

BCS THE CHARTERED INSTITUTE FOR IT

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

SYSTEM DESIGN METHODS

Wednesday 22nd April 2026 – Afternoon

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) Describe the **three** aspects of a system that are modelled by a use case diagram.
(10 marks)
- b) Describe the **three** aspects of a system that are modelled by a class diagram.
(10 marks)
- c) Describe the **two** aspects of a system that are modelled by an activity diagram.
(5 marks)

A2.

A brewery wishes to develop an information system to monitor the brewing processes within its brewing plants.

- a) Discuss which systems design techniques could be used to design the interfaces for the brewing process monitoring system.
(10 marks)
- b) Discuss which systems design techniques could be used to design the data structures required for the brewing process monitoring system.
(5 marks)
- c) How could the systems design techniques used support prototyping of the brewing process monitoring system?
(10 marks)

A3.

- a) Discuss the differences and similarities between hard systems design methods, such as UML, and soft systems design methods, such as SSM.
(13 marks)
- b) Discuss the appropriateness of a waterfall systems development approach in terms of:
 - i. Clarity of requirements.
 - ii. Stability of requirements.
 - iii. Project management.
(12 marks)

Section B
Answer Section B questions in Answer Book B

B4.

- a) Your organisation has been using a structured method for many years. Now, they want to introduce an agile development method with Unified Modelling Language (UML). Discuss different approaches to training and educating the staff in agile methods and UML.

(9 marks)

- b) Explain the difference between reverse engineering and re-engineering in the software industry. Give **two** examples of software projects involving:

- i. Reverse engineering.
- ii. Re-engineering.

(10 marks)

- c) Outline **six** things that can go wrong when introducing a new systems design method.

(6 marks)

B5.

- a)
- i. What is the difference between software process metrics and software product metrics?
 - ii. Describe **three** types of software process metrics that may be collated as part of a software process improvement. Give **one** example of **each** type of metric.

(13 marks)

- b) Explain briefly what is meant by Software Quality Assurance (SQA).

(3 marks)

- c) Two main categories of SQA techniques are static and dynamic. Static techniques do not involve the execution of software. Dynamic techniques involve the execution of software. Discuss briefly which static and dynamic SQA techniques are suitable for:

- i. Checking the quality of software requirements.
- ii. Checking the quality of software design.
- iii. Checking the quality of code.

(9 marks)

END OF EXAMINATION