THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATIONS
BCS Level 4 Certificate in IT

INFORMATION SYSTEMS

15th October 2007, 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).

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

Calculators are **NOT** allowed in this examination.

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

1.   You have been appointed to investigate the admissions processes of a local college and to
design an on-line system for them.

Students apply to the college to study for a particular part-time course using an on-line
application form. They can apply for more than one part-time course provided they have the
appropriate qualifications and the timetable allows the students to attend each course. They
complete the application form and submit it on-line to the college. An Admissions Assistant
checks the application to make sure it is completed correctly and there is no clash with the
timetable. If there are any errors then the form is emailed back to the student for amendment.
Once the form is correct they are passed to the Admissions Counsellor who has the options to
make an offer for one course, offer an alternative or will reject the application. The student is
emailed indicating the details of the offer and is asked to accept or reject the offer. Once the
offer has been accepted, the student details are entered onto the Admissions Database

a)   Draw a context diagram and a high level data flow diagram to depict the above
system.   **(12 marks)**

b)   Identify the main entities, indicating primary keys for each entity and draft a simple
logical data model.   **(6 marks)**

c)   Design a set of screens which would

i)   Be used by the student to apply for a course
ii)   Be used by the Admissions Counsellor to make an offer
iii)   Be used by the student to accept/reject the offer

(12 marks)

2.

a)   Define the main role and typical functions of a database management administrator
(DBA)   **(10 marks)**

b)   Describe the main theories of a relational database approach to storing and accessing
data.   **(10 marks)**

c)   Object-oriented concepts are widely used within web application development.

Explain, using examples, the following:

i) Class
ii) Type
iii) Method
iv) Inheritance
v) Persistence

(10 marks)

3.

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) Project Management Systems
iii) Management Information Systems **(10 marks)**

c) Security of information within an organisation is extremely important. Describe what measures you would take to ensure complete security of all the information held on the computers within your organisation. **(10 marks)**

4.

a) As manager of a project implementing a new system, describe the steps you would take to ensure a quality project which was produced on time. **(10 marks)**

b) Testing is often seen as the final stages of the system development project. Draft a testing strategy that would be adopted by the team throughout the development.
(8 marks)

c) There are several ways that can be used to transfer the data to this new system and for users to start using it. Describe the following and give an example of when each would be suitable:

i) Parallel method
ii) Direct changeover
iii) Pilot systems **(12 marks)**

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

5. Black box and white box are two common examples of testing.

  a) Discuss what is meant by:
  i) Black box testing **(4 marks)**
  ii) White box testing **(4 marks)**

  b) Name ONE other testing method and outline its benefits. **(4 marks)**

6. Normalisation and entity relationship diagramming are two common techniques for designing tables.

  a) Discuss these two techniques highlighting the differences between them. **(9 marks)**

  b) Which of these techniques would you use and why? **(3 marks)**

7. Define what is meant by the following terms, and then provide an example for each.

  a) client server database **(4 marks)**

  b) three tier architecture **(4 marks)**

  c) n-tier architecture **(4 marks)**

8. Discuss what is meant by the following methodology related terms. For each methodology state a type of project that is suitable for that methodology, and outline the methodology.

  a) RAD **(4 marks)**

  b) Extreme programming **(4 marks)**

  c) Agile methodology **(4 marks)**

9. A potential source of information from a fact finding exercise is a questionnaire.

  a) Discuss the design of questions for:
  i) Quantitative data (closed questions)
  ii) Qualitative data (open ended questions) **(10 marks)**

  b) Comment on which style of questionnaire you would recommend **(2 marks)**

10. Computer Aided Software Engineering (CASE) tools can be used to develop a range of applications. A Software Engineering definition of CASE tools would be a development environment such as Visual Basic. An Information Systems definition would focus on the analysis and design aspects of a project.

  a) Describe three features that you would expect to be included in an information systems CASE tool. **(6 marks)**

  b) Describe three features that you would expect to be included in a software engineering CASE tool. **(6 marks)**

11.

    a)   Create an organisational tree for a multi-national IT company. **(6 marks)**

    b)   Using the tree created for part a) add key information flows. **(6 marks)**

12.   Discuss the types of media that could be used to present information which allow special needs users, such as visually impaired or deaf, to interact effectively with a web site.

    Your discussion should include comments on the advantages and disadvantages of each type of media, with respect to the special needs user. **(12 marks)**