

BCS THE CHARTERED INSTITUTE FOR IT
BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 4 Certificate in IT

INFORMATION SYSTEMS

Tuesday 5th October 2021 - Afternoon

Time: TWO hours

Section A and Section B each carry 50% of the marks.
You are advised to spend about 1 hour on Section A (30 minutes per question)
and 1 hour on Section B (12 minutes per question).

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 2 questions (out of 4) in Answer Book A. Each question carries 30 marks.

A1.

A town council needs to set up an online system for a mobile library which will travel to local villages and allow villagers to borrow and return books without having to come into the town. The system has to deal with stocking books in the library from the town library stock, registering members, the borrowing and returning of books and raising fines for overdue books. The council has appointed a library manager and assistant to discuss the development with a small systems software house.

- a) Describe the following techniques and draw examples using the above scenario.
- i) A context diagram;
 - ii) A high-level dataflow diagram;
 - iii) An entity relationship model.

(15 marks)

- b) This system could be developed using a prototyping method. Describe **THREE** prototyping methods.

(9 marks)

- c) The software house employs system analysts and web developers. Describe the different functions of these roles.

(6 marks)

A2.

- a) Before the library system described in question one is developed, the council requires a feasibility study to be carried out. What areas should be contained in a feasibility report?

(10 marks)

- b) Briefly describe **FOUR** data gathering techniques that could be used in the discussions between the manager and the software house employees.

(12 marks)

- c) Describe what makes an effective screen design.

(8 marks)

A3.

- a) What is the theory behind a relational database?
(6 marks)
- b) Describe the main functions of a relational database and how data is stored and accessed.
(12 marks)
- c) What measures need to be taken to recover a database from a system failure due to a power outage?
(12 marks)

A4.

- a) Describe the advantages and disadvantages of **THREE** different ways of implementing a completed system, giving a typical example of each.
(12 marks)
- b) What is meant by system metrics and key performance factors with regard to development and implementation?
(6 marks)
- c) Identify the **THREE** main levels of management information flows through a business describing the type of information and software used at each level.
(12 marks)

[Turn Over]

Section B

Answer 5 questions (out of 8) in Answer Book B. Each question carries 12 marks.

B5.

Traditional database management systems (DBMS) conform to ACID.

- a) Discuss what is meant by ACID and how it ensures data integrity. **(6 marks)**
- b) Discuss either CAP or BASE with respect to how data integrity is maintained. **(6 marks)**

B6.

What documentation would you expect to develop to fully support an Entity Relationship Diagram?

(12 marks)

B7.

Explain what is meant by Agile, a software development methodology.

(12 marks)

B8.

Explain why you would use the following testing strategies.

- a) Stress; **(3 marks)**
- b) Load; **(3 marks)**
- c) Unit; **(3 marks)**
- d) Integration. **(3 marks)**

B9.

Explain what is good practice with respect to:

- a) Password policy; **(6 marks)**
- b) Access control policy. **(6 marks)**

B10.

Outline the positives and negatives of a small business moving its database to a cloud provider.

It is assumed that the small business will have a reliable, consistent and stable connection to the Internet. Therefore, there will be no marks for discussing the business's internet connection.

(12 marks)

B11.

A company has decided to change the software it uses for managing its business. Outline a report to the company management on how it could mitigate the risks of this process.

(12 marks)

B12.

a) Define what is meant by multimedia.

(3 marks)

b) Discuss methods of ensuring that multimedia can be inclusively used within a web site, so that users with an impairment (either visual or aural) can still effectively use that site.

(9 marks)

End of Examination