

2019 USGO Nationals Map Examination - Key and Marking Scheme

Section 1 [20 marks]

1. To the nearest percent, what percentage of the population of the United States was foreign born in the last census? By how many percentage points has that number increased since 1990? To the nearest million, what was the foreign-born population of the United States in the last census? What country ranks second to the United States in the number of foreign-born residents?
2. Identify and explain three reasons why the percentage of native-born population has declined in the area of Middle America shown on the map.
3. Define the term chain migration. How might chain migration account for some of the trends shown in Middle America on these maps? Make reference to specific locations and immigrant groups in your answer.
4. Define the term friction of distance. How does friction of distance account for the immigration trend shown on these maps in the area of southwestern Texas?

Grading notes: This question is typical of the types of immigration and demographics questions that might appear on the AP Human Geography examination or the iGeo WRT.

Expected answers:

1. % of US population [1 mark] – 13% (accept 12% to 14%); % change [1 mark] – 5% (accept 4% to 6%); number of foreign born [1 mark] – 40 million (accept 38 to 42 million); country [1 mark] – Germany
2. [2 marks per answer / explanation] increase in immigration to these areas; outmigration of native-born population in these areas; ageing of the native-born population; low birth rate for native-born population compared to foreign-born population [other reasonable answers accepted]
3. chain migration [2 marks] migration influenced or encouraged by the presence of existing groups or communities in a particular location [other reasonable answers accepted]; explanation [4 marks] acceptable answers may vary, but must include reference to specific immigrant groups moving to specific locations or spreading outward adjacent to existing populations (e.g. populations of Latin American immigrants spreading northward from the Rio Grande Valley into the Texas Panhandle and into Oklahoma and Kansas to join expanding Latin American populations in these areas)
4. friction of distance [2 marks] distance requires some amount of effort, energy, time, and/or other resources to overcome. Because of this, spatial interactions like human migration will tend to take place more often over shorter distances; explanation [2 marks] because of the geographic proximity of this area of Texas to Latin America (particularly Mexico), immigrants from Latin America are much more likely to settle in this region [other reasonable answers accepted]

Section 2 [30 marks]

1. Based on the information in the map, describe in detail the spatial pattern of each of the following: a) road networks in the Southern Hemisphere; b) airline routes in the Northern Hemisphere; c) shipping lanes on a global scale
2. Identify and explain three specific environmental impacts resulting from airline travel. Identify and explain two ways that aircraft manufacturers could mitigate these environmental impacts. Identify and explain two policies that could be enacted by governments to reduce the environmental impacts of air travel.
3. Define the term e-commerce. Identify and explain two positive impacts of e-commerce on the environment and two negative impacts of e-commerce on the environment. Be as specific as possible in the space provided.

Grading notes: This question set is partly adapted from the 2017 iGeo WRT examination. All questions are level marked.

Expected answers:

1. [2 marks per answer] a) road networks connect population centers, are more dense in densely populated areas, notable lack of road networks in Amazon rainforest and African and Australian deserts; b) airline routes are heavily concentrated in the Northern Hemisphere, numerous connections between North America, Western Europe and East Asia; c) concentration of shipping lanes in Northern Hemisphere, connections between major commercial centers in Middle East, North America, Europe and East Asia, routes through Suez Canal and Panama Canal [other reasonable descriptions accepted]
2. environmental impacts [2 marks per answer] - aircraft engines emit heat, noise, particulates and gases which contribute to climate change and global dimming. Airplanes emit particles and gases such as carbon dioxide, water vapor, hydrocarbons, carbon monoxide, nitrogen oxides, sulfur oxides, lead, and black carbon which interact among themselves and with the atmosphere. Air travel emissions are worsening due to rapid increases in number of passengers and air miles flown. [other reasonable answers accepted]; manufacturing changes [2 marks per answer] - increasing efficiency of engines, alternative fuels, electrification of air travel, lighter airframes, more efficient designs and better operational efficiency; government policies [2 points per answer] – emissions regulations and environmental controls, regulation of fares to reduce air travel, noise regulations, increased taxes on airfares and air travel [other reasonable answers accepted]
3. e-commerce [2 marks] the activity of buying or selling of products on online services or over the Internet; positive impact [2 marks per answer] – less energy intensive than traditional shopping due to less driving to look for goods, no retail carbon footprint, more efficient logistics and supply chain [other reasonable answers accepted]; negative impact [2 marks per answer] increased packaging, rapid shipping can increase environmental impact, customers placing multiple orders that may be shipped separately, increased consumerism and impulse buying [other reasonable answers accepted]

Section 3 [15 marks]

1. On what minor tectonic plate is this area located? What geologic process causes frequent earthquakes at the boundary between this plate and the Indo-Australian Plate?
2. What type of volcanoes, commonly formed at this type of plate boundary, are nearly all of those shown on the map? Identify two typical physical characteristics of this type of volcano.
3. The area of Malang on this map is characterized by a series of maars. Define the term maar.
4. Given the frequency of earthquakes and tsunamis in this region, identify and explain four things that the Indonesian government could do to mitigate the effects of these disasters.

Grading notes: Questions 1, 2 and 3 are point marked, question 4 is level marked.

Expected answers:

1. plate [1 mark] – Sunda Plate; process [1 mark] – subduction
2. type [1 mark] – stratovolcano (composite volcano); characteristics [1 mark per answer] - built up by many layers of hardened lava, tephra, pumice and ash, steep profile with a summit crater and periodic intervals of explosive eruptions and effusive eruptions, although some have collapsed summit craters called calderas, lava flowing from stratovolcanoes typically cools and hardens before spreading far, due to high viscosity [other reasonable answers accepted]
3. [2 marks] A maar is a broad, low-relief volcanic crater caused by a phreatomagmatic eruption. A maar characteristically fills with water to form a relatively shallow crater lake which may also be called a maar. [reasonable equivalents accepted]
4. [2 marks per reasonable and well-developed solution] increasing and improving early warning technology for tsunamis, including detection of ocean wave heights (not just on the beach); improving the efficiency and scope of disaster relief and management capabilities; increased and improved training for residents in disaster protocols and evacuation routes; improvement of communication infrastructure to withstand tsunamis and earthquakes; increasing funding for disaster preparation and relief [other reasonable answers accepted]

Section 4 - [17 marks]

1. Define the term gerrymandering.
2. Define the term compactness as it relates to a legislative district. Explain how this district is or is not a compact district.
3. Define the terms cracking and packing as they relate to legislative districts. Given that greater Houston (the area enclosed by Sam Houston Parkway – the larger of the two loop highways) is largely Democratic with some areas of affluent, conservative voters, and that the Houston suburbs are predominantly Republican, how might this district be considered to crack Democratic voters in greater Houston?
4. How can geographic information systems (GIS) data be used to draw legislative districts that are more 'fair'? What criteria might be considered to measure fairness in congressional districts? Be as specific as possible in the space provided.

Grading notes: This section is adapted from a question set on the 2015 AP Human Geography examination. Definitions are point marked, explanations are level marked, and question 4 is also level marked.

Expected answers:

1. [2 marks] gerrymandering is a practice intended to establish a political advantage for a particular party or group by manipulating district boundaries [reasonable equivalents accepted]
2. compactness [2 marks] a shape that minimizes the distance between each person in the district to all of the other people, usually by attempting to approximate a circular shape [reasonable equivalents accepted]; explanation [2 marks] given the shape and geographic spread of this district it does not qualify as compact [other reasonable answers accepted]
3. cracking [2 marks] diluting the voting power of the opposing party's supporters across many districts; packing [2 marks] concentrating the opposing party's voting power in one district to reduce their voting power in other districts [reasonable equivalents accepted]; explanation [2 marks] assuming the swath of greater Houston included in the district is Democratic-leaning, removing those voters from other Democratic districts in greater Houston would dilute their voting power by including them with suburban Republican voters [other reasonable answers accepted]
4. [4 marks] measures such as partisan voter index, income inequality, and diversity can all be considered, in addition to numerous other sets of socioeconomic and demographic data; in order to receive full marks for this question, students should identify specific types of data and also provide a clear definition of what constitutes 'fairness' with regard to congressional representation
5. [4 marks] the Constitution requires the census every ten years to reset the proportional representation in the House of Representatives and reapportion the seats in the House; results are used to redraw congressional boundaries and the districts for state legislatures as well; GIS data from the census can be used by political parties to gain an advantage in redistricting [other reasonable answers accepted]

Section 5 [15 marks]

1. Given the information on the map, what two nations have the largest number of citizens at risk from particulate air pollution?
2. According to the WHO, people in low- to middle-income countries experience a disproportionate burden from health effects of particulate air pollution. Identify and explain two reasons why this is likely to be true.
3. Despite their wealth, cities such as Jeddah and Riyadh consistently rank among the most polluted in the world. Identify and explain one natural cause that would result in high levels of particulate pollution in these cities. Identify three other reasons these cities are likely to experience very high pollution levels.

Grading notes: This question is adapted from a visual on the 2018 iGeo MMT exam. Question 1 is point marked. All other questions are level marked.

Expected answers:

1. [2 marks] China and India
2. [2 marks per answer] Reasons may vary, but can include a range of answers from public policy, public health and economic conditions. Students may mention other contributing factors, such as higher percentages of smoking and other chronic health issues. Cook fires in homes are also a large contributor to pollution-related health problems in developing countries.
3. natural cause [3 marks] proximity to the desert and dry climate contribute greatly to the level of particulates in cities like Jeddah and Riyadh due to high levels of sand and the frequency of sandstorms; other causes [2 marks per answer] these will range from rapidly growing urban populations, prevalence of petrochemical plants, drilling operations and refineries, desertification due to increased agricultural production and lack of a public transportation infrastructure [other reasonable answers accepted]