THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATION
Diploma

SOFTWARE DEVELOPMENT ENVIRONMENTS

4th May 2005, 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. *a)* Write down EIGHT components of the software development lifecycle and then explain why the production of software is not just an eight stage linear process but instead the word 'cycle' is used.   **(10 marks)**

    b) Explain, with examples, why the process of describing what a program is to do, designing the program and writing it are three separate activities.   **(15 marks)**

2. *a)* "A beginner writes a whole program in a single file and runs it using an interpreter. A professional constructs a project and uses a compiler." Referring to this scenario, explain the difference in scale of the programs involved and the different demands made on the language implementation system used.   **(10 marks)**

    b) Under one operating system a program is supplied with data by dragging a data file onto the program icon. In another the name of the program is typed followed by the name of the data file. Contrast the two approaches and describe scenarios where each is shown at its best.   **(9 marks)**

    c) What precautions should be taken when writing an application in a high level language to ensure cross-platform compatibility?   **(6 marks)**

3. *a)* When a program is executing, data can be read from a file and results can be written to a file. Describe and compare the following terms relating to files:
    i)   Text file/binary file
    ii) Sequential/direct access
    iii) Local/remote
    iv) Open for reading/writing/appending   **(18 marks)**

    b) In most programming languages there is a "file open" and a "file close" command. Describe the purpose of these two commands and include information on the parameters which are used and any results obtained.   **(7 marks)**

4. *a)* Identify a program development environment with which you are familiar and discuss THREE features it offers to assist individual programmers to develop code. **(10 marks)**

b) Describe THREE features of a debugger that can be used to assist in the identification of errors within a computer program. **(9 marks)**

c) Identify THREE compiler options with which you are familiar and indicate the circumstances under which each of these would be used. **(6 marks)**

5. *a)* Describe TWO *software tools* (i.e. not 'processes' or 'methods' such as top-down or bottom-up) that can be used to assist the testing process. Your answer should highlight the benefits of using each tool, give an example of where it would be appropriate to use it and identify any issues with which a user of the tool should be familiar. **(10 marks)**

b) Testing is often divided into unit testing, module testing, sub-system testing, system testing and acceptance testing. Explain the role of each of these individual stages, identifying the types of error likely to be detected at each stage. **(15 marks)**

6. *a)* Identify FIVE measures of software quality. For each, explain what it attempts to measure and outline how "high quality" software (as indicated by the measure) can be achieved. **(15 marks)**

b) To remain useful, most commercial software is regularly updated after the initial installation phase. Describe how the process of deciding which requests for changes should be implemented could be managed within an organisation that receives many requests for such updates. **(10 marks)**