1. (a) (i) Both of these elements for 1 point
- New strains with higher yields; increases in agricultural productivity
- Changing agricultural practices (e.g., commercialization, shift from subsistence to commercial farming)

1. (a) (ii) Any two of these for 1 point
- Artificial fertilizer
- Irrigation
- Insecticides and herbicides
- Mechanical machinery (e.g., tractors)
- Hybridization; crossbreeding (e.g., “. . . for disease resistance”)

1. (a) (iii) 2 points

### Not credited:
- Europe, Africa, United States
- An answer based on an incorrect linkage of a country with a crop; no credit even though region is on credited list (e.g., “coffee in Colombia,” “apples in China”).

### Credited:
- A response that names India and China, though arguably in the same “region,” will receive 2 points; this will probably be the only exception to this rule.
- Countries within a region will be credited for that region.
- No overlapping (e.g., “China and Asia,” “India and South Asia”).

1. (b) 4 points possible, to be determined as follows:

#### Condition 1
<table>
<thead>
<tr>
<th>ID only</th>
<th>1 point</th>
</tr>
</thead>
</table>

#### Condition 2
<table>
<thead>
<tr>
<th>ID + Description</th>
<th>2 points</th>
</tr>
</thead>
</table>

### Not Credited:
- Availability of space
- Crop rotation

1. (c) 4 points
These must be CAUSES — not effects — and the discussion must say why the factor(s) may limit the long-term success of the practices/technologies.
- Increased costs of artificial fertilizer, herbicides, insecticides, fuel
- Decline in soil quality (fertility)
- Water pollution
- Finite supply of water $\Rightarrow$ Water table; $\Rightarrow$ Drought
- Some groups (e.g., women) cannot obtain credit (equality)
- Crushing debt load (e.g., for farmers, nations, governments, etc.)
- Operation of commodity markets (e.g., “global economy”)
- Availability of funds (e.g., for additional equipment, seeds, etc.)
- Climatic factors (e.g., erosion, desertification, etc.)
- Limited amount of arable land (for 1 ID point only)
- Potential loss of biodiversity (1 point for assertion that one crop will disappear; 2 points only if there is a convincing argument about how loss of biodiversity will increase the costs of agricultural practices to limit its success)

### Not Credited:
- Political instability (unless tied to economic factors)
A. List TWO factors that have increased the demand for poultry. (One-word answers acceptable; 2 points)

- Population increase (national or global)
- Health benefits (e.g., low fat diets)
- Safety of poultry vs. other meats like beef & pork (e.g., “mad cow”)
- Enhanced image of poultry (e.g., ease of preparation, appearance, marketing, advertising)
- Availability (e.g., growth of poultry-based franchises like Chick Fil-A, restaurant menus) NB Supply based arguments not acceptable
- Everydayness: shift in cultural tradition to the consumption of poultry more frequently (not just special occasions like Thanksgiving)
- Some groups have ethnic/religious/cultural taboos against beef and pork
- Falling prices (compared to other meats, or historically), NB Supply based arguments not acceptable

B. Briefly describe TWO characteristics of the present economic organization of poultry production in the U.S. (2 points)

- A corporation controls multiple elements of poultry production (feed production-delivery of feed & chicks-raising-processing-marketing) (i.e., vertical integration/commodity chains)
- Large scale operations (as seen in the number of birds per farm)
- Specialized farms (they raise poultry only)
- Application of manufacturing process (mass production style/factory-like) (e.g., use of chemicals to produce a healthier & faster growing product, inputs-outputs, assembly line process)

C. Describe TWO features of the present geographic distribution of poultry production in the U.S. (2 points)

- Regional concentration or clustered in a particular location, NB Not acceptable: regional names only, explanations based on references to climate or grain growing
- Proximity to markets or transportation corridors
- Regional concentration in economically depressed farming areas
- Regional concentration in areas with low wage rates
- Attraction of an immigrant work force
- Effects of concentration of poultry into small areas (e.g., environmental concerns, land use conflicts), NB Ethical arguments not acceptable
PART A  (1 Point)

Apply the underlying principles of von Thünen's agricultural land-use model to predict the locations of the activities shown in X and Y relative to a large urban area.

Must identify the location of BOTH agricultural activities relative to the city.

- X is located closer to the city, or in the city, and Y is located farther from the city.

PART B  (2 Points: 1 point for identifying a concept, and 1 point for explanation)

Choose either activity X or activity Y and apply the underlying principles of von Thünen's agricultural land-use model to explain the location of the activity.

1 point: Must identify a concept that relates to the location of the agricultural activity at either X or Y.

- X—intensive agriculture, higher-value land, perishable goods, accessibility to market, where the farmer can maximize profit

- Y—extensive agriculture, lower-value land, fewer perishable goods, less accessibility to market, where the farmer can maximize profit

1 point: Explanation of why the concept caused this type of farming to locate at X or Y.

PART C  (4 Points: 1 point for the identification of each of two factors, and 1 point for each of two discussions)

Discuss two factors that explain why agricultural land-use patterns today differ from those developed by von Thünen's model in 1826.

1 point: Must identify and briefly explain a factor that results in agricultural land-use patterns different than those proposed in von Thünen's model:

- refrigeration and food preservation
- improved transportation
- regional, global markets; corporate decision making
- government policy
- agricultural products used for purposes other than food (multiple use)
- forests no longer occupy a zone close to the market

1 point: The discussion must relate to today's spatial pattern of agricultural land use compared to the pattern suggested by von Thünen's model of 1826 (pattern-based discussion).
Von Thünen’s model of land use and Burgess’ model of land use are similar in appearance but different in their geographic setting. Analyze and discuss the two models in terms of each of the following:

**Part A**  (1 point)

For each of these models, identify the type of land use the model addresses.

*Acceptable answers (both are required)*

- Von Thünen: agricultural, farming, or rural
- Burgess: urban, city, or a minimum of two descriptors

*Note: Students may receive credit for this answer if reference is made elsewhere in part B or part C to Burgess, along with words descriptive of urban land use (e.g., “residential” or “housing” and “manufacturing” or “warehousing”). But, students cannot use the same point twice.*

**Part B**  (2 points)

Identify two assumptions that are shared by both models.

*Any two of the following*

- Isotopic flat plain or uniform surface; featureless
- Importance of centrality (e.g., accessibility to market; CBD)
- Individuals maximize profit/minimize costs/maximize use—“highest and best use”
- Transportation costs are proportional to distance in all directions
- Single market or CBD (e.g., isolated state)

**Part C**  (4 points: 1 point for the identification of each of the models’ effects, and 1 point for each of the two explanations)

For each of these models, explain how relative location affects land-use patterns.

**VON THÜNEN**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensive land-use near market</td>
<td>High profit(s) needed to pay rent</td>
</tr>
<tr>
<td>Wood and perishable/fragile products near market</td>
<td>High (frequent) transportation to nearby market</td>
</tr>
<tr>
<td>Extensive agriculture (grain crops/grazing) at the periphery</td>
<td>Low land rent or low transportation costs</td>
</tr>
</tbody>
</table>

**BURGESS**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensive land use near CBD</td>
<td>High costs of land/accessibility</td>
</tr>
<tr>
<td>Intensity/density of residential land use decreases with distance away from CBD</td>
<td>Households and other land uses locate away from the CBD, as they can afford transportation</td>
</tr>
<tr>
<td>High socioeconomic class at edge of city</td>
<td>Households in this range can afford larger homes and acreage, as well as transportation</td>
</tr>
</tbody>
</table>
Agriculture in the United States has changed significantly in the past few decades. With respect to the past, present, and projected trends in agriculture shown in the diagram above, answer the following:

**Part A (4 points)**

First identify and then explain **TWO** factors contributing to the steady decline in the number of dairy farms since 1970.

<table>
<thead>
<tr>
<th>Factors (1 point per factor; max 2 points)</th>
<th>Explanations (1 point per explanation; max 2 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased production of milk</td>
<td>Decreased production yields, meaning fewer cows are needed to meet the demand for milk; therefore, there are fewer farms.</td>
</tr>
<tr>
<td>Increased mechanization</td>
<td>Mechanization/technological changes in the milking process have enabled farmers to increase the size of their dairy herds. The efficiency has made small farms unprofitable.</td>
</tr>
<tr>
<td>Development of agribusiness, economies of scale, factory farms, industrialization of agriculture, changes from labor-intensive to less labor-intensive forms of agriculture</td>
<td>The number of farms, including dairy farms, in the United States is decreasing, owing to one or more of these factors (elaboration required).</td>
</tr>
<tr>
<td>Displacement by urbanization</td>
<td>Dairy farms close to cities where dairy farms traditionally have been located (milk sheds) have been displaced by urbanization, leading to a decline in the number of dairy farms overall.</td>
</tr>
</tbody>
</table>

**Scoring Notes:**
- Students must identify and then explain **TWO** factors—that is, limit the decline in the number of farms (EFFECT) to a factor (CAUSE). Just saying “agribusiness” or “industrialization” is insufficient to earn 2 points.
- Do not award points for discussion of the **LOCATION** of dairy farms (e.g., repetition of von Thünen’s Island that is not directly related to the decline in the **NUMBER** of farms.

**Part B (4 points)**

First identify and then explain **TWO** factors contributing to the increase in the number of organic farms since 1970.

<table>
<thead>
<tr>
<th>Factors (1 point each; max 2 points)</th>
<th>Explanations (1 point each; max 2 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing demand for organic products, has made organic agriculture profitable and led to a growth in organic farming (both large-scale and small scale)</td>
<td>Consumers in the U.S. seek alternatives to the industrial products of modern agriculture because of health-driven concerns about the nutrition and healthiness of conventional agricultural products. Consumers have become wary of the use of pesticides, herbicides, fertilizers, and genetically modified organisms (GMOs) used in agriculture and to produce food. People have become concerned about related long-term health issues. Population of the U.S. is increasing in wealth and is better able to afford (and willing to pay) higher prices for organic products. Buying organic food is an example of conspicuous consumption to display cultural preferences (a green lifestyle). Some consumers switch to organic products because they are concerned about the humane treatment of animals. Households have declined in size and have more disposable income to spend on higher-quality (organic) food rather than lower-quality (nonorganic) food. Better advertising and marketing systems have made organic products more appealing to consumers, thereby increasing the demand for goods and profitability. The demand has increased aided by the growth of chains of supermarkets dedicated to organic products, which has increased profitability and led to the growth of suppliers for these chains.</td>
</tr>
<tr>
<td>Shifts in organic agriculture have led to better care for the land (land stewardship, sustainability, environmental concerns)</td>
<td>As stewards of the land, farmers/consumers wish to sustain it in the same state they found it rather than exhaust it or otherwise degrade it by the application of agricultural chemicals. Some consumers switch to organic products because they wish to eat foods that have a less negative impact on the environment (wish to live in greater harmony with nature). The economies of scale achieved by large-scale operations have kept the retail price of food low. Because small-scale operations cannot achieve these economies, they have to either go out of business or shift to more intensive forms of agriculture or supply specialty food for niche markets that bring higher prices and greater profitability, e.g., producing higher-priced, higher-quality organic products.</td>
</tr>
</tbody>
</table>

**Scoring Notes:**
- For parts A and B, factor points and explanation points are independent; students can earn one without the other.
- For both parts, do not award full credit for a “double dip” — e.g., two explanations of demand for organic foods.
In 1798 Thomas Robert Malthus published An Essay on the Principle of Population in which he argued that population growth will inevitably outpace food production, resulting in widespread famine.

**Part A (4 points: 1 point for each reason identified [ID] and 1 explanation point per ID)**

Identify and explain TWO reasons why some geographers today believe Malthus' theory can be used to predict future population issues.

**ID:** Population has been rising quickly  
OR  
Population has generally grown as predicted by Malthus.

**Explanation**
- Limited use of contraception.
- Political policies, economic decisions, cultural beliefs that support population growth.
- Demographic transition model, referring to Stage 2 and/or early Stage 3.

**ID:** Food supply has increased, but it has not kept up with population increase  
OR  
Food supply has generally grown as predicted by Malthus.

**Explanation**
- Failure to adopt agricultural innovation, owing to political policies, economic decisions, cultural beliefs.
- Conversion of farmland for urban use.
- Environmental degradation such as desertification, overgrazing, clear cutting, soil erosion, unavailability of fresh water.
- Conversion of life-supporting crops to cash crops (tobacco, sugar, cotton, tea, coffee).
- Rising fuel costs will slow down growth of food production and distribution.
- Climate change will decrease production.

**ID:** There are other limiting factors on population in addition to food.

**Explanation**
- Because of resource overuse and/or environmental degradation, we are in danger of exceeding the carrying capacity (clean air, fossil fuel, water, and other resources).

**Part B (4 points: 1 point for each reason identified [ID] and 1 explanation point per ID)**

Identify and explain TWO reasons why some geographers today believe Malthus' theory cannot be used to predict future population issues.

**ID:** Population growth has not been rising geometrically/exponentially.  
OR  
Population has generally not grown as predicted by Malthus.

**Explanation**
- Expanded use of contraception.
- Political policies, economic decisions, cultural beliefs that limit population growth.
- Demographic transition model, referring to late Stages 3, 4, and/or 5 (declining birth rate).

**ID:** Food supply has grown faster than predicted by Malthus.  
OR  
Carrying capacity has expanded.

**Explanation**
- New technologies, such as mechanization, factory farming, industrial agriculture, agribusiness, use of chemicals, irrigation, GPS.
- Greater efficiencies, such as: larger farms, consolidation of farms, mechanization, multicropping.
- Green Revolution, genetically modified crops, multicropping, improved seeds, high-yielding cultivars.
- Expansion of agricultural lands.
- Human ability to create new techniques.

**ID:** Our ability to preserve food and/or distribute food to areas of need is much greater than during Malthus' time.

**Explanation**
- Improvements in any and all methods of transportation (highways, containerization, refrigerated trucks).
- Improvements in food preservation (refrigeration, packing, processed food).