Geography 12

June 1999 Provincial Examination

ANSWER KEY / SCORING GUIDE

Topics:
1. Focus 1 – Environments and People
2. Focus 2 – Physical and Biological Processes
3. Focus 3 – Resources
   Focus 4 – Challenges of the Future

Part A: Multiple Choice

Q	K	C	T	CGR	Q	K	C	T	CGR
1.	A	U	2	2B2a	21.	D	U	2	2A2g
2.	D	U	2	2B2b	22.	C	U	2	2C1a
3.	C	U	2	2B1b	23.	B	K	2	2C1b
4.	D	K	2	2B2c	24.	B	K	2	2C2c
5.	C	U	2	2B2f	25.	D	E L E T E D		
6.	C	U	2	2B2c	26.	B	U	2	2A3e, 2C2f
7.	D	U	2	2B3a	27.	D	U	2	2C3b
8.	A	K	2	3B3d	28.	B	U	2	2C2d
9.	D	U	2	2B3f	29.	C	U	1	1Bf
10.	D	K	2	2B3e	30.	D	K	1	1Aa
11.	A	K	2	2B3j	31.	A	K	3	3Ae
12.	B	K	2	2B3g	32.	B	K	3	2A3f, g, 3Ce
13.	D	U	2	2B4h	33.	A	K	3	3Ck
14.	B	K	2	2C1a	34.	A	U	3	3Ag, 3Cc, f, k, l
15.	A	K	2	2B4b	35.	C	U	3	4Ad
16.	D	K	2	2A3f, g	36.	C	U	3	4Ad
17.	C	U	2	2A3a	37.	B	U	3	4Ad
18.	A	U	2	2A2b	38.	B	U	2	2B3h, i
19.	B	U	2	2A2d	39.	C	U	2	2C2d
20.	C	U	2	2A2c, g	40.	A	U	3	3Ah

Multiple Choice = 40 marks

Part B: Written Response

Q	B	C	S	T	CGR
1.	1	U	4	2	2B3h
2.	2	H	6	1	1Bd
3.	3	U	2	2	2A2a
4.	4	U	3	2	2C2b
5.	5	H	6	3	3Cd
6.	6	U	5	3	3Ba, e, 3Cb, i
7.	7	U	5	3	3Ai, 3Ck
8.	8	H	4	2	2C2h, 4Bd
9.	9	H	6	4	1Cc, 4Bc, h
10.	10	H	6	3	3Cc, m, n
11.	11	H	3	3	3Ck

Written Response = 50 marks

Multiple Choice = 40 (40 questions)
Written Response = 50 (11 questions)
EXAMINATION TOTAL = 90 marks

LEGEND:

Q = Question Number **C** = Cognitive Level **T** = Topic
K = Keyed Response **S** = Score **CGR** = Curriculum Guide Reference
B = Score Box Number

PART B: WRITTEN RESPONSE

Value: 50 marks **Suggested Time: 80 minutes**

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

REFERENCE DATA BOOKLET

Select either feature X or feature Y on the topographic map to answer question 1. Indicate your selection with a ✓.

☐ Erosional feature X ☐ Depositional feature Y

1. a) **Name** the erosional or depositional feature selected. _____ **(1 mark)**

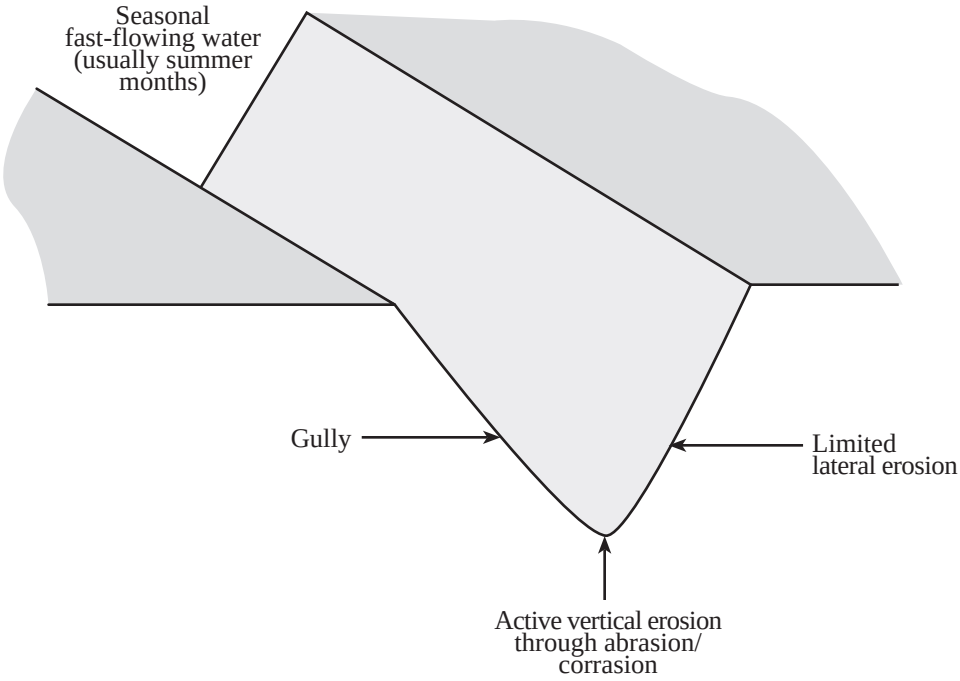
Response:

Erosional Feature X	• gully, rills, badlands, young river, V-shaped valley, tributary
Depositional Feature Y	• slip-off slope, sandbar, flood plain

b) With the aid of a clearly labelled diagram, **explain** how the feature you have selected was formed. **(3 marks)**

Response:

GULLY



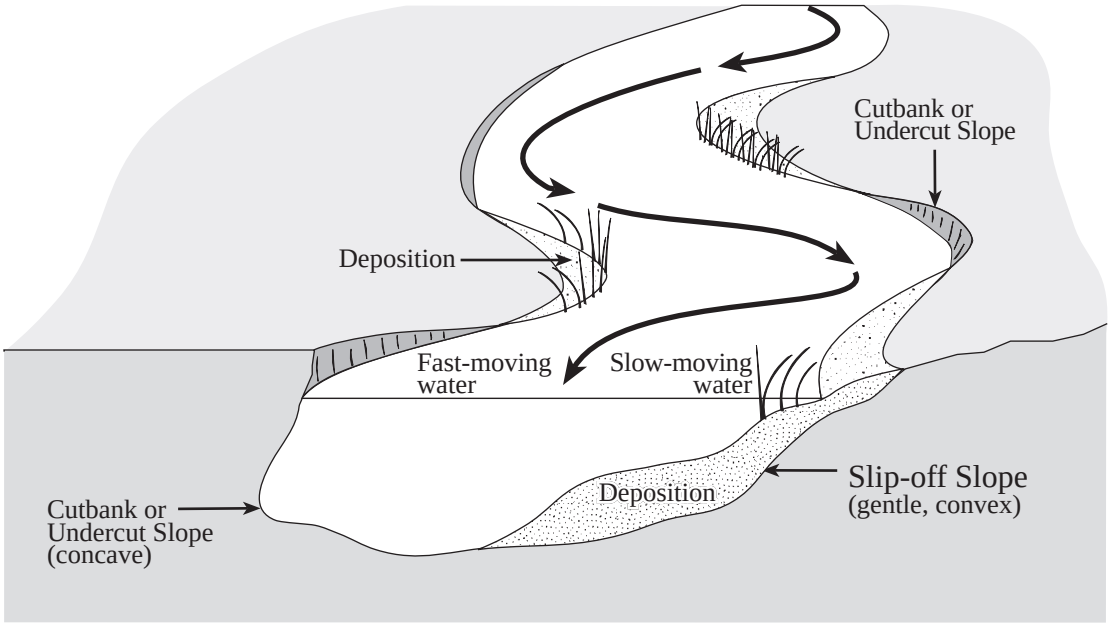
Small V-shaped valley (youthful stage) caused by stream erosion on steep slopes. Due to corrasion (abrasion) and hydraulic action, stream vertically erodes landscape. The stream is not near base level so the dominant erosion is downcutting (vertical). Splash erosion, sheet erosion and rills lead to gullying helped by the absence of vegetation to anchor the soil.

Note to Markers:

Allow 1 mark for the diagram and 2 marks for the explanation. Part of the explanation may be shown within the diagram.

Response:

SLIP-OFF SLOPE



A river flowing across a flood plain will meet resistant rock which can cause the water to meander laterally. The river's energy decreases on the inside bank (slip-off slope or point bar) because its velocity is being diminished by the erosional process and deposition occurs, building up the inside bank.

OR

Material eroded from undercut banks upstream is transported by traction/saltation and then deposited downstream where river velocity decreases.

Note to Markers:

Allow 1 mark for the diagram and 2 marks for the explanation. Part of the explanation may be shown within the diagram.

Use Photograph 5 and the topographic map to answer question 2.

2. Medicine Hat was established in 1883, shortly after Canada became a nation. Over the course of a hundred years, people have been influenced by the physical environment of the region and, in turn, have influenced the environment through their activities.

Explain the influence that physical geography and human activity have had on each other in this environment. You must address both the physical and human influences to receive full marks. Answer in **paragraph** form. **(6 marks)**

Response:

Influence of physical geography on human activity	• climate permits agriculture in summer; prohibits winter cultivation • the river provides a source of water and encourages settlement • fertile soil encourages agriculture • flat land is suitable for agriculture • dry conditions influenced the kind of agriculture practiced (dryland farming, intermittent water supply, away from river) • exposure to the prevailing winds • ease of transportation and settlement • flat land poses few barriers to transportation • the river was difficult to cross in the early days • natural gas has been extracted from the sedimentary rock of the region, providing wealth • the river and flood plain influenced the areas that could be settled (the river valley formerly limited the growth of the town) • flooding river threatens settlement and agriculture during spring melt • any urban/industrial development leads to loss of natural vegetation
Human impact on the environment	• domestic run-off • run-off from the municipality • leachates from the dump seep into the groundwater • effluent flowing into the river • sewage treatment plant located near the river • lead contaminants from rifle range • fertilizers and chemicals run off the croplands • chemical plant settling pond and air pollution may well be a problem • golf course—conversion of agricultural land (chemical applications) • gas and oil extraction could contaminate land, water and air • airport diminishes agricultural land base while contributing pollutants
Note to Markers: **This question is to be marked holistically. The student must address both influences to receive full marks.**	

3. **Identify** and **explain** ways that oceans and the atmosphere transfer heat. **(2 marks)**

Response:

Methods of transfer	• both distribute heat through conduction and convection • both have convection currents which redistribute heat • when cold and warm air/water meet, turbulence occurs • the earth's rotation deflects and influences the direction of energy transfer • ocean currents have a strong effect on air temperature patterns • heating from ocean currents is more restricted than from air masses because they are more constrained • atmosphere distributes heat through terrestrial radiation (long wave)

Use Photograph 6 and the climate graph to answer question 4.

4. a) **Identify** the natural vegetation zone associated with this climate region. **(1 mark)**

Response:

Vegetation Zone	• tundra, mountain vegetation, alpine vegetation

b) Vegetation in this biome has adapted to the physical conditions in several ways. **Explain** the reason for each of the following adaptations. **(2 marks)**

Response:

Shallow Roots	• poor, shallow, water-logged soils, bog soils • permafrost below surface prevents major root development • prohibits water uptake in winter
Stunted Growth	• limited precipitation • short growing season • lack of direct heat rays • extreme cold which hampers the growth of shrubs or trees, but which certain grasses, mosses and lichens can tolerate • dormancy during winter

Select one of the following resources to answer question 5.
Indicate your selection with a ✓.

☐ Coniferous Forest ☐ Renewable Energy Sources

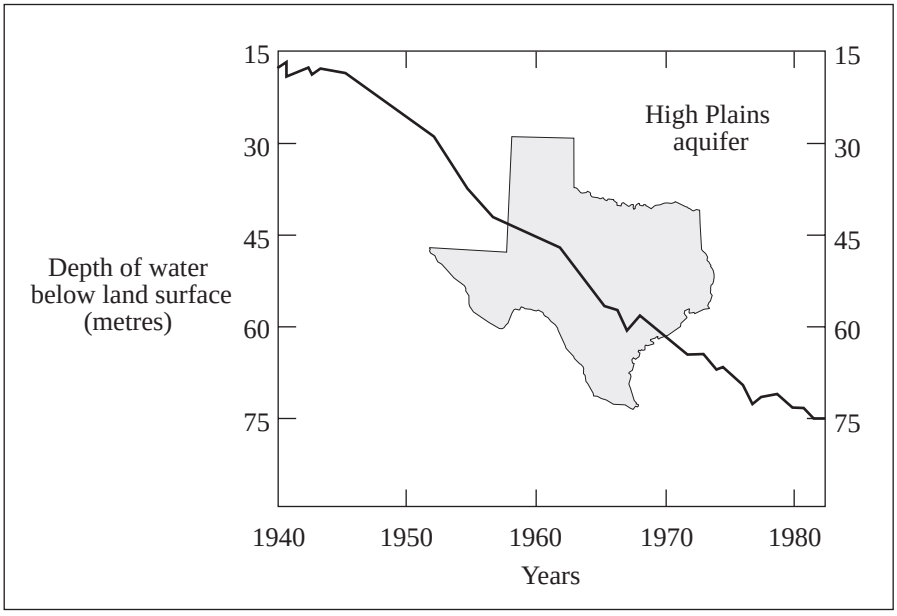
5. Mismanagement of resources is a global problem. **Discuss** the problems associated with the choice you have selected and **propose** ways to better manage the resource. Answer in **paragraph** form. **(6 marks)**

Response:

	Problems	**Management**
Coniferous Forest	• removal of shade • thermal pollution • conflicts with tourism and fishing • inappropriate harvesting methods (clearcutting) • harvesting triggers other problems (soil erosion, siltation of rivers, destruction of habitat, destruction of watersheds) • limited reforestation (only replaces recently cut forests, need to plant more to make-up for the years of harvesting before reforestation)	• improved silvicultural methods (e.g. selective logging) • sustained yield • stricter legislation • tree farm licences • reforestation/afforestation • restrict annual allowable cut • strict enforcement of forest practice code • buffer zones along stream/river channel
Renewable Energy Sources	• uneven distribution of resources • location driven (e.g., hydro-electric dams, solar cells, wind turbines) • the cost of alternatives (wind, solar, tidal, hydro; these are technology driven so use is limited to mainly developed countries) • reliance on biomass in developing and least developed countries often results in an increase in deforestation and desertification in marginal or sensitive biomes • the powerful lobbying of multinational automobile and oil companies impedes research for alternatives	• a greater degree of technology transfer from developed to developing and least developed countries • international agreement for governments to reduce or phase out the use of non-renewable fossil fuels, such as petroleum (e.g., California's electric car legislation) • seek international cooperation to create a global cap or limit on the emission of CO_2 • decrease dependency on fossil fuels by providing publicly funded financial incentives to implement renewable alternatives • use small scale operation (e.g., "micro" dams to reduce the scale of potential environmental impact) • foster energy conservation (e.g., "Power Smart")
Note to Markers: **This question is to be marked holistically.**		

Use the following graph to answer question 6.

Water level in High Plains aquifer
Southern USA



U.S. Geological Survey *Water Supply Paper No. 2275*

6. a) Identify the trend indicated in the graph above. **(1 mark)**

Response:

Trend	• water table dropped between 1940 and 1980

b) Suggest **two** reasons that might explain the trend illustrated above. **(2 marks)**

Response:

This trend has been caused by	• the refining of metals. • the irrigation of crops. • the use of water in food processing. • the use of water for industrial cooling. • population growth increasing the demand for water (increased consumption). • more powerful pumps allowing deeper wells to be drilled. • the exploitation of unsuitable natural lands, which requires more water. • a prolonged drought. • a diminished recharge rate.

c) Outline **two** ways that this problem can be addressed. **(2 marks)**

Response:

This problem can be addressed by	• recycling water. • using drip irrigation. • drought resistant crops. • the use of water diversion projects. • putting meters on wells to monitor and govern use. • limiting the number of wells drilled into the aquifer. • increasing the price paid for water in order to discourage waste and increase conservation. • implementing user pay fees for water consumption. • enforcing efficient water use, with penalty for non-compliance being the loss of land.

Use Photograph 4 to answer question 7.

7. a) **Identify** the activity at **3K** in the photograph. **(1 mark)**

Response:

Economic Activity	• mining/open pit mining/quarry/gravel pits

b) **Describe two** benefits people in this region would gain from this activity. **(2 marks)**

Response:

People would benefit from this activity through	• job creation. • increased foreign trade. • positive economic spin-off. • improved standards of living. • diversification of economic base. • development of transport corridors. • post production opportunities—roads, tourism. • extraction of useful raw materials for industrial and other uses. • investment profitability—profits go to shareholders who then reinvest in company. • possible development in other regions of the country. • increased tax revenue for government; improved government services.

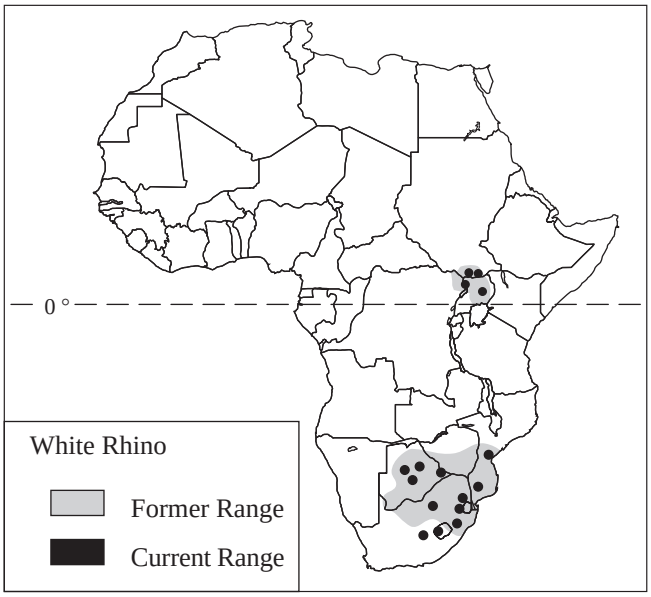
c) **Outline two** impacts this activity may have on the biosphere. **(2 marks)**

Response:

This activity may affect the biosphere by	• disrupting the food chain. • destroying animal habitat. • leachates degrading fish habitat and water sources. • the removal of forests leading to increased soil erosion. • increasing run-off (a consequence of the removal of vegetation). • causing atmospheric pollution through the use of heavy machinery which could contribute to acid rain and global warming, thus, impacting humans and animals and their habitat.

Use the following map to answer question 8.

White Rhino Habitat



8. a) **Propose two** specific conservation measures that can be taken to reverse the trend illustrated on the map. **(2 marks)**

Response:

The trend could be reversed by	• restricting sports hunting licences. • enlisting more conservation officers. • strict law enforcement with heavy penalties. • local ownership of the resource to protect species. • introducing protected areas such as game reserves. • having international agreements regarding the trade of animal parts. • increasing education programmes to raise awareness of endangered species. • involving the public in raising funds to enable conservation authorities to afford patrolling and law enforcement. • more rigorous measures to stop poaching. • introducing economic activities that would replace poaching as a source of income.

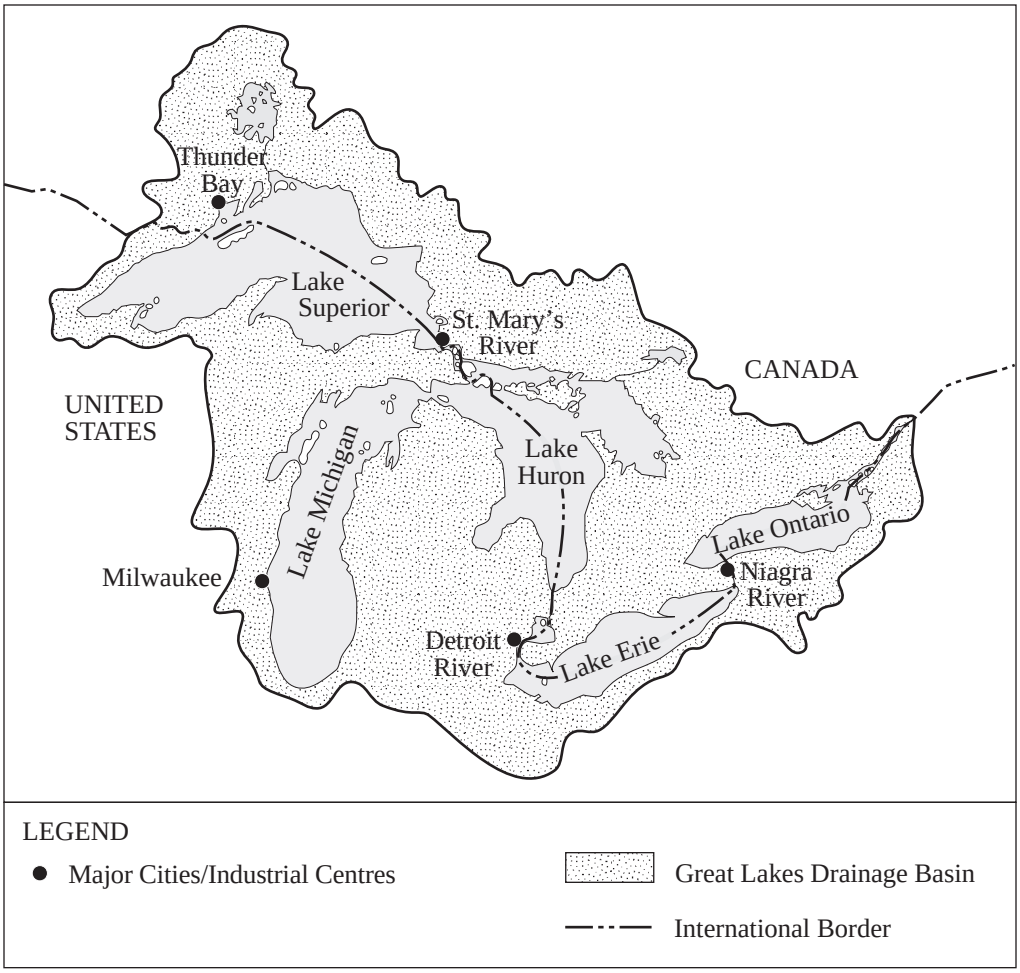
b) **Give two** reasons why it is difficult to implement conservation measures. **(2 marks)**

Response:

It is difficult to implement conservation measures because	• there is a lack of international cooperation. • of the need for subsistence survival by native people. • of a lack of money (the cost of enforcing laws). • there are economic spin-offs from big game hunting. • there are economic benefits from the trade of animal parts. • some cultures do not place a high value on conservation. • ecotourism is not seen by some governments as an economic alternative. • there is a lack of education regarding the importance of endangered species.

Use the following map to answer question 9.

The Great Lakes Basin



9. a) **Identify two** toxic substances that contaminate the Great Lakes. **(2 marks)**

Response:

Toxic Substances That Contaminate the Great Lakes	• chemical-laced manure run-off (increased coliform count) • shipping discharge (oil) • leachates from garbage dumps and mining • wastes from pulp and paper manufacturing (dioxins) • agricultural run-off (pesticides, herbicides, fertilizers) • municipal run-off (lawn fertilizers, detergent, oil and gas leaking) • effluent from the sewage plants, domestic waste, burning of solid wastes and wood waste • industrial discharge from such heavy industry plants such as steel manufacturing (PCBs, mercury) • sulphuric and nitric acids from acid precipitation

b) **Explain two** effects that these toxins have on the environment. **(2 marks)**

Response:

Effects on the Environment	• toxins are defined as substances which are a serious threat to human health: chloracne—a painful skin problem, possible liver damage, cancers, nervous disorders, paralysis, fetal disorders or abnormalities and death • tumours in fish • loss of insect life • destruction of forests • destruction of fish habitat • weakens immune system of animals • thin shells of bird's eggs, species loss • abnormalities in birdlife (e.g., bird's beaks) • bioaccumulation, biomagnification (movement of toxins up the food chain)
Note to Markers: **Students can receive full marks for one well-developed answer.**	

c) **Suggest two** reasons why solutions are difficult to implement. **(2 marks)**

Response:

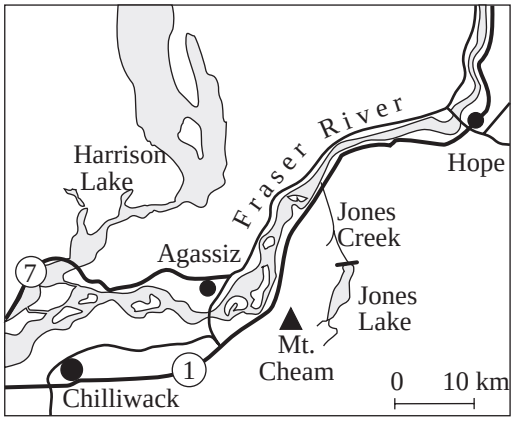
Solutions are difficult to implement because	• atmospheric pollutants carried by global winds are impossible to control. • fines for violators do not serve as a penalty to large corporations. • of the need for close inspection and monitoring of the wastes going into the system. • international cooperation between the governments of Canada and the United States and the local governments must be obtained.

Use the following information to answer question 10.

World Examiner

November 4, 1996

After Disastrous Meddling, Time Runs Out for Crucial Salmon Stream



The chum salmon that spawn in Jones Creek are one of the wonders of the world. They are the earliest migrating stock in the world's biggest producer of wild salmon, the Fraser River. But they are on the brink of extinction! Despite all the political speeches about saving the Pacific salmon, humans have destroyed in a few decades what nature protected for over 10 000 years. Historically, this small tributary supported runs of 5 000 pinks, 500 chum, sockeye and hundreds of coho, steelhead, and cutthroat trout. Logging of the watershed began in the 1930s and a dam was built on the creek in 1954. Years of cooperative efforts by B.C. Hydro, logging companies, environmental groups and Environment Canada have failed to rescue the runs.

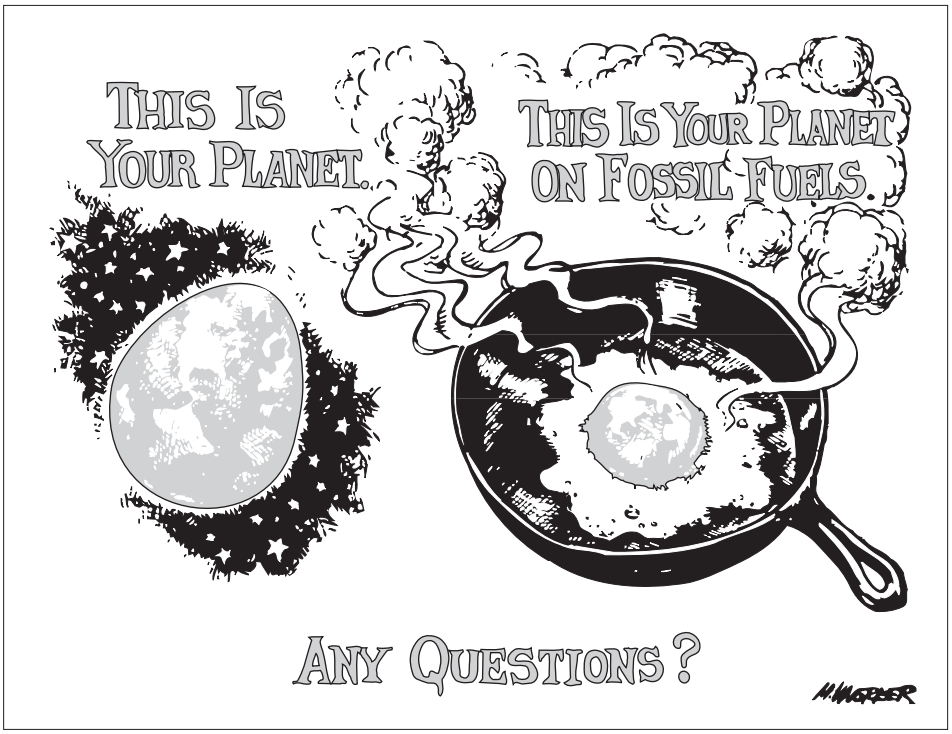
Based on information taken from: "After Disastrous Meddling Time Runs Out for Crucial Salmon Stream." *The Vancouver Sun*, November 4, 1996. Courtesy of *The Vancouver Sun*.

10. Make recommendations to avoid the mistakes of the past and to ensure that watersheds remain sustainable despite development. Answer in **paragraph** form. **(6 marks)**

Response:

Future development of watersheds such as Jones Creek	• must strictly adhere to proven silviculture practices. • should utilize computer modelling to predict impacts. • should restrict logging (reduced annual allowable cut). • need to consider treaties restricting the amount of fish caught. • should include planting of buffer zones along water courses. • requires that an environmental impact assessment be completed before development begins. • must include plans to preserve and/or compensate for the use of such watersheds. • should include development of fish hatcheries (salmonid enhancement programs). • should be required to gather and analyze data from similar cases along the west coast and determine ways to avoid the inherent problems. • should include construction of water treatment plants. • need to implement more expansive and consistent monitoring. • should consider passing and enforcing pollution laws. • must use better sewage treatment.
Note to Markers: **This question is to be marked holistically.**	

Use the following cartoon to answer question 11.



11. a) In your own words, describe the problem the cartoonist is addressing. **(1 mark)**

Response:

The cartoon is addressing the problem	• that the burning of fossil fuels is causing global warming/greenhouse effect. • that the use of fossil fuels (natural resources) harms the environment.

b) Discuss **two** consequences of this problem. **(2 marks)**

Response:

Consequences	• change to growing season • increase in global temperature • drought, shortage of irrigation water • increased forest fires, diseases, pests • melting of polar ice caps, more icebergs • changes to fish migration pattern (biomigration) • coastal flooding if icecaps and glaciers begin to melt • an increase in global temperature means less need for heating therefore lower heating costs, but there would be greater demand for air conditioning which is just as costly

END OF KEY