THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATION
Diploma

SYSTEMS SOFTWARE

3rd May 2002, 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. The company you work for is developing a major piece of software for analysing the effects of possible failures in car electrical systems. The software is expected to take about six hours to analyse a single system. It will take as input the data structures produced by any one of the widely used computer-aided design packages used in this area.

    Discuss the criteria you would use to choose the operating system on which the software will run, and the programming language in which it will be written. **(25 marks)**

2. *a)* Describe the execution-time debugging features you would expect to be provided by an interpreter.
    (15 marks)

    b) Discuss the extent to which such features can reasonably be provided in a compiled implementation of the language. **(10 marks)**

3. *a)* Identify the phases into which the process of compilation is normally divided and describe the functions of each phase. **(15 marks)**

    b) Describe the main data structures used to communicate between the phases. **(10 marks)**

4. *a)* List FOUR possible CPU scheduling algorithms which might be used in a multi-tasking operating system.
    (4 marks)

    b) Compare and contrast the efficiency of three of these with respect to their complexity, ease of implementation and throughput. Include any other measures which you believe to be appropriate.
    (21 marks)

5. *a)* What are the requirements of privacy and security with respect to:
        i) immediate access memory, *and*
        ii) file storage
        in a multi-user system? **(15 marks)**

    b) How should these requirements be met? **(10 marks)**

[Turn over

6. *a)* List devices in common use which may be used to store persistent data, and give functional characteristics of three of them. **(15 marks)**

b) Discuss the suitability of two of these when used for general file storage. **(10 marks)**