

# THE BRITISH COMPUTER SOCIETY

## THE BCS PROFESSIONAL EXAMINATION Certificate

### INFORMATION SYSTEMS

23rd April 2003, 10.00 a.m.-12.00 p.m.  
Time: TWO hours

#### SECTION A

Answer TWO questions out of FOUR. All question carry equal marks.

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

1. Two large national Video/DVD rental companies have merged. You have been assigned as a member of the team which has been employed to investigate the current business activities and information systems that support them.
  - a) Briefly outline an approach to managing this project and controlling the investigation and subsequent development of a common integrated system. **(15 marks)**
  - b) Give an example of TWO control techniques often used in project management. **(6 marks)**
  - c) You have been assigned to obtain facts from members of staff at all levels. You have been warned that although the management fully supports your investigation, you must plan with care. Prepare a plan describing a fact-finding strategy containing at least THREE different techniques. **(9 marks)**
  
2.
  - a) Compare and contrast the following, giving appropriate examples:
    - i) Relational Table – Indexed Sequential File **(5 marks)**
    - ii) Hypertext Mark-Up Language (HTML) – 3<sup>rd</sup> Generation Language **(5 marks)**
    - iii) Narrative Specification Techniques – Graphical Specification Techniques **(5 marks)**
  - b) Write brief notes on the following:
    - i) CASE and its role in prototyping **(5 marks)**
    - ii) An Expert System **(5 marks)**
    - iii) Object-Oriented Concepts **(5 marks)**

3. a) Information is said to be the most important resource within a business organisation. Briefly discuss how the information flows in a typical organisation hierarchy giving examples of the type of information at each level. **(6 marks)**
- b) Define what is meant by each of the following:
- i) Executive Information System
  - ii) Management Information System
  - iii) Transaction Processing System
- (9 marks)**
- c) Draft a report explaining how multimedia applications could be used on the internet to increase a business's market and to give it a competitive advantage. **(10 marks)**
- d) As a member of the British Computer Society, you must be aware of the legal and ethical issues when developing on-line applications. Outline what precautions you must take during such a development to ensure that the application conforms to these legal and ethical issues. **(5 marks)**
4. a) A Systems Analyst is traditionally responsible for investigation of a project from initiation to implementation. Throughout each phase of a structured methodology, various techniques are used. You are required to describe, giving examples using a named methodology with which you are familiar, the following techniques:
- i) Dataflow Diagrams **(5 marks)**
  - ii) Entity/Relationship Modelling (Logical Data Modelling) **(5 marks)**
  - iii) Normalisation **(5 marks)**
- b) Implementation and transfer of data from an existing system to a new system is an extremely important function. There are several approaches that can be used. Outline at least THREE different methods and indicate what actions need to be taken to ensure a good professional and trouble free changeover from the current system to the newly developed one. **(15 marks)**

## SECTION B

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

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

5. Certain data-centred analysis techniques (see below) are often confused and used inter-changeably. Briefly describe EACH of the following techniques.
- a) Data Warehousing
  - b) Data Mining
  - c) OLAP (On-line analytical processing) and
  - d) OLTP (On-line transaction processing)
- (4 x 3 marks)**

6. Some organisations store their operational and strategic data on a central database, alternatively some organisations have a de-centralized approach by which they allow individual departments to store their operational data on local databases held within the department.

a) What are the benefits of the centralized approach? (6 marks)

b) What are the benefits of the de-centralised approach? (6 marks)

7. A college library uses an information system to process transactions such as those listed in **Table 1** below. The transaction data is stored and processed by a spreadsheet package. Each column on the spreadsheet represents a field and each row represents an individual transaction record. Each transaction has a unique transaction number which reflects the row number of the spreadsheet. The spreadsheet package is programmed to allow users to 'look-up' related data (e.g. names of borrowers) which is held on other parts of the spreadsheet.

<u>Transact Number</u>	<u>Transaction type</u>	<u>Trans-action date</u>	<u>Librarian</u>	<u>Borrower ID</u>	<u>Borrower Type</u>	<u>Book Number</u>	<u>Amount</u>
10234	Book Loan	1/03/02	McKee	23	Student	1242	
10235	New Member	1/03/02	McKee	77	Staff		7.50
10236	Book Loan	1/03/02	Mistry	2	Student	1240	
10237	Book Purchase	1/03/02	McKee	1		3009	9.99
10238	Book Return	2/03/02	T.Young	21	Retired	1238	
10239	Fine Paid	2/03/02	T.Young	21	Retired	1238	0.50
10240	Book Purchase	2/03/02	T.Young	2	Student	3010	12.95
10241	Book Return	2/03/02	T.Young	2	Student	1240	
10242	Book Loan	2/03/02	McKee	77	Staff	3010	

**Table1**

Describe the problems that could occur by using a spreadsheet rather than a database to store and process the above transactions. (12 marks)

8. Describe the function of the following web-based user interface facilities:

- a) Style Sheets
- b) Image Maps
- c) Java Applets
- d) Frames

(4 x 3 marks)

9. Describe the characteristics of the software development tools that could be used to help build an information system containing significant static and animated image content. (12 marks)

10. What security issues need to be considered when developing an e-commerce application for the internet?  
(12 marks)
11. Describe THREE methods that could be used to test the processing logic of the user interface of a highly interactive information system.  
(12 marks)
12. Part of an order processing system is dedicated to handling customer telephone enquiries about the supply of products. In particular, a user often enquires about invoices - on many occasions products have not been received despite appearing on a customer invoice. To counter complaints made by customers, a web-based enquiry system is to be developed allowing customers to query their own orders on-line and view the data returned from enquiries via a web browser. A prototype is to be developed and evaluated.
- a) Draw the enquiry screen and the resulting display screen for the prototype.  
(4 marks)
- b) Comment on the features of your design that demonstrate it is suitable for users with a range of computer experience.  
(8 marks)