

BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

WEB APPLICATION DEVELOPMENT

Monday 7th October 2024 – Morning

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) Demonstrate the use of the document object model when using JavaScript to build dynamic frontend webpages. **(10 marks)**

- b) Support the following statement “The CSS box model is said to be a fundamental concept as to how elements are rendered on screen and will affect how elements are positioned on the page”. **(9 marks)**

- c) Appraise XML and JSON for use in storing and sharing data. **(6 marks)**

A2.

Version control systems are widely used in software development. When answering the following questions, you may use examples of a version control system you are familiar with, such as GitHub.

- a) Discuss how the use of repositories and branches in a version control system allow developers to work off-line/ locally on separate coding task allocations, which can then be merged back to the main project. **(12 marks)**

- b) Evaluate how developers work collaboratively and remotely using version control systems, local and remote repositories, and the use of branches. **(8 marks)**

- c) Discuss how a version control system can help with code reuse. **(5 marks)**

A3.

A new website about historic events is being developed. It should allow users to search for information on historic events and upload any memorabilia they may have for public viewing. There will be a forum and chat function, as well as streaming archived clips of famous historic events. At anniversaries of events, there may be a huge increase of traffic in short time periods.

Justify, using an example, **each** of the following tests which could be carried out during development of the website:

- i. Unit testing.
- ii. Integration testing.
- iii. Load testing.
- iv. Visual testing.
- v. Cross-functional testing.

(25 marks)

Section B
Answer Section B questions in Answer Book B

B4.

- a) Explain the architectural principles of microservices. **(3 marks)**

- b) Discuss **four** scenarios where you would consider using microservices. **(12 marks)**

- c) Describe **five** key features of back-end technologies when developing web applications. **(10 marks)**

B5.

- a) Discuss how front-end frameworks are used to build web applications, including **four** reasons for their use and the reasons for making the choice of which one to adopt. **(10 marks)**

- b) Assess **five** advantages of using JavaScript for building web applications. **(15 marks)**

B6.

Large language models are increasingly being used in web applications to enhance user experiences, provide valuable features, and automate various tasks.

- a) Discuss **four** ways that language models are used to enhance the user’s web experiences. **(12 marks)**

- b) Discuss **four** problems associated with the use of large language models in web applications. **(13 marks)**

END OF EXAMINATION