

OLLSCOIL NA hÉIREANN, GAILLIMH  
NATIONAL UNIVERSITY OF IRELAND, GALWAY

SEMESTER 1  
WINTER EXAMINATIONS 2002

SECOND YEAR EXAMINATION IN COMPUTING STUDIES

**CT232**

METHODOLOGY AND C

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

Candidates are required to answer **THREE** questions  
All questions carry equal marks  
Time allowed: **TWO** hours

- 1 In connection with functions, what is meant by the term 'parameter'? Distinguish between value, value-result and reference parameters. Outline a simple C function 'swap' that makes use of parameters in order to interchange the values of two variables. Given that C employs value parameters, how is this swapping actually achieved?
- 2 What is meant by the term 'recursion'? In connection with image recognition work, sketch a recursive C algorithm that distinguishes between an 'A', a 'B' and a 'C', stating all assumptions you make.
- 3 In connection with primitive types in a language, give two such types and two operators associated with each type as found in the C language. If it were required to have a 'point' type, where a point is given by two Cartesian coordinates, how far in your estimation could this requirement be accommodated in C?
- 4 'Pointers are fundamental to working with C'. Discuss this statement, explaining what is meant by the terms 'dereferencing', 'address', and 'indirection' in the course of your answer. By considering a function employing local variables that returns a pointer to one such local variable, or otherwise, explain why care must be exercised when working with pointers.
- 5 'A large C programming environment contains many elements'. Discuss this statement, explaining what is meant by the terms 'header file', 'make facility' and 'debugger' in the course of your answer.