

BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

SOFTWARE ENGINEERING

Wednesday 23rd April 2025 - Afternoon

Answer **any** FOUR questions out of SIX. All questions carry equal marks.

Time: TWO 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) Define what is meant by the term software, discuss its characteristics and explain how it differs from other components of a computer system.
(10 marks)
- b) Describe in detail **three** different types of software that are commonly found in computer systems and discuss the function of each.
(15 marks)

A2.

An automated ticket-issuing system sells rail tickets. When the user presses the start button, a menu display of potential destinations is activated along with a message to the user to select a destination.

Once a destination has been selected, users are requested to input their credit card. Its validity is checked, and the user is then requested to input a personal identifier. When the credit transaction has been validated, the ticket is issued.

- a) Describe **five** ambiguities or omissions that you find in this statement of requirements.
(10 marks)
- b) Explain what is meant by a non-functional requirement and discuss **three** non-functional requirements for such a system and give reasons why they are appropriate.
(15 marks)

A3.

- a) Explain why it is important to model the context of a system that is being developed.

Give **two** examples of possible errors that could arise if software engineers do not understand the system context.
(15 marks)

- b) Develop a sequence diagram showing the interactions involved when a student registers for a course in a university.

Assume that the student accesses an electronic course catalogue to find out about available courses.

Courses may have limited enrolment, so the registration process must include checks that places are available.

(10 marks)

Section B
Answer Section B questions in Answer Book B

B4.

- a) Describe the **three** main types of software maintenance. Explain why it is sometimes difficult to distinguish between them. Give examples to illustrate your answer.
(10 marks)
- b) Discuss **three** circumstances in which an organisation might decide to scrap a system when the system assessment suggests that it is of high quality and of high business value.
(6 marks)
- c) Discuss **three** problems with support software which might mean that an organisation must replace its legacy systems.
(9 marks)

B5.

- a) Discuss **three** advantages and **three** disadvantages of using a source control system.
(12 marks)
- b) Explain why adaptors are usually needed when systems are constructed by integrating Commercial Off The Shelf (COTS) products.

Suggest **three** practical problems that might arise in writing adaptor software to link two COTS application products.
(13 marks)

B6.

- a) Explain, giving at least **three** reasons, why testing can only detect the presence of errors, not their absence.
(13 marks)
- b) Explain **four** benefits of involving users in release testing at an early stage in the process.

Discuss **two** disadvantages of user involvement.
(12 marks)

END OF EXAMINATION