

THE BRITISH COMPUTER SOCIETY
THE BCS PROFESSIONAL EXAMINATION
Professional Graduate Diploma

ADVANCED DATABASE MANAGEMENT SYSTEMS

30th April 2003, 10.00 a.m.-1.00 p.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. Describe the characteristics of the infrastructure for mobile computing, and explain how database systems operate within it. **(10 marks)**

Discuss some of the areas of difficulty in providing mobile database services and how these may be overcome. **(15 marks)**

2. There are a number of algorithms for computing a join of two relations. Describe THREE such algorithms. **(15 marks)**

Using illustrations, compare and contrast them in terms of efficiency. **(10 marks)**

3. Explain why transaction management is an essential part of multi-user database systems. **(10 marks)**

Evaluate TWO common methods for ensuring integrity of data in concurrent transaction processing, with reference to the following schedule.

Transaction A	Transaction B
Read (A)	
	Read (A)
Read (B)	
	Read (B)
Write (B)	
	Write (A)
Write (A)	
	Write (B)

(15 marks)

Turn over]

4. a) Explain what is meant by the term 'constraint database system'. **(12 marks)**
- b) Compare the way spatial data is handled in:
i) constraint databases
ii) relational and object-oriented databases. **(7 marks)**
- c) Compare the way temporal data is handled in:
i) constraint databases
ii) relational and object-oriented databases **(6 marks)**
5. a) Describe the CORBA architecture. **(9 marks)**
- b) Discuss the reasons why combining a CORBA implementation with database technology may:
i) benefit a CORBA application **(8 marks)**
ii) increase the functionality offered by a database management system. **(8 marks)**