BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

INFORMATION SYSTEMS

Tuesday 26th September 2017 – Afternoon
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 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
A team of doctors are opening a new clinic. They require a system to deal with registering patients, arranging and cancelling appointments for existing and new patients, and recording the discussions. Patient details will be recorded and each patient is assigned a unique clinic number. Patients contact the receptionist to arrange or cancel an appointment. When the patient attends the appointment they enter their name and date of birth on a check-in screen. Confirmation will be displayed and the time, room number and clinic number for the appointment displayed. After the appointment the doctor enters the details of the consultation and prescriptions provided.

a) Using the above description
   i) Draw a Context Diagram
   ii) Draw a High Level Dataflow Diagram

b) There are several methods for analysing systems. Describe the stages in the following including techniques:
   i) A typical waterfall method
   ii) A typical iterative method

A2
a) Describe what should be included in a feasibility report.

b) Discuss how you would manage a large information systems project which is estimated to take at least one year.

c) Briefly explain the following elements in object-oriented analysis and design:

   i) Use Case and Sequence diagrams.
   ii) Object Classes and Inheritance, including an example.
A3

a) The following is an example of a form used to manually record appointments.

<table>
<thead>
<tr>
<th>Appointment Date</th>
<th>Appointment Time</th>
<th>Doctor No</th>
<th>Doctor Name</th>
<th>Room No</th>
<th>Patient Clinic No</th>
<th>Patient Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/08/16</td>
<td>10.00</td>
<td>D1</td>
<td>Dr Jones</td>
<td>1</td>
<td>123</td>
<td>Mrs Brown</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.00</td>
<td>D2</td>
<td>Dr Chin</td>
<td>2</td>
<td>234</td>
<td>Mr Smith</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02/08/16</td>
<td>10.00</td>
<td>D1</td>
<td>Dr Jones</td>
<td>1</td>
<td>345</td>
<td>Miss Ball</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02/08/16</td>
<td>10.00</td>
<td>D3</td>
<td>Dr Peters</td>
<td>3</td>
<td>123</td>
<td>Mrs Brown</td>
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</tr>
<tr>
<td></td>
<td>10.30</td>
<td>D2</td>
<td>Dr Chin</td>
<td>2</td>
<td>345</td>
<td>Miss Ball</td>
</tr>
</tbody>
</table>

i) Describe the three stages of normalisation to provide 3NF (third normal form)  
(6 marks)

ii) Identify the normalised relations in the form in part a) indicating primary and foreign keys  
(6 marks)

iii) Draw an entity relationship diagram using these relations  
(4 marks)

b) Briefly discuss the advantages of using a database management system instead of separate files.  
(2 marks)

c) What are the main functions of a modern database management system?  
(12 marks)

A4

a) When planning the final installation of a system, discuss how you would organise training, system testing and conversion of existing data.  
(10 marks)

b) Briefly discuss the advantages and disadvantages of choosing packaged software rather than developing customised software.  
(8 marks)

c) Discuss measures taken to ensure as high a level of security as possible for the following:

i) Providing on-line ordering and payment systems over the internet.  
(6 marks)

ii) Protecting computers, terminals and networks in a company.  
(6 marks)

Section B

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

B5

Define what is meant by the following cloud computing terms and describe the potential benefits for a small computing company:

a) Infrastructure as a service  
(3 x 4 marks)

b) Platform as a service  

(3 x 4 marks)

c) Software as a service  

(3 x 4 marks)
B6
Discuss software solutions that can be implemented to ensure that a blind person can successfully use a web page.

[Focus only on software – there are no marks for discussing hardware related solutions]  (12 marks)

B7
Discuss, using examples, the advantages and disadvantages of closed and open questions in a questionnaire.  (2 x 6 marks)

B8
With reference to an example and the type of information shown, describe:

a) Pie Charts
b) Scatter Charts
c) Bar Charts  (3 x 4 marks)

B9
Discuss methods of ensuring that a data centre is physically secure.  (12 marks)

B10
With reference to the type of decisions made, define:

a) Operational Management
b) Strategic Management
c) Tactical Management  (3 x 4 marks)

B11
Define what is meant by the following terms:

a) Multimedia
b) Hypertext
c) Metadata
d) XML  (4 x 3 marks)

B12
What is meant by the following software maintenance related terms?

a) Legacy System
b) Software Bug
c) Version Control
d) Software Patch  (4 x 3 marks)