BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

INFORMATION SYSTEMS

Monday 25th March 2019 - Morning

Time: TWO hours

Section A Answer 2 questions (out of 4). Each question carries 30 marks.
Section B Answer 5 questions (out of 8). Each question carries 12 marks.

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 any Section A questions you attempt in Answer Book A
Answer any 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 2 questions (out of 4). Each question carries 30 marks.

A1

An old railway line has been renovated by a town council to create a cycle path. A small cycle shop is to be opened providing cycles and cycle helmets for hire by customers and a selection of healthy snacks and bottled water. The shop will be staffed by volunteers and one employee who will be responsible for purchasing the perishable stock, checking sell by dates and maintaining the bicycles. Each cycle will be identified by a unique number and checked regularly to ensure safety. A small computer system will be required by the council to deal with the hiring and selling aspects of the shop.

a) Describe a suitable method which could be used to develop this small system, explain why you have chosen the method and any problems that may occur.

(12 marks)

b) Identify the entities, possible key attributes and relationships.

(8 marks)

c) Draw a data flow diagram identifying external entities, processes and data stores.

(10 marks)

A2

a) Project management software is often used when developing a large computerised system. What features would you expect to find?

(12 marks)

b) Briefly describe the following object-oriented terms with examples: an object and class, inheritance and encapsulation.

(9 marks)

c) An entity history consists of the following: sequence, selection and iteration. Give examples of each.

(9 marks)

A3

Compare and contrast:

a) Histograms and network charts. **(10 marks)**

b) Interviews and questionnaires. **(10 Marks)**

c) Normalised relations and a relational data model. **(10 marks)**

A4

a) Using the required cycle shop system described in Question A1, prepare a report advising the council of the steps you have taken in your development to ensure security of the data being processed.

(12marks)

b) Describe the following implementation techniques:

i. parallel running;
ii. direct changeover;
iii. staged implementation.

(12 marks)

c) What is meant by BCS professionalism?

(6 marks)

SECTION B
Answer 5 questions (out of 8). Each question carries 12 marks.

B5

Traditional HCI defines three type of users, *Novice*, *Intermediate* and *Expert*.

Discuss how you would design data capture screens that would be relevant to all three levels of user.

(12 marks)

B6

You have been asked to assemble a new software development team.
Provide an outline of the roles and jobs that you consider essential to be in that team.

(12 marks)

B7

Define the tools and techniques of the following:

a) hard methodology; **(6 marks)**
b) soft methodology. **(6 marks)**

B8

Using the following numbers:

1,3,2,1,1,7

illustrate what is meant by the following terms:

a) median; (**4 marks)**
b) mode; (**4 marks)**
c) mean. (**4 marks)**

B9

a) What is meant by the following terms? Provide an example.

   i) data;
   ii) information. **(4 marks)**

b) Describe what is meant by *Big Data* and identify some of the difficulties in processing the data.

(8 marks)

B10

What is meant by the following terms with respect to data?

a) compression;
b) encryption;
c) cloud databases;
d) XML. **(12 marks)**

B11

Discuss what techniques you would use to test the following:

a) a new database;
b) a new web application;
c) a real time system.

(12 marks)

B12

Discuss the following Rapid Application Development (RAD) terms:

a) time-boxing;
b) Joint Requirements Planning;
c) CASE.

(12 marks)

END OF EXAMINATION PAPER