These questions are drawn from concepts presented in class in Lectures 1-7 and in your textbook reading assignments.

1. A map is the only way to visualize the results of a geographic analysis.
   True
   False – results can be in the form of a single number (e.g., Moran’s index) or a table

2. The vector data structure represents features using grid of cells.
   True
   False

3. Define “mixed” pixel - a pixel (grid cell) containing multiple attributes for a single ground extent of a grid cell. A common representation problem in which the cell covers a transitional area between two data categories and some decision must be made about how to classify the cell. Mixed pixels can be a problem resulting from vector to raster data conversion as well.

4. Define topology – the process or characteristic of explicitly calculating and storing spatial relationships between connected features (points, lines, areas) in a GIS. For example, the topology of an arc includes its from- and to-nodes and its left and right polygons

5. Why is the determination of topology critical for GIS?
   Making the software run faster
   Performing spatial analyses
   Building map symbology
   Unzipping zip files

6. Which definition of interpolation is correct?
   Outputs data to an external file in a supported format.
   Performs arithmetic or logical operations on all, or selected records in the active field of a table.
   Predicts values for a surface from a limited number of data points.
   Displays the attributes of features on a view by clicking on them with the mouse.
7. Characteristics of a GIS that distinguish it from other kinds of computerized systems include:

A GIS provides algorithms for spatial analysis of georeferenced data

A GIS has "spatial intelligence" (i.e., GIS treats points, lines, areas, etc. as actual spots on the earth)

A GIS provides links between geographic locations and, within a database, their accompanying attributes

All of the above

8. "Research on the fundamental nature of space, as well as the generic issues that surround the use of GIS technology, impede its implementation, or emerge from an understanding of its capabilities" is called:

A data model.

A data structure.

Object Oriented.

Geographic information systems.

Geographic information science.

9. The Benton County is planning a new park in north Corvallis. You are hired as a planner to identify possible sites for this future park in an area that is experiencing population growth while also trying to preserve the prime agricultural land of the county. You are given the following guidelines. The park must be:

1) Within 16 kilometers of a city population greater than 20,000.
2) On land that is not zoned as Agricultural, Industrial, Commercial or Conservation.
3) On land that is currently Vacant.
4) On land that does not contain an endangered species.
5) On slopes greater than 2.5% (to provide topographic relief for hiking trails as well as scenic beauty).
6) On land that is accessible from an existing road.

And finally the park must be at least 40 hectares (100 acres) in size.

Write down what data sets (data layers, data themes) are likely to be needed for such a project and whether they should be vector or raster. Indicate also if the data set would be considered a FRAMEWORK data set according to our class discussions about spatial data infrastructure.
Land Use (data on the current type of land use – residential, commercial, agriculture, etc.) – Vector (polygons)

Endangered Species (point data on the approximate location of all known endangered plant and animal species) – Vector (points)

DEM – Raster - FRAMEWORK

Road data – Vector (lines or arcs) - FRAMEWORK

Zoning (data on the present zoning for each parcel of land) – Vector (polygons) – if it includes ownership then it is considered cadastral and FRAMEWORK by the FGDC (and recall that the FGDC is the Federal Geographic Data Committee, the arm of the U.S. Geological Survey responsible for implementing our US National Spatial Data Infrastructure)

Demographic data including population (not population density, although you could use the GIS to calculate population density) – Vector (polygons or points which include population as a descriptive attribute)

10. Go back to your syllabus and write down which of the Learning Outcomes this practice test touches on.

“Synthesize and integrate concepts of GIS theory and methodology, including data models, data structures, topology, and spatial analysis” is touched on by Questions 1-6 and 9.

Question 8 touches on “Understand and articulate what geographic information science is and some of its topics and challenges.”

Questions 7 and 9 touch on “Describe the functional basis of a GIS (i.e., how it works), including how it differs from other computerized systems, and why.”

“Outline the key data quality issues involved in using GIS and state the importance of metadata” is not directly touched on above, but questions on this topic WILL be on the test.

Interested in the topology portion of the answer key? See http://dusk.geo.orst.edu/arc/topology_ans.html

Good luck on the midterm! 😊