

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) Identify ONE city on the map that is both a metacity and a world city. 1 point

Accept one of the following:

- A1. Beijing, Shanghai, or Tokyo

(B) Describe the spatial pattern of world cities shown on the map. 1 point

Accept one of the following:

- B1. World cities are located in North America, Europe, and/or Asia.
- B2. Most world cities are located in the Northern Hemisphere or the Eastern Hemisphere.
- B3. Many world cities are located on or near a coastline.
- B4. World cities are most densely clustered in Europe.
- B5. World cities are located in more economically developed areas.
- B6. There are no world cities in Africa, South America, northern Asia, and/or Australia.

(C) Compare the concept of a metacity with the concept of a world city. (Response must include both concepts in the comparison.) 1 point

Accept one of the following:

- C1. Metacities are determined by population size (over 20 million people), whereas world cities are determined by their importance (e.g., economic, cultural).
- C2. Most metacities are located in less developed countries, whereas most world cities are located in more developed countries.
- C3. Metacities have attained their status through rapid rural-to-urban migration and/or rapid urban growth, whereas world cities have attained status through their position as major centers in the global economy.
- C4. World cities function at the top of the world's urban hierarchy and/or drive globalization, whereas metacities primarily have national economic and/or cultural importance.

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- (D) Explain ONE reason why the cities shown on the table have higher city GDP per capita than the country GDP per capita. 1 point**

Accept one of the following:

- D1. These cities are more economically productive than other parts of the country because they offer greater opportunities and/or more goods or services.
- D2. These cities function as centers of the service economy (e.g., tertiary, quaternary, quinary, technology) that generate more economic value or output.
- D3. Higher-income residents often cluster in these cities due to the services available and/or the increased variety of social opportunities (e.g., entertainment, sports, charitable organizations).
- D4. People in these cities are less likely to work in primary sector activities (e.g., agriculture, resource extraction) than people outside of cities.

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- (E) Explain ONE way population growth in a metacity may challenge environmental sustainability. 1 point**

Accept one of the following:

- E1. By consuming natural resources (e.g., water, energy, forests) faster than they can be replaced, creating a larger ecological footprint, larger energy footprint, or larger carbon footprint.
 - E2. By generating large amounts of waste and/or pollution (e.g., air pollution, water pollution, solid waste, sanitation waste), causing environmental degradation or contamination.
 - E3. Population growth may cause local biodiversity loss, habitat loss, and/or pollution through land use change.
 - E4. By increasing carbon emissions (e.g., through energy use, vehicular use, construction) and/or contributing to climate change, affecting local, regional, and/or global ecosystems.
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(F) Explain ONE reason why migrants to metacities may have difficulty obtaining housing. 1 point

Accept one of the following:

- F1. Migrants may encounter high housing costs or may not be able to find vacancies due to high population densities.
- F2. Migrants may encounter high housing costs or may not be able to find vacancies due to a large or growing urban population.
- F3. Available land for new housing may be on the urban periphery, far from employment locations, schools, transit, and/or service centers.
- F4. Access to housing may be tightly controlled by a small number of owners or agents who set prices and/or discriminate against migrants.
- F5. Available land for new housing may be located in potentially hazardous areas, zones of disamenity, and/or inaccessible places.

(G) Using the data from the table, explain the relationship between a city's level of economic development and the city's percent population growth over time. 1 point

Accept one of the following:

- G1. Lower city GDP per capita (e.g., Cairo, Dhaka) corresponds with, or has an inverse relationship with, higher percentage population growth.
- G2. Higher city GDP per capita (e.g., New York City, Paris) corresponds with, or has an inverse relationship with, lower percentage population growth.
- G3. Lower city GDP per capita (e.g., Cairo, Dhaka) corresponds with a city that is in the early stages of the demographic transition model, when population growth is high.
- G4. Higher city GDP per capita (e.g., New York City, Paris) corresponds with a city that is in the later stages of the demographic transition model, when population growth is low or negative.
- G5. Cairo and/or Dhaka are metacities where higher population growth corresponds with, or has an inverse relationship with, lower city GDP per capita.
- G6. New York City and/or Paris are world cities where lower population growth corresponds with, or has an inverse relationship with, higher city GDP per capita.
- G7. For cities in the table, economic productivity may encourage population growth due to pull factors (e.g., employment opportunities, business opportunities, or investment opportunities).

Total for question 3: 7 points

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.

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- (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