

# THE BRITISH COMPUTER SOCIETY

## THE BCS PROFESSIONAL EXAMINATION Certificate

### INFORMATION SYSTEMS

19th April 2004, 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. a) Information systems development requires careful thought and planning. Several methods are available to support the development.
- Give examples and a brief overview of the main features in the following:
- i) UML
  - ii) A soft system approach
  - iii) A prototyping method **(15 marks)**
- b) Using any system as an example, describe the use of the following techniques:
- i) Normalisation (1NF to 3NF)
  - ii) Data flow diagrams
  - iii) Logical data model (Entity/relationship diagrams) **(15 marks)**
2. A holiday tour company, which sells local and overseas coach tours, has merged with two smaller companies so they can provide more opportunities to their customers. A new system will be required to deal with the increased load. It will need to provide an on-line (web-based) enquiry system as well as booking and payments.
- a) As the senior analyst, you are responsible for planning the investigation and implementation of the above system. Using a structured systems methodology with which you are familiar, describe the stages and tasks you would use within the project. **(12 marks)**
  - b) Show how you would control and manage your team in carrying out this project and what techniques you would use. **(9 marks)**
  - c) The first stage of the development life cycle is a feasibility study, which is not normally part of the methodology. What is a feasibility study and what areas would you expect to include in the feasibility report? **(9 marks)**

**Turn over]**

3. a) A maintenance company offers maintenance contracts for both hardware and software. The company requires a system to assist with the support of the telephone calls it receives from its clients. The system needs to record information from the calls on a database for subsequent solution and analysis.
- i) Design an input screen on which the support staff can record the details of the call and comment on what design techniques you would use to ensure a user-friendly system. **(8 marks)**
  - ii) Design a simple data model which will need to be implemented for your screen. **(3 marks)**
  - iii) Define the validation needed for typical fields. **(4 marks)**
- b) Fact finding techniques such as interviews and questionnaires would be required to enable you to design the above system.
- i) Draft a memo to your manager describing the benefits and drawbacks of using these techniques. **(12 marks)**
  - ii) Give an example of an 'open' question and a 'closed' question which could be used in your questionnaire. **(3 marks)**
4. Your company has been advised that it is losing business as it is failing to keep up to date with new technology.
- a) You have been asked to prepare a report explaining how the web and the introduction of database management systems, multimedia and object oriented technology could be used to increase its competitive advantage. **(15 marks)**
  - b) New staff appointments would be required; briefly describe the functions of the following:
    - i) Network Administrator
    - ii) Database Administrator **(8 marks)**
  - c) As a member of the British Computer Society explain what the Professional Code of Conduct means. **(7 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. a) Describe THREE different methods that could be used to test an application. **(9 marks)**
- b) Outline why testing is an essential part of any project. **(3 marks)**
6. Define what is meant by the following terms and provide an example of the use for each.
- a) 1 tier Database architecture
  - b) 2 tier Database architecture
  - c) 3 tier Database architecture
  - d) N tier Database architecture **(4 x 3 marks)**

7. Computer Aided Software Engineering (CASE) are suites of tools that can be used to develop a range of applications.

Describe SIX features that you would expect to be included in a CASE tool. **(12 marks)**

8. a) Explain the difference between data validation and data verification (using examples). **(4 marks)**  
b) Discuss data validation and data verification with respect to how you would design the processes to validate and verify a customer's name, address and age. **(4 marks)**  
c) Outline typical functionality that could be incorporated in a system such as the Microsoft Windows development environment for ensuring that data is correctly entered. **(4 marks)**

9. Special needs' users (blind, partially sighted, deaf, etc.) may not always be included in the design of a multimedia web site.

Comment on the features that can be incorporated into the web site to assist this group of users. **(12 marks)**

10. It is 15:30 in the afternoon and a company's database has just crashed. Outline the backup strategy that needs to have been in place to ensure the recovery of all data that had been processed and committed to the database (including all transactions that would have successfully completed by 15:29). **(12 marks)**

11. a) State what the following abbreviations mean and discuss what deliverables you would expect from the following stages (taken from a Rapid Application Development style methodology):

i) JRP **(3 marks)**  
ii) JAD **(3 marks)**

- b) Briefly discuss TWO different approaches to prototyping and comment on the disadvantages of each. **(6 marks)**

12. Data analysis and modelling is used to prevent potential problems with the following standard database functions.

i) Insert  
ii) Update  
iii) Delete

For EACH of the above three functions, describe what the potential problems are. For EACH function, provide an example of where the data structure will cause a problem and one of where the problem has been solved.

**(3 x 4 marks)**