# Practice Examination

## CSC222 Geographic Information Systems

## 17 November 2014

1. We can specify a location on the earth's surface with a latitude and longitude.

   (a) What is the range of values for latitudes?

   (b) What is the range of values for longitudes?

   (c) Both latitudes and longitudes are angles. What are two notations for specifying angles?

2. The earth is not spherical. Is the distance from the North Pole through the earth's center to the Sount pole more or less than the distance from a point on the equator through the center of the earth to a point on the equator that is 180 degrees removed from the first point?

3. We should know where we are.

   (a) To the nearest one thousand miles or kilometers, what is the radius of the earth?

   (b) To the nearest five degrees, what is the latitude of Mount Vernon, Iowa?

   (c) To the nearest five degrees, what is the longitude of Mount Vernon, Iowa?

4. Canada has ten provinces and three territories. The capital city is on the border of which two provinces?

5. Geography influences the development of economies. People who live in Los Angeles, New York, and other great ports understand the importance of water to the prosperity of their cities. They might not understand the importance of water-borne commerce to the economic development of Iowa, Illinois, Wisconsin, Minnesota, and Michigan. What would you tell them to help them understand?

6. From the end of the Second World War in 1945 until 1990, West Berlin was an enclave.

   (a) What is an enclave?

    (b) Identify another enclave.

7. Names of places sometimes change.

    (a) Name a city in Asia whose name has changed.

    (b) Name a nation in Asia whose name has changed.

8. A nation that lies on a crossroads will often find itself at the center of conflicts. China would like to build a north-south railroad to the sea through a country in southeast Asia. Japan built an east-west railroad through the same country during the Second World War. What is the name of the country?

9. A mathematical function is a relationship between elements of one set and elements of another set. A project is a mathematical function that defines a relationship between two sets of points. What are those two sets of points?

10. Describe two ways of creating a new layer on a map from one or more existing layers.

11. Identify at least three ways that errors can enter a map.

12. What distinguishes an algorithm from a computer program?

13. Graphs can model networks of roads, railroads, power lines, communications lines. In this context, a graph is a set of nodes and a set of edges. Identify at least two algorithms that we might use to solve a problem related to networks.

14. QGIS and other geographic information systems make use of a relational database.

    (a) How is data organized and stored in a relational database?

    (b) With what language do we direct the relational database management system to give us the data that we want?