BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

INFORMATION SYSTEMS

Thursday 24th March 2016 - 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 <u>Section A</u> questions you attempt in <u>Answer Book A</u>
Answer the <u>Section B</u> questions you attempt in <u>Answer Book B</u>

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 2 questions (out of 4). Each question carries 30 marks.

A1

a) Students apply to their local library for membership. Each member is able to borrow up to three books over a period of 4 weeks, after which a fine is raised for each week or part of a week a book is overdue. The library may hold more than one copy of a book. The value of the fine varies according to the number of weeks overdue. Books cannot be borrowed if there is an outstanding fine. Books can be reserved, these are kept for 1 week. Once they become available the student is notified by email. If the student does not pick the copy of a book up in time, the copy is returned to the shelves.

   i)   Draw a simple high level diagram depicting the current system.   **(12 marks)**

   ii) Identify the entities and the relationships between them. Give one example of possible attributes for each entity and identify primary and foreign keys.   **(12 marks)**

b)   Outline two different tools that can assist in the development process.   **(6 marks)**

A2

a) Compare and contrast the following:

   i)   PERT and GANTT charts   **(5 marks)**

   ii)   The role of a programmer and a database administrator   **(5 marks)**

   iii) Packaged software and in-house developed systems   **(5 marks)**

   b) How can object oriented techniques provide a more robust system?   **(2 marks)**

c) Briefly describe the following object oriented terms:

   i)   Class   **(2 marks)**
   ii) Method   **(2 marks)**
   iii) Inheritance   **(2 marks)**
   iv) Persistence   **(2 marks)**

d) A librarian describes the following process for overdue books :-

   'For all overdue books, I check the date of return on my records. If it is up to two weeks
   overdue, the student has to pay a fine of £1. If it is between two and three weeks late, the
   fine goes up by 50 pence. Between three and four weeks late the fine is £2.50. After four
   weeks, I mark the record with 'NR', set the fine to £5 and inform the Finance Department.'

   Describe the process using Structured English or pseudocode.   **(5 marks)**

A3

 a) Describe the type of information and typical software used at the three major different
    levels of management and draw a diagram illustrating your answer.   **(12 marks)**

b) Give reasons why normalisation is used and describe the three steps of normalisation to
   produce relations in third normal form   **(8 marks)**

 c) Your manager is concerned about why a large project may fail; prepare a report
    describing possible reasons.   **(10 marks)**

A4

a) There are many risks and threats which need to be considered when developing and
   supporting computer systems. Describe how you would protect the security of the
   following

   i)   data
   ii) hardware
   iii) network

                                                                     (3 x 5 marks)

b) Important issues must be considered by the systems analyst after a system has been
   developed and before the installation/implementation. Draft a memo to your manager
   detailing steps you would take to ensure a professional installation of a completely new
   system.   **(9 marks)**

c) Identify three different ways of installing this system including one different advantage
   and disadvantage of each and explaining typically when each is used.   **(6 marks)**

B5

SSADM recommends the use of Throwaway Prototypes.

a) Discuss what a throwaway prototype is

b) Discuss the advantages of throwaway prototyping

c) Discuss the disadvantages of throwaway prototyping

(3 x 4 marks)

B6

Questionnaires are a fact finding technique used during the early stages of analysis.

a) Discuss what is meant by open ended questions by use of examples

b) Discuss what is meant by closed ended questions by use of examples

c) Where else in the project may questionnaires be used?

(3 x 4 marks)

B7

For less complex applications all the features of a Database Management Systems (DBMS) are not required.

Discuss what you consider to be the advantages and disadvantages of using a DBMS

(12 marks)

B8

The use of multimedia is often seen as essential to the success of many websites. Discuss the guidelines you would recommend for the use of THREE different types of multimedia.

(3 x 4 marks)

B9

Discuss, with an example, what type of projects are best suited for the following type of methods.

a) Soft methodology
b) Hard methodology

(2 x 6 marks)

B10

Draft a report on what factors you should take into consideration when designing applications for visually impaired users. **(12 marks)**

B11

Briefly describe the following

a) Black box testing
b) White box testing
c) Stress testing

(3 x 4 marks)

B12

Data stored in a public cloud is often seen as one way small businesses can afford current technology.

Discuss the advantages and disadvantages of a small business using a cloud database.

(12 marks)