

2023



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# AP<sup>®</sup> Human Geography

## Free-Response Questions

### Set 1

**HUMAN GEOGRAPHY**

**SECTION II**

**Time—1 hour and 15 minutes**

**3 Questions**

**Directions:** You have 1 hour and 15 minutes to answer all three of the following questions. It is recommended that you spend approximately one-third of your time (25 minutes) on each question. It is suggested that you take up to 5 minutes of this time to plan and outline each answer. You may plan your answers in this orange booklet, but no credit will be given for anything written in this booklet. **You will only earn credit for what you write in the separate Free Response booklet.**

**Question 1**

1. The rate of natural increase (RNI), also known as the natural increase rate, helps geographers assess annual population growth or decline.
  - A. Define the concept of RNI.
  - B. Describe how a country may have a negative RNI.
  - C. Compare ONE difference between RNI and the total fertility rate as indicators of population change.
  - D. Explain ONE reason why RNI in urban areas may vary significantly from RNI in rural areas in the same country.
  - E. Explain why there are often differences in doubling times between less developed countries and more developed countries.
  - F. Explain ONE reason ethnonationalism might lead a government to promote pronatalist policies.
  - G. Explain the degree to which a unitary government may be more effective than a federal government in enforcing antinatalist policies.

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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.**

## Question 2

**PER CAPITA PRODUCTION OF STAPLE FOOD CROPS  
IN HEARTH-OF-DOMESTICATION COUNTRIES**

<b>Country</b>	<b>Corn (maize)</b> (pounds per capita)	<b>Potato</b> (pounds per capita)	<b>Rice</b> (pounds per capita)	<b>Yam</b> (pounds per capita)	<b>Cassava (manioc or yuca)</b> (pounds per capita)
	Hearth: Mexico	Hearth: Peru	Hearths: China and Mali	Hearth: Niger River basin	Hearth: Amazon River basin
Brazil	1,056	39	108	3	183
China	412	145	333	0	52
Mexico	471	31	4	0	0
Nigeria	121	15	93	549	618
Peru	107	362	216	0	13

Source: Food and Agriculture Organization of the United Nations

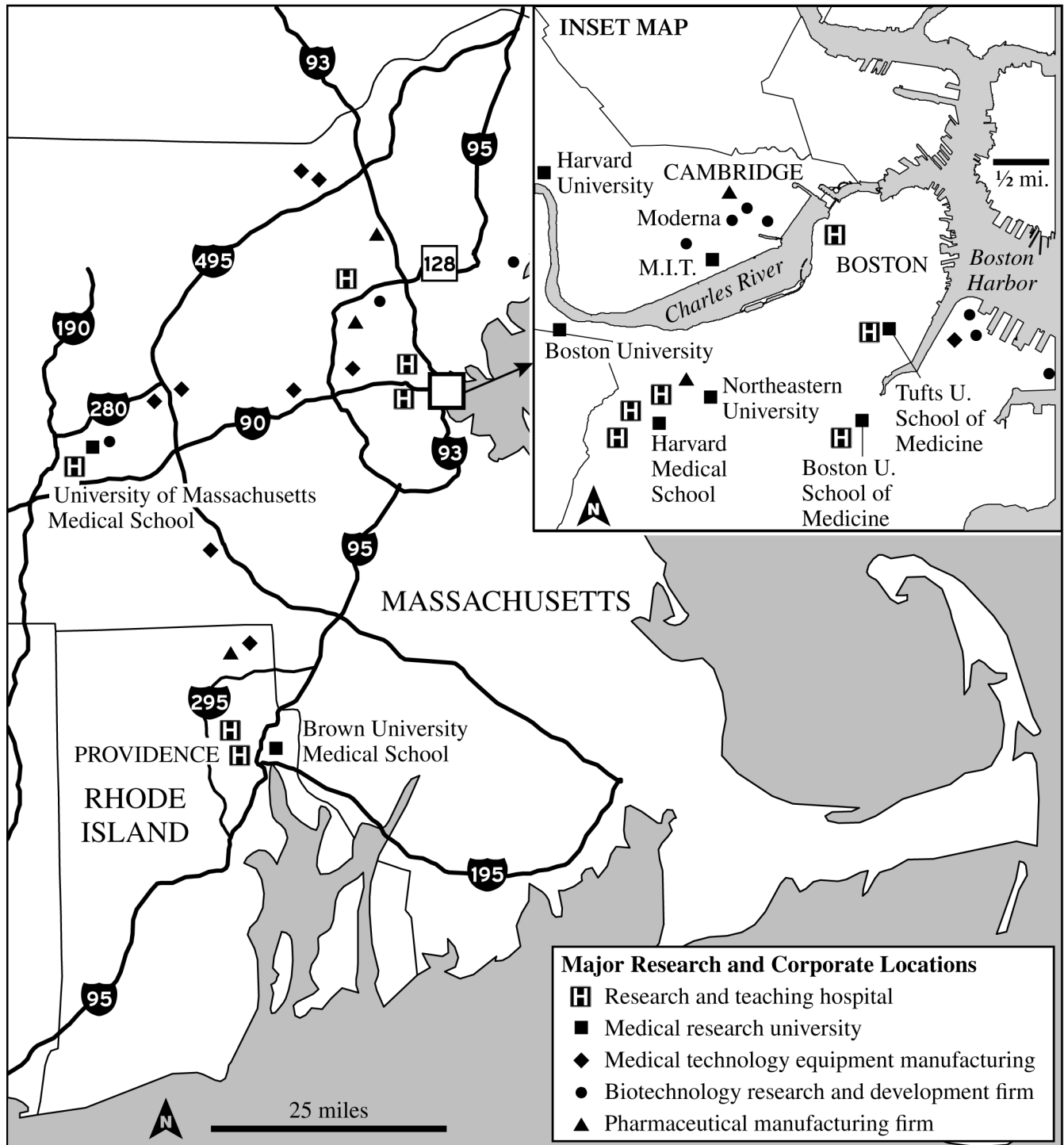
2. Staple food crops provide most of the carbohydrates in people’s diets, and some staples are also used as animal feed or in the distillation of ethanol. Cassava is a root crop (tuber) that is the source of farinha, tapioca, and the pearls in bubble tea.
- Describe the concept of an early hearth of domestication.
  - Identify the crop listed in the table that has diffused the least from its hearth of domestication to the countries listed in the table.
  - Explain how food preferences can be a culture trait.
  - Explain how the Columbian Exchange contributed to a crop’s diffusion beyond its hearth of domestication.
  - Explain how the data in the table support the concept of a crop’s consumption pattern being the result of globalization.
  - Explain why a crop may be farmed intensively in a less developed country and be farmed extensively in a more developed country.
  - Explain ONE way the global supply chain links crops such as those listed in the table to consumers in other countries.

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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.**

Question 3

**MAJOR MEDICAL AND BIOTECHNOLOGY COMPANIES AND INSTITUTIONS IN THE BOSTON AND PROVIDENCE REGION**



Source: National Institutes of Health

The inset map shows the downtown areas of Boston and Cambridge, Massachusetts.

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**SELECTED TECHNOLOGY RESEARCH AND DEVELOPMENT AREAS  
IN THE MEDICAL FIELD**

Category	Product or Service
<b>Biotechnology:</b>	<ul style="list-style-type: none"> <li>• Genetic engineering research</li> <li>• Biochemistry research</li> <li>• Diagnostic and testing science</li> </ul>
<b>Gene therapies:</b>	<ul style="list-style-type: none"> <li>• Cancer treatments</li> <li>• Neurological treatments</li> <li>• Rare and genetic disease treatments</li> <li>• Antiviral treatments and vaccines (e.g., Moderna)</li> </ul>

3. Since the 1980s, the northeastern United States has developed into a major global center of high-technology industry that specializes in the medical field.
- A. Describe the spatial pattern of the companies and institutions shown in the inset map.
  - B. Describe the concept of a growth pole.
  - C. Explain ONE way education infrastructure affects a region’s potential for high-technology development.
  - D. Explain how the pattern shown on the map resembles the galactic city model.
  - E. Explain ONE way local economic changes may be a result of deindustrialization.
  - F. Explain how the products and services listed in the table demonstrate that this economy has moved into the quaternary sector.
  - G. The map focuses on a regional scale. Explain a possible limitation of drawing country scale conclusions from a regional scale map.

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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.**

**STOP**

**END OF EXAM**

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