

BCS THE CHARTERED INSTITUTE FOR IT

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

SOFTWARE ENGINEERING 2

Tuesday 10th November 2020 - 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) The spiral model of the software process was originally proposed by Boehm.
- i) Provide a brief description of this software life cycle model.
(3 marks)
 - ii) Explain how various models such as the waterfall model, the prototyping model and the incremental model can be accommodated in the spiral model.
(9 marks)
- b) Identify and briefly discuss **THREE** advantages of incremental software development.
(6 marks)
- c) Consider a bookshop specializing in tourist guides, maps, atlases etc. The owner wants to introduce an online sales system.
- Describe how you would implement/deliver this system using an incremental approach.
(7 marks)

A2.

- a) Explain why the process of project planning is iterative and why a plan must be continually reviewed during a software project.
(6 marks)
- b) Identify the main sections of a software project plan and briefly explain the purpose of each section.
(12 marks)
- c) Explain why several software cost estimation techniques should be used to produce a cost estimate for a large complex software system.
(7 marks)

A3.

- a) Discuss **THREE** factors which contribute to difficulties when undertaking software maintenance and give examples of each.
- (9 marks)**

- b)
- i) Briefly explain the meaning of software re-engineering.
 - ii) Software re-engineering has **TWO** key advantages over software re-development (i.e. replacement of the existing software with the new one).

Briefly discuss these advantages.

(9 marks)

- c) Briefly explain how a conventional software system can be re-engineered into an object-oriented implementation and which techniques (e.g. UML techniques) could be used to achieve this.

(7 marks)

[Turn Over]

Section B
Answer Section B questions in Answer Book B

B4.

- a) Discuss how Software Process Improvement (SPI) frameworks, such as CMM-I, can reduce cost and improve the timeliness and quality of engineering and management practices in software organisations.

(15 marks)

- b) Discuss the view that SPI reference models leave too much of the implementation detail to software practitioners.

(10 marks)

B5.

- a) For **BOTH** of the following techniques, explain their use in software development and assess their impact on **BOTH** the quality and cost of any resulting systems:

- i) Software reuse;
- ii) Design patterns.

(16 marks)

- b) With the aid of suitable examples, explain the concept of software product lines, and assess the extent of their use in the software industry.

(9 marks)

End of Examination