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THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATION Advanced Diploma

PROGRAMMING PARADIGMS

27th April 2000 - 2:30p.m. - 5:30p.m.

Answer THREE questions out of FIVE. All questions carry equal marks.

Time: THREE hours.

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

1. A variety of programming languages is available for the implementation of computer systems. Compare and contrast two different programming language types (such as data-oriented, imperative, object-oriented), discussing what characteristics they have and what type of applications they are most appropriate for. **(25 marks)**

2. Describe four important concepts of object-oriented programming and discuss why they are important. Illustrate your answer with appropriate examples. **(25 marks)**

3.
 - a) Describe briefly the range of tools available to support the programming development process. **(10 marks)**
 - b) Evaluate the success of these tools in improving the productivity of programmers and the quality of the code they produce. **(15 marks)**

4.
 - a) Discuss the role of higher-order functions within the implementation of applicative (functional) programming languages. **(12 marks)**
 - b) In a functional programming language, an expression is evaluated within the context of an environment. Discuss this statement commenting upon any similarities, or otherwise, that might exist between functional and imperative programming languages. **(13 marks)**

5.
 - a) Describe the basic concepts of pure logic programming and discuss the compromises that exist between these concepts and those of a real logic programming language. **(12 marks)**
 - b) Logic programming languages have been proposed that integrate logic programming with other programming paradigms such as functional programming. Present arguments for and against this integration. **(13 marks)**