

THE UNIVERSITY *of York*

Degree Examination 2005



ENVIRONMENT DEPARTMENT

BSc in Environment, Economics and Ecology, Part 1b

GEOGRAPHICAL INFORMATION SYSTEMS

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

Answer any **two** questions

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

1. [50 marks] Digital spatial data are available for a particular geographical area. The data include a digital elevation model, a soil map, a geology map, a land cover map, a land use map, a road map and a map of human population distribution. How could a group of planners, with access to ArcGIS, use these data sets and the software to help them in locating a new housing development in the area? Amongst other considerations, the planners have to take into account the expense of building on different terrains, the cost of purchasing land for the development, potential ecological damage and the resultant population distribution caused by the new development.
2. [50 marks] Describe how raster data can be used in overlay operations and proximity analysis.
3. [50 marks] Digital elevation models (DEMs) are important base data sets in many environmental applications of GIS. Explain what a gridded DEM is and describe the sorts of operations, available in most GIS software, that can be performed using DEMs.
4. [50 marks] 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.