Question 3

Metacities and Top-Tier World Cities, 2020

Source: United Nations

Selected Cities

Urban Area	Population, 2000	Population, 2020	Population Growth, 2000 to 2020	City GDP per Capita, 2020	Country GDP per Capita, 2020
Cairo	13.6 million	20.9 million	54%	$4,865	$3,609
Dhaka	10.3 million	21.0 million	104%	$7,920	$2,001
New York City	17.9 million	18.8 million	5%	$86,615	$63,529
Paris	9.7 million	11.0 million	13%	$71,346	$39,180

Note: Values are estimates based on publicly available data.

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3. The world cities and metacities shown on the map are features of contemporary globalization and urbanization. The data table shows gross domestic product (GDP) per capita at the city and country scale.

    A. Identify ONE city on the map that is both a metacity and a world city.

    B. Describe the spatial pattern of world cities shown on the map.

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

    D. Explain ONE reason why the cities shown on the table have higher city GDP per capita than the country GDP per capita.

    E. Explain ONE way population growth in a metacity may challenge environmental sustainability.

    F. Explain ONE reason why migrants to metacities may have difficulty obtaining housing.

    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.

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Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

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END OF EXAM

| **(C)** | **Explain how transportation technology has increased economies of scale in the agricultural sector of less developed countries.** | **1 point** |

Accept one of the following:

- C1. Trucks, trains, and/or shipping containers can move large and/or larger quantities of crops, increasing production and/or consumption.
- C2. Farm machinery (e.g., tractors, harvesters) has helped reduce the amount of human labor and/or increased the amount of production.
- C3. Farm machinery has allowed farms to increase the amount of farmland with reduced labor costs and/or improved efficiency.
- C4. Chemical herbicides, pesticides, and/or fertilizers applied by transportation technology (e.g., tractor, airplane) have reduced labor and/or increased crop yields.
- C5. Airplanes and/or ships are used to transport perishable products (e.g., flowers, fruits, vegetables), increasing their sales in other markets.

| **(D)** | **Explain a likely negative economic outcome of Green Revolution agricultural practices on rural communities.** | **1 point** |

Accept one of the following:

- D1. Pollution of water, air, and/or soil resources harms economic productivity or livelihoods.
- D2. Smaller farms may close, and/or farmers may sell land because they cannot compete with larger farms that can afford Green Revolution technologies.
- D3. Loss of agricultural jobs and/or loss of access to farmland may result in loss of income or migration (e.g., rural-to-urban).
- D4. Expensive farm inputs (e.g., high-yield seeds, agricultural chemicals, fossil fuels) increase the cost of agricultural production and/or reduce profits for farms.
- D5. Changes in land ownership (tenure), land use patterns, and/or agriculture-related jobs may economically disadvantage subsistence farmers.

| (E) | **Explain ONE weakness of Malthusian theory in predicting the relationship between food production and population growth in contemporary society.** | **1 point** |

Accept one of the following:

- E1. Population growth has not outpaced food production, and/or populations have not run out of food.
- E2. Malthusian theory did not consider changing social, political, and/or economic factors that decrease fertility.
- E3. Improvements in agricultural technology (e.g., mechanization, Green Revolution) increased food production at a rate that outpaced population growth.
- E4. Advances in transportation have improved the global distribution of food.
- E5. The challenges of feeding the world's population have led to the opening of new agricultural lands or the development of new technologies that overcome the constraints of the environment and/or produce more food.
- E6. Farmers learned to farm more intensively with new agricultural practices and/or technologies to increase yields, increase carrying capacity, or increase the amount of cultivated land.
- E7. Growing populations have more resources to problem-solve and/or develop new methods of increasing food supplies.
- E8. Growing populations can move to areas with food surpluses or move away from areas of food insecurity.

| (F) | **Explain how surplus food production has changed the global market for local agricultural products.** | **1 point** |

Accept one of the following:

- F1. Consumption patterns, changed diets, and/or increased popularity of certain foods (e.g., local foods, seasonal crops, specialty crops) have expanded the global sales of these foods.
- F2. Surplus food drives global prices down, resulting in less expensive items, higher sales or exports, and/or increased competition with other goods.
- F3. Increasing global sales of popular crops can increase local farm profitability, increase local investment, and increase or decrease the number or type of local products for sale (e.g., value-added products, value-added specialty crops).

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.

| **(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.

| **(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.

(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