

# THE BRITISH COMPUTER SOCIETY

## THE BCS PROFESSIONAL EXAMINATIONS BCS Level 4 Certificate in IT

### INFORMATION SYSTEMS

22<sup>nd</sup> April 2008, 10.00 a.m.-12.00 p.m.  
Time: TWO hours

Section A and Section B each 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).

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

Calculators are <b>NOT</b> allowed in this examination.
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#### SECTION A

Answer TWO questions out of FOUR. Each question carries 30 marks.

1. A holiday resort is being developed and the local airport needs to expand its business. One area required is an on-line car hire system, which will cover several processes.

Drivers can make enquiries, reserve cars and pay a deposit using a credit or debit card. On arrival they pay the outstanding amount, take out optional additional insurance, which is offered by a reputable insurance company and pick up the car. Alternatively, a car can be booked on arrival, subject to availability. If the passenger does not pick up the reserved car, they are invoiced for the outstanding amount.

When the car is returned, it is checked for damage. If the driver did not pay for extra insurance, a charge is made for any damage.

Cars are obtained from local suppliers. When a request is made, a delivery order is placed with a suitable supplier. The car is allocated to the appropriate driver's request and delivered to the airport car park on the date required. An invoice is raised by the supplier, which is paid by the airport car rental company. When the car is returned to the local supplier, it is cleaned and repaired if required to wait further hiring.

- a) i) Draw a Context Diagram depicting the above system, explaining the main symbols used. **(5 marks)**
- ii) Identify the main processes and data stores required dealing with the driver reservation only, assuming a High Level Diagram is to be drawn. **(12 marks)**
- b) Draw a Low Level Diagram dealing with the ordering of cars from the local supplier only. **(8 marks)**
- c) Briefly describe the main advantages of using a structured systems analysis method. **(5 marks)**

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2. a) Define the terms data and information, giving an example. **(2 marks)**
- b) Briefly describe the benefits of using a database within an organisation. **(4 marks)**
- c) Information flows through an organisation. Draw a diagram indicating how management information flows through an organisation, identifying the three main levels of management and name typical systems used at each level. **(6 marks)**
- d) With examples, explain the type of information that each level of management would typically require. **(6 marks)**
- e) Discuss the main features of each of the following:  
i) Transaction Processing System (TPS)  
ii) Data Warehouse System  
iii) Knowledge Based System  
iv) Decision Support System **(12 marks)**
3. a) Identify the main purpose of a feasibility study and describe where it fits within the system development life cycle. **(2 marks)**
- b) What are the main issues that should be considered when undertaking the feasibility of a project? **(10 marks)**
- c) Describe the advantages and disadvantages of at least **FIVE** fact-finding techniques. **(10 marks)**
- d) Briefly discuss the steps you would take to ensure a project of good quality was produced on time. **(8 marks)**
4. a) Write brief notes on the following:  
i) Data Dictionary  
ii) CASE Tool  
iii) An Object Model  
iv) A Normalised Relation **(12 marks)**
- b) Documentation is an essential part of system development. Discuss how you would ensure good system documentation. **(8 marks)**
- c) Human Computer Interaction (HCI) is an important element of good design. Discuss the techniques that should be used to provide an easy to use interface. **(10 marks)**

## SECTION B

Answer FIVE questions out of EIGHT. Each question carries 12 marks.

5. Define the types of testing required to ensure the quality of a commercial web site (for example, a company selling books). **(12 marks)**
6. a) Describe what is meant by evolutionary prototyping. **(4 marks)**  
b) State four advantages of this technique. **(4 marks)**  
c) State four disadvantages of this technique. **(4 marks)**
7. a) What is required (e.g. types of documentation) to convert an Entity Relationship Diagram (ERD) into an Entity Relationship Model (ERM)? **(8 marks)**  
b) Explain why developers might want to de-normalise data once it is in third normal form. **(4 marks)**
8. a) State two methodologies where the user is an integral part of the development process. **(2 marks)**  
b) Outline one of the methodologies specified in part a). **(7 marks)**  
c) Briefly discuss the benefits of user involvement in the development process. **(3 marks)**
9. Security is an essential part of any information system. What advice would you give on the following areas?  
a) A password policy. **(6 marks)**  
b) Level of user privileges in the context of database systems. **(6 marks)**

Turn over]

10. Backup and recovery of a database is seen as routine procedure in most organisations.
- a) Outline a policy that ensures that all data and transactions are backed up. **(8 marks)**
  - b) Why should an organisation test its recovery procedures? **(4 marks)**
11. What is meant by the following terms, with respect to the development of Internet applications?
- a) Web services **(4 marks)**
  - b) HTML **(4 marks)**
  - c) XML **(4 marks)**
12. In the context of mobile devices, outline what methods are available within a standard application development environment that you could use to minimise the error rate in data entry. **(12 marks)**