THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATION
Diploma

SYSTEMS SOFTWARE

9th May 2001 – 10.00 a.m. – 12.00 p.m.
Answer FOUR questions out of SIX. All questions carry equal marks.
Time: Two hours.

*The marks given in brackets are **indicative** of the weight given to each part of the question.*

1. Describe the facilities provided for users by TWO different named operating systems. **(15 marks)**

Compare the facilities offered by each operating system and comment on their relative 'user friendliness'. **(10 marks)**

2. Briefly describe a typical memory hierarchy, consisting of at least three levels, for a stand-alone computer system. **(7 marks)**

For each level of memory, describe its functional characteristics, and the ways in which it interacts with its neighbour(s) in the hierarchy. **(18 marks)**

3. With reference to a named operating system, describe the organisation of its filing system, explaining how files are accessed, including mechanisms to allow for the sharing of files between simultaneously executing processes. **(15 marks)**

Describe mechanisms to ensure the privacy and security of files, distinguishing between the two requirements. **(10 marks)**

4. Describe in outline the major components from which an operating system is constructed. **(7 marks)**

What information is passed between these components, and for what purposes? You should describe any necessary data structures used, with their typical contents. **(18 marks)**

5. Modern interactive program development systems provide much more than straightforward compiling or interpreting facilities. Describe briefly the sort of facilities you would expect to find in such a system. **(10 marks)**

Discuss the implications that such facilities have on the way the program is represented within the storage of a computer system. **(15 marks)**

[Turn over

6. The syntax of an identifier in a certain programming language is described in Backus Naur Form by the following:

<identifier> ::= <upper_case_letter>|<upper_case_letter> <tail>
<upper_case_letter> ::= A|B|C| . . . |Z
<tail> ::= <letter_string>|<letter_string><digit_string>
<letter> ::= <upper_case_letter>|a|b|c| . . . |z
<letter_string> ::= <letter>|<letter><letter_string>
<digit> ::= 0|1|2| . . . |9
<digit_string> ::= <digit>|<digit><digit_string>

a) Describe *carefully* in normal English the permissible forms of an identifier. **(5 marks)**

b) Develop a finite state machine that will recognise identifiers of this type. Annotate your description appropriately. **(15 marks)**

c) Demonstrate the operation of your machine by describing how it will deal with the following character strings:

AbC12
A1b

(5 marks)