Geography 12

August 2004 Provincial Examination

ANSWER KEY / SCORING GUIDE

Topics: 1. The Nature of Geography
2. Systems of the Earth
3. Resources of the Earth

Part A: Multiple Choice

Q	K	C	S	T	PLO	Q	K	C	S	T	PLO
1.	A	K	1	3	3A1	21.	B	U	1	1	1B1
2.	**D**	**E**	**L**	**E**	**T**	**E**	**D**	22.	D	U	1	2	2C1a, 2C1d
3.	A	U	1	3	3B1	23.	C	U	1	2	2C1e
4.	D	U	1	1	1A1	24.	D	U	1	2	2C1b
5.	B	K	1	1	1A2	25.	D	U	1	2	2C2, 1C2
6.	A	U	1	1	1B2	26.	A	U	1	2	2C1c, 2C3, 1C3
7.	D	U	1	2	2B5	27.	D	U	1	2	2C1b
8.	A	K	1	2	2A1	28.	A	U	1	2	2D1, 1C2
9.	D	K	1	2	2A4	29.	B	U	1	2	2D1, 1C2
10.	B	U	1	2	2A2	30.	B	K	1	2	2D3a
11.	C	U	1	2	2A3	31.	C	U	1	2	2D3b, 1C2
12.	D	U	1	2	2B1, 2A3	32.	D	U	1	1	1C2, 2D3b
13.	B	U	1	2	2A3, 1C2	33.	A	U	1	2	2D3d, 1C2
14.	B	U	1	1	1C2	34.	A	U	1	2	2D3d, 1C2
15.	A	U	1	1	1C2	35.	C	U	1	2	2D3e
16.	C	U	1	2	2B2, 1C2	36.	C	U	1	1	1C1
17.	B	U	1	2	2B2, 1C2	37.	B	U	1	1	1C1
18.	C	U	1	2	2B1	38.	A	U	1	2	2D3c, 1C2
19.	D	U	1	2	2B3	39.	A	U	1	2	2D3c, 1C2
20.	D	U	1	2	2B4, 3C1	40.	C	U	1	1	1C1

Multiple Choice = 40 marks

Part B: Written Response

Q	B	C	S	T	PLO
1.	1	H	6	1	1B3
2.	2	U	4	2	2B3
3.	3	U	5	3	3C1, 3C3
4.	4	U	4	2	2A2
5.	5	H	4	3	3C1, 3A2, 3A3, 3B2, 3C3
6.	6	U	3	3	3A1
7.	7	U	4	3	3A4a, 3B2, 3C1
8.	8	H	5	2	2D3b, 1B4
9.	9	H	5	1	1B2, 3C1, 3B2
10.	10	H	10	3	1B4, 3B3, 3C3, 3C4

Written Response = 50 marks

Multiple Choice = 40 (40 questions)
Written Response = 50 (10 questions)
EXAMINATION TOTAL = 90 marks

LEGEND:

Q = Question Number
K = Keyed Response
B = Score Box Number
C = Cognitive Level
S = Score
T = Topic
PLO = Prescribed Learning Outcome

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.**

Use the following information along with the detachable air photograph on page 15 and topographic map on page 17 to answer question 1.

In the 1960s, lead, zinc, and copper mining gradually replaced pulp and paper production as the major industry in the Bathurst region. A major mining and smelting operation is located 20 km south of Bathurst on the Little River.

1. **Outline** the economic, social and environmental consequences of resource extraction for the people of the Bathurst region. Answer in **paragraph** form. **(6 marks)**

Response:

Consequences of Resource Extraction	• Population becomes dependent on the forests and minerals for its livelihood. • There is an economic boom when resources are abundant and an economic bust when resources are gone. • Provides profits for companies and shareholders. • Provides tax revenues for the province of New Brunswick and Canada. • Rising standards of health care and education for the people of the province as there is an expansion of services/infrastructure. • Spin-off benefits from the leading industries: construction, heavy equipment, transportation, marketing services, commercial, retail and service industries (direct and indirect employment). • As the non-renewable resources are depleted and economic standards decline the population can experience despair. • Highly acidic heavy metal contamination in the river and Bathurst Harbour. • Liquid effluents, air emissions and solid wastes from the pulp and paper industry. • Bioaccumulation of toxins such as dioxins and furans from the use of chlorine. • Wastewater from the sewage treatment centre, the water treatment centre and the urban run-off. • Loss of habitat for animals (mine site — increasing concerns over the health of the residents from the chemicals in their environment — harvesting of forests). • Alteration of the hydrology of the region. • The temporary nature of resources means a need to diversify the economy and use environment for tourism and recreation. • Clean-up costs. • Increased danger for workers. • Forestry workers need to be retrained.

Use the following photograph to answer question 2.

2. a) **Identify** the natural vegetation shown in the photograph. **(1 mark)**

Response:

Natural Vegetation	• desert • xerophytes • cactus • Joshua tree • succulent • prickly pear • mesquite • chaparral/maquis • teddy bear cactus

b) **Explain** two different ways the natural vegetation has adapted to the climatic conditions of this biome. **(2 marks)**

Response:

Adaptations	Vegetation: • thick waxy epidermis to limit/prevent evapotranspiration • fleshy leaves and wide trunks for water storage • thorns to protect leaves from animals which would expose flesh to dehydration by dry climate • subsurface root systems to collect atmospheric moisture • woody stems to protect against damage by animals which expose it to dehydration • small leaves to limit evapotranspiration • tap roots — plants develop deep root systems for groundwater • stunted growth due to lack of moisture • seeds lie dormant for long periods of time • plants are spread out for optimum use of moisture • thick bark to reduce transpiration and increase protection from predators • light colour to increase albedo • wide spacing to reduce competition for water • chemical under the leaves so other plants do not compete

c) **State** one threat to this biome. **(1 mark)**

Response:

Threats	• soil erosion • overgrazing • flash floods • invader species • urban encroachment • farming marginal lands • recreational development and activities (golf courses) • desert expansion/desertification • poaching of the cactus • climate change • brush fires • acid rain • ozone depletion

Use the following map to answer question 3.

Canada's Top 10 Endangered National Parks

1. Prince Edward Island National Park
2. Nahanni National Park Reserve
3. Point Pelee National Park
4. Wood Buffalo National Park
5. St. Lawrence Islands National Park
6. Riding Mountain National Park
7. Pacific Rim National Park Reserve
8. Gwai Haanas National Park Reserve
9. Elk Island National Park
10. Waterton Lakes National Park

3. a) **Describe** three possible threats to Canada's National Parks. **(3 marks)**

Response:

Development/ Land Use within Park Boundaries	• roads fragment wildlife habitat (parks are islands of natural vegetation surrounded by human activity) • vehicle-animal collisions (roads interfere with migration corridors) • resorts require infrastructure – roads, railways, power lines, buildings remove vegetation – construction of accommodations, commercial and retail services – golf courses, ski runs – depletion of water supplies – waste disposal • resource extraction (forestry, mining, oil, natural gas) – forestry: soil erosion and siltation of rivers (fish runs) – mining: acid rock drainage – fossil fuels: leaks and pipelines – agriculture: agrocides • residential • hydro-electric dam and water diversion • fires (human and natural causes) • landfills • lack of funding for parks
Pollution	• water – marine pollution to coastal parks (oil spills, domestic sewage, industrial waste) – contamination of streams and rivers due to the resource extraction/processing or urban run-off/expansion • air – wind carries contaminants from other regions (acid rain) – car exhaust, power facilities, industry • global warming
Overuse	• overcrowding causing gridlock • noise pollution • human and animal confrontation • stress on animals from too many humans • creation of unregulated trails • poaching and hunting • illegal harvesting
Disease	• tree diseases (pine beetle)

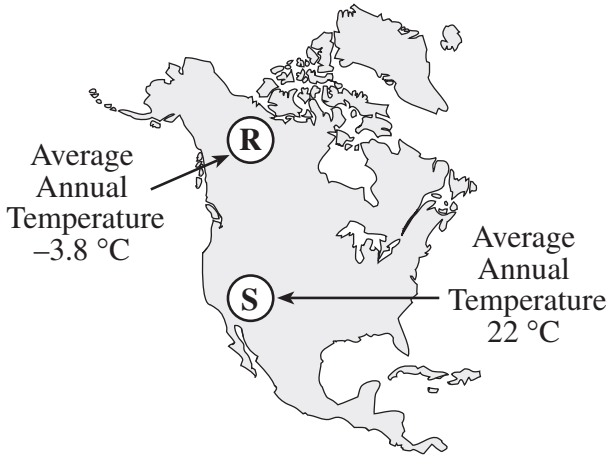
b) **Explain** two reasons why it is important to protect Canada's National Parks. **(2 marks)**

Response:

Protect and Preserve	• old growth forests • educational opportunities • unique ecosystems • biological diversity • marine and aquatic ecosystems • habitat (breeding grounds, flyways) • cultural, natural heritage, archaeological sites
Opportunities	• ecotourism • non-destructive forms of recreation • appreciation of aesthetic value of wilderness
Sustainability	• wetlands (habitat, natural water filter) • water quality (drainage basins are protected) • air quality (vegetation takes in carbon dioxide) • parks should be classified as "National Treasures" saved and preserved for future generations

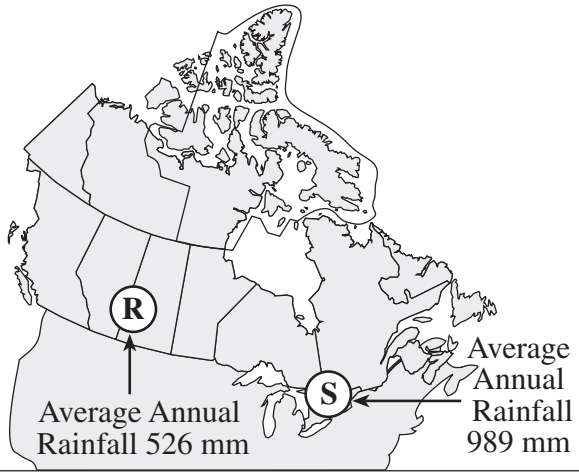
Select one of the following maps to answer question 4.
Indicate your selection with a ✓.

Map X



☐ I have selected Map X

Map Y



☐ I have selected Map Y

4. a) **Identify** the dominant climate control responsible for the conditions illustrated on the map you have selected. **(1 mark)**

Response:

Map X	• latitude
Map Y	• nearness to large body of water • continentality • leeward side of Rockies (rainshadow effect) • proximity to water

b) **Explain** the reasons for the difference in climatic conditions illustrated at locations **R** and **S** on the map you have selected. **(2 marks)**

Response:

Map X	**Location R** • Angle of sun's rays; diffused over a larger area, shifting thermal equator and periods of near darkness; snow covered, therefore greater albedo, less absorption of solar radiation. **Location S** • More direct rays of sun; increased angle of incidence; modest seasonal variation in temperature.
Map Y	**Location R** • Continentality; distance from large bodies of water; leeward side. **Location S** • Moderating influence of Great Lakes, increased evaporation, therefore more precipitation (rain and snow).

c) **Describe** how human activities are influenced by the climate control you have identified. **(1 mark)**

Response:

Map X	• length of growing season, population density, outdoor activities, heating and construction costs, clothing needed, effects on driving, recreation activities
Map Y	• type of vegetation, agricultural activities, irrigation practices, extreme weather, flood control (flash floods on the prairies), clothing needed, effects on driving, recreation activities

5. **Explain** why the sustainability of global resources is difficult to achieve. **(4 marks)**

Response:

Threats	• Presently, demand exceeds supply. The faster resources are required, the quicker the exhaustion of non-renewable resources occurs. Renewable resources are not given enough time to sustain themselves. • The greater the level of a country's development, the greater the need for ever increasing quantities of renewable and non-renewable resources to sustain and to fuel its industrialized economy. There is a direct correlation between the level of industrialization and the per capita consumption of fossil fuels, metals, and other non-renewable resources. • profit motives • industrialization • consumer society • government policies • rapid population growth • conflicting resource ethics • technological advancement • power/influence of multinationals • ecological footprint (affluent lifestyle) • "throwaway society" • policies of the World Trade Organization (WTO) favours exploitation of resources • Once a country industrializes, its appetite becomes insatiable in order to sustain the level of social and economic development it has attained. Few individuals/groups/countries are willing to give up a standard of living that has taken centuries of industrialization to achieve. • As the struggle for the control of global resources intensifies, international agreements will be harder to attain. • Little can be done if a major player (a nation state or a multinational corporation) does not want to comply with what has been agreed upon by other members of the international community. • GAIN (Greed, Apathy, Ignorance, NIMBY).

6. a) **Provide** a benefit associated with fossil fuel (thermal) electrical power generation. **(1 mark)**

Response:

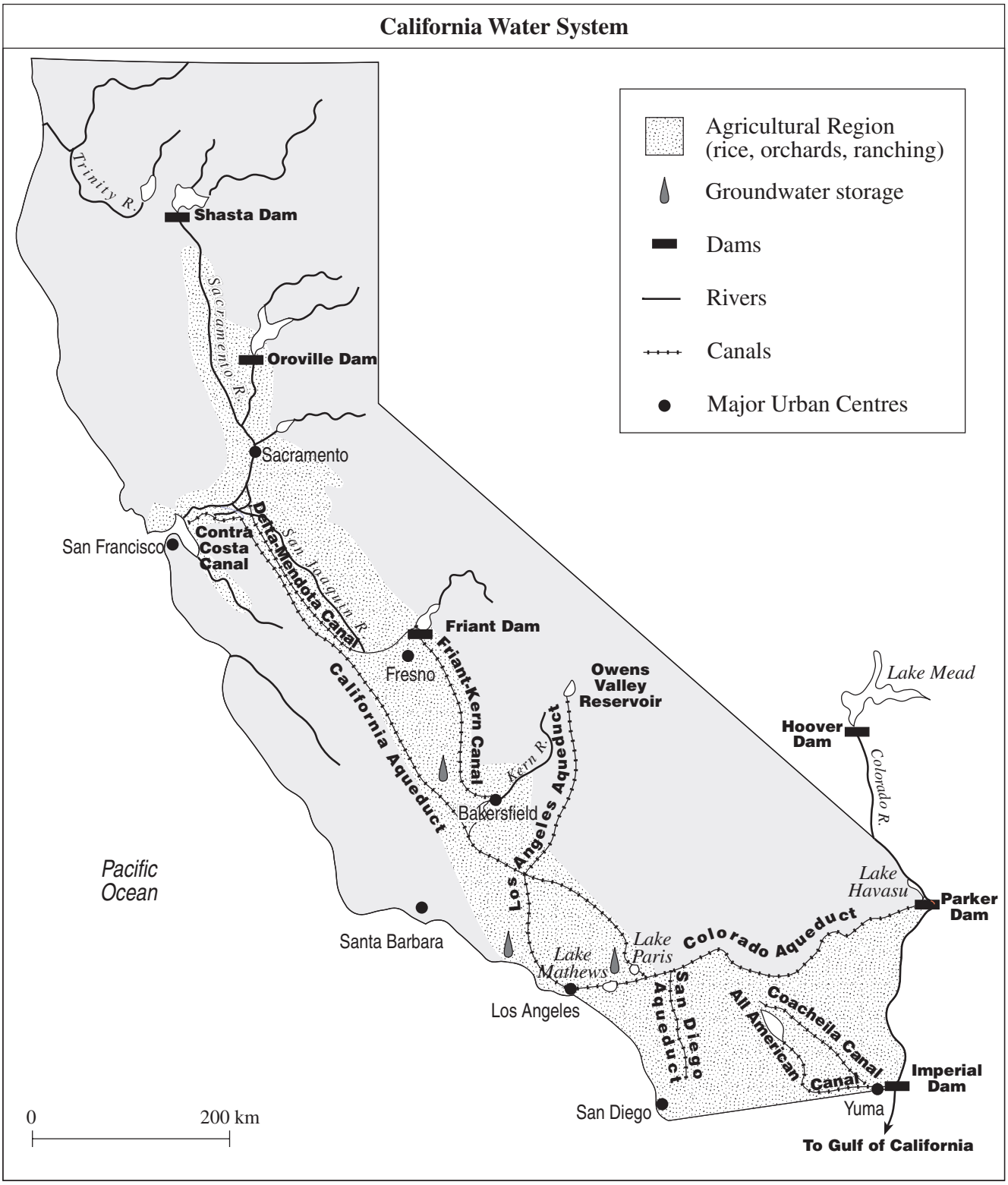
Thermal Power Generation	• easy access to coal, oil and natural gas • existing plants are set up to use this form of power generation • not site specific • inexpensive • abundant • natural gas is cleaner

b) **State** two different negative consequences associated with thermal power generation. **(2 marks)**

Response:

Thermal Power Generation	• non-renewable • aquatic life is threatened • exploration is hazardous • pollution of air and water • sulphur release leads to acid rain • transportation problems (oil spills) • radioactive particles are released (coal) • disposal of waste products is expensive • leads to greenhouse effect and global warming (climate change) • limited amount (millions of years to accumulate) • burning creates ash, gas and carbon dioxide (coal) • new technology to aid in exploration is expensive • oil platforms are plagued by the danger of icebergs • extraction may conflict with treaties or reserve land • extraction is costly, dangerous and environmentally destructive

Use the following map to answer question 7.



7. a) **Provide** two reasons for the need to divert water to Southern California. **(2 marks)**

Response:

Reasons for Water Diversion to Southern California	• population pressures • agro business requires vast quantities of water (such as rice cultivation) • semi-arid region (dry on-shore winds/high evapotranspiration rates) • consumption exceeds recharge • pollution from industrial, agricultural, and residential activities • affluent lifestyle (pools and garden ponds) • lack of governmental regulations and minimal fines • water abusive activities (car washing and water slides) • conflict between stakeholders (Who controls the water?) • inappropriate choices of crop selection • over irrigation of crops, improper irrigation methods and poor farming techniques • subsidies to farmers (making water inexpensive) • urban expansion and development • influence of political power

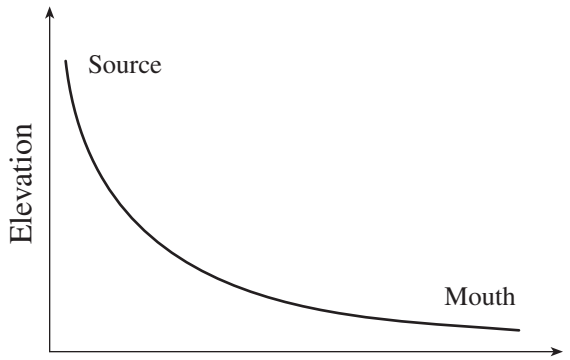
b) **Propose** two strategies that will make the use of fresh water more sustainable in this region. **(2 marks)**

Response:

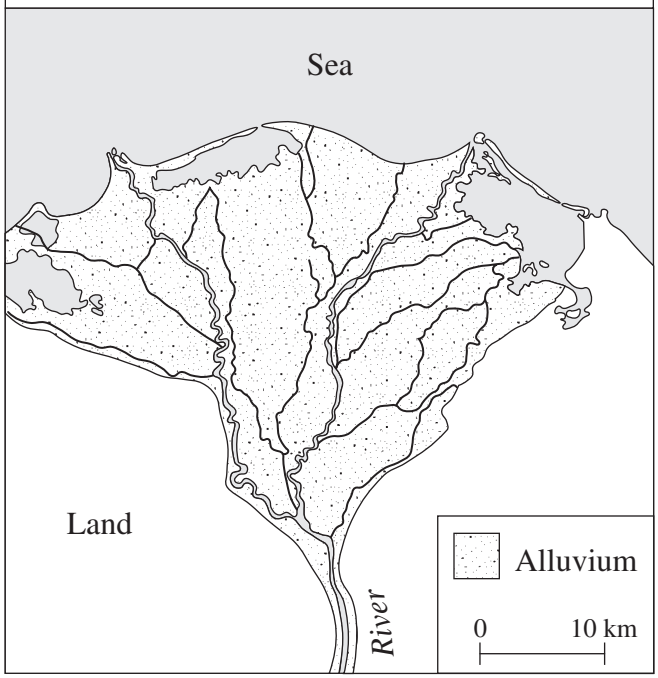
Strategies to Make the Use of Fresh Water More Sustainable	• use of low water consuming appliances • increase the cost of water • laws and enforcement • xerophytic landscapes • education programs regarding the issue of water restrictions • improve irrigation techniques/practices • development of desalinization plants • incentives to comply or exceed government standards • restrictions for ponds and pools • recycling of water (golf courses, industry) • lined irrigation ditches to reduce infiltration • covering canals to reduce evaporation • small-scale water collection • dryland farming techniques • farming of appropriate crops, not crops needing high levels of irrigation (cotton, rice) • improved treatment so water may be recycled • use of treated sewage on farmland • desalinization plants to reduce pressure on freshwater sources • restrict development and pollution near groundwater sources

Use the following data to answer question 8.

Long Profile of the Nile River



Overhead View of the Nile Delta



8. a) **Describe** two processes associated with the formation of the delta illustrated in the data. **(2 marks)**

Response:

Processes	• Hydraulic Action: the sheer force of running water pounds against rocks, boulders, and the valley walls and helps disintegrate and break down the rock materials. • Abrasion: under the force of water, rocks crash and bash against one another, further adding to the load carried by the river. • Lateral bank erosion adds to the load carried by the river. • Deposition of silts, sands and clays (added to the river by tributaries). • All of these materials are then transported by the river (via the processes of suspension, traction, saltation). This occurs because the grade and the velocity of the river are such that transpiration exceeds deposition — velocity is still strong. • As the river matures and begins to reach its base level, the velocity of the river decreases substantially and the materials held in suspension are deposited on the riverbed. • Deposition materials accumulate near the mouth of the river (alluvium). Deposition > Erosion = Delta • Wave action, longshore drift extends spits (baymouth bar). • Gravity increases the rate of erosion at the source, lack of gravity at the mouth increases deposition.

b) **Explain** three ways that a large-scale dam on the river may affect the delta region. **(3 marks)**

Response:

Processes	• reduction in water flow • reduction in deposition of silt, therefore reduction in size of the delta • possible change to fishery due to the loss of water-borne nutrients • change in water quality of coastal wetlands, due to reduced flushing • loss of annual deposit of alluvium, therefore loss of rich agricultural soils, may lead to reliance on chemical fertilizers • coastal erosion exceeds river deposition, therefore delta features shrink, therefore loss of habitat and loss of land for settlement • loss of animal habitat (wetlands) • increased salinization • saltwater intrusion into groundwater • threat of flooding • increased mercury pollution • liquefaction of the delta due to earthquake activity from dam construction

Select one of the following photographs to answer question 9.
Indicate your selection with a ✓.

Photograph X

http://pictures.care2.com/view/2/683240531

☐ I have selected Photograph X

Photograph Y

"S5," *Vancouver and Fraser Valley Orthophotos on CD-ROM*, Triathalon Mapping Corporation

☐ I have selected Photograph Y

9. a) **Identify** the dominant economic activity in the photograph you have selected. **(1 mark)**

Response:

Photograph X	• forestry, logging, clear-cutting, softwood harvesting, deforestation
Photograph Y	• farming, agriculture, cultivation, crop production

b) **Outline** two benefits associated with this economic activity. **(2 marks)**

Response:

Photograph X	• jobs — direct and indirect • profits • tax revenue • stumpage fees • efficient, economical harvesting method • wood as a resource (renewable) • spin-off benefits: health care, schools, infrastructure • safest method of logging for workers • commodity for trade • land now available for urbanization/development • most economical method of logging • provides wood and paper products
Photograph Y	• provides jobs, profits and taxes • provides food • renewable products for exports • protects land from development • diversifies the economy • habitat for wildlife, birds • self-reliance reduces the need for expensive imports

c) **Explain** how this economic activity could have an impact on the hydrosphere and the biosphere. **(2 marks)**

Response:

Photograph X	**Hydrosphere** • turbidity • transportation pollution • damage to the watershed • siltation due to soil erosion • water purity is compromised • increased run-off and flooding • decreased transpiration affects the hydrologic cycle • increased thermal pollution due to the lack of shade **Biosphere** • loss of gene pool • food chain is disrupted • habitat destruction/creation • loss of biodiversity of flora and fauna • loss of potential medicines from plants • inland and coastal fisheries damaged or lost • salmon spawning grounds affected due to siltation
Photograph Y	**Hydrosphere** • depletion of surface and groundwater supplies • alteration of the water cycle – infiltration, evaporation, transpiration, and run-off rates • alteration of drainage basins – dams for reservoirs – diversion channels • contamination of water – agrocides – manure • siltation from erosion **Biosphere** • agrocides, impact of bioaccumulation on the food chain • impact of toxins on insects, birds, decomposers, fish • monoculture reduces gene pool • genetically modified crops reduce loss of crops to disease • dependence on fossil fuels — resulting in climatic changes that impact life forms • loss of natural vegetation

Use the case study The Fate of the Doñana Wetlands on pages 30 and 31 to answer question 10.

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

- **Describe** why the Doñana wetlands are considered a valuable ecosystem.
- **Explain** how human activity threatens the Doñana wetlands.
- **Assess** the current management strategies for the Doñana wetlands.

Answer in **multi-paragraph** form. **(10 marks)**

Response:

Value of the Doñana Wetlands	**Purify water** • natural filters that absorb pollutants from water **Freshwater storage** • store water during periods of summer drought and slowly release it, recharging surface and groundwater supplies • supply a source of water for – irrigation (golf course and crops such as strawberries) – agriculture (livestock and flooding rice fields) – domestic use – businesses (hotels and resorts) **Flood control** • absorb water during periods of high rainfall or run-off and reduce a flood's destructive power **Reduce coastal erosion** • act as a buffer protecting beaches, deltas and coastlines during severe storms **Habitat and breeding grounds for wildlife, waterfowl, marine and aquatic life** • endangered species find sanctuary in them (Iberian lynx) • migratory birds (6 million) use them as wintering grounds or resting locations • fish and amphibians use them for nurseries **Agricultural soil** • when drained they are suitable for growing fruit crops and rice **Recreation and tourism** • provide opportunities for – nature activities (bird watching) – outdoor activities (hiking, fishing, pilgrimages) – beach activities (resorts)
Note to Markers:	**Some credit for the use of 5 themes of geography, especially "place" as a way of proving your understanding of geography.**

Threats to the Doñana Wetlands	**Reduced water levels due to exploitation (extraction)** • agriculture – rice cultivation requires flooded fields – flower, fruit and vegetable crops require intensive irrigation – warm mediterranean climate allows farming all year • tourism – resort development – golf course • residential development – domestic use **Drying up due to loss of recharge sources** • dam on the Guadalquivir River • water diversion for processing at the Aznalcollar Mine • reduced infiltration (development in the region surrounding the wetlands) **Drainage and conversion** • agriculture • residential development • hotels and resorts • commercial activities • infrastructure (roads, highways, gas, power and sewer lines) **Invasion by salt water** • a rise in sea level due to climate change **Contamination** • chemical pesticides and fertilizers (residential, resorts, golf courses, agriculture) • urban run-off (roads, highways) • effluent (cities and towns upstream) • garbage (residential and resort waste) • toxic sludge from mines • sewage (residential and resort development) • fuel leaks (boats and pleasure craft along the Guadalquivir River) • oil spills (tankers travel along the Spanish coastline) **Siltation** • deposition of eroded sediment from the Guadalquivir River

Assessment of Current Management Strategies	**There appears to be a contradiction between what a park is and the meaning of sustainability** • How can wetlands truly be protected when development is still allowed? – the Andalusian Region Government allows economic development in its Natural Park – the Regional Government has reclassified land in the wetlands from green belt to urban, thus making way for future development – Matalascanas, located within Doñana Natural Park, is still promoted as a tourist destination, which will lead to further growth **Governments have been slow to respond to the loss and restoration of the wetlands** • only recently created: Doñana National Park (1969), Doñana Natural Park (1989) • restoration plans are limited or non-existent – water conservation strategies could easily be implemented **No evidence of cooperation between the various levels of government** • Doñana National park is controlled by the National Government, where the larger Doñana Natural Park is controlled by the Regional Government **The Sustainable Development Plan for Doñana is limited** • does not involve all levels of government • does not appear to have a long-term vision of conservation • focuses more on development than conservation – construction of necessary tourist infrastructure – development of tourism and agriculture – promotion of businesses in Doñana • if this plan allows more development it will increase demands on the already declining water supply of the wetlands

END OF KEY