BCS The Chartered Institute for IT

THE BCS PROFESSIONAL EXAMINATIONS
BCS Level 4 Certificate in IT

INFORMATION SYSTEMS

Thursday 22nd April 2010 - Morning
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).

Answer the Section A questions you attempt in Answer Book A
Answer the Section B questions you attempt in Answer Book B

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 in Answer Book A. Each question carries 30 marks.

A1. Taxi Company

A taxi/minibus company realised they were losing lucrative airport booking business as they did not have an on-line booking system. You are a member of a small software development company and have been asked to analyse the proposed system.

Records will be kept detailing the vehicles (taxis, minibuses), maximum number of passengers and driver details. More than one driver may be allocated to a taxi but not all drivers are eligible to drive certain vehicles, so driver details and availability are required. One driver will be responsible for the allocation of the vehicle and is designated as head driver. It will also be necessary to store airport distances and time allowances. All these details will need to be created, amended and deleted. Potential customers will be asked to register on the system by providing a username and password and contact details. Single or return bookings can then be made. The customer will enter the required airport destination, dates, number of passengers, flight numbers and flight details. The system will need to calculate the time span, check whether there is a suitable sized taxi available, ask for payment details and confirm the booking. Payment will be made either by debit or credit card. Charges will be made for use of a credit card. The system will need to use appropriate credit company payment checking software to ensure that a genuine card is being used.

(a) Give examples of the following techniques using the above example:
- (i) Data flow diagramming including a context diagram and a high level data flow diagram **(8 marks)**
- (ii) Entity relationship modelling **(3 marks)**
- (iii) Rich picture **(4 marks)**
- (iv) Entity life history **(3 marks)**

b) Describe the functions of a feasibility study discussing its position in the Systems Development Life Cycle. **(12 marks)**

A2.

a) Object oriented techniques are used to combine data and function, when analysing a system. Describe the following techniques using examples from the case study in question A1.
(i) Type
(ii) Class
(iii) Inheritance
(iv) Method **(12 marks)**

b) Relational data analysis techniques are used to define the system data. Define the following relationships drawing an example from the case study in question A1 using conventional symbols.
(i) Mandatory relationship
(ii) Recursive relationship
(iii) Optional relationship **(9 marks)**

c) Describe the functions of a Database Management System. **(9 marks)**

A3.

a) In a typical organisation, information provided to management falls within three main areas.
Identify the types of information and typical systems used in each area. **(12 marks)**

b) During the system investigation there are many ways of extracting facts from users. Identify three traditional different methods discussing their advantages and disadvantages. In addition discuss other more informal ways of obtaining the facts. **(12 marks)**

c) Within an organisation, there are a variety of identifiable functions carried out by departments. Write brief notes indicating the brief functions of the following departments:
(i) Sales
(ii) Finance
(iii) Production **(6 marks)**

A4.

a) There are several ways in which users can be provided with a new system, depending on the type of system. Describe the following implementation methods indicating advantages and disadvantages and examples of when each would be used.
(i) Parallel Running
(ii) Direct Changeover
(iii) Pilot System **(9 marks)**

b) The advent of networking and the use of trading over the internet have exposed corporate information systems to security issues. Prepare a report to your manager advising what steps the company should take with both the hardware and software to prevent loss of data.

(12 marks)

c) As part of the implementation or installation of a system, there are other aspects you need to consider. Write brief notes on plans which need to take place for the following:

(i) Testing
(ii) Training
(iii) Data conversion **(9 marks)**

SECTION B

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

B5.

Large scale projects will be managed by a Project Manager.

What other roles / positions would you expect to have within a large scale project and why?

(12 marks)

B6.

a) Discuss what is meant by a hard methodology, and name one hard method.

(6 marks)

b) Discuss what is meant by soft methodology, and name one soft method.

(6 marks)

B7.

Human Computer Interaction (HCI) is often seen as the most important part of the systems design. Outline what guidance you would give to the BCS if they were to produce a new website targeted at the country in which you live.

(12 marks)

B8.

Prototypes are often seen as a useful tool for fact finding.

What types of facts can be established by using prototyping and how?

(12 marks)

B9.

Web sites use a variety of multimedia to present information.

Outline three different types of media that could be used to present information, commenting on their strengths and weaknesses.

(3 times 4 marks)

B10.

a) Outline the structure and stages of Normalisation so that the data is left in third normal form.

(6 marks)

b) It is then permitted to De-Normalise the data, why?

(6 marks)

B11.

a) Outline what you consider to be the best backup strategy for a database (not using RAID technology)

(6 marks)

b) What would a Database Administrator need to do to ensure that a) was achieved?

(6 marks)

B12.

Companies are now using the web to trap more and more data from their customers.

How would you design a web form so that it aided the customer to enter their data correctly?

(12 marks)