BCS THE CHARTERED INSTITUTE FOR IT

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

SOFTWARE ENGINEERING 2

Wednesday 23rd March 2016 – Morning
Answer **any** THREE questions out of FIVE. All questions carry equal marks.
Time: THREE hours

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 Section A questions in Answer Book A

A1.

a) Distinguish between software process and software product metrics. **(5 marks)**

b) At which stages of software development projects would you use the following software metrics and software quality 'measures':

(i) Function Points
(ii) Lines of Code Count (LOC)
(iii) Cyclomatic Complexity
(iv) Coupling and Cohesion

Explain why. **(8 marks)**

c) Comment on applicability of Function points, LOC, Cyclomatic complexity and classical Coupling and Cohesion to 'object-oriented' projects. **(12 marks)**

A2.

a) Explain what is meant by a legacy system and why such systems may be critical to the operation of an organization. Discuss ways in which organizations can lessen their reliance on legacy systems. **(10 marks)**

b) Explain the differences between reverse engineering, re-engineering and re-structuring in software projects. **(6 marks)**

c) Outline the process of preventive maintenance and discuss why such maintenance is needed. **(9 marks)**

A3.

a) Discuss whether software project management differs from the management of projects in other sectors of society. **(10 marks)**

b) As a software project manager what factors would you take into account when selecting staff to work on a software development project? **(7 marks)**

c) There is no simple way to make an accurate estimate of the cost and effort required to develop a software system. Two popular software cost estimation techniques are Expert Judgement and Algorithmic Cost Modelling. You have been given a task to briefly explain these techniques and discuss their potential disadvantages. **(8 marks)**

Section B
Answer Section B questions in Answer Book B

B4.

a) Discuss the merit of each of the following Open Source Software Engineering (OSSE) project practices, giving clear explanations and appropriate examples:

i. Adopting standards and facilitating reuse
ii. Early product release and peer review
iii. Develop communities of volunteers both as users and developers

(15 marks)

b) Discuss the view that the future advancement of open source practices amongst all software developers is wholly dependent on the widespread adoption of Open Source Software Engineering tools. **(10 marks)**

B5.

a) Present a brief outline of the hierarchical structure of the Capability Maturity Model (CMM) and give examples of key process areas and goals. **(8 marks)**

b) Discuss how the many process areas and goals of CMM might be tailored for a small organization wishing to move into e-commerce, by adopting processes that are rigorous, disciplined, and of industrial strength. **(9 marks)**

c) Discuss the view that agile methodologies can adequately address many Level 2 and 3 practices of software process improvement. **(8 marks)**