BCS THE CHARTERED INSTITUTE FOR IT
BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

WEB APPLICATION DEVELOPMENT
Thursday 6th October 2022 - 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) Describe the following types of web analytics:
   i). Click analytics  
   ii). Page tagging  
   iii). Logfile analysis  
   iv). Customer lifecycle analytics  
   v). Off-site web analytics.  

(10 marks)

b) When using the Hypermedia as the Engine of Application State (HATEOAS) method to develop back-end technologies, discuss the:
   i). Advantages  
   ii). Disadvantages  

(5 marks)
(5 marks)

c) List FIVE potential issues that may occur when a web application has a large volume of network traffic.  

(5 marks)

A2. 

a) Discuss the potential uses for property-based testing.  

(5 marks)

b) Describe the relationship between cross-functional testing and end-to-end testing.  

(5 marks)

 c) Discuss the importance of using Jira to manage a web application team with more than 20 members.  

(15 marks)
A3.  
a) Describe FIVE main aspects of version control.  
(10 marks)  
b) Outline FIVE potential advantages of version control tools using a version control tool of your choice.  
(10 marks)  
c) Write the complete workflow of the ‘commit-pull-push’ mantra.  
(5 marks)
Section B
Answer Section B questions in Answer Book B

B4.
a) Describe the Brewer’s (CAP) Theorem, naming the THREE guarantees specified in the theorem and discuss its importance with respect to web applications.  
(8 marks)
b) Describe each of the THREE guarantees for distributed systems that are specified by Brewer’s Theorem.  
(6 marks)
c) Evaluate to what extent all three can be achieved in practical web applications. Give examples to illustrate your answer.  
(11 marks)

B5.
a) Describe THREE principal characteristics of a Graph Database.  
(6 marks)
b) Assess THREE key advantages of using a Graph Database in a web application over other available storage systems.  
(9 marks)
c) Outline a web application that demonstrates the advantages of deploying a graph database.  
(10 marks)

B6.
a) What are cookies?  
(5 marks)
b) Discuss how cookies are used in web applications.  
(10 marks)
c) Explain the security implications of using cookies and how they can be addressed by the application builder.  
(10 marks)

End of Examination