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THE UNIVERSITY of York

Degree Examination 2007

ENVIRONMENT DEPARTMENT

BSc in Environmental Science & BSc in Environment, Economics and Ecology
Part 1b

GEOGRAPHICAL INFORMATION SYSTEMS

Time allowed: **one and a half hours**

Answer any **TWO** questions
Each question carries equal marks

Pay adequate attention to spelling, punctuation and grammar, so that your answers can be readily understood

1. By the time geographical data are stored as computer files in a GIS they are several levels of abstraction removed from reality. Discuss the ways in which spatial data structures can be used to hold models of the real world.

2. Compare and contrast raster and vector methods for proximity analysis. Illustrate your answer with possible applications of different proximity analysis techniques.

3. Aronoff (1989, p 39) defines GIS as "any manual or computer based set of procedures used to store and manipulate geographically referenced data". Describe the functionality available in ArcGIS that makes such a computer-based system more powerful than a set of map drawers for storing and manipulating spatial data.

4. You work for an electricity generating company in their GIS department, where you use the ArcGIS software. As well as all of the customer and infrastructure data that you hold in your GIS, you also have spatial data on UK land cover, including existing woodland and arable land (stored in a raster format), a detailed road network (stored in a vector format) and the location of the company's existing power stations. The members of the board of directors of the company want to expand into the renewable energy market by developing generating capacity through the use of fast growing woodland as a fuel source. They want you to assess which of their power stations might best be adapted to receive the new form of fuel to capitalise on the spatial distribution of existing woodland, along with arable land that could be converted to grow the wood crop. Additionally, they want to know where it might be best to build two new power stations to use this fuel. How would you use your GIS skills to address the task they have given you?