BCS THE CHARTERED INSTITUTE FOR IT

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

PROGRAMMING PARADIGMS

Wednesday 22nd April 2026 – 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) Describe what is meant by the terms declarative and imperative in relation to programming languages, including summarising how **each** deals with control flow.

(8 marks)

b) Compare procedural and object-oriented programming styles, by discussing **three** advantages and **three** disadvantages of **each**.

(12 marks)

c) Discuss what is meant by the term scripting language and explain where they are most likely to be used.

(5 marks)

A2.

a) Identify and describe **four** steps used by compilers and interpreters.

(8 marks)

b) Compare compiled and interpreted approaches by discussing **three** advantages and **three** disadvantages of **each**.

(12 marks)

c) Discuss whether hybrid (compilation with interpretation) approaches overcome the disadvantages of using each approach on its own.

(5 marks)

A3.

a) Identify and discuss **two** approaches by which polymorphism is achieved in object-oriented programming. Include a code example showing the syntax by which **each** is implemented and state whether the approach is classed as run-time or compile-time polymorphism.

(12 marks)

b) How does single inheritance differ from multiple inheritance and why is multiple inheritance sometimes considered to be poor practice? Include code examples to show the syntax required for **each** type of inheritance, including **one** that illustrates a problem that can occur with multiple inheritance.

(8 marks)

c) What is meant by the term message in object-oriented programming?

(5 marks)

Section B
Answer Section B questions in Answer Book B

B4.

a) Give **two** advantages and **two** disadvantages of recursion when compared to iteration.

(8 marks)

b) Discuss what is meant by total function and partial function in functional languages. Provide an example of **each** and then give a code example in which your example is implemented.

(12 marks)

c) What does it mean to say that a function is strict in functional programming? Give an example of a strict function.

(5 marks)

B5.

a) Identify and describe the **two** types of quantifier in first-order predicate logic. Using **one** of them as an example, show how it can be used in logic programming.

(8 marks)

b) Two forms of query in logic programming are existential and conjunctive. Distinguish between these types of query and provide an example of **each** in a logic programming language.

(9 marks)

c) What is the closed world assumption in logic programming, and how does it relate to the idea of negation as failure? Include an example in a logic programming language to illustrate your answer.

(8 marks)

END OF EXAMINATION