

2019 US Geography Olympiad Multiple Choice Examination - Part 1

Instructions – This portion of the multiple choice examination consists of 40 questions. You will receive two points for a correct answer. You will lose one point for an incorrect answer. Blank responses lose no points. Please fill in the bubbles completely on the answer sheet. You may write on the examination, but all responses must be bubbled on the answer sheet. All images are contained in the resource booklet. Diacritic marks such as accents have been omitted from place names and other proper nouns. You have one hour to complete both the written portion of the examination and this set of multiple choice questions.

Questions 1-5 refer to the image in section 1 of the resource booklet.

1. What type of geologic formation is shown in this photograph?
 - A. a caldera
 - B. an impact crater
 - C. a cirque
 - D. a playa
2. Which of the following characterizes this type of formation geologically on earth?
 - A. tektites and shocked quartz
 - B. magma and tephra
 - C. large deposits of igneous rock
 - D. certain types of sandstone and sedimentary rock
3. According to research, how many formations of this type larger than 6km in diameter exist on earth?
 - A. only 1
 - B. just over 125
 - C. about 500
 - D. in excess of 2,000
4. All of the largest examples of this type of structure on earth were formed during which of the following time periods?
 - A. less than 100,000 years ago
 - B. between 100,000 and 250,000 years ago
 - C. between 500,000 and 1 million years ago
 - D. over 1 million years ago
5. Examples of this type of formation at Chicxulub and Popigai are associated with which of the following?
 - A. helping to precipitate the last minor ice age
 - B. recent disruptions in air travel and communications
 - C. extinction events within the last 100 million years
 - D. very deep mid-ocean trenches

Questions 6-11 refer to the image in section 2 of the resource booklet.

6. This image shows an aerial view of which of the following storms that struck Puerto Rico in September 2017?
 - A. Hurricane Harvey
 - B. Hurricane Maria
 - C. Hurricane Franklin
 - D. Hurricane Gert
7. This storm underwent an explosive intensification between September 17 and 18 due to all of these factors EXCEPT which of the following?
 - A. its compactness
 - B. extremely warm water temperatures
 - C. high wind shear
 - D. high levels of atmospheric moisture
8. When hurricanes undergo an eyewall replacement cycle, which of the following will generally happen?
 - A. the storm will become more intense and will change direction
 - B. the eyewall will collapse resulting in the dissipation of the storm within 24 hours
 - C. wind speeds will increase, usually by more than 50mph
 - D. the storm will temporarily weaken but will usually re-intensify and even strengthen
9. Which of the following best characterizes the result of the 2017 Atlantic hurricane season?
 - A. it was a hyperactive season with four catastrophic storms and was one of the worst Atlantic seasons on record
 - B. it was, other than the storm that struck Puerto Rico, quieter than an average Atlantic season
 - C. it had fewer named storms than average and was of average intensity
 - D. Due to El Nino conditions, the season had a brief period of intensity but was far shorter than a normal season
10. Which of the following best describes the political relationship between the United States and Puerto Rico?
 - A. they are close allies linked by a mutual defense treaty
 - B. Puerto Rico is a possession of the United States and its residents do not have the same rights as American citizens
 - C. Puerto Rico is an unincorporated territory of the United States and its residents are American citizens
 - D. Puerto Rico is a member of the Commonwealth of Nations and not part of the United States

Questions 11-15 refer to the images in section 3 of the resource booklet.

These images show Lake Urmia in Iran in 1984 (left) and 2014 (right). The images are the same scale.

11. Which of the following best describes Lake Urmia?
 - A. It is currently one of the largest freshwater lakes in the Middle East
 - B. It is an endorheic salt lake
 - C. It is a reservoir created by a major hydroelectric project
 - D. It is an ancient rift lake and formerly among the deepest in the world
12. Based on the images, how has the surface area of the water of Lake Urmia changed since 1984?
 - A. increased by approximately 10%
 - B. decreased by approximately 30%
 - C. decreased by approximately 70%
 - D. decreased by approximately 90%
13. Which of the following is the most likely cause of the changes seen in these images?
 - A. diversion of water from rivers feeding the lake and increased use of surrounding groundwater
 - B. increased petroleum refining and drilling in the area
 - C. a major earthquake
 - D. overuse of lake water for irrigation
14. Which of these has most likely been the result of the changes seen in the images?
 - A. migratory bird habitats have increased
 - B. local villagers have begun to build houses and farms closer to the lake
 - C. shipping on the lake has almost completely stopped
 - D. fishing has increased in the remaining areas of the lake
15. Which of the following policies could be enacted by the Iranian government to restore water levels in Lake Urmia?
 - A. eliminating irrigation by farmers in the area
 - B. pumping water into the lake directly from the Caspian Sea via a pipeline
 - C. stricter regulation of industrial water use
 - D. allowing more water from surrounding rivers to reach the lake and providing farmers with sustainable alternatives to extensive irrigation

Questions 16-20 refer to the image in section 4 of the resource booklet.

16. What type of landform is marked as 1 on the image?
 - A. moraine
 - B. tunnel valley
 - C. drumlin
 - D. cirque

17. What type of landform is marked 2 on the image?
 - A. esker
 - B. drumlin
 - C. outwash fan
 - D. col

18. Which of the following names the type of lakes labeled 3 on the image?
 - A. paternoster lake
 - B. kettle lake
 - C. finger lake
 - D. tarn

19. When the type of lake shown in the image is drowned by the sea at one end it is referred to as which of the following?
 - A. a morainic dam
 - B. a fjord
 - C. a suncup
 - D. a kettle delta

20. All of the landforms labeled on this image were formed by which of the following?
 - A. glacial action
 - B. seismic activity
 - C. volcanic activity
 - D. the change in course of a major river

Questions 21-25 refer to the following passage.

“A city street equipped to handle strangers, and to make a safety asset, in itself, out of the presence of strangers, as the streets of successful city neighborhoods always do, must have three main qualities:

First, there must be a clear demarcation between what is public space and what is private space. Public and private spaces cannot ooze into each other as they do typically in suburban settings or in projects.

Second, there must be eyes upon the street, eyes belonging to those we might call the natural proprietors of the street. The buildings on a street equipped to handle strangers and to insure the safety of both residents and strangers, must be oriented to the street. They cannot turn their backs or blank sides on it and leave it blind.

And third, the sidewalk must have users on it fairly continuously, both to add to the number of effective eyes on the street and to induce the people in buildings along the street to watch the sidewalks in sufficient numbers. Nobody enjoys sitting on a stoop or looking out a window at an empty street. Almost nobody does such a thing. Large numbers of people entertain themselves, off and on, by watching street activity.”

- Jane Jacobs, *The Death and Life of Great American Cities* (1961)

21. Based on this passage, which of the following recent trends in urban planning would Jacobs most strongly support?

- A. construction of toll roads to link cities and suburbs
- B. development of mixed use residential and commercial spaces in cities
- C. increased commercial development in city centers
- D. self-contained suburban developments

22. When Jacobs refers to 'eyes on the street' in urban neighborhoods, she is most likely referring to which of these?

- A. increased police presence to ensure neighborhood safety
- B. use of closed-circuit surveillance and traffic cameras
- C. neighborhood associations or watch organizations responsible for community policing
- D. the presence of neighborhood residents on porches, stoops, in yards and at windows in a natural and communal setting

23. The assertion that buildings cannot 'turn their backs' on the street serves which of the following purposes according to Jacobs?

- A. maintains foot traffic at varying times of the day to ensure the vitality of the neighborhood and street
- B. prevents blight from occurring on city streets
- C. gives residents easier access to buildings
- D. makes neighborhoods easier for emergency services to access

24. Which of the following would Jacobs assert is key to the order and vitality of a city?

- A. easily accessible industrial areas
- B. well-developed highways
- C. active sidewalks
- D. high-rise apartments to maintain density in neighborhoods

25. With which of these did Jacobs most seriously and vocally disagree?

- A. rationalist planners like Robert Moses
- B. the 'City Beautiful' movement
- C. Decentrists like Lewis Mumford
- D. orthodox urbanism ideas proposed by Le Corbusier

Questions 26-30 refer to the image in section 6 of the resource booklet.

26. This diagram shows the three basic processes involved in which of the following?

- A. longshore drift
- B. pedogenesis
- C. wind erosion
- D. landslides

27. Which of the following numbers on this diagram represents the process of saltation?

- A. 1
- B. 2
- C. 3
- D. 4

28. The airborne collision of particles shown by number 5 on the diagram is referred to as

- A. obliteration
- B. deposition
- C. suspension
- D. attrition

29. The movement of larger particles shown by number 1 is known as

- A. slipping
- B. creeping
- C. lithification
- D. surface movement

30. What is the maximum size of the particles typically held aloft by suspension?

- A. about 70 micrometers
- B. about 150 micrometers
- C. about 2 millimeters
- D. about 3 millimeters

Questions 31-35 refer to the image in section 7 of the resource booklet.

31. Which of the following should be the label on the bottom axis of this graph?

- A. distance in miles from the coast
- B. distance in miles from suburb
- C. distance in miles from primate city
- D. distance in miles from central business district

32. This graph is an illustration of which of the following?

- A. the core-frame model
- B. bid rent theory
- C. the Hoyt sector model
- D. the multiple nuclei model

33. This model assumes which of the following ideas?

- A. that industrial use of land generates high incomes
- B. residential developments are usually located near industry
- C. recreational land use is not necessary for a functioning city
- D. retail establishments want to maximize profits and are willing to pay high rents for prime land

34. At what point on this graph will residential land use begin to overtake commercial?

- A. about 1 mile from the center
- B. about 3 miles from the center
- C. about 5 miles from the center
- D. about 7 miles from the center

35. This model fails to account for which of the following realities of North American cities?

- A. the existence of high-income housing on the edges of cities
- B. the willingness of industry to locate in city centers
- C. agricultural use of land in suburbs
- D. the existence of commerce near suburbs

Questions 36-40 refer to the passage below.

Mass Movement is defined as the down slope movement of rock and regolith near the Earth's surface mainly due to the force of gravity. Mass movements are an important part of the erosional process, as it moves material from higher elevations to lower elevations where transporting agents like streams and glaciers can then pick up the material and move it to even lower elevations.

Prof. Stephen A. Nelson, Tulane University (2018)

36. All of the following are part of the regolith EXCEPT which of these?

- A. bedrock
- B. soil
- C. duricrust
- D. groundwater

37. The steepest angle that a cohesionless slope can maintain without losing its stability is known as which of the following?

- A. shear angle
- B. conical angle
- C. angle of repose
- D. coefficient of friction

38. All of these are types of slope failures resulting in mass movement EXCEPT which of the following?

- A. slumps
- B. falls
- C. solifluctions
- D. slides

39. What is a common manmade cause of over-steepening of slopes resulting in mass movement?

- A. grooming of ski slopes
- B. overgrazing
- C. construction of roads in mountainous areas
- D. deforestation due to forest fires

40. Which of the following have caused the largest number of deaths from mass movement processes over the last 20 years?

- A. earthquakes
- B. precipitation-induced mudslides and landslides
- C. biological activity
- D. over-steepening