

UNIVERSITY OF SOUTH AUSTRALIA

DIVISION OF INFORMATION TECHNOLOGY, ENGINEERING AND THE
ENVIRONMENT

School of Geoinformatics, Planning and Building

Semester 1, 2003

Geographical Information Systems 5: GEOE 3012

Time Allowed: 3 hours + 10 minutes reading time

General Instructions to Candidates

All questions are of equal value. Marks for part of questions are as indicated.

Answer any **TWO** questions from **Section A** and any **TWO** questions from **Section B**.

Please ensure the front of your answer books are completed with your name, student I.D. number, course and section of the examination.

SECTION A

QUESTION 1 [25 marks]

- a) Discuss the main differences between fuzzy and Boolean logic. (15 Marks)
- b) Describe the fuzzy operators AND, OR, SUM, PRODUCT, and GAMMA. (10 Marks)

QUESTION 2 [25 marks]

- a) Describe the two main approaches to the development of fuzzy membership functions. (13 Marks)
- b) Discuss the “learning process” of an Artificial Neural Network as applied to a GIS problem, using the optimisation for the location of a new sales outlet in a metropolitan area, as an example. (12 Marks)

QUESTION 3 [25 marks]

- a) Discuss the main issues in the application of GIS to multi-temporal problems. (11 Marks)
- b) Expert systems derive their inputs from the coding of expert knowledge. Discuss the typical models for the combination of expert knowledge within a spatial environment. (14 Marks)

SECTION B

QUESTION 4 [25 marks]

- a) Describe in detail the four main stages of a generic project life cycle and the activities that need to be addressed during each stage. (20 marks)
- b) Describe the main reasons for the failure of GIS projects in organizations. (5 marks)

QUESTION 5 [25 marks]

- a) What are the key principles of Quality Management in a Project context? (10 marks)
- b) Describe how a Work Breakdown Structure for a Project is created. (15 marks)

QUESTION 6 [25 marks]

- a) Why is structured risk management important to the success of a Project? (10 marks)
- b) Discuss why the Project plan is a key document for monitoring and controlling a Project. What are the main elements of a Project plan? (15 marks)