BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 6 Professional Graduate Diploma in IT

SOFTWARE ENGINEERING 2

Friday 2nd October 2015 - Morning
Answer **any** THREE questions out of FIVE. All questions carry equal marks.
Time: THREE hours

Answer any <u>Section A</u> questions you attempt in <u>Answer Book A</u>
Answer any <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 Section A questions in Answer Book A

A1.

a) Explain what is meant by software re-factoring. Discuss the steps involved in re-factoring a large software system and discuss why re-factoring little and often may be a more effective strategy for a software development team to adopt.
(10 Marks)

b) A company wishes to convert a desktop application interacting with a local database to a web-based database application where the database will be on a remote server and users will access the application via a web browser. Discuss the high level architecture of both systems and indicate what steps you would undertake to achieve the necessary conversion. (10 Marks)

c) During the course of the project, the company decides that it wishes the new web-based application's interface to be made accessible to international users. How can this be achieved and what advantages would the company achieve by having an application that is accessible to international users? (5 Marks)

A2.
a) Explain why it is necessary to maintain a software system over its lifetime. In your answer, you should outline the various types of maintenance that software systems require and give examples of each type. (12 Marks)

b) Discuss at least three factors which contribute to difficulties during software maintenance and give examples of each. (9 Marks)

c) It has been stated that it is equally important to maintain all the associated documentation of a system as well as its software over time. Discuss the reasons for this statement. (4 Marks)

Section B

Answer Section B questions in Answer Book B

B1.
a) Present an outline of a software improvement framework with which you are familiar (for example CMMI), and discuss how such frameworks handle evaluation and improvement management. (15 Marks)

b) Discuss the extent to which the software industry of today is moving towards and achieving the very highest level of excellence, by using such frameworks. (10 Marks)

B2.
a) For each of the following reuse techniques, provide a clear definition and appropriate examples of usage:
  i. Application system reuse
  ii. Component-based development
  iii. Design patterns

(15 Marks)

b) Explain why, despite the real and potential benefits of reuse, some companies still experience major difficulties with it. (10 Marks)

B3.

a) A company is looking to develop a new proprietary software application that can compete amongst current social media platforms. As Chief Analyst, give an outline of the different stages of requirements engineering, and discuss the tools and techniques that you would adopt to derive a complete and consistent requirements specification from the company. (15 Marks)

b) Discuss why many systems continue to fall below user expectations, despite the established practice of software requirements engineering. (10 Marks)