GEOG 1800 Practice Midterm Exam

This practice exam contains questions similar to those that you will see in the midterm. This exam does not contain all of the content that may be covered by the midterm—please refer to the midterm review sheet for a list of topics. Content may include any material from lectures, labs, and assigned readings.

Multiple choice questions

1. You are given the latitude and longitude for a point in Providence, Utah (41° 42' 18" N, 111° 48' 51" W). What else would you need to know to get to the precise point identified by these coordinates?
    a. The State Plane projection of the coordinates
    b. The datum of the coordinates
    c. The UTM zone number
    d. All of the above

2. Spatial thinking involves which of the following?
    a. Recognizing spatial interactions between objects
    b. Evaluating spatial patterns of objects or phenomena
    c. Developing hypotheses about how underlying processes cause spatial patterns
    d. All of the above

3. _____ are the basic building blocks of vector data and part of each vector data type.
    a. Lines
    b. Polygons
    c. Points
    d. Vertices

4. _____ are two-dimensional vector data objects bounded by a continuous line.
    a. Arcs
    b. Polygons
    c. Lines
    d. Nodes

5. The beginning and ending of a line are known as…
    a. Nodes
    b. Terminals
    c. Ends
    d. Arcs

6. Which horizontal datum is now standard in the U.S.?
    a. NAD27
    b. NAVD88
    c. NAD83
    d. Clarke 1866

7. Topology refers to information about all of the following except…
    a. Adjacency between features
    b. Spatial features that enclose other features
    c. Connectivity between spatial features
    d. Precise coordinates of features

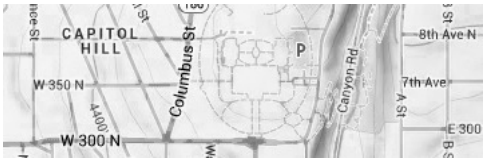
8. What type of map typically contains many different types of information and is often used for navigation and displaying the precise location of features?
    a. Thematic map
    b. Reference map
    c. Iconic map
    d. Choropleth map

9. Which of these maps has the <u>smallest</u> scale?

a. 

b. 

c. 

d. 

10. Which of the following would be closest to the scale of a world map in a desk atlas?
    a. 1:100
    b. 1:1,200
    c. 1:200,000
    d. 1:100,000,000

11. On a 1:1,200 scale map, how many <u>inches</u> on the map are equal to 1,000 <u>feet</u> on the earth?
    a. 100 inches
    b. 10 inches
    c. 1 inch
    d. 0.1 inches

12. Which of these labels would be most appropriate for a river feature on a map?
    a. Susquehanna River
    b. *Susquehanna River*
    c. S U S Q U E H A N N A R I V E R
    d. SUSQUEHANNA RIVER

13. You are shipwrecked on an uninhabited island and discover a chest of buried treasure. Included in the chest is what looks like a sextant, a device used to measure the angles between objects. How could you use the sextant to find your latitude?
    a. Measure the angle between the moon and the horizon
    b. Measure the angle between Vega and Sirius
    c. Measure the angle between Polaris and the horizon
    d. Measure the angle between Jupiter and Mars

14. Your suitcase washes ashore and inside you discover your watch, which is still working. You also remember that you can find your longitude by looking up the time at the Prime Meridian when it is solar noon at your location. If you calculate that it is 5:00 PM at the Prime Meridian when the sun is highest in the sky on your island, what is your approximate longitude?
    a. 135º West
    b. 60º East
    c. 75º West
    d. 67º 30' East

15. Which statement about map projections is true?
    a. All map projections are conformal
    b. All map projections are equal-area
    c. An equal-area map cannot also be conformal
    d. A map can be both equal-area and conformal

16. Which of the following map projections accurately represents angular directions (rhumb lines) and the shapes of features, but distorts distances and areas?
    a. Mercator projection
    b. Mollweide projection
    c. Robinson projection
    d. Gnomonic projection

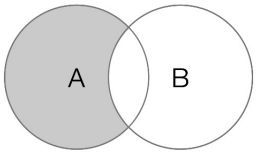
17. Which of the following map projections properly represents the areas of features but distorts shapes and distances?
    a. Lambert Conformal Conic projection
    b. Universal Transverse Mercator projection
    c. Mollweide projection
    d. Gnomonic projection

18. What shape is the developable surface of an azimuthal equidistant projection?
    a. Cylinder
    b. Cone
    c. Plane
    d. Cube

19. If you wanted to create a choropleth map depicting the distribution of sage grouse habitat in Utah, Idaho, Nevada, and Wyoming, which of the following projections would be most appropriate?
    a. Orthographic
    b. State Plane
    c. Albers Equal Area Conic
    d. Gnomonic

20. Which overlay operation is based on the OR Boolean operator?
    a. Intersection
    b. Union
    c. Clip
    d. Point-in-Polygon

21. Which Boolean operator does this diagram represent?



    a. NOT
    b. AND
    c. OR
    d. >

22. Imagine a GIS database of road segments in Cache County. Some roads are maintained by cities, some are maintained by the county, some are maintained by the state, and some roads are jointly maintained by more than one entity. If the county transportation department wanted to link the road segment database to a database of entities responsible for maintaining the roads, what kind of database relationship would this probably require?
    a. One-to-one
    b. Many-to-one
    c. Many-to-many
    d. None of the above

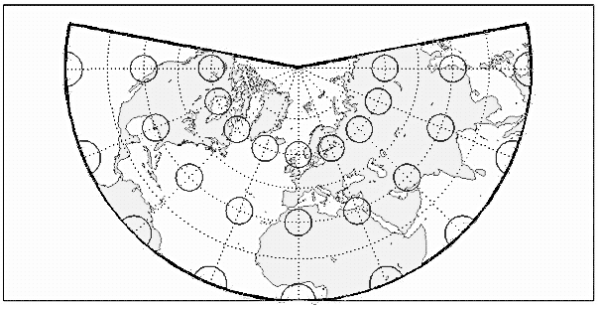
23. Imagine a GIS database of a forest plot with layers representing trees (points), streams (lines), and roads (lines). If you wanted to select trees that were growing within 10 meters of a road, what procedure could you use?
    a. Attribute query
    b. Spatial query
    c. Spatial interpolation
    d. Ground truthing

24. Which data type represents the smallest number of bytes?
    a. Short integer
    b. Long integer
    c. Single precision floating point
    d. Double precision floating point

25. Columns in a data table are also known as _____.
    a. Records
    b. Cells
    c. Headings
    d. Fields

26. The number of times a cell value occurs in a raster dataset is shown in a _____.
    a. Value attribute table
    b. Summary attribute list
    c. Point attribute table
    d. Relational database

27. What property does the map projection below have?



    a. Equidistant
    b. Conformal
    c. Equal area
    d. B and C

28. The shortest distance between any two points on the globe is along a _____.
    a. Small circle
    b. Great circle
    c. Rhumb line
    d. Meridian

29. Which of these is NOT an example of an in-situ data collection method?
    a. LIDAR
    b. Wildlife tracking collar
    c. Soil sample
    d. Rain gauge

30. How do modern smartphones calculate their position?
    a. Using signals from GPS satellites
    b. Using signals from cell towers
    c. Using signals from wi-fi networks
    d. All of the above

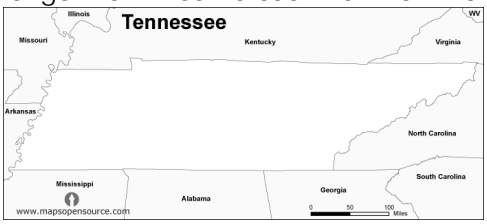
31. Which of the following countries is NOT operating or developing a global navigation satellite system (GNSS)?
    a. Canada
    b. Russia
    c. China
    d. United States

32. What is the best definition of spectral resolution in remote sensing?
    a. The smallest separation between two objects on the ground that can be detected by the remote sensing system
    b. The area on the ground covered by one detector element in the remote sensing instrument
    c. The length of time between repeated observations of the same area
    d. The number and size of wavelength bands in the electromagnetic spectrum that the instrument can detect

33. What tool could be used to extract a subset of one GIS layer using a polygon from another layer? This operation is useful for masking out unneeded areas in a GIS dataset.
    a. Attribute query
    b. Clip
    c. Split
    d. Buffer

34. Which of the following is NOT a characteristic of the graticule on the globe?
    a. Parallels are roughly the same distance apart everywhere on the globe
    b. Meridians are roughly the same distance apart everywhere on the globe
    c. Parallels and meridians cross at right angles
    d. Meridians intersect at the poles

35. Which aspect would be best for minimizing distortion if you were mapping a region that is longer from west to east than from north to south (like the map below)?



    a. Normal aspect
    b. Oblique aspect
    c. Transverse aspect
    d. None of the above

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Short-answer questions

Please answer the following questions in one paragraph or less (no more than 5-6 sentences).

36. How do GPS receivers calculate their position?

37. You are planning on buying a property to build a new house. The zoning codes in your city require that all structures be built at least 12 feet away from property lines and at least 15 feet away from roads. You have access to GIS datasets of existing property polygons and city roads. Describe the steps you would use to create a new polygon showing the area that you could build your house on the property (there may be multiple ways to do this! You only need to describe one way).