N15/3/GEOGR/BP2/ENG/TZ0/XX/M

Diploma Programme
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Markscheme

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Geography

Higher level and standard level

Paper 2

33 pages

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) State **and** briefly outline what environmental problem A **and** environmental problem B could be. **[2+2]**

*In each case, award **[1]** for stating a valid problem and **[1]** for a relevant outline.*

Possible answers could include:
- groundwater problems – excessive use can cause rapid depletion of available supplies / subsidence of ground
- salinization – increasing concentration of salts in upper layers of soils
- pollution – irrigation run-off carries farm waste into rivers
- eutrophication – irrigation water washes fertilizers/nitrates into water bodies.

Credit any other reasonable point, such as leaching or soil erosion.

(b) Using **one named** example, briefly explain **one** cause and **two** consequences of an international conflict related to freshwater. **[6]**

*For the example named, award up to **[2]** for the cause and **[2+2]** for two consequences.*

The most likely cause might be: two countries both in need of limited water supplies **[1]** and gives a detail, *eg* population sizes/different demands/arid climate/boundary dispute *etc* **[1]**.

Possible consequences could be:
- treaties/international agreement **[1]** and gives a detail *eg* date **[1]**
- escalation of international conflict **[1]** and gives a detail *eg* political repercussions **[1]**
- one country builds a dam to maximize its supply **[1]** and gives a detail *eg* date of construction, or ecological/economic harm downstream, or navigation issues **[1]**
- a substitution strategy *eg* desalinization **[1]** and gives a detail **[1]**.

For example: Sudan and Egypt had a conflict over the Nile river, as both are in need of limited water supplies **[1]** to satisfy the demands of the growing populations [1]. This conflict resulted in the Nile treaty **[1]** in 1959 **[1]**. Since then the Egyptians have tried to use desalinization to meet their water needs **[1]**. This uses a process called reverse osmosis to remove salt and produce freshwater **[1]**.

*Award up to a maximum of **[4]** if inappropriate or no named example.*

Two separate consequences are needed; do not credit multiple problems associated with dam construction.

If more than one example is used, mark only the first.

(c) "Natural factors are always more important than human factors in causing a river flood." Discuss this statement with reference to **one named** example. **[10]**

A river flood should be clearly identified and located. It is not necessary to identify an actual river, as long as a river flood is identified and located; *eg* Bangladesh floods in 2005.

An account of the causes of a particular flood on the named river should be detailed. Both natural and human factors should be included (case study dependent) and good answers should include some specific details that refer to that river flood (not generalizations).

Likely human causes include urbanization, deforestation *etc*.

Physical causes may include frontal rainfall, extreme weather, steep slopes, *etc*.

Good answers may discuss how human and natural factors may interrelate: land use changes can exacerbate a natural tendency towards flashy hydrographs. A combination of urbanization and high-intensity rainfall may be the reason why extreme flooding has affected a place.

At band D, expect reference to a named river flood and a description of the natural and human causes of the flood.

At band E, expect <u>either</u> a more in-depth explanation of the natural and human causes, <u>or</u> some critical discussion of the relative importance of natural and human factors.

At band F, expect both.

Marks should be allocated according to the markbands.

2. (a) (i) Briefly outline how the natural recharge of an aquifer takes place. **[2]**

Natural recharge happens through normal percolation after rainfall/snowfall **[1]** and/or a gradual seepage from rivers or other water bodies **[1]**.

*Credit any valid extension of either point or any comment that relates to the geology/porosity of rock **[1]** of the area that allows downward movement of water.*

(ii) State **two** methods that can be used to artificially recharge an aquifer. **[2]**

Through creation of recharge basin lakes **[1]** or water pumped down the bore hole **[1]**. Credit any other logical reason why more water could be introduced to a region where an aquifer is present, *eg* drainage diversion **[1]**.

(b) Suggest how **three** human modifications of a floodplain can help to reduce flooding. **[2+2+2]**

*In each case award **[1]** for explanation of what the modification is and **[1]** for link clearly established with flooding.*

Modifications should be exclusive of each other. Modifications could include:

- afforestation
- changing agricultural practices
- urban changes *eg* "greening"
- river management schemes *ie* any measures that decrease the flood (*eg* flood relief channels, land-use zoning / river restoration schemes, channelization, levees).

For example: Flood relief channels are artificial channels parallel to the river **[1]** which divert water away from the river in a controlled manner, reducing flood risk **[1]**.

For example: Restoration of rivers allows them to meander and deliberately flood an area **[1]**, reducing the risk of floods downstream **[1]**.

Only modifications on the floodplain may be credited.

(c) Evaluate the strategies that have been used to resolve competing demands for water in **one named** river basin. **[10]**

Responses will depend on the river basin chosen. The river basin should be named and located.

The competing demands should be outlined and could include farming, industry, domestic supplies, recreation and power supply.

Strategies depend on the river basin selected but could include: customer metering of water, dams and reservoirs, transfer of water, zoning, water use restriction (temporary or permanent), customer advisory services, the use of incentives for installation and/or retrofitting of water efficient equipment, reduction of water use by the water utility, leakage detection and repair programmes and pressure reduction, regulation of the efficiency of water using appliances, especially in new buildings, and use of reclaimed water (*eg* waste water/grey water) to reduce the need for fresh water supplies.

Good answers may discuss the varying power and/or perspectives of different user groups in relation to how a resolution is arrived at (commercial/human need for water may ultimately take precedence over the needs of ecosystems/wetlands, for instance) Another approach might be to evaluate the importance/success of strategies/actions.

Answers that do not refer to a named river basin and focus on demands only should not move beyond band C.

At band D, expect description of some strategies used to tackle water demand problems in a recognizable river basin.

At Band E, expect either more in-depth explanation of strategies, or some critical evaluation of how successful the strategies have been.

At band F, expect both.

Marks should be allocated according to the markbands.

Option B — Oceans and their coastal margins

3. (a) Identify **and** briefly describe **two** coastal landforms in area X marked on map B. **[2+2]**

Landforms present in area X include: a spit, lagoon, bay/cove, wave-cut platform, stacks, foreshore flats/sand in water. For example, wave-cut platform/shore platform **[1]** has a long shallow gradient / is submerged at high tide **[1]**.

(b) Using located examples, suggest **two** reasons why ocean pollution may impact areas far from the source of pollution. **[3+3]**

*In each case award **[1]** for the located example (credit source or sink regions; or named examples of ocean currents/regions) and a further **[2]** for the reason offered. If the same example is used twice, award up to a maximum of **[5]**.*

Possible examples:
- oil pollution from the Deepwater Horizon oil spill travelled 80 km to make landfall along the US coastline
- ocean currents driving accumulation of plastics in the Great Pacific Garbage Patch
- radioactive material from nuclear power stations/industrial process/research *eg* Fukushima, Japan
- other named sources for fertilizers/sewage/detergents/plastics.

Possible reasons:
- discharge/channel flow in rivers takes pollution away from source **[1]** which can lead to the development of eutrophic/nutrient-rich conditions in named coastal areas **[1]**
- surface movement of oil / solid wastes / chemical spills is driven by ocean currents and wind systems **[1]** and may provide further details **[1]**
- ocean movements caused by tropical cyclones **[1]** may also disperse pollutants into areas far from their source and may give details **[1]**
- oil may be ingested by some species **[1]** which travel long distances perhaps for food / breeding grounds **[1]**
- pollution builds up (bioaccumulation / biomagnification) **[1]** in species higher up in the food chain which have travelled further for their food supply **[1]**.

For example: Oil pollution from the Deepwater Horizon oil spill in the Gulf of Mexico travelled over 80km to make landfall along the US coastline **[1]**. The oil spill was driven by ocean currents and winds onto the coastline **[1]**. The oil also covered and was ingested by various marine animals and thus severely affected ecosystems along the Louisiana coast **[1]**.

Credit other valid reasons and developments.

(c) Evaluate the contribution that subaerial processes and wave action make to the development of coastal landforms. **[10]**

Likely landforms include erosional features, such as cliffs, stacks, arches, wave-cut platforms, and depositional features, such as beaches, spits, bars and dunes. Full marks could be gained through an examination of just two landforms if the balance between subaerial processes and wave action is well evaluated.

- Subaerial processes include weathering, mass movements and surface run-off. Mass movements include slumping, rotational slumps, slides and flows. Weathering processes in coastal areas may be responsible for wave-cut platform, and the weathering of cliffs.
- Wave actions include the actions of destructive (erosional) waves and constructive waves. The former may be involved in the formation of cliffs, arches, stacks, stumps, whereas the latter may be involved in the formation of beaches, spits, bars, barrier beaches *etc*. Longshore / littoral movements also potentially play a role.

Answers where one set of processes is absent in both cases will be self-limiting as that answer will only explain, and will not evaluate.

Good answers may evaluate explicitly the relative balance of the two sets of processes, perhaps in relation to contrasting landforms. The timescale for process operation could be considered also.

At band D, expect answers which describe two or more landforms in a way that shows how subaerial processes and/or wave action have an influence.

At band E, expect <u>either</u> a wider range of landforms/processes explained <u>or</u> some critical examination of the relative influence/interaction of subaerial and wave processes (for instance in relation to cliffs).

At band F expect both.

Marks should be allocated according to the markbands.

4. (a) Describe **two** physical and/or human features shown in the photograph that suggest this is an advancing coastline. **[2+2]**

*In each case, award **[1]** for a brief statement of evidence (either a landform feature or reference to human activity), and **[1]** either for an extended description of the feature, or an explicit link that is made with the fact that the coast is advancing.*

For example:
- the land here is very flat/sandy **[1]** suggesting it may be new land, a result of deposition by constructive waves **[1]**
- there is a new industrial/port area extending out from the coast **[1]**, which is sited on land that appears to have been recently reclaimed from the sea **[1]**
- the main landform appears to be a spit **[1]**. There are a number of recurves (*eg* in square D3) located along the spit as a result of deposition over time **[1]**
- the growing marsh/salt marsh **[1]** is the result of freshwater from the stream mixing with salt water in an enclosed environment **[1]**.

(b) Explain how oceanic trenches are formed. **[6]**

*Award up to **[2]** for description and location of ocean trenches, and **[4]** for an explanation of their occurrence*

Description:
- very long, linear (underwater) features **[1]**
- the deepest parts of the oceans **[1]**
- may offer example(s) **[1]**.

Explanation:
- formed at oceanic-continental subduction zones **[1]**
- denser oceanic crust plunges under less dense continental crust **[1]**
- alternatively, at an island arc system, denser ocean crust plunges under less dense ocean crust **[1]**
- as the plunging plate subducts into the mantle, it forms a steep, deep, trench, typically at an angle of 45° **[1]**
- the cause of plate movement is convection currents in the mantle, causing material to be pushed away from mid ocean ridges **[1]**
- provides relevant diagram **[1]**.

Credit other valid points.

(c) "There are no simple solutions for the conflicts that arise over the use of coastal areas." Discuss this statement. **[10]**

There are many competing land uses in coastal areas – urbanization, transport, tourism, recreation, fishing, industry, energy production, conservation. This can lead to many conflicts *eg* access to the land, use of resources, conflicts between farmers, developers, local residents *etc*.

Conflict can also arise over the use of coastal waters *eg* aquaculture, mangrove management, wind farms, *etc*.

For example, urbanization may lead to the loss of habitat / species diversity / lowering of groundwater, causing salt water intrusion/water pollution. This may anger those who are trying to conserve natural habitats and biodiversity.

Full marks can be achieved by a discussion of two conflicts and their possible solutions (do not expect balance).

Good answers may highlight the uneven power of different user groups (meaning that conflict is brushed aside rather than resolved). Another approach might be to establish interrelationships with processes such as in-migration, economic development or long-term sea-level changes: any of these processes may mean that conflicts over land use are especially hard to resolve.

If the candidate refers to geopolitical conflicts in relation to oceanic resources, rather than conflicts on a coastline, do not award above a band C.

At band D, expect an identification/description of at least one conflict (and interest groups) <u>or</u> description of some general solutions/strategies for coastal management.

At band E, expect <u>either</u> more detailed explanation of two conflicts and possible solutions, <u>or</u> some critical discussion of why conflicts are difficult to resolve.

At band F, expect both.

Marks should be allocated according to the markbands.

Option C — Extreme environments

5. (a) Describe **two** changes in the landscape shown by the two photographs that demonstrate glacial retreat. **[2+2]**

*In each case, award **[1]** for a valid change and **[1]** for a description that demonstrates a link with glacial retreat.*

Possibilities include:
- snout of glacier has moved up the valley **[1]** demonstrating it has got shorter
- there is a new lake **[1]** which shows the glacier is melting/shrinking **[1]**
- land is exposed on valley sides **[1]** as glacier is not as deep/wide **[1]**
- other valid suggestions.

(b) Explain the formation of **two** features resulting from the processes of glacial and/or fluvioglacial deposition. **[3+3]**

Possible depositional or fluvioglacial depositional features could include: tills, lateral moraine, medial moraine, terminal moraine, kame terraces, esker, drumlin, outwash plains, erratics.

*In each case, award **[1]** for identifying a feature, **[1]** for description if given and up to **[2]** for explanation of how the feature has formed.*

Credit should be given for use of an explanatory diagram.

*For example: Lateral moraine **[1]** is the material on margin/sides of a glacier **[1]**. This material is deposited along the valley edge when the glacier retreats **[1]**.*

(c) Using examples, discuss the opportunities for agriculture in hot, arid areas. **[10]**

Hot, arid areas are characterized by high temperatures and low/variable annual rainfall. There are various opportunities for agriculture that can be explained:

- pastoral nomadism (the traditional way of dealing with insufficient amounts of rainfall and pasture)
- settled farming making use of/access to aquifers and artesian basins or irrigation close to rivers or oases, with increased use of drought-tolerant and/or disease-resistant species.

Good answers may critically discuss one or more factors that determine whether agricultural outcomes can be optimized/realized or not; or may discuss whether opportunities have increased or lessened over time. Themes might include unequal or improving access to technology; poverty; conflict; climate change *etc*.

At band D, expect answers which describe a few real or perceived opportunities that are appropriate for hot, arid areas, with few or limited examples.

At band E, expect <u>either</u> the well-exemplified explanation of a wider range of opportunities for recognizable arid areas, <u>or</u> some critical discussion of whether one or more opportunities have actually been realized.

At band F, expect both.

Marks should be allocated according to the markbands.

6. (a) Referring to the photograph, briefly describe how people have adapted their clothing **and** transport in order to live in extreme cold environments. **[2+2]**

*In each case, award **[1]** for identifying an aspect(s) of clothing/transport and **[1]** for describing why it is needed/linked to cold environments.*

Possibilities for clothing are skins / heavy clothing / heavy boots / head protection / gloves **[1]** because of below-freezing temperatures / wind chill / might get frostbite / other specific point (do not accept "very cold" or "extreme cold") **[1]**.

Possibilities for transport are specific modifications including ski style transport / rugged construction / wide tracks **[1]** because of extensive/permanent snow cover / ice cover / permafrost **[1]**.

(b) Explain **two** causes of low rainfall in hot, arid environments. **[3+3]**

*In each case, award **[1]** for an identified cause of rainfall and up to **[2]** for the explanation, which may include **[1]** for an example.*

Possibilities could include:
- latitude – dry descending air heated above dew point, absence of clouds *ie* anticyclonic conditions, the Hadley Cell
- continentality – large areas of dry land, due to wind blowing over large land areas
- rain shadow effect – air descends and warms on the leeward side of mountains
- cold, offshore currents – air is cooled travelling over cold water and is unable to hold moisture.

Diagrams should be given credit.

For example: Rain shadow effect **[1]** – the high ground forces air to rise where it cools and forms rain **[1]** and as it descends, it warms and dries **[1]**.

(c) Examine how tourism in **one** type of extreme environment has led to a wide range of adverse environmental impacts. **[10]**

Increased tourism activity in extreme environments has sometimes resulted in increased pressure on a delicate environment. Environmental impacts that might be explained can include mass movement, erosion and land degradation, water usage, vulnerability to hazards, loss of biodiversity, waste disposal issues. These impacts could in turn threaten social sustainability with further knock-on effects for the environment.

Good answers may do more than explain/list different, unconnected impacts. They may additionally examine the interrelations, complexity or timescale of different impacts, for instance by stressing the possible irreversibility of certain impacts (*eg* permafost melting, desertification, species loss), or showing **interrelated** impacts *eg* how ecosystems are affected by water shortages, *etc*.

At band D, expect answers which describe some negative impacts of tourism for a recognizable extreme environment.

At band E expect <u>either</u> an explanation of a wider range of environmental impacts in named extreme area(s), <u>or</u> some critical examination of a narrower range of impacts.

At band F, expect both.

Marks should be allocated according to the markbands.

Option D — Hazards and disasters – risk assessment and response

7. (a) Using data from the diagram, describe **three** trends shown. **[4]**

*Award **[1]** for each valid statement, up to **[3]**.*

Possibilities could include:
- total population increases **[1]**
- over-65s no change 1915–65 then rise in 2015/after 1965 **[1]**
- poverty % rises then falls **[1]**.

*Award **[1]** for each valid point up to a maximum of **[3]**. The final **[1]** is reserved for some quantification.*

(b) Suggest how a community's vulnerability to hazards is affected by:

(i) the demographic characteristics of its population; **[3]**

Responses may use own knowledge or may refer to the diagram.

*In each case, award **[1]** for each basic link between a valid population factor and some aspect of vulnerability/risk (such as preparedness, resilience, response) and up to **[2]** for further development using applied knowledge of a hazard, an example, or data from the diagram.*

Possibilities could include:
- more people means greater numbers are at risk **[1]** may give example of a place **[1]**
- more migrants who speak a different language and do not understand warnings **[1]**
- older people may have greater knowledge of dangers and are better prepared **[1]**.

For example: Vulnerability increases if more elderly people are in a place at risk of flooding who might be unable to move quickly **[1]**, this might be the case for a coastal town in Florida **[1]** with large numbers of elderly there who also may struggle to hear warnings **[1]**.

(ii) the socio-economic characteristics of its population. **[3]**

Responses may use own knowledge or may refer to the diagram.

*In each case, award **[1]** for each basic link between a valid population factor and some aspect of vulnerability/risk (such as preparedness, resilience, response) and up to **[2]** for further development using applied knowledge of a hazard, an example, or data from the diagram.*

Possibilities could include:

- high levels of poverty may mean more people living in hazard-prone areas **[1]**
- poorer people/areas have lower quality housing that is vulnerable to hazard events **[1]**
- lower income groups may not be able to afford insurance so are more vulnerable **[1]**
- high levels of affluence means more valuable possessions at risk **[1]**
- people with less formal education may have less knowledge of risks **[1]**.

For example: Low income groups cannot afford insurance and so are vulnerable **[1]**, and also may not have a television so do not get the warnings in time **[1]**. The poor were badly affected when Hurricane Katrina struck New Orleans **[1]**.

(c) Using examples, contrast the strategies adopted to minimize the risk from future droughts and hurricanes. **[10]**

There are multiple aspects of adjustment and response, including building construction, land-use planning, insurance, education and community capability-building, planning for rescue and rehabilitation.

Answers may also highlight the possibility of climate change, making hurricanes and droughts more frequent/less predictable, and thus management strategies would need to plan for the future.

Good answers may highlight and comment on the clear contrasts that emerge from the analysis, and the way these relate to the varying nature of the risk (hurricanes are sudden onset, powerful, destructive events and this ought to be factored into the way buildings are constructed; whereas droughts are slow onset, pervasive periods of water shortage and this may require better governance in relation to water management / food storage).

Answers that do not deal with predicted/future risk, but instead contrast the emergency/reconstruction response to events that have occurred already should be judged on their merits and might reach band D.

At band D, expect a basic description of strategies used for the two hazards (do not expect balance).

At band E, expect either greater, well-exemplified detail of the varied strategies and/or risks, or some critical evaluation of the contrasting character of the responses/risks.

At band F expect both.

Marks should be allocated according to the markbands.

8. (a) Referring to **either** earthquakes **or** volcanoes, briefly outline:

(i) **one** scale used to measure the magnitude of the hazard event; **[2]**

- identifies a scale **[1]**
- provides detail of the scale **[1]**.

Example: (earthquakes) The Richter scale **[1]** gives values for magnitude on a logarithmic scale **[1]**.

Accept other valid details about the scale.

(ii) why some hazard events are categorized as disasters. **[2]**

- outside help is needed to deal with the disruption
- provides further detail or an example.

(b) Referring to **either** earthquakes **or** volcanoes, briefly explain their occurrence:

(i) at a destructive (convergent) plate margin; **[3]**

Earthquakes:
- two plates move towards each other **[1]** and one is subducted/sinks due to density **[1]**
- this results in friction/tension that generates earthquakes **[1]** may give additional details *eg* deep focus events to a depth of 700 km **[1]**
- provides a clear diagram in support **[1]**.

Volcanoes:
- two plates move towards each other **[1]** and one is subducted/sinks due to density **[1]**
- this results in melting / partial melting to produce magma **[1]** may give additional details *eg* viscous lava resulting in explosive eruptions **[1]**
- provides a clear diagram in support **[1]**.

(ii) in areas **other than** along a plate margin. **[3]**

Earthquakes:
- transform/minor faults **[1]** run hundreds of kilometres perpendicular to plate boundaries **[1]** may give example **[1]**
- may occur at volcanic hotspots **[1]** due to thin plate / highly active plume **[1]** may give example **[1]**
- human-induced hazards *eg* reservoir construction **[1]**, mining or fracking **[1]** may give example **[1]**
- provides a clear diagram in support **[1]**.

Volcanoes:
- may occur at volcanic hotspots **[1]** due to thin plate / highly active plume **[1]** may give example **[1]**
- volcanoes at destructive boundaries may be some distance from actual margin due to the angle of subduction **[1]** may give details **[1]**
- provides a clear diagram in support **[1]**.

(c) Discuss why some hazard events are easier to predict than others. **[10]**

The most likely framework will be to explain, in turn, some combination of different types of hazard events: hurricanes, tectonic hazards, droughts and human-induced (technological) hazards. Two named types must be discussed in some depth for the award of full marks.

Credit should be given for the use of an alternative conceptual framework, for instance looking at the probability of high-impact / high-magnitude events as opposed to low-impact events with different recurrence intervals. Another approach is to look at spatial and temporal probabilities. We may predict where, but not when (San Andreas fault); or we may predict when, but not where (next year's hurricane season).

Good answers might critically discuss:

- the general predictability of hurricane activity but lack of ability to predict actual paths / intensities / landfall
- how our ability to predict in the short-term is actually improving/dynamic, *eg* analysis of earthquake "swarms" or GIS applied to detect magma chamber expansion
- the varying capabilities of countries at differing levels of development and their ability to predict/anticipate hazards
- unpredictability of human-induced hazards.

Only credit answers that refer to one or more of the four types of hazard included in the syllabus.

At band D, expect answers which describe some basic reasons for differences in our ability to predict where/when different hazards may strike.

At band E, expect <u>either</u> more detailed explanation of our varying ability to predict where/when different types of hazard will strike <u>or</u> some critical discussion of the statement

At band F, expect both.

Marks should be allocated according to the markbands.

Option E — Leisure, sport and tourism

9. (a) Referring to the graph, describe the relationship between household income and participation in sport in Canada. **[4]**

*Award **[1]** for each valid point, up to a maximum of **[3]**, with an additional **[1]** for some quantification.*

Possibilities could include:
- households with less than C$20 000 show the least participation in sport
- households with C$50 000 or more show the greatest participation in sport
- participation in sport has decreased in all income groups between 1992 and 2005
- there is less participation in sport in 2005 than in 1992 for all income groups
- the decrease in participation has been greatest in income groups C$20 000 to C$49 999
- the decrease has been least in income group C$50 000 or more
- there is a positive relationship between increases in household income and participation in sport.

(b) Using examples, explain how levels of participation in international sport are affected by:

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

Economic factors could include:
- income levels in a country
- funding for sports facilities
- recession means that fewer people can afford to participate in sports.

*Award **[1]** for the identification of a factor and an additional **[2]** for the development of the factor.*

*If only a generic response is given, and no sports event or sport is named, award up to a maximum of **[2]**.*

For example: Many low income countries cannot invest in building and maintaining expensive sporting facilities **[1]** consequently participation in international sports like swimming that require Olympic-sized pools **[1]** will be limited as nationals will have nowhere to train **[1]**.

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

Political factors could include:
- political initiatives to promote sport
- government investment in sport
- hosting of a major international sporting event, such as the Olympics or football World Cup
- international prestige
- in some Islamic countries, religion, with political backing, may require female athletes to remain fully clothed, inhibiting them from competing.

*Award **[1]** for the identification of a factor and an additional **[2]** for the development of the factor.*

*If only a generic response is given, and no sports event or sport is named, award up to a maximum of **[2]**.*

For example: In the UK, the government won the hosting of the London Olympics **[1]**, and this resulted in an increase in sport participation in the UK, due to people wanting to emulate the success of athletes **[1]**, and also increased media coverage of sport **[1]**.

(c) "Land value is the most important factor influencing the location of recreation and sports facilities in urban areas." Discuss this statement with reference to specific urban areas. **[10]**

Reference should be made to the location of recreation and sports facilities in specific urban areas. The choice of examples may affect the validity of the statement.

While it could be argued that land value is an important factor, other factors such as accessibility, physical factors, and the socio-economic characteristics of different urban zones are also important.

For example, in some countries golf courses are often located on the rural–urban fringe because of the need for large areas of open space and low land values, but also because the wealthier people tend to live in the outer suburbs and have easier access. Also, football stadia are often located close to the central areas of cities, where land values are higher, because of historical factors and ease of access to large numbers of supporters due to good transport facilities. Gymnasia and swimming pools require relatively little land and can locate closer to the centre, and have easier access to a large population. Sometimes, physical factors are important, such as floodplains near a city centre, which can be the location of football pitches, cricket grounds and playing fields.

Good answers may discuss how land values may be of greater importance for understanding the location of some activities than they are for others (recreational spaces such as public parks may have a long and complex history which explains where they are found/protected; whereas the location of sports facilities may be more easily explained using land values). Another approach might be to discuss how the statement may be truer for some places than it is for others.

At band D, expect responses that describe how land values or other factor(s) have influenced where facilities are in a recognizable urban area.

At band E, expect <u>either</u> more detailed explanation of how land values and other factors have influenced facilities, <u>or</u> some critical discussion of the statement.

At band F, expect both.

Marks should be allocated according to the markbands.

10. (a) Briefly describe:

(i) the pattern shown on the bar graph; **[2]**

*Award **[1]** for a valid regional comparison with an additional **[1]** for quantification. A simple list with numbers should receive no more than **[1]**.*

For example: Europe has more than twice as many tourist arrivals as any other region **[1]**, and ten times as many as Africa **[1]**.

(ii) the trend shown on the map. **[2]**

*Award **[1]** for each valid statement:*
- most regions show an increase
- anomaly (Middle East) or quantification.

(b) Using examples of countries, suggest **three** reasons why numbers of international tourist arrivals have sometimes **decreased**. **[2+2+2]**

Possible reasons include:
- war or civil unrest reduces numbers of tourists to a country
- some regions or countries decline due to lack of investment or association with high crime rates
- changing fashions in tourism result in the decline of some areas
- saturation of market (Butler model)
- hazard events
- other places become more popular
- seasonality – *eg* tourist numbers may decline in some countries in a hot, wet monsoon season.

*Award **[1]** for a valid idea, and **[1]** for extension, or applied use of an example.*

For example:
- there has been a decrease in tourism in Egypt **[1]** because of recent civil unrest/terrorism and fears for tourist safety **[1]**
- there has been a decline in tourist numbers to some areas of coastal Spain **[1]** due to its poor image for rowdy behaviour and high crime rates **[1]**
- there has been a decline in tourist numbers to some UK resorts **[1]** due to a lack of investment in tourist facilities and/or poor weather conditions **[1]**.

(c) "The economic gains from tourism always exceed its negative social impacts." Discuss this statement with reference to **one or more** case studies. **[10]**

Responses should consider a variety of both positive and negative economic and social impacts of tourism with reference to a case study (or case studies).

Economic impacts might include improved employment opportunities, growth of local industry and increased farm output, improvements to infrastructure, increased GDP and incomes, but also revenue leakage to high-income countries and TNCs, and uneven economic development with tourist ghettos. Negative social impacts could include increases in prostitution, crime, social inequality, forced migrations, conflicts over land and resources, and loss of cultural identity.

Good answers may discuss the timescale over which impacts are experienced. Another approach might be to discuss varying perspectives and reasons why views may differ (social impacts could be hard to quantify, for instance). Another approach might be to discuss how the validity of the statement may depend on the place contexts used for exemplification: if tourism is more carefully managed in some places than in others, this could affect the balance of gains and negative impacts.

Do not credit environmental impacts unless there is some link to people's quality of life or wealth.

At band D, expect responses that describe some relevant positive and negative impacts of tourism for a recognizable place(s).

At band E, expect <u>either</u> greater explanation (range or depth) of economic gains and social impacts <u>or</u> some critical discussion of the statement.

At band F, expect both.

Marks should be allocated according to the markbands.

Option F — The geography of food and health

11. (a) (i) Identify the malnutrition category experienced in Swaziland, but **not** in Poland. **[1]**

child stunting **[1]**

(ii) Briefly describe how the malnutrition category you have identified in (a)(i) affects an individual. **[2]**

Children are less tall than they would be with adequate nutrition **[1]**, and have a lower cognitive capacity or a reduced ability to learn **[1]**.

Accept other valid points such as "they are likely to earn less when they grow up".

*If a candidate chooses micronutrient deficiency in part (i) and describes it well in part (ii), award up to a maximum of **[2]**.*

(iii) Identify malnutrition category C. **[1]**

adult obesity **[1]** (accept "obesity")

(b) Briefly describe what is meant by the term famine. **[2]**

A famine occurs when there is a serious shortage of food **[1]**, normally over a wide area or affecting a large number of people **[1]**. Accept other valid statements such as leads to an increase in regional mortality, or severe health consequences, or places a population on the brink of starvation.

(c) Referring to **one** type of agricultural system, explain what is meant by the term energy efficiency ratio. **[4]**

*Award **[2]** for explaining that "energy efficiency ratio" is the ratio between energy inputs **[1]** and energy outputs **[1]** for any particular type of agriculture.*

*Award a further **[2]** for relating this to a specific type of agricultural system.*

For example: Growing tomatoes in glasshouses in non-tropical countries requires very large inputs of energy **[1]** compared to the energy contained in the crop produced **[1]**, making this form of agriculture very energy inefficient.

Award up to full credit for a diagram that demonstrates this concept.

(d) To what extent is access to safe water a good indicator of the health of a population? **[10]**

One approach to answering the question is to focus on links between safe water and health. Another approach would be to discuss alternative indicators of health. Some candidates may do both.

Access to safe water has positive effects on a population, not only in relation to nutrition, but also in relation to food production, public health, disease prevention and treatment.

Good answers may evaluate the extent to which the availability of sufficient safe water underpins some of the other factors mentioned, including, for example, indicators. Another approach might be to evaluate the extent to which there are other, possibly better, indicators of health other than safe water, such as such as infant mortality, maternal mortality, the incidence of gastrointestinal diseases, wealth or access to technology.

At band D, expect some description of links are described between safe water and a population's health.

At band E, expect <u>either</u> greater explanation of how water can affect health <u>or</u> some critical evaluation of the extent to which the statement is true.

At band F, expect both.

Marks should be allocated according to the markbands.

12. (a) (i) Identify the type of diffusion shown on map A by the spread of flu in the first two weeks. **[1]**

expansion diffusion

(ii) Identify the type of diffusion shown on map A by the spread of flu in week four to new areas such as the settlement of Digby Island. **[1]**

relocation diffusion

(iii) Using evidence from map B, suggest why the flu outbreak started in square 1419. **[2]**

Possible suggestions would be "outsider" arrived in the city by boat, or was brought to the court house or police station.

*Award **[1]** for the map feature that is identified and **[1]** for the justification given, eg "there is a marina in 1419 and someone with flu may have sailed here".*

*If the wrong square is used (eg identifies City Hall in 1319), only **[1]** can be awarded for the justification.*

(b) Using evidence from map B, suggest **three** reasons for the spread of this disease between the end of week one and week four. **[2+2+2]**

In week two, the high density of population in the central area of the city leads to people infecting others around them; this area includes the city hospital (likely to be visited by many people with weakened immune systems and who therefore help spread the disease), as well as the community centre and local sports clubs (*eg* golf).

During week three, the movement of people, including travellers using the ferry and visiting the airport, result in the flu area expanding rapidly (more to the west than the east) to include not only outlying parts of Prince Rupert (*eg* around Oldfield), but also jumping to Digby Island, with cases reported from the areas near the ferry dock and around the airport).

Communication links during week four result in flu reaching the settlement of Digby Island, perhaps because some residents of Digby Island settlement work at the airport.

*Award up to **[2]** for each developed reason.*

*For example: During week three, someone from Prince Rupert travelling on the ferry **[1]** carries the flu to a previously unaffected area **[1]**.*

No marks should be awarded for reasons not supported by map evidence.

Full marks may be awarded even if the reasons suggested cover only part of the time range.

(c) Examine the reasons why some communities enjoy greater food security than others. **[10]**

The WHO defines food security as "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" (*ie* people are not living in hunger or fear of starvation).

The concept of food security has three different aspects/assumptions:
- food availability (having sufficient quantities of food available on a consistent basis)
- access to food (having the resources, economic and physical, to obtain appropriate foods for a nutritious diet) and
- use of food (making appropriate use of food based on knowledge of basic nutrition and care, as well as adequate water and sanitation).

Some communities live on more fertile land and get higher agricultural output or have more wealth enabling the community to purchase more food.

Good answers may explicitly examine disparities in different aspects of food security. Another approach might be to examine disparities for communities at varying scales, *eg* from village to nation, or even to examine how food security may vary for individuals within a community.

At band D, expect some description of reasons why food security/availability may vary for communities.

At band E, responses are likely to <u>either</u> provide greater depth/breadth of explanation for the reasons why food security/availability varies <u>or</u> offer some examination of the concept of food security or community.

At band F, expect both.

Marks should be allocated according to the markbands.

Option G — Urban environments

13. (a) Using photographic evidence, outline **two** characteristics of the informal sector of the economy in King William's Town. **[2+2]**

*For each case, award **[1]** for identifying a characteristic and **[1]** for development of the point.*

For example:
- it is located on the side of a road/close to a bus park **[1]** – the best locations to locate are close to highly accessible areas such as bus parks/stations **[1]**
- the people are selling goods on the side of the road **[1]** because they cannot afford to own/rent a shop/premises **[1]**
- it is small-scale **[1]** – they can only bring what they can carry so the amount of goods is limited **[1]**
- they appear to be mainly selling food/fruit/vegetables **[1]** – they can only afford to buy and re-sell cheap goods/some may grow the food on their own land-holdings **[1]**.

(b) Referring to examples, explain **two** factors that influence the location of megacities. **[3+3]**

*Award **[1]** for identifying a factor and **[2]** for further exemplification/explanation. Factors may be physical (eg coastal location / river valleys) and/or socio-economic (eg tax-free zones / free-trade areas / areas of rapid industrialization).*

For example: Many of the world's megacities, such as Shanghai and Mumbai, are located in coastal areas/large river valleys **[1]** as this increases the potential for trade and commerce **[1]**. Coastal areas are also more favourable for industrial development as they are able to import raw materials and finished products more competitively than inland areas/landlocked countries **[1]**.

*Award up to a maximum of **[4]** if no or only inappropriate examples are given.*

(c) "Sustainable urban management is desirable but impossible to achieve." Discuss this statement, using examples. **[10]**

Sustainable urban management can have an economic, social or environmental focus, and ideally all three. Good answers may comment on this or discuss the interrelationships that exist. Alternatively, candidates may approach the question using linear and circular urban systems.

There are a number of sustainable urban strategies *eg* recycling, re-use, reduce, sustainable forms of transport, urban agriculture, sustainable forms of energy *etc*. Some of these may be small-scale *eg* Bedzed in south-west London, whereas others are much larger in scale *eg* Curitiba, Brazil or Masdar City, UAE. Good answers are likely to present the achievements and limitations of two strategies.

Good answers may discuss external/long-term issues affecting the sustainable management of urban areas *eg* the context of continuing population growth/rural–urban movement. Another approach might be to discuss the veracity of the statement for different place contexts (cities in countries at different stages of development). Another approach might be to discuss how some strands of sustainability (social/housing) could be easier to achieve than others (ecological footprint minimization).

At band D, expect some description of a limited range of urban problems, or sustainable strategies, or the drawbacks to sustainability schemes.

At band E, expect <u>either</u> greater explanation of the strengths and weaknesses of at least one sustainable strategy (and a second strategy outlined), <u>or</u> some critical discussion of why sustainable urban management is hard to achieve.

At band F, expect both.

Marks should be allocated according to the markbands.

14. (a) (i) Define the term *suburbanization*. **[2]**

Suburbanization is the outward growth of towns or cities **[1]** that leads to former villages or rural areas becoming urban **[1]**, or the movement of people to the rural–urban fringe **[1]**.

(ii) Briefly outline **two** possible **population** changes in an urban area where suburbanization is occurring. **[2]**

*Award **[1]** for each outlined <u>population</u> change (either to suburban or other affected area):*

- more people arrive in suburbs (newer housing)
- fewer people might be left in city centre
- lower density left in city centre
- older people in particular may move to (quieter) suburbs
- families in particular may move to (spacious) suburbs.

There are many other possibilities that can be credited.

(b) Referring to **one or more named** cities, explain **two** ways in which humans affect urban air pollution. **[3+3]**

Possible ways humans affect air pollution in urban areas include through transport emissions, burning of fossil fuels for energy production/domestic heating/commercial enterprises.

Equally, it is possible that human activities may reduce air pollution in urban areas, *eg* Beijing's relocation of iron and steel plants before the 2008 Olympics, the use of park and rides, Clean Air Acts, *etc*.

*In each case, award **[1]** either for the identification of a specific source of urban pollution in a named city or for a located pollution reduction strategy. In each case award up to **[2]** for the description and explanation of what the effect (positive or negative) has been.*

*Only award **[2]** in each case if no city named.*

For example: In Los Angeles, vehicles release nitrogen oxides **[1]**. NOx react in sunlight to form ground level ozone **[1]**. High levels of ground-level ozone form photochemical smog pollution **[1]**.

For example: In Paris 2014 the authorities introduced a policy to reduce the number of cars in the central area **[1]**. Cars with an odd-numbered number plate were allowed in certain days of the week whereas those with an even numbered-number plate were allowed in on the other days of the week **[1]**. This has reduced emissions of NOx, improving air quality **[1]**.

(*Vehicle pollution includes NOx, CO, particulates and hydrocarbons; NOT carbon dioxide.*)

(c) Examine the effects of the movement of services and manufacturing activities to new locations in cities. **[10]**

Responses could consider the movement of economic activities into cities in developing/emerging economies; or the relocation movement from central areas to out of town/edge of town locations for well-established cities. There are also redevelopments in inner urban areas and some central areas of older cities, as a result of regeneration schemes. The movement of services (accept retailing) and manufacturing to new locations can have many effects: environmental, economic and social.

Socio-economic effects could be discussed, for instance changes in employment and social class structure, and associated neighbourhood changes.

Negative environmental effects may include increase in impermeable surface, poorer air quality due to the volume of people traveling to the new location. Effects may be highly damaging in newly-industrializing areas *eg* Pearl River Delta.

On the other hand, new business developments in post-industrial cities increasingly include landscaping, creation of new environments and a more varied habitat. There may also be environmental impacts in the post-industrial area which industry has left – at first dereliction and visual pollution of the environment; then urban succession; but longer-term improvements/landscaping may also occur.

Good answers may do more than explain/list different, unconnected effects. They may additionally examine the **interrelations** or the timescale of different effects, for instance by showing how economic impacts and social effects are linked. Another approach might be to examine what the effects are for cities at different stages of development, or for areas gaining/losing activity.

At band D, expect a description of some effects of relocations, or new economic activities, within one or more recognizable cities / types of city.

At band E, there should be <u>either</u> an explanation of a wider range of effects/ /movements <u>or</u> some critical examination of how cities/places/people are affected.

At band F, expect both.

Marks should be allocated according to the markbands.