

THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATIONS Certificate

INFORMATION SYSTEMS

17th October 2005, 10.00 a.m.-12.00 p.m.
Time: TWO hours

Both Section A and Section B carry 50% of the marks.
You are advised to spend about 1 hour on Section A (30 minutes per question)
and 1 hour on Section B (12 minutes per question).

SECTION A

Answer TWO questions out of FOUR.

You are advised to spend about 1 hour on Section A (30 minutes per question)

All questions carry equal marks.

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

1. You have been appointed as a software development consultant for a hire car company, which has merged with several smaller companies with the prospect of enhancing their business into the overseas market. Consequently, the existing systems need to be investigated thoroughly. You have been advised to take both a hard and soft system approach to this investigation.
 - a) Describe the investigation process using a structured analysis approach with which you are familiar, detailing the tools and techniques you would envisage using. **(16 marks)**
 - b) Give examples of soft system techniques which would also be useful in the investigation. **(8 marks)**
 - c) Briefly describe THREE fact-finding techniques you could use in the investigation and state in which situation each could be used. **(6 marks)**

2.
 - a) Describe how information flows within an organisation, using an example with which you are familiar. You should indicate the three levels of management information, providing examples of each. **(10 marks)**
 - b) Briefly describe the following types of system:
 - i) Transaction Processing Systems
 - ii) Intelligent Systems
 - iii) Management Information Systems **(10 marks)**
 - c) Compare and contrast the following software systems indicating how they may be used:
 - i) Spreadsheets
 - ii) Database Management Systems
 - iii) Project Management Systems **(10 marks)**

Turn over]

3. A new Accommodation Block has been built on a university campus enabling any student who is attending the university for the first time, or any who requires special needs, to be close to the university facilities. Previously, the Accommodation Office only dealt with private landlords, now it requires a database to support the new processes as well as dealing with the existing private lets. When a student is offered a place at the university, an accommodation leaflet and application form is sent to them. The form contains all the students' personal details, the course they have applied for, the type of accommodation they prefer, plus any special needs they require. The type of accommodation can be; a single room with bathroom, a single room with shared bathroom, a double room with shared bathroom, or private. All university accommodation has shared kitchen and dining facilities. There is a limit on all types of university accommodation especially a double room, but there are plenty of private rooms/houses available. Students are requested to put their choice in order of preference. Rooms are allocated to students on a first-come, first-served basis. Once the offer has been made, the students must confirm their acceptance and send a deposit within one month of the offer being posted. However, there are several problems that can occur, students may not send a deposit or acceptance, they may reject the offer and ask for a different offer or they may never arrive at the university. Therefore there has to be a further allocation of offers and further negotiation. A waiting list is produced and rooms offered, as they become available.
- a) Draw a set of dataflow diagrams depicting the main processes detailed above. You must include a context diagram. **(10 marks)**
 - b) Construct a simple entity relationship model. **(6 marks)**
 - c) Identify the main entities with primary and foreign keys and provide suggestions for attributes, which would need to be recorded. **(6 marks)**
 - d) Design a set of storyboards demonstrating the system to the Accommodation Office Manager to enable him/her to see what the screens would look like. **(8 marks)**
4. The management of a large auction house is investigating the use of the internet to advertise their goods and process the bids.
- a) Prepare a report, which explains the terms that the auction house management needs to understand with regard to the technological aspects of the internet. You must also discuss the issues and problems that may occur whilst trading over the internet. **(14 marks)**
 - b) The initial investigation will need to include a feasibility report. Outline the areas that would need to be considered to produce this report. **(8 marks)**
 - c) The company will need to employ a network specialist and a database administrator. Draft a memo to the managing director outlining possible qualifications and skills that are essential and desirable in order to appoint to each of these posts. **(8 marks)**

SECTION B

Answer FIVE questions out of EIGHT.

You are advised to spend about 1 hour on Section B (12 minutes per question)

All questions carry equal marks.

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

5. During every phase of a project, metrics should be gathered to assist in the planning on new or the next project. Comment on the type of metrics and statistics that could be gathered during the life of a project to help the management of future projects. **(12 marks)**

6. Human Computer Interaction (HCI) is often seen as the most important aspect of any new system design. One technique to evaluate the success of a system is to prototype the application and demonstrate it to potential end-users.
- a) State TWO different prototyping techniques. **(2 marks)**
- b) Discuss in-depth the advantages and disadvantages of ONE of the techniques you have answered in part a). **(8 marks)**
(4 marks for advantages)
(4 marks for disadvantages)
- c) Do you consider prototyping to be a good requirements capture technique? **(2 marks)**
7. Imagine that you are a database consultant for a new internet site. The owners of that site wish to have a 24 hour, 7 days a week web presence.
- The site will be available 24 hours a day, and customers will be able to enter orders on-line.
- Comment on your recommendations for a strategy to ensure that the data is backed-up and that the data in the database is secure from potential hacking. **(12 marks)**
(6 marks for discussion of backup strategies)
(6 marks for security discussion)
8. Computer Aided Software Engineering (CASE) are suites of tools that could be used to develop a range of applications.
- A Software Engineering definition of a CASE tool would be a development environment such as Visual Basic. An Information Systems definition would focus on the analysis and design aspects of a project.
- Describe SIX features that you would expect to be included in an “information systems” CASE tool. **(12 marks)**
9. Company X are considering using text-only dumb terminals for all data entry and using high specification Windows PCs for all management functions (reports, queries, market trends etc.).
- Define, and then discuss, the advantages and disadvantages of using these two types of interfaces. **(12 marks)**
(2 marks for definitions)
(10 marks for discussion)
10. a) Describe TWO different methods that could be used to test an application. **(6 marks)**
- b) Discuss why testing is an essential part of any project. **(3 marks)**
- c) As an Information Systems developer, apart from testing, highlight how you might prove that quality has been built into an application or project. **(3 marks)**

11. a) Discuss what is meant by prototyping with respect to systems analysis. **(2 marks)**

b) Discuss the safeguards you would put in place to ensure that prototyping was a success. Your answer should include the disadvantages of prototyping and how you would ensure that these disadvantages were overcome. **(10 marks)**

(5 marks for disadvantages)

(5 marks for how to avoid the stated disadvantages)

12. a) Define what is meant by the following terms and provide examples of their use.

i) Client Server Database

ii) Three tier Database architecture

(6 marks)

(Definition 2 x 2 marks)

(Example 2 x 1 mark)

b) A customer's name, date of birth and address are possibly the most difficult items to validate and verify during data entry. Comment on what you would recommend to reduce the errors entered during this process. **(6 marks)**