BCS THE CHARTERED INSTITUTE FOR IT

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

SOFTWARE ENGINEERING 2

Thursday 21st April 2022 – 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) Compare and contrast the following approaches to reuse in the software industry:

 i) Application system reuse
 ii) Component-based development.

(10 marks)

b) Explain the main differences between the following techniques:

 i) Software development with reuse
 ii) Software development for reuse.

(6 marks)

c) Component based systems development (CBSD) methods place a lot of emphasis on component reuse, i.e. they usually incorporate both techniques listed in b) above.

Outline a typical CBSD method. In particular, discuss the main stages typically employed in CBSD methods.

(9 marks)

A2.

a) Define the term 'software maintenance' and distinguish between corrective, adaptive, perfective and preventive maintenance activities.

(10 marks)

b) Draw a diagram which shows a typical software maintenance/software evolution process initiated by change requests and briefly discuss the main steps of this process with the particular emphasis on impact analysis.

(15 marks)

A3

a) Explain how, as a software project manager, you would estimate and measure the productivity of your software development team.

(5 marks)

b) Outline **FIVE** factors that, as a software project manager, you would need to consider when selecting and building a project team to undertake a new development project. In the case of **each** factor, discuss relevant issues that need to be taken into consideration to lower any risks.

(15 marks)

c) Briefly discuss the main differences between 'traditional project planning' and 'agile project planning'.

(5 marks)

Section B
Answer Section B questions in Answer Book B

B4.

a) Write a report outlining the different types of models involved for process improvement and assessment, recommending an appropriate reference model to be followed, for a large commercial organisation of 10,000 employees, considering various software improvement programmes.

(17 Marks)

b) Briefly discuss the current state of practice of Software Process Improvement (SPI) efforts in industry and whether such standards (such as Software Engineering Institute (SEI) and International Standards Organisation (ISO)) are easily applicable to small firms.

(8 Marks)

B5.

a) Define 'Open Source Software Development' and explain how this development process adheres to the principles and practices of software engineering as a discipline. Illustrate your answer with suitable examples.

(17 Marks)

b) Briefly comment on the reliability, efficiency, and functionality of open source software in the practice of software engineering today.

(8 Marks)

End of Examination