Helping you Achieve Highest Grades in IB

IB Geography SL

First Assessment 2019

Geographic themes—seven options
SL—two options; HL— three options
Freshwater, Oceans and coastal margins, Extreme environments, Geophysical hazards, Leisure, tourism and sport, Food and health, Urban environments

Mark Scheme

Short Answer Questions

Theme: A- Freshwater

Marks: 180

Total Marks: / 180

Suitable for SL Students sitting exams 2026+ onwards.
However, HL Students will also find this useful

Markschemes

19N.1.BP.1

a.i. Around 40 (accept 39 to 41)
a.ii.
10 (hours)15 (minutes) (allow 10 to 10 hours 30 minutes)
Accept answers in decimal points (10.0–10.5)
b.
There is a limit to how much water can be stored on leaf surfaces / on vegetation [1], and after a few hours of rainfall no more interception storage can occur [1].
c.
Award [1] for each valid effect and [1] for further development of how this might change the movement/flow/storage of rainwater.
For example: Urbanization would remove vegetation and thus interception storage [1]; as a result, more rain will flow through the drainage basin [1].
Do not accept reference to dams and reservoirs.

Other possibilities include:
May be more surface storage, as rainwater cannot drain away due to impermeable surfaces.
Little infiltration of rainfall due to impervious concrete surfaces, increasing run-off
Small soil storage, as little rainwater will filter downwards from the surface.
Altered overland flow of rainfall due to drainage channels and gutters.

19M.1.BP.1

a. Award [1] for 6.3 (m_3/s) (allow 6.2–6.4).
b.
Award [1] for 8 times.
c.
In each case, award [1] for a valid land use change (eg, urbanization, deforestation) that might explain increased river discharge, and [1] for how this could account for the increase shown.
For example:

- A change from rural to urban land use / urbanization [1] would result in an increase in impermeable surfaces and reduced infiltration, resulting in increased overland flow and thus river discharge [1]
- Change in vegetation cover by deforestation [1] would reduce interception and so increase surface run-off [1].

d.i.
Award [1] for a valid modification and [1] for further development of how this might increase flood risk.
For example: Straightening the river channel [1] allows faster removal of an increased amount of water away from the area, increasing flood risk downstream [1]
d.ii.
Award [1] for a valid modification and [1] for further development of how this might decrease flood risk.
For example: Constructing man-made levees [1] increases channel capacity, allowing greater discharge without flooding [1].
As the question asks for "different modifications", do not accept the same modification twice.
Do not accept afforestation, changing agricultural practices or other land use changes.

Markschemes

19N.1.BP.2

a. Refer to Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
The focus of the response should be on the varied pressures on one named wetland ecosystem, and the relative success of strategies.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

- The importance of wetlands as major ecosystems; a critical part of the natural environment; eg. water stores, reducing the impact of floods, improving water quality, rich biodiversity.
- Increasing pressures on wetlands include: water abstraction, land drainage, chemical and physical pollution, eutrophication, growing populations, reclamation, dam construction, conversion for aquaculture
- Strategies for management of wetlands, including the roles of international (eg, Ramsar Convention), national and local stakeholders.
- The purpose of management from different perspectives – eg, biodiversity, water security, tourism.

Good answers may be well-structured (AO4) and may additionally offer a critical evaluation (AO3) that examines the different perspectives and relative success of different management strategies, and the varying power of stakeholders. Wetlands continue to be of significant environmental, economic and social importance, and management may partly depend on the scale of the issues. Another approach might be to critically evaluate the strengths of management using a sustainability framework.
For 5–6 marks, expect some weakly evidenced outlining of some pressures on a wetland.
For 7–8 marks, expect a structured account that includes:

- either an evidenced explanation of the pressures and strategies for one named wetland
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

For 9–10 marks, expect both of these traits.
b.
Refer to Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
The response should focus on environmental consequences of agricultural intensification, such as pollution of water supplies, eutrophication and salinization, and the role of different stakeholders in their management.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

- Intensification of agriculture has significant impacts on both surface and groundwater quality, including direct run-off of chemical pesticides and nutrients, slurry from animals, and sediments from soil erosion. This has resulted in pollution of water supplies, affecting water security and biodiversity through eutrophication.
- Also important is increased irrigation and groundwater abstraction, resulting in salinization of soils, especially in semi-arid regions.

Good answers may be well-structured (AO4) and may additionally offer a critical evaluation (AO3) that examines the relative importance of different impacts, or possible spatial interactions between them, and the possible conflicting views from different stakeholders.
For 5–6 marks, expect some weakly evidenced outlining of some environmental effects of agriculture on freshwater quality.
For 7–8 marks, expect a structured account, which includes:

- either an evidenced examination of the relative severity of different environmental consequences of agriculture on water quality
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

Markschemes

19M.1.BP.2

a. Refer to Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
Increasing demands on water, and reduction in quality, necessitate management of resources in a drainage basin. Integrated drainage basin management (IDBM) coordinates conservation, management and development of water, land and related resources for a river basin. Different stakeholders will receive different economic and social benefits from water resources without depletion.
Candidates may not focus on an actual IDBM plan, but use examples such as the Mississippi basin, Mekong river basin and Great Artesian Basin with reference to management. These examples should be accepted.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1) include:

- locational knowledge of a named basin
- description of the management strategies employed, recognizing that they are integrated in some way
- costs and benefits may be economic, political, environmental, social
- costs and benefits vary for different stakeholders
- costs and benefits may be both short and long term
- the importance of sustainability principles.

Good answers may be well-structured (AO4) and may additionally offer a critical evaluation (AO3) of the statement in a way that explicitly examines the balance of costs and benefits, and may show understanding that perspectives (eg, political, economic, social and environmental) differ on where the balance lies. Another approach might be to examine which stakeholders gain greater benefits, perhaps in relation to varying power over the decision-making process. Another approach might be to examine changing costs and benefits over different time scales.
For 5–6 marks, expect some outlining of a recent IDBM plan, and some of its costs and/or benefits. The response is partial, narrow or lacks supporting evidence.
For 7–8 marks, expect a well-structured account, which includes:

- either a well-evidenced explanation of a range of IDBM stakeholder costs and benefits (do not expect balance)
- or an ongoing evaluation (or discursive conclusion) grounded in geographical concepts and/or perspectives.

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

b.
Refer to Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
The focus of the response should be on both erosional and depositional processes and their role in the formation of these landforms. Floodplains and meanders involve both erosion and deposition. Over time the relative importance of these processes varies according to discharge, base level and other factors.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

- Floodplains are the result of deposition at times of high discharge when the flow exceeds bankfull discharge. This is dependent on erosion upstream and transportation downstream of bedload and suspended load.
- Rivers meander across floodplains eroding the valley sides over time. With changing conditions, rivers may erode into floodplains, creating river terraces.
- Both erosion and deposition are essential in different parts of the meander curve with erosion on the outside of the bend and deposition on the inside.
- Meanders are formed as a complex interplay of erosion and deposition as the river seeks to flow efficiently and minimize energy loss.

Markschemes

Good answers may be well structured (AO4) and may additionally offer a critical evaluation (AO3) which examines the statement in a way that shows understanding that the relative importance between erosion and deposition varies over different time scales (seasonal or short / long term). Another approach might be to examine spatial variations in the operation of erosion and deposition processes for each landform (eg, slip-off slope and river cliff) and the way these processes interact to create landforms. Another approach might be to examine interactions between the creation of floodplains and meanders.
For 5–6 marks, expect some outlining of the formation of floodplains and/or meanders. The response is partial, narrow or lacks supporting evidence.
For 7–8 marks, expect a well-structured account which includes:

- either a well-evidenced explanation of the formation of floodplains and meanders by erosion and deposition
- or an ongoing evaluation (or discursive conclusion) grounded in geographical concepts and/or perspectives.

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

21N.1.BP.1

a.i.South-east
a.ii.
About 20 % (accept 10–30 %)
b.
Award [1] for the basic relationship and [1] for further development (either explanation or other outlined development, e.g. mention of Bradshaw model).
For example: The relationship is positive [1] / they both increase with distance downstream [1] as the river's size and energy increases [1].
Do not award marks for definitions.
c.
In each case, award [1] for a valid landform change resulting from fluvial processes, and up to [2] for development / explanation / exemplification.
For example: a meander develops into an ox-bow lake [1] when river erosion cuts through the neck of the meander [1] and deposition continues to isolate the lake [1].
Other possibilities which are appropriate for the lowland fluvial environment shown in the photograph include:

- Meanders - accept increasing, more sinuosity, formation implying change
- Levees - formation implying change
- Floodplains - formation implying change
- Deltas
- Slip-off slope / river cliff
- River terraces.

Markschemes

21N.1.BP.2

a. Marks should be allocated according to the Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
The focus of the essay is on the management challenges facing the use of internationally shared water resources (rivers, lakes, wetlands and aquifers). Conflicts over shared water resources may be serious and difficult to resolve, especially where resources are scarce and demand is high. There are competing demands for water, which should be allocated on an equitable basis, to satisfy all users. Increasing demands from agriculture, industry and urban. Water scarcity is becoming an important issue; physical and economic water scarcity is increasing. The varying power of different stakeholders should be considered in relation to water management.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

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

Good answers may be well structured (AO4) and may additionally offer a critical evaluation (AO3) of the statement in a way that examines the management challenges, and may show that perspectives (e.g., political, economic, social and environmental) may differ between stakeholders. Another approach might be to examine which stakeholders gain greater benefits, perhaps in relation to the varying power over the management process.
For 5–6 marks, expect weakly evidenced outlining of one or more management challenges created by internationally shared water resources.
For 7–8 marks, expect a structured account which includes:

- either an evidenced explanation of two or more management challenges created by internationally shared water resources
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

For 9–10 marks, expect both of these traits.
b.
Marks should be allocated according to the Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
The construction of large dams for multi-purpose water schemes can have significant benefits, but often come at a considerable cost. The cost and benefits are shared unevenly between different communities and environments, and some will benefit more than others.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

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

Markschemes

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

For 5–6 marks, expect weakly evidenced outlining of one or more benefits of large dam construction for communities and/or environments (places).
For 7–8 marks, expect a structured account which includes:

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

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

21M.1.BP.1

a.i.USA.

a.ii.
840 (“m” not needed).

b.
Award [1] for a basic outline of a valid landform and [1] for further development of its main feature(s) or the process relating to its formation.
For example: A meander is a winding/sinuous section of a river [1] with a steep river cliff on the outside bend [1].
Other erosional landforms include:

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

c.
In each case, award [1] for a valid reason and [2] for further explanation/development of variation in rates of erosion at different waterfalls.
For example: If the drop in height is great [1], the water will be very fast [1]; therefore, there will be more rapid abrasion/hydraulic action [1].
Other possible reasons include:

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

Markschemes

21M.1.BP.2

a.
Marks should be allocated according to the Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
River flooding continues to cause serious human and environmental problems, especially in urban and densely populated rural areas. In order to reduce the impact, severity and frequency of flooding it is important that there should be an understanding of the physical and human causes of river flooding.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):
Human factors that may contribute to low flood risk include:

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

Physical factors that may contribute to low flood risk include: • geology, including rock permeability

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

Good answers may be well structured (AO4) and may examine the relative importance (AO3) of the two sets of processes, or the interaction of the two sets of processes, or how influences may vary from place to place.
For 5–6 marks, expect some weakly evidenced outlining of how human and/or physical factors contribute to a low flood risk.
For 7–8 marks, expect a structured account that includes:

- either an evidenced explanation of how human and physical factors (do not expect balance) contribute to a low flood risk
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

b.
Marks should be allocated according to the Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
As the quantity of water resources available to meet rising demands over time intensifies, and the quality of water degrades, there is increasing competition and possible conflict between water users. The rising demands include freshwater supplies from rivers, lakes and aquifers, fishing, irrigation and navigation. Many river basins cross political boundaries and there is a need for international agreements and cooperation to avoid possible conflicts over increasingly scarce resources.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

- Freshwater resources include rivers, lakes, reservoirs and aquifers.
- Many large river basins cross political boundaries, and there is potential conflict over the use of water resources.
- Increasing demands for water resources come from meeting the needs of water supply, fishing, agriculture, energy and navigation, and there is a potential for conflict between different stakeholders.

Markschemes

- There is a need for international treaties and agreements to resolve the potential conflicts.
- The different stakeholders involved in resolving possible conflicts include local populations, national governments and international associations like the UN, FAO and UNESCO.
- International agreements may also be important in water management, conservation and protection.

Good answers may be well structured (AO4) and may additionally offer a critical evaluation (AO3) of the roles and power of different stakeholders in relation to water management issues. Perspectives can differ so greatly that no consensus can be arrived at. Different stakeholders have unequal power, which means that some views are ignored. The scale and complexity of the issue affects outcomes.
For 5–6 marks, expect some weakly evidenced outlining of the management of one or more water resources.
For 7–8 marks, expect a structured account that includes:
either an evidenced explanation of the management of one or more water resources, and why it is difficult to get stakeholder agreement
or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.
For 9–10 marks, expect both of these traits.

20N.1.BP.1

a.

- Increased severity [1].
- Greater area of water affected [1].
- Increased distance from shore affected [1] / 100-150 km distance [1].

b.
Award [1] for the problem and [1] for development.
For example: Fish die [1] due to oxygen depletion [1].
Possible problems include:

- declining biodiversity
- creation of dead zones
- excessive vegetation on surface.

c.
In each case, award [1] for the reason and up to [2] for development / explanation.
Possible human reasons include:

- agricultural
- industrial
- settlement.

For example: Runoff from farming into particular parts of the lake [1] carries high amounts of nitrates [1] that were used as fertilizer [1].
Possible physical reasons include:

- drainage patterns
- wind / storms / currents
- hydrological flows
- relief
- depth/temperature of water.

For example: An area of water with many rivers draining into it [1] will receive more inputs of dissolved nutrients in solution [1], leading to excessive algae growth in that part of the lake [1].

Markschemes

20N.1.BP.2

a.

Marks should be allocated according to the Paper 1 markbands (available under the "Your tests" tab > supplemental materials).

Freshwater is an essential resource that has come under increasing pressure due to growth in demand, especially from increased population and urbanization, industry and intensive agriculture. Water quality is also under threat from physical and chemical pollution and salinization. Scarce and poor water quality can seriously affect the health of local communities.

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

- Local management strategies aimed at providing fresh, sustainable water quality; access to clean and affordable water.
- Local communities play an important role in the improvement of health and well-being, and adequate supplies for agriculture and irrigation.
- Local efforts or strategies to reduce pollution from urban areas and agricultural run-off.
- Construction of wells, boreholes and small reservoirs.
- The role of different stakeholders, for example national governments, international organizations, TNCs, in assisting local communities in management of water resources.

Good answers may be well structured (AO4) and may additionally offer a critical evaluation (AO3) that examines the role and power of different stakeholders. Another approach might be to critically evaluate the importance of interactions between different scales of management using a sustainability framework.

For 5–6 marks, expect some weakly evidenced outlining of some local strategies in relation to management of water resources.

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

- either an evidenced explanation of the role/importance/work of local communities managing different water resources
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

b.

Marks should be allocated according to the Paper 1 markbands (available under the "Your tests" tab > supplemental materials).

A range of different physical factors affect the characteristics of river hydrographs. Many physical factors may be inter-related to affect the shape of the hydrograph. Physical factors may vary between rivers in different places, and also within the same large river basin. They may vary over different time scales, from seasonal to annual and long term. Climate change may have a long-term influence.

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

- Characteristics of the hydrograph include peak discharge, lag time, steepness of rising and falling limbs, and baseflow.
- Physical factors that affect the characteristics of hydrographs include:
  - rock permeability and soil type/thickness; topography and relief; the type and amount of vegetation cover
  - climatic factors, such as rainfall amount, duration and intensity
  - snowfall (precipitation held in storage)
  - drainage basin characteristics, such as basin shape, drainage density and bifurcation ratio.
- Climate change may cause the character of the hydrographs to change overtime, eg the impact of reduced rainfall, or more intense rainfall.

Markschemes

Good answers may be well structured (AO4) and may additionally offer a critical evaluation (AO3) that examines the different scales/importance of physical factors, and the interactions between different physical factors, eg the impact of climate change on local water systems.
For 5–6 marks, expect some weakly evidenced outlining of the influence of two different physical factors.
For 7–8 marks, expect a structured account that includes:

- either an evidenced explanation of two or more physical factors affecting hydrograph characteristics
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

22M.1.BP.1

a.i
13

a.ii.
Afghanistan

b.
Award [1] for a valid impact and an additional [1] for development.
Ground subsidence [1] due to all the water having been removed/over-abstraction [1].
Other impacts include:

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

c.
Award [1] for each way and a further [2] for development / explanation / exemplification.
For example, pipes/sewers/water filters can be built [1] in order to separate sewage and drinking water [1] thereby reducing the risk of disease for future generations [1].
Reference to sustainability is not required although it may be implied.
Other ways include, but are not limited to:

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

Markschemes

22M.1.BP.2

a.
Marks should be allocated according to the Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
Drainage basins operate as open systems, in which inputs, stores, flows and outputs are inter-related. The relationships between these will vary depending on the characteristics of the drainage basin, including geology, slope, shape, and land use, and the nature of the inputs, including type, intensity and variability of precipitation.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

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

Good answers may be well structured (AO4) and may additionally offer a critical evaluation (AO3) of the statement in a way that examines the importance of a systems approach in the study of processes within a drainage basin. Another approach might be to examine drainage basins at different time and spatial scales, for example with changes in land use or climate.
For 5–6 marks, expect weakly-evidenced outlining of a systems approach to a drainage basin.
For 7–8 marks, expect a structured account that includes:

- either evidenced explanation of why a systems approach is useful to the study of drainage basins
- or a discursive conclusion (or ongoing evaluation) grounded in geographical concepts and/or perspectives.

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

b.
Marks should be allocated according to the Paper 1 markbands (available under the "Your tests" tab > supplemental materials).
There are growing pressures on wetlands, and it is important that they are managed for a sustainable future. The focus of the response should be on the varied and often conflicting pressures from different stakeholders, and the future possibilities for management.
Possible applied themes (AO2) demonstrating knowledge and understanding (AO1):

- The importance of wetlands as major ecosystems which form a critical part of the natural environment: diverse ecosystems, flood control, improving water quality, carbon sinks, fertile farmland, recreation and tourism.
- Increasing pressures on wetlands include: water abstraction, land drainage, chemical and physical pollution, eutrophication.
- Different stakeholders at local, national and international scales, who may be in conflict, include: environmentalists, water management organisations, farmers, tourist organisations, local and national governments.

Markschemes

- The purpose of management from different perspectives – e.g. biodiversity, water security, flood control, tourism, climate change.
- Strategies for management of wetlands, including the roles of international (e.g. Ramsar Convention), national and local stakeholders.

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

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

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

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

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