BCS THE CHARTERED INSTITUTE FOR IT

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

SOFTWARE ENGINEERING 2

Friday 22nd March 2019 - 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   *[Software reuse. Component based software engineering]*

a)   Explain what is meant by COTS. Discuss the validity of the claim that "COTS means compromise".

(5 marks)

b)   Write a brief report explaining the meaning of Component-Based Software Engineering (CBSE) and its main features. The report should also briefly discuss the impact of Open Source Software Engineering projects, available from the Internet, on the practice of CBSE.

(10 marks)

c)   In the context of CBSE discuss the real and potential benefits of reuse and explain why some companies still experience major difficulties with it.

(10 marks)

A2   *[Software evolution]*

a)   It is widely recognised that change in any complex system, such as a software application, is inevitable. Discuss why this is the case, outlining at least FOUR reasons, and what steps can be taken in preparation for the inevitable changes.

(12 marks)

b)   Explain what is meant by Impact Analysis in the context of software change management. Outline the process of change management discussing when and how Impact Analysis is carried out, and why it is important.

(13 marks)

B3 *[Software Process Improvement]*

a) Discuss the principal stages of the process improvement lifecycle, paying particular attention to the concepts of measurement, modelling, and goal setting.

(15 marks)

b) Discuss the notions of process capability and maturity for process improvement. Illustrate your answer with examples from a typical model in use today.

(10 marks)

B4 *[Software Maintenance and the related types of maintenance, Impact Analysis, Reverse and Re-engineering of software]*

a) Compare the different approaches to software maintenance and comment critically on the factors that may affect their costs.

(12 marks)

b) A small, but historically profitable manufacturing company must decide whether to scrap, maintain, re-engineer, or replace its legacy payroll system. Discuss the strengths and weaknesses of each option and recommend a possible option for the company going forward.

(13 marks)

B5 *[Software Architecture and software re-factoring, Architectural styles, examples, and applications, Architectural models, Model-driven development]*

a) Using suitable examples and diagrams, explain the characteristics of Model-driven development.

(10 marks)

b) Briefly discuss the following in respect of Model-driven development:

i) programmer productivity and application generators;
ii) software product quality and domain-specific language tools;
iii) architectural styles and refactoring.

(15 marks)

END OF EXAMINATION PAPER