Name: _____ Class: _____ Date: _____

Chapter 2

1. A datum represents _____.
   a. a reference surface used in computing coordinates
   b. a zero point from which to calculate elevations
   c. the curvature of the Earth used in computing latitude and longitude
   d. the origin point for longitude measurements

ANSWER: a

2. A model of the Earth based on mean sea level is a(n) _____.
   a. geoid
   b. great circle
   c. ellipsoid
   d. spheroid

ANSWER: a

3. Geodesy is the science of _____.
   a. analyzing the Earth's landscape features
   b. analyzing the Earth's minerals and composition
   c. establishing individual coordinate systems for the Earth
   d. measuring the Earth's shape

ANSWER: d

4. Where can the WGS84 datum be used for measurements?
   a. at all points across the world
   b. only in North America
   c. only the entire northern hemisphere
   d. the whole world except for the North and South Poles

ANSWER: a

5. Latitude and longitude are used as the measurement system for which of these?
   a. GCS
   b. SPCS
   c. USNG
   d. UTM

ANSWER: a

6. To improve spatial reference and coordinate measurements, what is the National Geodetic Survey preparing to roll out in 2022?
   a. a new national datum to replace NAD83
   b. a new national datum to replace WGS84
   c. a new national geoid to replace NAD27

Chapter 2

d. a new national geoid to replace NAD83

ANSWER: a

7. A dataset of roads and a dataset of parcel boundaries of the same area do not line up. What is the most likely reason for this offset?

a. One dataset was crowdsourced and the other was not.
b. One dataset is a KML file and the other is a KMZ file.
c. The datasets are based on two different datums.
d. The datasets are used by different industries.

ANSWER: c

8. One minute of latitude is equivalent to _____.

a. 1 degree of longitude
b. 60 degrees of latitude
c. 60 meters
d. 60 seconds of latitude

ANSWER: d

9. The origin point for 0 degrees longitude is _____.

a. Greenwich, England
b. Paris, France
c. San Salvador Island, the Bahamas
d. Washington, D.C., United States

ANSWER: a

10. Which of these is equal to 2.5 decimal degrees of latitude?

a. 2 degrees, 5 minutes, 0 seconds of latitude
b. 2 degrees, 30 minutes, 0 seconds of latitude
c. 2 minutes, 5 seconds of latitude
d. 250 minutes, 0 seconds of latitude

ANSWER: b

11. What marks the difference between north and south latitude?

a. compass rose line
b. equator
c. international date line
d. prime meridian

ANSWER: b

12. What marks the change between east and west longitude?

a. antimeridian

Chapter 2

b. equator
c. international date line
d. prime meridian

ANSWER: d

13. The shortest distance between two points on a sphere is the _____ distance.
a. datum
b. equatorial
c. great circle
d. equatorial

ANSWER: c

14. If it is 11 p.m. Sunday night in London, England, what day and time is it in New York City, New York?
a. 4 a.m. Sunday
b. 6 p.m. Sunday
c. 4 a.m. Monday
d. 6 p.m. Monday

ANSWER: b

15. A map projection is a _____.
a. model of the Earth based on the size and shape of objects on the Earth's surface
b. representation of how time zones are distributed with respect to geographic boundaries
c. system used in translating decimal degrees to other forms of measurement
d. translation of locations on the Earth's surface to their corresponding locations on a flat surface

ANSWER: d

16. What is an unavoidable consequence of translating a 3D object to a 2D surface?
a. classification
b. distortion
c. generalization
d. selection

ANSWER: b

17. The Mercator projection should not be used to _____.
a. compare global population densities by country
b. follow a line of constant compass bearing
c. map a route from Madagascar to Australia
d. navigate the Atlantic Ocean from Cuba to Senegal

ANSWER: a

Chapter 2

18. What is the only accurate representation of the world?
    a. a cylindrical surface
    b. a globe
    c. a projection
    d. a rectangular grid system

ANSWER: b

19. Which of these map projections is best suited for east–west trending areas like the continental United States?
    a. Azimuthal Equidistant projection
    b. Lambert Conformal Conic projection
    c. Mercator projection
    d. Transverse Mercator projection

ANSWER: b

20. What does the location of the line or lines of tangency indicate about a map projection?
    a. where all measurements are accurate
    b. where all properties are preserved
    c. where distortion is at its least
    d. where great circle routes can be calculated

ANSWER: c

21. Which of these map projections is best suited for north–south trending areas like South America?
    a. Azimuthal Equidistant projection
    b. Lambert Conformal Conic projection
    c. Mercator projection
    d. Transverse Mercator projection

ANSWER: b

22. What is the extent of the UTM grid system?
    a. 80° N to 90° S
    b. 84° N to 80° S
    c. 84° N to 84° S
    d. 90° N to 90° S

ANSWER: b

23. What unit of measure does the UTM system use?
    a. decimal degrees
    b. degrees
    c. feet

Chapter 2

d. meters

ANSWER: d

24. How are negative values avoided in the UTM system when locating features south of the Equator?
a. by measuring from a false easting
b. by measuring from a false northing
c. by measuring from one standard parallel
d. by measuring from two standard parallels

ANSWER: b

25. What is the value given to each UTM zone's central meridian?
a. 500,000 feet
b. 500,000 meters
c. 10,000,000 feet
d. 10,000,000 meters

ANSWER: b

26. The UTM coordinates of Enchanted Rock State Natural Area in Fredericksburg, Texas, are 517266.07 E, 3374884.58 N, Zone 14R. How far is it from the zone's central meridian?
a. 17,266.07 meters east
b. 17,266.07 meters west
c. 2,374,884.58 meters east
d. 2,374,884.58 meters west

ANSWER: a

27. What pieces of information are required to locate a position using the UTM and SPCS systems? Select all that apply.
a. the easting
b. the northing
c. the projection
d. the zone

ANSWER: a

28. The UTM system is the basis for the United States National Grid, which is also known as the _____.
a. Federal Emergency Management Axes
b. Geographic Coordinate System Grid
c. Military Grid Reference System
d. State Plane Coordinate System

ANSWER: c

29. Explain why a zone designation is required to locate a position using the UTM system.

Chapter 2

ANSWER: The UTM system is divided into sixty zones that are each 6 degrees of longitude wide. Without a zone designation the position could be in any one of the UTM system's sixty zones. Each zone begins a new coordinate system with a new origin. Within each zone, the coordinates are measured east and north of that new origin. Thus, each set of coordinates could define a point in sixty different zones.

30. What projections does the SPCS use? Select all that apply.
    a. Azimuthal Equidistant projection
    b. Lambert Conformal Conic projection
    c. Mercator projection
    d. Transverse Mercator projection

ANSWER: b, d

31. What defines SPCS zones? Select all that apply.
    a. county boundaries
    b. lines of latitude
    c. lines of longitude
    d. state boundaries

ANSWER: a, d

32. What unit of measure does the NAD27 version of the SPCS use?
    a. decimal degrees
    b. degrees
    c. feet
    d. meters

ANSWER: c

33. Why is it important to determine whether the NAD27 or NAD83 version of SPCS is used to map an area?
    a. There may be a different number of zones used.
    b. There may be different projections used for each zone.
    c. There may be different values for each zone's origin.
    d. There may be different zone designations for each state.

ANSWER: c

34. The SPCS is used only for data from the _____.
    a. European Union
    b. polar regions
    c. United Kingdom
    d. United States

ANSWER: d

Chapter 2

35. Why are the SPCS baselines and principal meridians positioned differently in some states?
    a. Some states cover a greater geographic extent than other states.
    b. Some states are more densely populated than other states.
    c. Some states are oriented north–south and others oriented east–west.
    d. Some states have extensive ocean coastlines.

ANSWER: c