

Chapter 02 Techniques of Geographic Analysis

Multiple Choice Questions

1. Every projection has some degree of distortion because
- A. a curved surface cannot be represented on a flat surface without distortion.
 - B. parallels and meridians never cross at right angles on a globe.
 - C. the grid system is two-dimensional but the earth is three-dimensional.
 - D. a sphere is a developable surface.

Bloom's Level: 1. Remember
Section: 02.03

2. All of the following are key reference points in the grid system EXCEPT the
- A. North and South Poles.
 - B. Greenwich Village, New York.
 - C. equator.
 - D. prime meridian.

Bloom's Level: 1. Remember
Section: 02.02

3. Which one of the following correctly lists the four main properties of maps?
- A. area, direction, latitude, longitude
 - B. equivalence, shape, latitude, longitude
 - C. conformality, equivalence, direction, symbols
 - D. area, shape, distance, direction

Bloom's Level: 1. Remember
Section: 02.03

4. All of the following statements about small-scale maps are true EXCEPT that they
- A. give a general idea of the relative locations of major features.
 - B. show significantly less detail than do larger scale maps.
 - C. typically smooth out such features as coastlines and rivers.
 - D.** permit the accurate measurement of major features.

Bloom's Level: 1. Remember
Section: 02.04

5. Which of the following features is NOT commonly found on topographic maps?
- A. elevation contours
 - B. rivers, lakes, and coastal features
 - C. cultural features such as buildings, orchards, cities, and roads
 - D.** proportional circle symbols depicting population distribution

Bloom's Level: 1. Remember
Section: 02.05

6. Which of the following statements about remote sensing is NOT true?
- A. It is a faster means of reconnaissance than ground surveying.
 - B.** It began with data collected by the United States space program.
 - C. One of the most common sources of remotely sensed data is Landsat imagery.
 - D. Aerial photographs must be interpreted before maps can be made of them.

Bloom's Level: 1. Remember
Section: 02.06

7. Which of the following is NOT a way to show a quantity at a point on a map?
- A. dots
 - B. three-dimensional symbols
 - C. proportional circles
 - D.** pixels

Bloom's Level: 1. Remember
Section: 02.05

8. Which of the following is the largest scale map?

- A. 1: 8,000
- B. 1: 24,000
- C. 1: 50,000
- D. 1: 63,360

Bloom's Level: 3. Apply
Section: 02.04

9. Probably the most often misused projection is

- A. Goode's Homolosine.
- B. simple conic.
- C. gnomonic.
- D. Mercator.

Bloom's Level: 1. Remember
Section: 02.03

10. Which of the following statements about latitude is true?

- A. Latitude is a measure of distance and of the equator.
- B. Latitude lines are always parallel to each other on a globe.
- C. Latitude varies from 0° to 180°.
- D. On a globe, lines of latitude intersect parallels of longitude at right angles.

Bloom's Level: 1. Remember
Section: 02.02

11. A contour interval

- A. is the vertical spacing between contour lines.
- B. connects points of equal elevation above sea level.
- C. is a single map in a topographic series.
- D. heightens the graphic effect of a topographic map.

Bloom's Level: 1. Remember
Section: 02.05

12. A map drawn at which of the following scales would provide the greatest level of detail?

- A. 1: 8,000
- B. 1: 24,000
- C. 1: 50,000
- D. 1: 63,360

Bloom's Level: 3. Apply
Section: 02.04

13. The prime meridian

- A. passes through Greenwich Village, New York.
- B. is given in nature.
- C. connects the North and South Poles.
- D. is parallel to the equator.

Bloom's Level: 1. Remember
Section: 02.02

14. A map scale of 1: 24,000 means that

- A. one inch on the map represents 2,000 feet on the earth.
- B. one inch on the map represents 24,000 inches on the earth.
- C. one foot on the map represents 2,000 inches on the earth.
- D. one foot on the map represents 24,000 miles on the earth.

Bloom's Level: 3. Apply
Section: 02.04

15. Which of the following statements about topographic maps is NOT correct?

- A. They are used by engineers, regional planners, and land use analysts.
- B. The contour line is the principal device used to indicate elevation.
- C. They portray the terrain rather than features people have added to the natural landscape.
- D. Aerial photography is employed to speed up the production process.

Bloom's Level: 1. Remember
Section: 02.05

16. An equidistant projection

- A. shows true distance in all directions from one or two central points.
- B. has parallels and meridians intersecting at right angles.
- C. shows true directions from a single point to all other points.
- D. is almost always conformal.

Bloom's Level: 1. Remember
Section: 02.03

17. Under the survey system established by the Land Ordinance of 1785, land is divided into

- A. metes and bounds.
- B. base lines and meridians.
- C. townships and sections.
- D. acres and hectares.

Bloom's Level: 1. Remember
Section: 02.02

18. Which of the following variables would NOT be suitable for depiction on a flow-line map?

- A. the amount oil flowing through a network of pipelines
- B. the number of immigrants who have come from different regions of the world to the U.S.
- C. the number of immigrants living in each region of the U.S.
- D. the average amount of water flowing in the major rivers of the U.S.

Bloom's Level: 3. Apply
Section: 02.05

19. Which of the following statements about proportional dot symbols is correct?

- A. They can be easily misinterpreted.
- B. The size of the symbol is constant.
- C. They are used when the range of the data is small.
- D. They are used in vector but not raster formats.

Bloom's Level: 1. Remember
Section: 02.05

20. A digital record of geographic information is called a
A. geographic database.
B. density slice.
C. pixel.
D. vertical axis.

Bloom's Level: 1. Remember
Section: 02.07

21. Which of the following is NOT a globe property?
A. All meridians are one-half the length of the equator.
B. Parallels increase in length as one nears the poles.
C. Meridians and parallels intersect at right angles.
D. The scale on the surface of the globe is the same in every direction.

Bloom's Level: 1. Remember
Section: 02.03

22. Given a map scale of 1: 63,360, how many inches on the map would be needed to represent 2 miles on the ground?
A. 2 inches
B. 4 inches
C. 8 inches
D. 12 inches

Bloom's Level: 3. Apply
Section: 02.04

23. All of the following are problems inherent in showing quantities in areas EXCEPT that
A. such maps imply uniformity within an area.
B. such maps imply abrupt changes at boundaries that are unrealistic.
C. color choice may impart more importance to some areas than to others.
D. such maps can show quantities but not rates, percentages, or densities.

Bloom's Level: 1. Remember
Section: 02.05

24. Contour lines

- A. can be detected by remote sensing.
- B. connect points of equal elevation above sea level.**
- C. aren't useful for depicting mountainous regions.
- D. are less accurate than shaded relief in depicting terrain.

Bloom's Level: 1. Remember
Section: 02.05

25. Thermal scanners are characterized by all of the following EXCEPT that they

- A. sense the heat emitted by objects on earth.
- B. can operate only in the daytime.
- C. have been used to detect water pollution.
- D. do not use photographic film.**

Bloom's Level: 1. Remember
Section: 02.06

26. Which of the following statements about longitude is correct?

- A. Values of longitude range from 0° to 360° degrees.
- B. Meridians decrease in length away from the International Date Line.
- C. Distance between adjacent degrees of longitude increases away from the equator.
- D. It is the angular distance east or west of the prime meridian.**

Bloom's Level: 1. Remember
Section: 02.02

27. The federal agency that makes most of the topographic maps in the United States is

- A. USDOT.
- B. USGS.**
- C. NASA.
- D. BLM.

Bloom's Level: 1. Remember
Section: 02.05

28. A map on which one square inch represents an identical number of square miles anywhere on the map is called

- A. equidistant.
- B. conformal.
- C. azimuthal.
- D.** equivalent.

Bloom's Level: 1. Remember
Section: 02.03

29. A map that accurately portrays the shapes of small areas is called

- A.** conformal.
- B. graphic.
- C. equivalent.
- D. compromise.

Bloom's Level: 1. Remember
Section: 02.03

30. When mapping numerical data, a cartographer should use a projection that is

- A. conformal.
- B. topographic.
- C. equidistant.
- D.** equal-area.

Bloom's Level: 1. Remember
Section: 02.03

31. An example of a map that is a compromise between an equal-area and conformal projection is

- A. the sinusoidal projection.
- B. the Mercator projection.
- C.** the Robinson projection.
- D. a satellite image.

Bloom's Level: 1. Remember
Section: 02.03

32. Maps that adjust the size of area units based on the values of the data they depict are called

- A. choropleth maps.
- B. topographic maps.
- C. flow-line maps.
- D.** cartogram maps.

Bloom's Level: 1. Remember
Section: 02.05

33. Which of the following is NOT one of the five major components of a geographic information system?

- A. geographic database
- B.** pixel
- C. computer hardware
- D. computer software

Bloom's Level: 1. Remember
Section: 02.07

34. When one travels one fourth of the distance around the world along the same parallel of latitude, the number of time zones traversed is likely

- A. 4.
- B.** 6.
- C. 12.
- D. 24.

Bloom's Level: 3. Apply
Section: 02.02

35. Meridians of longitude converge at the

- A. equator.
- B. poles.**
- C. International Date Line.
- D. Line of Greenwich.

Bloom's Level: 1. Remember
Section: 02.02

36. An example of a choropleth map would be a map showing

- A. dots, each depicting 1,000 acres of corn production.
- B. the location of schools in a census tract.
- C. population density by county.**
- D. proportional circles depicting the population of selected cities.

Bloom's Level: 3. Apply
Section: 02.05

37. If it is 5 p.m. at the Royal Observatory in Greenwich, England, what time is it at 45° E longitude?

- A. 2 p.m.
- B. 8 p.m.**
- C. 1 a.m.
- D. 11 p.m.

Bloom's Level: 3. Apply
Section: 02.02

38. What is the representative fraction scale of a map in which one inch represents one half of a mile on the ground?

- A. 1: 31,680**
- B. 1: 15,840
- C. 1: 10,560
- D. 1: 2,640

Bloom's Level: 3. Apply
Section: 02.04

39. Which one of the following sets of coordinates corresponds to a place on the earth?

- A. 57°N, 193°E
- B. 105°N, 126°W
- C. 180°N
- D.** 34°N, 84°W

Bloom's Level: 3. Apply
Section: 02.02

40. The Land Ordinance of 1785 established a systematic survey known as the

- A. base line system.
- B.** township and range system.
- C. orthographic survey system.
- D. public lands identification system.

Bloom's Level: 1. Remember
Section: 02.02

41. The projection used during the Cold War to exaggerate the Communist threat by distorting the areas of countries at high latitudes

- A. cartogram.
- B. the Robinson projection.
- C. Goode's Homolosine projection.
- D.** the Mercator projection.

Bloom's Level: 1. Remember
Section: 02.05

42. The most appropriate contour interval for a relatively flat area is

- A.** 5 feet.
- B. 50 feet.
- C. 100 feet.
- D. 1,000 feet.

Bloom's Level: 3. Apply
Section: 02.05

43. As one crosses the International Date Line going westward, the calendar day should be moved

- A. back one day.
- B.** ahead one day.
- C. ahead twelve hours.
- D. back twelve hours.

Bloom's Level: 3. Apply
Section: 02.02

44. A geographic information system (GIS) is primarily based on the use of

- A. the electromagnetic spectrum.
- B. remote sensing.
- C.** a computer.
- D. a thermal scanner.

Bloom's Level: 1. Remember
Section: 02.07

45. Which of the following are lines of constant value?

- A. cartograms
- B.** isolines
- C. GPS lines
- D. projection lines

Bloom's Level: 1. Remember
Section: 02.05

46. What is the angle of intersection of all parallels and meridians on the earth?

- A. 30%
- B. 45%
- C. 60%
- D.** 90%

Bloom's Level: 1. Remember
Section: 02.02

47. Which of the following is not a thematic map type?

- A. choropleth map
- B. cartogram map
- C. proportional symbol map
- D.** topographic map

Bloom's Level: 1. Remember
Section: 02.05

48. A geographic information system contains

- A.** A data input component and a data management component
- B. Data manipulation functions and terrain manuals
- C. Genomes and output components
- D. A data analysis function and a periodic table

Bloom's Level: 1. Remember
Section: 02.05

49. The U.S. network of bronze markers which indicate latitude, longitude, and elevation are called

- A. The Global Positioning System
- B. The red states/blue states
- C.** Bench marks
- D. Geographical Information Systems

Bloom's Level: 1. Remember
Section: 02.05

50. The Peters projection falls into which category of map

- A.** Equal-area
- B. Conformal
- C. Equidistant
- D. Thematic

Bloom's Level: 1. Remember
Section: 02.05

True / False Questions

51. The International Date Line generally follows the 49th parallel.

FALSE

*Bloom's Level: 1. Remember
Section: 02.02*

52. No projection can provide correct shapes for large areas.

TRUE

*Bloom's Level: 1. Remember
Section: 02.03*

53. The art and science of map-making is called cartography.

TRUE

*Bloom's Level: 1. Remember
Section: 02.01*

54. The steeper the slope, the closer together the contour lines rendering that slope.

TRUE

*Bloom's Level: 1. Remember
Section: 02.05*

55. No map projection can depict shapes and areas as accurately as the globe.

TRUE

*Bloom's Level: 1. Remember
Section: 02.03*

56. For as long as geographers have made maps, the prime meridian has always gone through Greenwich, England.

FALSE

Bloom's Level: 1. Remember
Section: 02.02

57. A false-color image is one on which colors do not appear natural.

TRUE

Bloom's Level: 1. Remember
Section: 02.06

58. The Peters projection attempts to promote social justice by showing the true areas of developing countries.

TRUE

Bloom's Level: 1. Remember
Section: 02.05

59. A map scale is the ratio between distance on the map and distance on the ground.

TRUE

Bloom's Level: 1. Remember
Section: 02.04

60. Geographic information systems are used in physical geography, but not in human geography.

FALSE

Bloom's Level: 1. Remember
Section: 02.07

61. Because maps are factual, they can never distort the truth.

FALSE

Bloom's Level: 1. Remember
Section: 02.05

62. The contour intervals are much greater for flatter surfaces than for mountainous and steeper slopes.

FALSE

Bloom's Level: 3. Apply
Section: 02.05

63. The 24 time zones of the world are roughly centered on meridians at 15-degree intervals.

TRUE

Bloom's Level: 3. Apply
Section: 02.02

64. The United States is the only country with satellites collecting remotely sensed data on the earth.

FALSE

Bloom's Level: 1. Remember
Section: 02.06

Short Answer Questions

65. What is the name of the parallel from which latitude is measured?

Equator

Bloom's Level: 1. Remember
Section: 02.02

66. What are the lines of constant elevation on topographic maps called?

Contour lines

Bloom's Level: 1. Remember
Section: 02.05

67. What are some of the applications of geographic information systems?

Answer varies. Examples include biologists mapping endangered species, ecologists mapping water pollution, epidemiologists mapping diseases, political scientists drawing up boundaries for legislative districts, and sociologists identifying clusters of segregation.

Bloom's Level: 2. Understand
Section: 02.07

68. What is the general term referring to collecting information about the earth using devices as aerial photography, radar, and thermal scanners?

Remote sensing

Bloom's Level: 1. Remember
Section: 02.06

69. Discuss the concepts involved in the formation of the earth's grid system. Draw and carefully label a diagram that aids your explanation.

Need grid system to describe locations of points on a sphere. Key reference points are the poles, equator, and prime meridian. Students should define these, label them on a diagram, and indicate that latitude measures distance north and south of equator and longitude the distance east or west of the prime meridian.

Bloom's Level: 2. Understand
Section: 02.02

70. Discuss the concept of remote sensing. What techniques are currently used in this field? Why is remote sensing useful?

Techniques include:

- (a) aerial photography with returned film,
- (b) nonphotographic imagery (e.g., thermal scanners and radar), and
- (c) satellite imagery.

Advantages: accuracy, speed, completeness of coverage, views of large regions, mapping the invisible, and practical applications (e.g., storm monitoring).

Bloom's Level: 2. Understand
Section: 02.06

71. What are the trade-offs in choosing between equivalent, conformal, and equidistant map projections for small-scale display maps?

An equal area map should be used for maps showing a real extent of a phenomenon; however equal area maps are not conformal and are not equidistant.

Bloom's Level: 2. Understand
Section: 02.03