BCS THE CHARTERED INSTITUTE FOR IT

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

SOFTWARE ENGINEERING 2

Monday 13th October 2025 – Morning

Answer **any** THREE questions out of FIVE. All questions carry equal marks.

Time: THREE hours

Answer any <u>Section A</u> questions you attempt in <u>Answer Book A</u>
Answer any <u>Section B</u> questions you attempt in <u>Answer Book B</u>

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) Discuss **five** principle stages you would use to create a preliminary architectural design for the first prototype of a mobile app that lets you create and save a shopping list on your device.

                    (13 marks)

    b) Identify and evaluate **six** opportunities to use open-source software when building the shopping app in part (a).

                    (12 marks)

A2.

    a)

        i. Describe what is meant by incremental development and explain why it is the **most** effective approach for developing business software systems.

                    (7 marks)

        ii. Discuss whether this model is **less** appropriate for real-time systems engineering.

                    (6 marks)

    b) Explain **four** reasons why it is important to make a distinction between developing the user requirements and developing system requirements in the requirements engineering process.

                    (12 marks)

A3.

a) Discuss the **key** differences between a software library and a framework giving examples of when it is appropriate to use each.

(7 marks)

b) Consider carefully the following three-stage scenario for publication of an academic paper:

    i.   Users can upload their papers to a central server.
    ii.   Refereeing stage: papers can be reviewed by a number of reviewers appointed by an editor. The editor can accept, ask for revisions or reject papers based on the majority view of the referees.
    iii.   Once the paper has been accepted, it can be retrieved via a web link or an API.

As a web engineer, identify **five** major challenges in the design and development of the academic publisher's site.

For **each** of the challenges identified, provide an outline solution including the recommended technology.

(No marks will be given for answers that quote stages of the Software Development Life Cycle (SDLC)).

(18 marks)

[Turn Over]

Section B
Answer Section B questions in Answer Book B

B4.

You have been hired as a developer to produce a new app, which is to deliver outstanding patient services for people requiring hospital treatment.

The healthcare provider has requested such an app to improve patient service and use of medical resources and is to be used primarily by the patients.

For now, this is a high-level idea with not much indication of how to go forward.

a) Explain the benefits of a prototyping approach to software development and discuss how it can be used when developing the new patient services app.
(10 marks)

b)
   i.   Compare and contrast **two** Agile development methodologies you are familiar with such as Scrum or Kanban.
   (10 marks)

   ii.   Evaluate the use of **one** of these Agile development methodologies for developing the patient services app.
   (5 marks)

B5.

An app has been created to advertise and sell tickets for a major annual boxing event, to stream the boxing matches live and to give information on the different fights, boxers, schedules and results.

The reach of this app will be global, and the audience of the event is anticipated to grow considerably over the next few years.

The developers are concerned that there may be some failings in the app and feel there is a need to observe and make improvements for future years.

a) On reflection, the developers found that most of the failings within the app were due to poor requirements management.

Discuss your recommendations for creating a requirements management strategy to help the development team.

(10 marks)

b) Using examples from the above scenario:

i. Explain how a non-functional requirement differs from a functional requirement.

(5 marks)

ii. Discuss why non-functional requirements (NFR) elicitation would be necessary.

(10 marks)

END OF EXAMINATION