

## National Exams December 2012

04-Geom-A7, Geospatial Information Systems Exam

3 hours duration

### **NOTES:**

1. If doubt exists as to the interpretation of any question, the candidate is urged to submit with the answer paper, a clear statement of any assumptions made.
2. This is a CLOSED BOOK exam. Nothing further is permitted including no calculator.
3. A complete paper consists of answering 20 questions from the 23 questions provided. All questions are worth 5 marks each.

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Complete 20 of the following questions (5 marks each).

1. What is the difference between automated cartography, CAD, and GIS
2. Discuss the basic functions of a GIS.
3. Define meta data in a GIS. Give examples of meta data in a GIS?
4. Define attribute data and spatial data in a GIS. Give examples of each data type.
5. What is a datum used in a GIS? Give three examples of datums commonly used in GIS.
6. What is rubber sheeting or conflation as used in GIS? What problems must be considered when perform a rubber sheeting operation in a GIS?
7. What are the basic components of a vector-based data model? What are the components of a raster-based data model? What are the advantage and disadvantages of each model?
8. What is conformal projection in the context of map projections? Give an example of a map projection that is conformal.
9. Uncertainty in GIS can take several forms. Define spatial uncertainty and attribute uncertainty. Give examples of each type.
10. What are spatial statistics and spatial analysis as used in a GIS? Give examples of each.
11. Explain the difference between spatial autocorrelation and spatial correlation as used in a GIS.
12. Buffers are used in GIS. How are buffers used in proximity analysis in GIS?
13. What is the difference between a DSM and a DEM? Explain two sampling schemes for the collection of a DEM.
14. What does the acronym TIN represent? Explain how is a TIN produced?
15. Explain the relationship between a Delaunay tessellation and a Voronoi diagram.
16. The point in polygon problem is commonly encountered when using a GIS? Explain how this process is completed in a GIS.
17. How is a quad-tree used in a GIS? What is run-length encoding in a GIS?
18. What is a DBMS and how is it used in a GIS. Give two examples of DBMSs used in GIS.
19. Why is map data organized into layers or coverages in a GIS?
20. Entity-relationship (ER) models are often used in GIS. Define what an ER model is and how it is used in a GIS.
21. What is the difference between map generalization and spatial interpolation?
22. What is the difference between spatial interpolation and spatial extrapolation?
23. How is a Structured Query Language (SQL) used in a GIS? Give an example of a SQL query.