

Question 1: No Stimulus**7 points**

A (Point 1)	Define the concept of an independent state. Examples of acceptable responses may include the following: • A1. The primary building block of the world political map. • A2. A sovereign country, sovereign state, or a political entity with its own independent government (governs itself autonomously and is not controlled by any other external power). • A3. A country with control over its own territory or laws, and/or a country that is recognized by other states.	1 point
B (Point 2)	Describe one purpose of supranational organizations. Examples of acceptable responses may include the following: • B1. To address transnational or environmental challenges, and/or to create economies of scale, trade agreements, and/or military alliances. • B2. To align member states (countries) that have a common interest or objective (e.g., administrative, economic, environmental, military, strategic, peace, security). • B3. To create free trade zones, cartels, lending agencies, and/or research institutions. • B4. To reduce the operational cost of governance, regulation, tariffs, business operations, currency exchange, banking fees and/or legal expenses. • B5. To increase regional or organizational economic power, productivity (e.g., gross national product), and/or size of the available labor force.	1 point

C (Point 3)	Describe one global outcome of an increase in international trade. Examples of acceptable responses may include the following: • C1. An increase in international trade allows countries to use comparative advantage and/or complementarity to specialize in the production of goods and/or services. • C2. Increase in globalization, free trade, trade agreements, interdependence, supranational organizations, and/or rising levels of international development. • C3. Outsourcing of jobs from countries with higher labor costs to countries with lower labor costs and/or increased competition between countries. • C4. Deindustrialization in more developed/core countries or regions. • C5. Improved or expanded infrastructure (e.g., port facilities, warehouses, roads, transportation networks). • C6. Increased pollution, use of natural resources, and/or environmental impacts. • C7. New manufacturing zones, free trade zones, special economic zones, and/or export processing zones. • C8. Changes in the economic sectors of national economies and/or changes in methods of production. • C9. Increased potential for supply chain problems (e.g., halted production, delayed shipment, tariffs, trade restrictions, labor shortages, quality control issues, technological integration, sustainability pressures, cost increases). • C10. Wider access to more diverse goods, services, technology, media, and/or ideas. • C11. Lower production costs and/or prices for consumers.	1 point
D (Point 4)	Explain how deindustrialization has affected the economy of core countries. Examples of acceptable responses may include the following: • D1. Economies have shifted away from manufacturing toward services and technology as the main sources of economic production. • D2. The loss of manufacturing businesses and/or jobs resulted in widespread unemployment, economic decline, and/or less business investment. • D3. Deindustrialization has contributed to an international division of labor and/or an economic sector shift in which core countries have higher-paying jobs. • D4. Outsourcing, offshoring, and/or economic restructuring have led to a decline in jobs in core countries and an increase in jobs in newly industrialized countries (developing countries, semiperiphery). • D5. Core countries and/or cities have developed strategies designed to attract new businesses to replace those lost from deindustrialization (e.g., lower taxes for businesses that relocate).	1 point

E (Point 5)	Explain why international boundaries on land or at sea may lead to disputes over resources.	1 point
Examples of acceptable responses may include the following:		
• E1. Boundaries may be contested due to more than one country or company claiming ownership over a resource. • E2. Countries may disagree with international agreements that define the rights and responsibilities of countries (e.g., United Nations Convention on the Law of the Sea [UNCLOS]). • E3. Political boundaries may be superimposed over resource areas claimed by different countries. • E4. Corporations, indigenous groups, and/or local communities may have competing claims to resources.		
F (Point 6)	Explain how supranational organizations such as the EU or ASEAN may challenge the sovereignty of member states.	1 point
Examples of acceptable responses may include the following:		
• F1. Supranational organizations implement international laws or policies that may result in limitations on the economic or political actions of individual member states. • F2. Supranational organizations may require participation in military alliances or impose changes in regional governance (e.g., border policies, currencies, trade regulations, environmental regulations, labor regulations, taxes, judicial systems) that replace or supersede existing systems of national government in member states.		
G (Point 7)	Explain how advances in communication technologies may affect state sovereignty.	1 point
Examples of acceptable responses may include the following:		
• G1. Advances in technology may affect state sovereignty by facilitating devolution, supranationalism, and/or democratization efforts that change the structure of the state or its system of governance. • G2. Advances in technology may affect state sovereignty by allowing people, social movements, and/or organizations (e.g., other governments, corporations) to communicate faster or more effectively, or to a larger audience, about political issues and/or social justice, leading to changes in law, government policy, strengthening of the state, and/or the devolution of the state. • G3. Advances in technology may affect state sovereignty by increasing the ability of a supranational organization to monitor what is occurring in member states (e.g., upholding agreements and enforcing regulations).		

Question 2: One Stimulus**7 points**

A (Point 1)	Identify the recent trend in fertility shown in the population pyramid. Examples of acceptable responses may include the following: • A1. Japan's fertility rate has declined. • A2. Japan's birth rate has declined. • A3. Fewer children are being born. • A4. Japan likely has a negative RNI. • A5. Japan has low, slow, zero, and/or negative population growth.	1 point
B (Point 2)	Based on the data shown in the population pyramid, describe the ratio of males to females in the Japanese population age 80 and above. Examples of acceptable responses may include the following: • B1. There are more women than men or there are fewer men than women. • B2. In the cohorts age 80–100+, the male population is approximately 3 percent to 4 percent of the total population, while the female population is approximately 6 percent to 7 percent of the total population. • B3. In the cohorts age 80–100+, the male population is approximately half the size of the female population.	1 point
C (Point 3)	Describe one process that drives urbanization. Examples of acceptable responses may include the following: • C1. Migration to cities or urban areas and/or increases in the population of a country, a city, metropolitan area, or an urban area. • C2. Economic growth, trade, industrialization, and/or development in a country, metropolitan area, or an urban area. • C3. Expansion of transportation and/or communication systems in a country, a city, metropolitan area, or an urban area. • C4. Government development policies, zoning, and/or urban planning in a country, a city, metropolitan area, or an urban area. • C5. Advancements in technology and/or infrastructure in a country, a city, metropolitan area, or an urban area. • C6. Situation (a location's relationships to other places) influences the function and/or growth of cities.	1 point

D (Point 4)	Describe one factor that may lead to a decrease in total population within a more developed country. Examples of acceptable responses may include the following: • D1. Declining fertility may lead to a decrease in the number of children born and/or to a decrease in total population. • D2. Increasing mortality may lead to a higher death rate and/or to a decrease in total population. • D3. Out-migration or emigration may lead to a decrease in total population. • D4. Social or cultural factors (e.g., access to education and employment) may lead to decreased fertility and/or a decrease in total population. • D5. Political factors (e.g., war, conflict, immigration policies) may lead to decreased fertility and/or a decrease in total population. • D6. Medical factors (e.g., epidemics, access to health care) may lead to decreased fertility, increased mortality, and/or a decrease in total population. • D7. Environmental factors (e.g., natural disasters, extreme weather, limited resources, pollution) may lead to increased mortality, and/or a decrease in total population. • D8. Economic factors (e.g., high unemployment, economic recessions, high cost of living, limited social programs) may lead to a decrease in total population.	1 point
E (Point 5)	Explain how a country's population pyramid can be used to predict the future needs of the population. Examples of acceptable responses may include the following: • E1. Pyramids can be used to predict future needs by analyzing pyramid shapes or population growth and/or decline to predict markets for goods or services. • E2. Pyramids can be used to predict future needs by indicating an aging population, which will lead to increased demand for goods and services for older people (e.g., medical care, housing, products marketed to older citizens). • E3. Pyramids can be used to predict future needs by indicating lower fertility or birth rates, which will lead to decreased demand for products and services for children (e.g., childcare, schools, recreational activities, products marketed to children). • E4. Pyramids can be used to predict future needs by indicating a rapidly growing population and/or high birth rates, which will lead to increased demand for goods and services for children and/or families (e.g., childcare, schools, recreational activities, products marketed to children). • E5. Pyramids can be used to predict future needs by indicating an aging population and/or low birth rates, which may lead to labor shortages and/or a need for migrants to provide goods or services. • E6. Pyramids can be used to predict future needs by indicating a rapidly growing population and/or high birth rates, which may lead to an increase in the labor force and/or economic growth.	1 point

F (Point 6)	Explain why the population pyramid provides limited information about immigration to cities in Japan.	1 point
Examples of acceptable responses may include the following: • F1. Population pyramids do not provide data on migration, or population pyramids do not provide data on migration to Japan. • F2. Population pyramids do not provide data on migration to cities, or population pyramids do not provide data on migration to cities within Japan. • F3. This population pyramid shows country-scale data rather than city-scale data or data about the urban population in Japan. • F4. Population pyramids are used to assess population growth and/or decline or used to predict markets for goods and/or services, but they are not used to assess migration data. • F5. Population pyramids include data on age-sex structures, but they do not include migration data.		
G (Point 7)	Explain the degree to which a country's population growth rate may be affected by a pronatalist policy. (Response must indicate the degree [low, moderate, high] and provide an explanation.)	1 point
Examples of acceptable responses may include the following: Statement of a moderate or high degree AND • G1. Pronatalist policies promote an increase in fertility through social programs and/or incentives. • G2. Pronatalist policies may increase the population growth rate by allowing parents to keep their jobs, getting paid while taking care of their children, and/or not having to return to work right away. • G3. Pronatalist policies may attract immigrants who find policy incentives (e.g., paid parental leave) attractive, increasing the population growth rate. OR Statement of a moderate or low degree AND • G4. Pronatalist policies may have little or no effect on population growth rates if the cost of raising children is still high and/or if parents lack adequate time to care for them. • G5. Pronatalist policies may have little to no effect on population growth rates if the policies are not granted equally to all residents. • G6. Pronatalist policies may have little impact on population growth rates because of differing societal norms (e.g., individual choice, concerns over environmental impact) and/or family structures.		

Question 3: Two Stimuli**7 points**

A (Point 1)	Identify an example of a culture trait. Acceptable identification: A1. Culture traits include such things as food preferences, art, architecture, language, religion, music, clothing, media, technology, and/or land use.	1 point
B (Point 2)	Describe the spatial pattern of cow's milk production in Africa, shown in Map 1. Examples of acceptable responses may include the following: - B1. Medium and/or high amounts of cow's milk production are concentrated or clustered in the north, east, and/or south. - B2. Low amounts of cow's milk production are concentrated or clustered in west, central, and/or southwest Africa.	1 point
C (Point 3)	Based on Map 1 and Map 2, compare the spatial patterns of cow's milk production and pork production in Asia. (Response must include both maps in the comparison.) Examples of acceptable responses may include the following: - C1. Map 1 shows that cow's milk is produced in most Asian countries at high or medium volumes, whereas Map 2 shows that pork is produced at high or medium volumes in East Asia and/or parts of Southeast Asia, or in low volumes in South and/or Southwest Asia. - C2. Cow's milk is produced in most Asian countries, whereas pork is not produced in regions with large Islamic populations, such as the Middle East (Southwest Asia), Central Asia, South Asia, and/or parts of Southeast Asia. - C3. Cow's milk production and pork production are low in insular Southeast Asia (e.g., Indonesia, Malaysia, East Timor, Papua New Guinea).	1 point

D (Point 4)	Describe one environmental effect of agricultural land use such as commercial animal farms. Examples of acceptable responses may include the following: • D1. Environmental effects of agriculture land use include pollution (e.g., air, water, waste), land cover change (e.g., soil erosion), nutrient depletion, desertification, and/or soil salinization. • D2. The reduction of water supplies for agricultural purposes, such as depleting reservoirs, lowering the local water table, and/or draining aquifers. • D3. The reduction of biodiversity from changes in land cover (e.g., deforestation, grassification, feed-crop monoculture). • D4. The spread of disease between domestic and wild animal populations or between animal populations and humans. • D5. Climate change and/or global warming because such farms produce greenhouse gases (e.g., carbon dioxide, methane, water vapor). • D6. Agricultural land use can promote the survival or the growth of environmentally beneficial species (e.g., pollinators, working animals, heirloom varieties).	1 point
E (Point 5)	Explain how the globalization of agriculture may affect local culture traits. Examples of acceptable responses may include the following: • E1. Globalization of agriculture and/or the global system of agriculture may lead to changes in food preferences. • E2. Globalization may lead to people preferring to eat foods imported from other countries that were not previously available to them (e.g., tropical fruits in temperate climates). • E3. Globalization may lead to the availability of less expensive imported foods that are substituted for more expensive local foods (e.g., imported wheat replacing locally grown corn). • E4. Consumers may resist the globalization of the food supply and in response buy domestically produced food, local food, and/or purchase food from community-supported agriculture. • E5. Globalization of agriculture may lead to a reduction in the number of small family farms, which can affect local cultural traits (e.g., settlement patterns by prompting rural-to-urban migration, social roles by having fewer people working in agriculture). • E6. Globalization may lead to changes in agricultural land use or agricultural production methods through the implementation of new technologies, architecture, and/or equipment (e.g., data analytics, drones, vertical farming, autonomous tractors), affecting local culture traits (e.g., crops, farming practices).	1 point

F (Point 6)	Explain why regions of agricultural production may become interdependent. Examples of acceptable responses may include the following: • F1. Some regions and/or countries have become highly dependent on one or more export commodities, which causes different regions to depend on one another for specific agricultural commodities. • F2. Regions of agricultural production are connected through global food distribution networks that are affected by political relationships, infrastructure, and/or patterns of world trade. • F3. Global patterns of food-processing facilities and markets, economies of scale, distribution systems, and government policies all contribute to greater interdependence among agricultural production regions. • F4. Countries may develop comparative advantages, complementarity, specialty crops, and/or consumer markets that establish trade relationships and increase interdependence between two or more countries. • F5. Countries in a region may form trade relationships that result in increased trade in farm products (e.g., EU, ASEAN, MERCOSUR).	1 point
G (Point 7)	Explain how domesticated animals such as pigs spatially diffused to create the spatial pattern shown on Map 2. Examples of acceptable responses may include the following: • G1. Domesticated animals such as pigs diffused from their hearths of domestication through relocation diffusion (e.g., settlers bringing animals to new areas). • G2. Domesticated animals such as pigs diffused from their hearths of domestication through the Columbian Exchange. • G3. International trade, imperialism, and/or colonization introduced domesticated animals such as pigs that were transported to other regions of the world. • G4. Domesticated animals such as pigs spread through migration or expansion diffusion, altering food preferences and/or increasing demand for diverse animal products domestically and/or internationally. • G5. Domesticated animals such as pigs spread to areas where consumption of these animals was culturally acceptable and/or did not spread to areas where consumption of such animals was culturally unacceptable.	1 point

Question 2: One Stimulus**7 points**

A (Point 1)	Using the data in the charts, identify the largest food export category between the two countries. Acceptable identification: • A1. Grains, fruits, vegetables.	1 point
B (Point 2)	Using the data in the charts, describe the difference between the two countries in the meat, dairy, and seafood category. Examples of acceptable responses may include the following: • B1. The amount of exports or trade from Country X is larger. • B2. The amount of exports or trade from Country Y is smaller. • B3. Exports or trade from Country X is \$5.1 billion, while exports or trade from Country Y is \$2.3 billion. • B4. The amount of exports or trade from Country X is approximately twice as much as exports or trade from Country Y.	1 point
C (Point 3)	Define the concept of comparative advantage. Examples of acceptable responses may include the following: • C1. Comparative advantage describes a situation in which an individual, business, or country can produce a good or service more efficiently and/or at a lower opportunity cost than another producer. • C2. Comparative advantage occurs when countries choose to specialize in producing goods or services that they can produce more efficiently, effectively, and/or that have a lower opportunity cost.	1 point
D (Point 4)	Describe one effect of Green Revolution technologies on food supplies in developing countries. Examples of acceptable responses may include the following: • D1. Green Revolution technologies (e.g., high-yield seeds, increased use of chemicals, mechanized farming) increased food supplies. • D2. Green Revolution technologies increased the amount of farm production and/or the agricultural yield of food crops and/or animals. • D3. Pesticide use led to pesticide resistance in some species, decreasing food production. • D4. Irrigation and/or the use of mechanized equipment led to soil erosion and/or loss of soil fertility, decreasing food production. • D5. Monocropping, mechanization, and/or the decrease in smaller farms changed the types of food produced and/or affected food supplies.	1 point

E (Point 5)	Explain how advances in agricultural technology may increase the carrying capacity of land.	1 point
	Examples of acceptable responses may include the following: • E1. Advances in agricultural chemicals (e.g., fertilizers, pesticides) may allow an area of land to produce more resources and support a larger population. • E2. Carrying capacity may increase through mechanization (e.g., tractors, vehicles, irrigation, processing equipment), which may allow an area of land to produce more resources and support a larger population. • E3. Carrying capacity may increase through the use of high-yield seeds, which may allow an area of land to produce more resources and support a larger population. • E4. Carrying capacity may increase if agricultural technology is used to bring areas with low population density into agricultural production leading to higher population density. • E5. Carrying capacity may increase through the use of agricultural technology (e.g., precision agriculture, GPS) that improves growing conditions or optimizes agricultural practices, leading to the production of more food and the ability to support a larger population.	

F (Point 6)	Explain the degree to which the economies of Country X and Country Y are interdependent. (Response must indicate the degree [low, moderate, high] and provide an explanation.) Examples of acceptable responses may include the following: Statement of a moderate or high degree AND - F1. Country X and Country Y are highly interdependent due to the billions of dollars of agricultural trade occurring between the two. - F2. Both countries are dependent upon one or more export commodities traded with each other (exports, imports) and/or agriculture is used as an economic strategy for both countries. - F3. Trade in agricultural goods between Country X and Country Y is part of the global supply chain and/or part of the global food distribution network that links producers and consumers. OR Statement of a moderate or low degree AND - F4. The amount of trade between the two countries for agriculture may be small in comparison to the trade in other sectors (e.g., manufacturing, services). - F5. The agricultural trade data in the charts do not provide enough information to demonstrate interdependence because agriculture is only a portion of the total amount of trade (of all goods and services).	1 point
G (Point 7)	Explain how the charts provide limited information about economic development. Examples of acceptable responses may include the following: - G1. The charts provide data for only one sector of the economy and/or do not include other measures of social and/or economic development (e.g., GDP, GNP, GNI per capita, sectoral structure, population data). - G2. Export data indicate the production of goods for international trade but not the production of goods for the domestic economy. - G3. Export data do not include non-food products (e.g., cotton) which contribute to economic development. - G4. The charts do not have a temporal or spatial dimension (e.g., a year, timeframe, variation by different areas) which is essential for understanding trends or making comparisons (e.g., uneven development). - G5. The charts show that Country Y has higher agricultural exports than Country X, but the charts do not show that Country X has a more developed economy.	1 point

Question 3: Two Stimuli**7 points**

A (Point 1)	Identify the scale of analysis used for Finland’s political divisions in Map 2. Acceptable identification: • A1. Local scale (e.g., city, town, rural municipality) or subnational scale.	1 point
B (Point 2)	Define geometric boundaries as shown in Map 1. Examples of acceptable responses may include the following: • B1. Border lines on a map (two-dimensional plane) that are straight, angled, and/or curved to form a geometric shape (e.g., straight line, square, rectangle, circle, other polygons). • B2. A boundary or border drawn based on lines of latitude and longitude, a grid system, and/or a township and range system (baselines and meridians). • B3. Boundary lines drawn without regard to the physical or cultural landscape.	1 point
C (Point 3)	Describe one function of internal boundaries. Examples of acceptable responses may include the following: • C1. Internal boundaries define the limits of sovereignty or government control between one subnational region and another. • C2. Internal boundaries delimit or unify different types of subnational regions (e.g., voting districts, states, provinces, territories, special administrative regions, autonomous zones). • C3. Internal boundaries can unify or separate distinct ethnic, cultural, or national groups. • C4. Internal boundaries can delineate, divide, or fragment zones of public infrastructure and/or local government (e.g., water districts, school districts, voting districts). • C5. Internal boundaries can reflect, preserve, or reduce cultural, linguistic, or historical identities. • C6. Internal boundaries can prevent, resolve, or exacerbate conflicts. • C7. Internal boundaries can facilitate or hinder the collection or analysis of data. • C8. Internal boundaries can facilitate or hinder the management, protection, or distribution of natural resources or ecosystems.	1 point

D (Point 4)	Explain how the spatial organization of a country such as Canada is affected by a federal system of governance. Examples of acceptable responses may include the following: • D1. Federal systems of governance affect the spatial organization of a country by creating locally based, dispersed power centers (e.g., subnational state or provincial capitals). • D2. Countries with a federal system of governance are typically organized into subnational units (e.g., autonomous regions, semiautonomous regions) and/or have regional capitals that may help reduce centrifugal forces and/or limit ethnic separatism. • D3. Federal systems tend to divide large amounts of land area into subnational divisions that may be difficult to govern from a centralized or single capital. • D4. Federal systems tend to divide multicultural countries into subnational divisions based on cultural differences (e.g., ethnic, religious, and/or linguistic diversity) that may be difficult to govern from a centralized or single capital.	1 point
E (Point 5)	Explain how the supranational organization shown in Map 2 may limit the actions of Finland as a member state. Examples of acceptable responses may include the following: • E1. The EU may enact international laws or policies that limit the economic actions of Finland or other member states (e.g., reducing or eliminating trade barriers, introducing a common currency, regulating industry). • E2. The EU may implement international laws or policies that limit the political actions of Finland or other member states (e.g., requiring common border policies, observing elections, sharing a common foreign policy). • E3. By joining the EU, Finland has agreed to allow the EU government to make laws and regulations on behalf of Finland and the other member states.	1 point
F (Point 6)	Describe one characteristic of a cultural landscape that may reflect cultural beliefs and identities. Examples of acceptable responses may include the following: • F1. Art, music, toponyms, clothing, architecture, and/or evidence of sequent occupancy may indicate elements of a culture or cultures. • F2. Religion, language, social institutions, and/or systems of governance may be based on a culture or cultures. • F3. Land use, land survey patterns, agriculture, resource use (e.g., hunting, fishing, crafts), and/or trade may indicate the practices of a culture or cultures. • F4. Foods, social interactions, holidays, and/or festivals are based on or have elements of a culture or cultures. • F5. Attitudes towards ethnicity or gender (e.g., the role of women in the workforce) may help shape the use of space in a given society.	1 point

G (Point 7)	Explain how communication technologies may affect the cultural patterns of indigenous languages.	1 point
	Examples of acceptable responses may include the following: • G1. Communication technologies (e.g., the Internet) may encourage members of indigenous communities to adopt more commonly used languages (e.g., English), resulting in indigenous language loss. • G2. Language loss may occur due to cultural convergence, which is accelerated by the use of communication technologies. • G3. Communication technologies may increase the availability of indigenous language resources (e.g., via websites, apps, social media), resulting in language preservation. • G4. Communication technologies may be used to increase awareness of indigenous identity issues, which may result in language preservation. • G5. Limited access or cultural resistance (e.g., reliance on oral tradition) to communication technologies can restrict or prevent significant changes in the cultural patterns of indigenous languages.	

Question 3: Two Stimuli**7 points**

(A) Describe the spatial pattern of the companies and institutions shown in the inset map. 1 point

Accept one of the following:

- A1. Agglomeration of similar economic activities.
- A2. Cluster or clustering of similar economic activities.
- A3. The concentration of similar activities along transportation routes (e.g., rivers, arterial roads).
- A4. There is a concentration of similar economic activities within a metropolitan area in Massachusetts.

(B) Describe the concept of a growth pole. 1 point

Accept one of the following:

- B1. A location where research, development, and/or innovation (e.g., new product or process) generate new products and/or services.
 - B2. An institution (e.g., university, hospital, laboratory) where scientific discoveries, inventions, and/or innovations create new economic opportunities.
 - B3. An area where new businesses start up and/or businesses locate to participate in the emerging market and/or attract investment for a new product and/or service.
 - B4. An area where new businesses start up and/or businesses locate to access a specifically skilled or educated pool of labor.
 - B5. An area designated by a government to facilitate economic activity for a specific purpose.
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(C) Explain ONE way education infrastructure affects a region's potential for high-technology development. 1 point

Accept one of the following:

- C1. Graduates of educational institutions, who remain in the region throughout their careers, can promote regional economic development, create innovative products or services, and/or create a source of wealth for investment in the region's high-technology businesses.
- C2. Educational institutions can develop a labor force with specialized capabilities that make an area better suited to attract high-technology businesses and/or investors from outside of the region to open new facilities and/or move existing facilities or headquarters into the region.
- C3. Educational institutions can sponsor research for new high-technology products and/or services that can be put into production or operation, thus creating new value, investment, and/or employment for the region's economy.
- C4. Public investment in technical or specialized worker training, businesses, infrastructure, and/or equipment may divert funds away from investment in other community and social programs that support economic development.
- C5. Lack of educational infrastructure can negatively affect a region's potential for high-technology development because there may not be a highly educated workforce, a specialized labor force, and/or sponsored research for high-technology products or services.

(D) Explain how the pattern shown on the map resembles the galactic city model. 1 point

Accept one of the following:

- D1. The region has multiple development centers (e.g., edge cities, central business districts [CBDs], suburban CBDs), which are based on a specialized product or service.
 - D2. The pattern of business development is decentralized or spread across the region in different locations.
 - D3. The region has a circumferential, circular belt, or radial highway pattern associated with a galactic city's transportation landscape.
 - D4. The region contains several highway intersections that serve as nodes for new business districts, central business districts, or development centers.
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(E) Explain ONE way local economic changes may be a result of deindustrialization.

1 point

Accept one of the following:

- E1. Deindustrialization may cause the local economy to shift from a manufacturing or industry-based economy (secondary sector) to a service and/or technology-based economy (tertiary, quaternary, or quinary sector).
 - E2. Outsourcing of manufacturing or industrial jobs to other countries can lead to a decline in local employment levels and/or an increase in the percentage of the workforce that is unemployed or receiving unemployment benefits.
 - E3. Increased unemployment in the central business district (CBD), declining investment, and/or declining real estate values may result from the loss of manufacturing firms, jobs, and/or services that were once supported by the former industrial economy.
 - E4. Increases in the local use of post-Fordist methods of production (e.g., highly specialized firms, just-in-time delivery supply chains, flexible production methods) by manufacturing firms can indicate a response to deindustrialization to make industrial production more efficient.
 - E5. Gross national income (GNI) per capita in the area may decrease as local people lose employment in manufacturing and/or are unable to find similar-paying jobs in another economic sector.
 - E6. Unemployment rates or underemployment may increase as local people lose employment in manufacturing and/or are unable to find similar-paying jobs in another economic sector.
 - E7. Cities and communities may see decreased tax revenues due to higher unemployment and/or a decrease in population as people move away to search for jobs elsewhere (e.g., backwash effects, migration).
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(F) Explain how the products and services listed in the table demonstrate that this economy has moved into the quaternary sector. 1 point

Accept one of the following:

- F1. The high-technology nature of the products and services listed demonstrates that the economy has moved into the quaternary sector.
- F2. The products and services rely on the knowledge and/or intellectual capabilities of the firms, institutions, and/or workforce that develop these advanced technologies.
- F3. The products and services are the outcomes of a highly educated, specialized, and/or creative class of employees who develop innovative solutions to consumer needs.
- F4. The products and services are dependent on the use of information technology for firms, institutions, and/or the workforce to be more productive, efficient, and/or cost-effective.

(G) The map focuses on a regional scale. Explain a possible limitation of drawing country scale conclusions from a regional scale map. 1 point

Accept one of the following:

- G1. Attempts to analyze research data from one scale of analysis to make claims about another scale of analysis may be inaccurate due to the change in scale's effect on spatial analysis.
- G2. Making research assumptions from map data at one scale of analysis to make claims about another scale of analysis may result in an incorrect calculation or an ecological fallacy due to the change in scale.
- G3. The region can be specialized in a sector or type of production that is different from the economic sectors or production types found in other regions of the country.
- G4. The region can have a long and continuing tradition of valuable or productive sectors that are very different from the changing mix of economic sectors that characterize the country's economy.

Total for question 3: 7 points