

Geography 12
Resource Exam B
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 Lake Louise, Alberta to answer questions 1 and 2.

1. **Outline** two negative and two positive impacts that people have had upon the environment of the Lake Louise region.

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

(4 marks)

Response:

Negative Impacts upon the Environment	• Tourism has the potential to destroy this pristine environment by leaving trails, collecting souvenirs, littering, etc. • Resorts and cities built along lakes and rivers have potential to pollute water sources (sewage, non-source point pollution and garbage). • Recreational sports can damage habitats and pollute (gas and oil). • Fertilizers and pesticides can harm the ecosystems. • Transportation corridors sever migratory routes and kill animals. • Urbanization has potential to encroach upon animals' habitats and feeding grounds. • Increased traffic congestion. • Train derailment (spills, noise). • Clearing of vegetation for development alters drainage patterns and increases erosion. • CO₂ climate change.
Positive Impacts upon the Environment	• Scientific studies can be done within this region and therefore increase public understanding of global issues such as climate change. • Establishment of new laws and regulations can save future generations of plants and animals.

Positive Impacts upon the Environment (continued)

- Spinoff industries such as ecotours can increase employment opportunities and the tax base whilst protecting the environment.
- Positive attitude about the local area may encourage people to take further care and have an appreciation of the region.
- Creation of park to preserve wilderness through:
 - aesthetics
 - photography or art
 - recreation in a pristine environment.
- Limiting development protects habitats.
- Absence of development/lack of resource extraction.
- Encouragement of green ethic.
- Scientific knowledge.
- Water treatment.
- Slope stabilization.
- Prevention/removal of invader species.
- Wildlife monitoring.

2. **Describe** the interactions that are occurring between the four spheres in the Lake Loos region. All four spheres must be addressed for full marks. Answer in **paragraph** form.

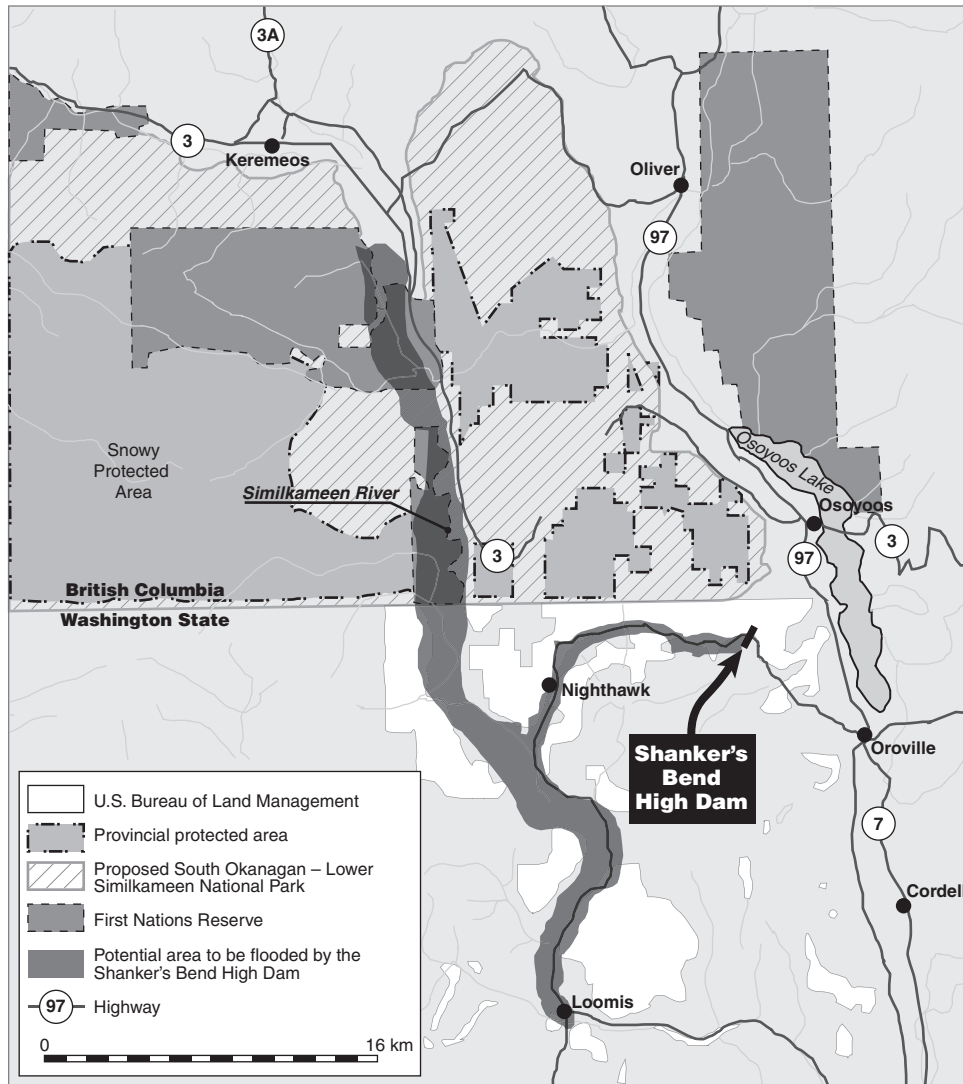
Use **page 2** in the Response Booklet.

(6 marks)

Response:

Interactions	• Coniferous trees in the biosphere are drawing nutrients from the soil in the lithosphere. • Podzolic soil (acidic from coniferous trees) in the lithosphere gains nutrients from plant material from the biosphere. • Organisms and animals in the biosphere use the soil in the lithosphere for building homes (e.g., marmots, elk, moose, bears and cougars). • Flora in the biosphere and water from the hydrosphere provide food and water sources for most animals in the biosphere. • Roots from the biosphere are anchored and grow in the lithosphere. • Plants in the biosphere photosynthesize and release oxygen into the atmosphere and take in carbon dioxide. • Trees through transpiration provide moisture to the atmosphere. • Plants and animals in the biosphere aid in physical and chemical weathering of the lithosphere. • Trees from the biosphere help maintain cool temperatures in the atmosphere. • Trees from the biosphere reduce wind and water erosion of soils in the lithosphere. • The atmosphere provides the air needed for plants and animals from the biosphere to survive. • Wind in the atmosphere aids in releasing and dispersing pollen and seeds from the biosphere. • The lithosphere heats the atmosphere through conduction. • The hydrosphere provides the necessary precipitation for the biosphere to grow. • The rain from the hydrosphere weathers the lithosphere. • Water from the hydrosphere affects the weather systems in the atmosphere. • Establishment of micro-climates. • Numerous factors such as temperature, moisture, topography, etc. influence ice. • Glaciers and rivers in the hydrosphere carve out transportation corridors in the lithosphere. • Albedo, elevation leads to differential heating. • Mountains of the lithosphere affect aspect. • Mineral material from the lithosphere provides nutrients to the hydrosphere. • Appreciation of human connections for biosphere (e.g., pollution, settlement. water use. etc.)
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Use the following map to answer question 3.



Sources: Okanagan Public Utility Department, B.C. Parks, Parks Canada

3. **Discuss** three benefits and three drawbacks of the Shanker's Bend High Dam project.

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

(6 marks)

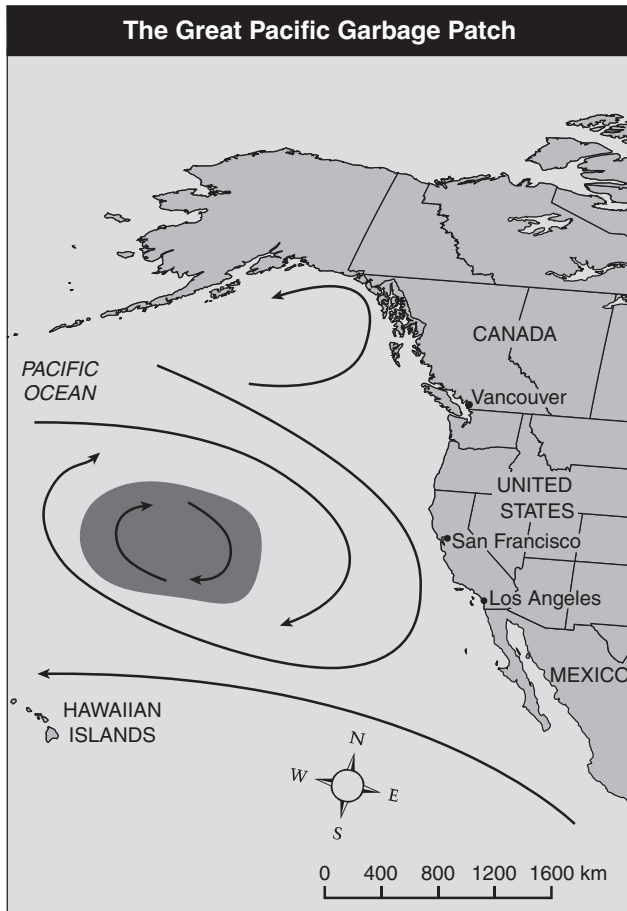
Response:

Benefits	• Produces hydro-electric power (renewable, reliable, relatively inexpensive), attracting new economic activities. • Reduces reliance on other sources of power; no negative atmospheric effects from fossil-based generating stations. • Controls downstream flooding. • Provides a reservoir for recreation and water for irrigation and domestic use. • Provides jobs (short term in construction/long term in maintenance). • Revenue from taxation of workers goes to governments and First Nations. • Increases international co-operation. • Increases tourism. • Lake-front property potential (increase in property values). • Transportation route.
Drawbacks	• Flooded valleys lead to loss/alteration of habitat and migration routes of land and water species. • Increased earthquake risk due to the weight of dam and reservoir. • Released water increasing downstream erosion and thermal pollution. • Reduces siltation and beach development downstream and increases siltation upstream. • Potential transfer of disease, parasites and invader species. • Local climate changes from increased evaporation (micro-climates). • Reduced water flow downstream, affecting aquatic species and changing erosion and deposition rates and patterns. • Loss of jobs and income from flooded farms and forests. • Cost of re-routing transportation routes. • Relocation of populations flooded by the reservoir. • Conflicts with First Nations as their land is affected. • Because an international border is involved and several levels of government will be in discussion, disputes may be difficult to resolve. • Increased mercury levels from decaying vegetation in the water supply. • Initial cost of the dam is high. • Alteration of wetlands and spawning grounds. • Alteration of river flow to meet seasonal power demand. • How to share the power (does US take all?). • Aesthetics—destroy natural beauty of the land. • Rotting vegetation—release methane and CO₂.

Drawbacks (continued)

- Increases global warming by decreasing carbon sink.
- Dangerous to construct.
- Build-up of pollutants in reservoir.
- Dam could break.
- CO₂ in construction.
- Shorter than expected dam life.

Use the following map and photograph to answer question 4.



LEGEND

- ← ocean currents
- area of the Great Pacific Garbage Patch



For decades, garbage, mostly plastic, has continued to build up and slowly rotate in the Pacific Ocean, forming the “world’s largest floating landfill.”

4. **Explain** why solutions to the Great Pacific Garbage Patch are difficult to implement.
Answer in **paragraph** form.

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

(6 marks)

Response:

- The garbage covers an extensive area (depth) isolated from human activity.
- Accumulating plastics are persistent and difficult to degrade, lasting for decades in the ocean.
- Plastics absorb chemicals, such as DDT and PCBs, concentrating these toxins and making them even more lethal and toxic.
- Garbage harms sealife through ingestion, filtration, suffocation and entanglement.
- Clean-up costs will be high.
- NIMBY—pollution is in the ocean.
- Slow ocean currents create the gyre/circular flow, trapping and concentrating the garbage.
- Plastics are too convenient and prevalent for societies to give up.
- Replacing plastics would be expensive.
- Apathy and ignorance—people pollute without understanding or caring about the consequences.
- Non-point sources of pollution make it difficult to find offenders.
- Clean-up of the area is difficult—no effective technology exists to collect garbage without significant impacts on already-stressed aquatic life.
- The problem is international in scope—Who is responsible? Who pays? How do you get an agreement? How do you enforce it?
- If we clean it up, where do we put it?
- Re-occurring problem.

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

- **Describe** the physical characteristics of Mount Pinatubo and the Philippine region.
- **Explain** the impacts the eruption of Mount Pinatubo had upon the Philippine region.
- **Propose** short-term and long-term strategies that could be implemented to reduce the impacts of this natural disaster.

Answer in a **multi-paragraph** essay.

(18 marks)

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

Response:

Physical Characteristics	Tectonics • Located in close proximity to a subduction zone. (The island arc is due to the subduction along the Manila Trench to the west.) • Pacific Ring of Fire (Philippine Plate subducts under the Eurasian Plate). • Various strike-slip faults surround the Philippine region as well. Topography • Mountainous islands with tropical rainforest and fertile soils. • Composite cone (stratovolcano) with layers of lava and ash. • Associated with pyroclastics, tephra and lahars. Philippine Region Location: – It lies between 4° and 21°N latitude and 116° and 126°E longitude. – Islands border the Philippine Sea on the east and the South China Sea on the west. Climate: – The local climate is hot, humid and tropical. – The average annual temperature is approximately 26.5°C. – Influenced by the Northeast Trade winds and the Intertropical Convergence Zone (ITCZ). – Area is subject to monsoon-type precipitation. – The country lies within the typhoon belt of the Western Pacific.
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Impacts of the Eruption	Deaths • Despite high population densities, only 800 people died; however, tens of thousands were displaced. • Over one million animals of economic value were lost. Health • Overall cost and the threat of epidemics is of special concern, due to the tropical climate of the affected area. – The re-establishment of health services in the affected communities, including the provision of medical supplies and equipment; the training of health staff (malaria). – Overcrowding leads to an increased risk of transferable diseases and infections. – Widespread psychological trauma associated with the repeated eruptions and future threat of a cataclysmic event. – Possible loss of self-worth due to displacement and devastating losses. Livelihood • Workers were forced out of work because of the destruction of their farms, shops, factories and workplaces. • Closure of the Air Force Base created a loss of spinoff jobs. • The impact on coastal farming communities, some of the poorest communities in the region, has been devastating with high losses of income, resources, as well as grazing stock. • Vast agricultural lands and fish ponds rendered into virtual wastelands. • Large tracts of forestry lands were wiped out as well as reforested areas. • Loss of income and jobs in affected areas—in farming, fishing, local services and tourism (tax revenue) forces a need to seek out new sources of income. • Loss of commodities for trade and revenue. • National and regional governments face huge, unexpected costs for relief for the displaced and dispossessed, and for the repair and rehabilitation of public infrastructure and services. • Increased dependency on outside sources for monetary help (foreign aid).
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Impacts of the Eruption (continued)	Infrastructure • Public infrastructure was devastated, especially communication roads, bridges and flood-control systems. • Houses and public buildings collapsed from the weight of accumulated ash deposits. • Increased costs of bringing in future supplies will be immense. • Water service facilities, power transmission and communication lines were damaged (mainly by lahars) and could cause health issues. • Urgent need for good quality temporary shelter; while plans are developed for work on permanent housing, forcing airports to become refugee camps. • Indigenous islanders, who had lived on the slopes of the volcano, were completely displaced, and most still wait in resettlement camps until they can return home. Local • The long-term effect on the indigenous flora and fauna is devastating due to the loss of their habitat (both land and sea). • Rain-induced torrents of volcanic debris killed people and animals and buried homes in the months after the eruption. (Damage was exacerbated by the simultaneous arrival of Typhoon Yunya.) • Insurmountable loss of arable lands. • Rivers were clogged with ash and debris. • Increased land and water pollution in the rebuilding phase. Global • Mount Pinatubo's eruption expelled large amounts of water, greenhouse gases and other gases into the atmosphere, affecting the temperature for 1–3 years.
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Proposed Strategies	Infrastructure • Immediate assessment of the situation using geotechnical engineering. • Establish clean and reliable water supply and sewage lines. • Residential property and industrial lands need to be a priority in the rebuilding phase. • Roads, bridges, buildings and flood control systems need to be rebuilt with new regulations. • Power, communication and transportation lines all need to be re-evaluated and built according to strict new risk assessment guidelines. • Set-up of temporary hospitals (field hospitals) and influx of medical staff. Economic • NGOs and other international organizations need to provide emergency aid and longer-term recovery. • Concentrate on economic recovery (provide an attractive investment climate). • Provide adequate livelihood and employment alternatives, especially for displaced farmers. • Establishment of new insurance policies and payment schedules. • Use power and influence of multinational corporations to help with reconstruction. History and Geography • Realize that this area is prone to volcanic activity and to predict and prepare for it is an absolute necessity. • Detailed histories of volcanoes should be produced. • Aerial magnetic and infrared photographic surveys should be taken often. • The sheer size of the affected area makes it imperative that all groups decide on the action plans. • Unpredictable fluctuations in the environment (climate, precipitation) must be included in discussions regarding strategies. • Impact of typhoons, tectonics and other potential natural disasters must be taken into consideration when formulating plans. Regulations • Open discussion among all parties involved in order to reach an agreement on a viable risk reduction concept. • Co-operation among interested groups (various provincial and federal level governments). • Much-improved civil engineering and building codes would be needed during the rebuilding phase.
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Proposed Strategies (continued)	• More research put into materials used for power lines and transportation routes and waterlines may take too long. • Ensure recovery is a high priority on government agenda. Knowledge • Increased education for being prepared and responding to future eruptions (organized disaster mitigation training). • Improved dissemination of information to track and warn people of dangers (satellites). • Annual evacuation drills, similar to fire drills, for the public and private sectors. • Identification of appropriate evacuation routes. • Migration to so-called “out of the shadow” areas. Technology • The use of satellite information and improved early warning systems. • New and up-to-date technologies available for environmental monitoring/risk management must be used (tilt meters and gas level analysis). • Training involved with monitoring and upkeep for new equipment must be a priority.
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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.