thoughtful examination of more complicated connections/interrelations.*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

**Option G — Urban environments**

13. (a) (i) Describe the general relationship between population density and air pollution from transport. [3]

Possible descriptions include:

- the relationship is negative / the lower the density, the higher the emissions [1]
- non-linear (or similar description) [1]
- exemplification using cities from the graph [1]
- Recognition of anomalies, such as Mexico City [1].

*If no reference to data, maximum [2].*

- (ii) State why Mexico City could be considered an anomaly. [1]

Mexico City has much higher emissions than the other cities of similar densities / it is a long way from the best-fit line [1].

- (b) Referring to **one or more named** cities, explain **two** ways in which a circular city system operates. [3+3]

*Award up to [3] for any of the following explanations. Two inputs/outputs would be acceptable.*

Inputs are reduced/controlled [1] and these include energy/water/resources/food [1], eg due to greater use of renewable energy in Masdar City UAE [1].

Outputs are reduced/recycled [1] and these include waste/energy/noise [1], eg Green Exchange in Curitiba (recycling scheme) [1].

May provide supporting diagram [1].

- (c) Examine the characteristics of urban deprivation in **one or more** cities you have studied.

[10]

The characteristics of urban deprivation are very varied and can take many forms – income inequality, single parents, long-term illnesses, unemployment, high residential densities, lack of access to sanitation/electricity, access to clean water, reduced access to fresh food and vegetables, reduced access to healthcare and education, *etc.*

Urban deprivation may be concentrated in inner cities, slums and shanty towns. Some deprivation may be found in areas near the edge of cities.

Some populations are more vulnerable than others – elderly, very young, migrants, unemployed. Social deprivation may lead to political unrest. It may also lead to community schemes to tackle deprivation, *eg* urban farms in Detroit, US.

A good account may be carefully structured around different interpretations of “characteristics”, such as social indicators, spatial patterns, urban environment, *etc.*

*At band D, expect a description of at least two aspects of urban deprivation.*

*At band E, expect either a more detailed explanation of urban deprivation or an attempt to examine a greater number of different aspects of urban deprivation.*

*At band F, expect both.*

*Marks should be allocated according to the markbands.*

14. (a) (i) Identify the region with the highest proportion of people living in urban areas in 2014. [1]

North America [1]

- (ii) Identify the region with the lowest rate of urbanization between 1950 and 2050. [1]

Oceania [1]

- (iii) Describe the change in the proportion of people living in urban areas in Latin America and the Caribbean between 1950 and 2050. [2]

*Award [1] for each valid point. Must have some quantification for [2].*

The proportion increases rapidly between 1950 and about 2000 [1] (from 40 % to around 70 %).

It increases more slowly between 2000 and 2050 [1] (from about 70 % to around 85 %).

- (b) Suggest **three** reasons why different ethnic groups are often concentrated in different parts of cities. [2+2+2]

*Award [1] for each reason identified and [1] for development/exemplification.*

For example: Due to greater availability of affordable/cheaper housing [1], less affluent groups may become concentrated in poorer parts of the inner city (eg Bangladeshi in East End of London) [1].

Other possibilities include:

- positive segregation – choosing to live in areas with an existing population due to more facilities, eg places of worship or family/community support, or speaking the same language
- negative segregation – avoiding areas where there may be potential conflict
- policies to segregate different ethnic groups
- work – employees grouped around work areas/industries
- historic factors
- relative wealth of migrants – rich and poor areas attract migrants of similar wealth.

- (c) Evaluate the success of **one** management strategy to tackle pollution in **one named** urban area.

[10]

Answers should refer to one named strategy. The strategy may have multiple strands, *eg* integrated transport management, promotion of public transport, renewable forms of energy. The pollution management strategy could be part of a holistic approach to achieve sustainable development (circular systems)/reduce pollution, *eg* Beijing and the 2008 Olympic games.

Good candidates may evaluate by recognizing that the strategy may have benefits as well as costs. Benefits may be environmental and social (such as improvements in health) whereas costs may be economic. They may evaluate using a sustainability framework. The success of the strategy may depend on political will, the ability to afford it/police it/perceived benefits. There may be local benefits (such as reducing traffic/car parking) but wider increases in pollution. Good candidates may also view the strategy from different perspectives, *eg* businesses may resent costs of tackling pollution.

*At band D, expect a description of a named management strategy.*

*At band E, expect either more detail or explanation of a named management strategy or an attempt to evaluate its success.*

*At band F, expect both.*

*Marks should be allocated according to the markscheme.*