

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)**