

OLLSCOIL NA hÉIREANN
The National University of Ireland

NATIONAL UNIVERSITY OF IRELAND, GALWAY

SEMESTER 1 EXAMINATIONS 2003

SECOND YEAR EXAMINATION IN COMPUTING STUDIES:2CS1
[CS201]

CT232

METHODOLOGY

Prof. D. Bell
Prof. G. Lyons
Dr. C. Mulvihill

Candidates are required to answer any **THREE** questions
Answer all components of each question
All questions carry equal marks
Time allowed: **TWO hours**

1. 'Programming environments have many associated elements.' Explain what is meant by each of the following terms: 'programming environment' 'complier', 'library', 'API' and 'debugger' (5 marks each)
2.
 - (a) What is meant by the term 'steganography'? (6 marks)
 - (b) Explain how a steganographic algorithm based on dealing cards can be used to hide portions of the bitstream 1001110111010000....., assuming a small deck of six cards and exactly two players. It is enough to consider dealing three cards (13 marks)
 - (c) How might a text file be steganographically used to hide information? (6 marks)
3.
 - (a) Why is pathfinding important in computer games? (6 marks)
 - (b) Discuss any two approaches to finding a path from a start node to a destination node, motivating your choices (13 marks)
 - (c) Give a brief account of the cove problem in pathfinding (6 marks)

4.

- (a) Why do you understand by the term 'data compression'? (5 marks)
- (b) Briefly outline an algorithm for run length encoding (8 marks)
- (c) Briefly outline an algorithm for Huffman encoding (12 marks)

5. Discuss how a typical commercial steganographic tool is used to hide information, explaining the terms 'covert file' and 'overt file' in the course of your answer (25 marks)