

Geography 12
Resource Exam A
Scoring Guide

PART B: WRITTEN RESPONSE

Value: 40 marks

Suggested Time: 65 minutes

INSTRUCTIONS: Answer each question in the **Response Booklet**. You may not need all of the space provided. Answers should be written in **ink**. **Comprehensive answers are required for full marks.**

**REFER TO
DATA PAGES**

Use the Topographic Map and Air Photograph of Saint John, New Brunswick to answer questions 1 and 2.

1. Outline:

- two ways that humans depended on the environment in the Saint John region
- AND**
- two ways that humans modified the environment in the Saint John region

Use **page 1** in the Response Booklet.

(4 marks)

Response:

Depended on the Environment	• Rivers and river valleys provide transportation routes today and historically. • Atlantic salmon spawn in the rivers. • Saint John Harbour offers a well-protected port for ships and is a trans-shipment point for goods and commodities such as oil and forest products. • A naval base is located in Saint John West, a natural harbour. • Reversing Falls affect the local people as the tide causes the natural flow of water to change direction. Power is being generated here. • The ria offers many bays that are used for anchorages and marinas. • Fishing and shellfish are based here. • Pulp and paper industry has a ready supply of softwood from the surrounding region and the headwaters of the Saint John River. • Many bays and beaches offer recreational opportunities. • Urban centre developed on the harbour. It has expanded to include many neighbourhoods on the hilly landscape surrounding the harbour and bays.
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Depended on the Environment (continued)	• Limestone from the region for cement. • River valley's alluvial soils used for agricultural activities. • Headlands used for defence and prime real estate. • Lakes and streams provide a freshwater supply. • Flood plains provide flat land for development. • Gravel deposits provide industrial minerals. • Bodies of water are used for waste disposal. • Scenic beauty provides recreational opportunities (parks, golf courses). • Variable elevation allows for skiing.
Modified the Environment	• Bridges have been built to connect to the islands. • Roads have been built across Courtney Bay and Hazen Flats altering the migration of marine animals and spawning grounds. • Ferry transport is available for commuters, thus wharfs installed. • Ports have been constructed altering the marine ecosystem. • Breakwater has been constructed to protect the deepwater port; altered depositional patterns. • Construction of an oil refinery (air, land and water pollution). • Logging of the nearby forests has altered the landscape and water ways (saltation). • Lakes have been dammed to conserve water. • Glacial deposits extracted for road construction. • Natural landscape and vegetation have been converted to urban, commercial and industrial use; i.e., covered in concrete and asphalt (restricts infiltration). • Sewage ponds have been constructed on creeks and rivers. • CNR has built a major railyard in Saint John (fuel leaks, altered drainage patterns). • Recreation facilities such as ski hills, parks, golf courses have been built, which have removed vegetation and caused loss of habitat and soil erosion. • Electrical generation stations and pulp and paper mills emit air pollution. • Salmon streams affected, pollution.

2. The Saint John Harbour has been dubbed *The World's Greatest Toilet* because six tonnes of waste are dumped into the water courses each day. Use the map and air photograph to **identify** the sources of this waste and **explain** the impact of these wastes on the environment. Answer in **paragraph** form.

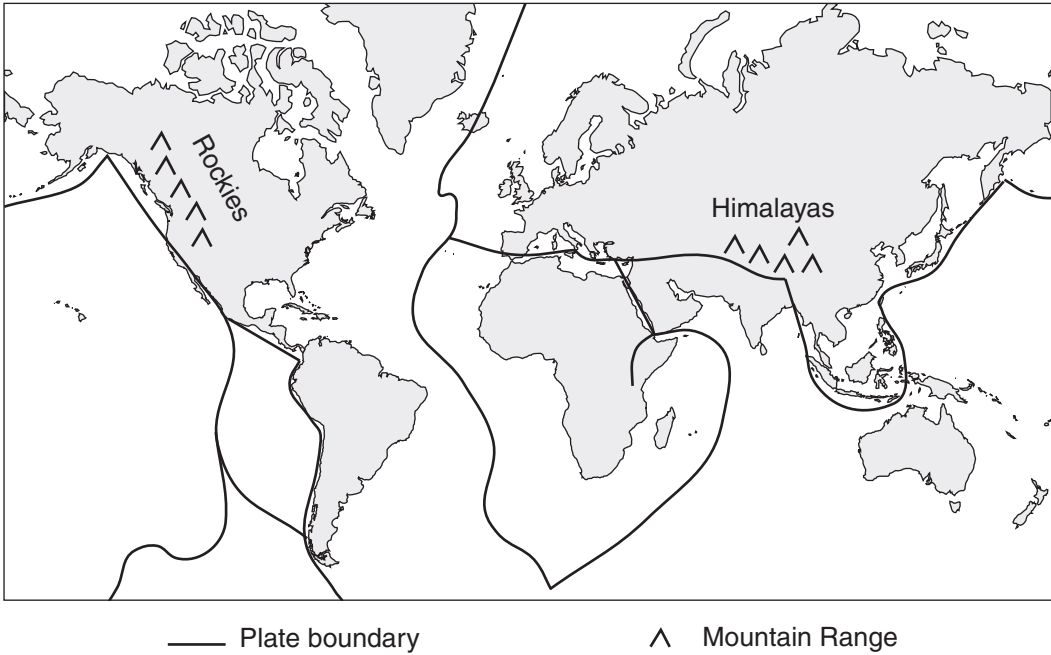
Use **page 2** in the Response Booklet.

(6 marks)

Response:

Source of Waste	• Discharge of sewage into streams that run through the heart of the city and into the harbour. • Agricultural run-off from the farms and the golf course along the rivers. • Septic run-off from the homes along the streams. • Industrial effluent from the mills, factories and generation stations. • Air contamination from mills and generation stations including nitrogen oxides and carbon dioxide, which leads to the acidification of the water. • Urban run-off pours into the rivers, bays and harbours with a variety of non-point sources and their respective contaminants. • Waste products from service industries. • Spillage or seepage of metals, pesticides and petroleum. • Oil spills and bilge cleaning from ships. • Seepage from auto wrecker. • Potential spills from the railway.
Impact of Wastes	• Effluent from pulp and paper mills changes the reproductive patterns in fish through hormone-disrupting chemicals or "gender benders." • Health risks from water-borne illnesses and a broad range of gastrointestinal, respiratory and skin disorders associated with sewage. • Eutrophication of streams and lakes reducing the dissolved oxygen and threatening aquatic life. • Drinking water threatened by the barrage of contaminants. • High fecal counts from agricultural run-off (threat to human health). • Nitrates from organic waste. • Organic wastes wash up on the beaches and rot in the heat, creating unbearable odours. • Inorganic wastes bioaccumulate in the environment and work up the food chain. • Heavy metals and plastics may never degrade. • Shell fishery becomes contaminated and therefore unproductive. • Aesthetics of the community and its role in tourism. • Potential algae blooms from waste. • Economic impacts/recalls. • Habitat loss.

Use the following map to answer question 3.



3. **Outline** three advantages and three disadvantages associated with living in the mountainous regions as shown above.

Use **page 3** in the Response Booklet.

(6 marks)

Response:

Advantages of Living Near Fold Mountains	• The windward side of the mountain is wet. – Allows trees to grow, making forested slopes suitable for commercial logging. – Increases surface run-off which recharges freshwater supplies. • The leeward side of the mountain is dry. – Suitable for dry land agriculture. • The south-facing slopes receive more intense or direct sunlight due to aspect. – Suitable for orchards and vineyards. • Mountain barriers. – Limits air pollution; better air quality. • Create chinooks or föhn winds which can have a warming effect on a region in winter. – During the day, valley breezes can produce thunderstorms on the hill slope where valleys are cloud free. • Mountains have varied elevation. – Creates diversity in vegetation (deciduous, coniferous, grassland, tundra) suitable for logging and range land. – Higher elevation means lower winter temperatures, which are suitable for alpine recreation such as skiing and snowboarding.
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Advantages of Living Near Fold Mountains (continued)	– Varied terrain is suitable for mountain biking and hiking. – Eroded landscape is scenic, attracting tourists. – Historically, has provided protection from military invasions. • Resource potential: – Many mountains contain minerals, ores and fossil fuels such as coal. – Steep slopes produce narrow valleys with fast-flowing rivers suitable for hydro-electric power generation, which attract industry to the region. – Historical volcanic activity produced fertile soils.
Disadvantages of Living Near Fold Mountains	• The windward side of the mountain is wet. – High surface run-off may cause flooding and mass wastage. • The leeward side of the mountain is dry. – Increases need for irrigation. • Frost and ice remain longer on north-facing slopes, creating driving hazards. • Wind patterns: – The Santa Ana winds that blow out to sea in southern California bring hot, drying winds and the threat of fire. – At night a mountain breeze can cause a temperature inversion allowing fog to develop in a valley. • They block the movement of air masses, jet streams and pressure systems. – Can trigger high rainfall or drought conditions. – Can increase the intensity of monsoon rains. • Varied elevation: – High elevation limits growing season. – High elevation (harder to breath). – Thin, unproductive soils are located at higher elevations. – Road construction and maintenance is costly. – Threat of mass wastage and avalanches. – Creates transportation and communication barriers (radios and cellular phones may not work in a mountain region). – High population density in the valleys because it is costly to build on hillsides. • Seismic and volcanic activity: – As plates continue to converge, there is the chance of earthquake activity.

4. **Compare** and **contrast** tropical and temperate deforestation. Both similarities and differences must be addressed for full marks. Answer in **paragraph** form.

Use **page 4** in the Response Booklet.

(6 marks)

Response:

Similarities	• The deforestation of hillsides contributes to soil erosion, mass wasting and the siltation of streams. • Clearcutting is the preferred method of harvesting because of the size and value of the forest products, as well as the nature of the topography. • Clearcutting is the most efficient and safest method of harvesting in these regions. • Logged areas are extensive and can utilize heavy machinery and large transportation vehicles. • The harvesting and processing of the forest resources provide both direct and indirect employment opportunities. • The species of trees that are harvested are in great demand and generate revenue in the international market place. • Both regions are rich in biodiversity. Extensive deforestation will impact the animal habitat and will threaten a variety of plant and animal species. • The forest industry opens the region up to development by other resource-based industries (e.g., mining, tourism and recreation). • The eventual development of an economic and transportation infrastructure (road and railway network, as well as services — towns, cities, schools, hospitals, electricity) tend to coincide with the expansion of the forest industry. • Both tropical and temperate forests used for commercial forest products. • Both have large trees.
Differences	• Species of the trees differ: – Tropical hardwoods (e.g., teak, mahogany and broadleaf evergreen). – Temperate softwoods (e.g., cedar, fir, hemlock and evergreen). • Potential extent of loss of biodiversity differs: – In the tropical forests, species classification is incomplete; possible extinction occurs before identification occurs. • Reasons for deforestation differ: – The main reasons that tropical deforestation occurs is because of: ➤ rapid population growth ➤ demand for land to settle peasant farmers ➤ land cleared for plantation agriculture ➤ cattle ranching, crop production, and mineral exploitation – Temperate deforestation also occurs because of: ➤ urban sprawl ➤ recreational activities (e.g., golf courses, ski runs) • Most temperate forests must be replanted (reforestation policies). • Temperate forests vary between coastal and interior. • Climatic conditions in tropical regions differ from those in temperate regions impacting challenges to deforestation (e.g., daily rain vs. snowfall).

**REFER TO
DATA PAGES**

Use the case study of the Mackenzie River Drainage
to answer question 5.

5. Using your understanding of geography and the data provided:

- **Describe** the physical characteristics of the Mackenzie River Region.
- **Explain** the impact of the climate change on the region.
- **Assess** why it is difficult for people to implement strategies that would reduce the rate of climate change.

Answer in **essay** form.

Use **pages 5 to 8** in the Response Booklet.

(18 marks)

Response:

Physical Characteristics	• Limited change in elevation only. • Western perimeter is folded mountains. • Mackenzie River flows north into estuarine delta. • Three very large lakes. • Deranged drainage patterns, swamps, wetlands (once largest in Canada) and lakes. • Large region approximately one-quarter of Canada. • Permafrost (continuous and discontinuous). • Dry, cold desert (103 mm), subpolar. • Tundra (mosses and lichens) to prairie to boreal. • Dominant high pressure region. • Influence of Maritime Arctic air mass. • Rainshadow of Northern Rocky Mountains from Maritime Polar Air. • Global wind circulation patterns result in concentration of air-borne pollution. • Convectional pattern of precipitation in summer months. • Two-month growing season (short). • Temperature range 40°C. • Tundra soils in the north. • Chernozem in the south. • Historic temperature and precipitation fluctuations. • Migratory mammals such as cariboo. • Nesting grounds for migratory birds. • Rivers, lakes and ocean (source of fish and aquatic mammals). • Sedimentary rock. • Mineral wealth. • Fossil fuels.
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Impacts of Climate Change in the Region

- Increased evaporation (drought):
 - Wetlands and deltas dry up.
 - Lake and river levels lowered.
 - Lower reservoir level for the Bennett Dam.
 - Increased thunderstorms.
- Glacial retreat:
 - Flooding along rivers.
 - Erosion of river banks due to increased water volume.
 - Relocation of coastal cities due to rising sea levels.
 - Salinity levels of northern waterways change (Beaufort Sea), impacting fish migration.
 - Alteration to drainage patterns.
 - Spring flooding is reduced, so wetlands are drying up.
 - Breakup of the ice pack creates security problems for Canada trying to monitor northern coastline.
- Increased precipitation:
 - Frequent rainfall increases erosion and possible landslides, resulting in stream turbidity.
 - Increase in wetlands and deltas.
 - Increased run-off/reduced infiltration.
- Thawing or retreating permafrost:
 - Road and power line damage.
 - Damage to building foundations.
 - Spills from oil pipelines (Norman Wells).
 - Slumping and landslides/earthflows.
 - Solifluction.
- Increased forest fires.
- Loss of original plant species.
- Insect infestation (pine beetle).
- Changes to animal migration patterns.
- Decrease in waterfowl breeding grounds.
- Warmer water increases bacteria growth.
- Introduction of new tree species (Douglas fir).
- Changes to wildlife behaviour (bears not hibernating until December).
- Longer growing season (increased irrigation — a decrease in limited water sources).
- Ozone depletion's impact on plants and animals.
- Crossbreeding (polar bears and kodiaks).

Difficulty Implementing	• Nature of the environment (rotation and wind circulation) • Influence of resource extraction and power generation lobby groups. • Lack of political voice for local inhabitants. • Problem is international in nature — inhabitants can reduce impacts of global warming in the Mackenzie River Drainage Basin, but difficult to prevent climate change since the source of much of the problem is beyond their legal boundaries. • Changing government policies/priorities. • Interprovincial/territories agreements. • Reduction policies are voluntary, not regulated. • Lack of funds to support research or provide incentives for greater use of renewable energy. • Point source pollution issues such as regulations and enforcement; e.g., oil spills. • Global consumption of fossil fuels. • Volcanic eruptions and solar flare-ups are unpredictable. • Copenhagen Climate Conference yielded little change internationally. • Long-term problem. • NIMBY/APATHY. • Disagreement in scientific community over causes of global warming. • Standards of living in North America are fossil fuel based (vehicles, plastics).
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SCORING GUIDE FOR THE CASE STUDY

An essay may or may not conform to each and every descriptor within a particular scale point. The marker should classify the response into a category based on general impression rather than by checking off each descriptor. **This is a first draft response and should be assessed holistically.**

6

- Thesis is clearly developed and provides a focus for discussion throughout.
- Superior interpretation and synthesis of the data demonstrates an extensive understanding of geographic concepts.
- Insightful supporting detail and analysis provided; meaningful conclusions are drawn.
- Expression is clear and fluent; the response need not be error free.

5

- Thesis is relevant, providing direction for discussion throughout.
- Excellent interpretation and analysis of the data presents a proficient and broad understanding of geographic concepts.
- Relevant use of supporting detail and analysis; effective conclusions are drawn.
- Expression is clear and fluent; the response need not be error free.

4

- Thesis is relevant providing for an appropriate discussion.
- Competent interpretation of the data showing a satisfactory understanding of geographic concepts.
- Appropriate use of supporting detail with some analysis; adequate conclusions may be drawn or attempted.
- Expression is generally clear and fluent; errors may be present but are seldom distracting.

3

- Thesis is attempted, but may be unclear or ambiguous.
- Simplistic interpretation and repetition of the data demonstrates limited understanding of geographic concepts.
- Minimal use of supporting data with little or no analysis; conclusions may be weak or non-existent.
- Expression is simplistic; errors impede meaning.

2

- Thesis is unfocussed and off topic.
- Inadequate interpretation of the data demonstrates a flawed understanding of geography.
- Irrelevant use of supporting detail; analysis is not evident.
- Expression is awkward; errors impede meaning.

1

- No attempt at thesis.
- Limited or no interpretation of the data demonstrates no understanding of geography.
- Absence of supporting detail with no analysis.
- Expression is unclear and makes understanding difficult.

0*

- While writing is evident, no discernible attempt has been made to address the topic given or the writing is illegible.
- * Any zero paper must be cleared by the table head.

NR

- A blank paper with no response given.